



Charnwood

Leading in Leicestershire

**CHARNWOOD BOROUGH COUNCIL
Air Quality Progress Report**

APRIL 2008

CHARNWOOD BOROUGH COUNCIL

DIRECTORATE OF HOUSING AND HEALTH

Environmental Protection Section

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EXECUTIVE SUMMARY

As part of the duties under the Environment Act 1995 local authorities are recommended to produce annual air quality progress reports in years when they are not undertaking review and assessments of air quality. This report provides both an up to date report on air quality in Charnwood and action being taken to address air quality problems.

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 were emissions from local traffic and commercial sources.

In 2007 monitoring of nitrogen dioxide at 30 locations (including 4 at kerbside) in Charnwood, demonstrated a breach of UK air quality objectives at 12 sites.

9 of those sites are within the existing Loughborough and Syston Air Quality Management Areas, with the additional 3 falling outside of existing AQMAs, namely at Birstall, Thurmaston and Nottingham Road (Loughborough).

Following discussions with DEFRA, 2 of these additional sites are already either subject to a future Detailed Assessment (Thurmaston), or continued data collation (Birstall).

In the case of Nottingham Road, air quality modelling calculations submitted in support of the planning application for the Loughborough Inner Relief Road (LIRR) indicate that, due to a forecasted decrease in traffic volume on this route, there will be a net positive improvement in NO₂ concentrations for all relevant receptors in this area.

As planning permission for the LIRR has now been granted and construction programmed to begin during 2009, then it is felt that under the circumstances any further assessment of this monitoring location would not provide a worthwhile contribution to assessing this particular objective breach, at this time.

Sulphur dioxide emissions from the Great Central Railway engine sheds are causing occasional breaches of short-term air quality objectives. Results 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.

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GLOSSARY

AADT	Annual Average Daily Traffic (vehicles per day)
AQMA	Air Quality Management Area
CBC	Charnwood Borough Council
CO	Carbon monoxide
DA	Detailed Assessment
DEFRA	Department for Environment Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
EPAQS	Expert Panel on Air Quality Standards
FAQ	Frequently Asked Questions
GCR	Great Central Railway
LAQM	Local Air Quality Management
LAQM.TG(03)	Local Air Quality Management Technical Guidance Document
LCC	Leicestershire County Council
LIRR	Loughborough Inner Relief Road
LTP	Local Transport Plan 2006-2011 (Leicestershire County Council)
mg/m ³	Milligrams of the pollutant per cubic meter of air
µg/m ³	Micrograms of the pollutant per cubic meter of air
ppb	Parts per billion
ppm	Parts per million
NAEI	National Atmospheric Emission Inventory
NAQS	National Air Quality Strategy
NEMA	Nottingham East Midlands Airport
NO	Nitrogen monoxide
NO ₂	Nitrogen dioxide
NO _x	Oxides of Nitrogen
PID	Project Initiation Document
PM ₁₀	Particles with diameter less than 10µm
QA/QC	Quality Assurance / Quality Control
R&A	Review and Assessment
SO ₂	Sulphur dioxide
TEOM	Tapered Element Oscillating Microbalance
TG	Technical Guidance [LAQM TG(03)] Document
UKAS	United Kingdom Accreditation Service
USA	Updating and Screening Assessment
UWE	University of the West of England
vpd	Vehicles per day
WHO	World Health Organisation

I. INTRODUCTION

I.1 BACKGROUND

The impact of air quality on humans has long been established. Government experts have estimated that up to 24,000 people die prematurely every year because of the effects of air pollution.

Due to the successful implementation of the Clean Air Act many source of visible pollution, such as the heavy urban smog's of the 1950's, have been successfully reduced.

Today's concerns lie more predominantly with the pollutants that we are unable to see, and as such the Review and Assessment is designed to look in detail towards the seven most recognised indicators of air quality on human health to enable a more effective approach for tackling the risks, as well as the associated significant economic costs, that can be attributed to poor health.

There is still much that we do not know about the exact relationships between our health and the concentrations of the individual pollutants in the air that we breathe. The ongoing framework of the Review and Assessment process takes account however, of improvements that have been made in the methods of predicting air quality changes to establish if there have been any significant changes in the sources of pollution in the local area.

The conclusions of this report will allow for plans to be drawn up, to allow us to further implement the necessary improvements required to improve on the generally good air quality that exists in the Borough, to which we are committed.

I.2 STATUTORY REQUIREMENTS

Section 82 of the Environment Act imposes a duty on all local authorities within the UK to periodically review air quality within their districts to assess compliance with the air quality objectives contained in the National Air Quality Strategy. The air quality objectives that must not be exceeded are outlined in section 1.3

If it is considered likely that there will be a breach of one or more of the objectives the local authority must submit a legal order designating an Air Quality Management Area (AQMA), and develop through consultation an action plan to ensure that the relevant objective(s) will be met. The Act and its associated regulations recommend time scales for completion of these duties.

1.3 NATIONAL AIR QUALITY OBJECTIVES

Objectives for air pollution are concentrations over a given time period that are considered to be acceptable in the light of what is known about the effects of the pollutant on health and on the environment. They can also be used as a benchmark to see if air pollution is getting better or worse.

The objectives adopted in the UK are part of the Air Quality Strategy published by the Government in January 2000. A summary of these objectives is given in the table below.

Summary of the UK Air Quality Strategy objectives

Pollutant	Objective	Measured as	To be achieved (& maintained) by
Benzene All Authorities	16.25 µg/m ³ (5ppb)	Running Annual Mean	31 December 2003
Benzene Authorities in England and Wales only	5 µg/m ³ (1.5ppb)	Annual Mean	31 December 2010
Benzene Authorities in Scotland and Northern Ireland only	3.25 µg/m ³	Running Annual Mean	31 December 2010
1,3-Butadiene	2.25 µg/m ³ (1ppb)	Running Annual Mean	31 December 2003
Carbon Monoxide	10 mg/m ³ (8.6ppm)	Maximum Running 8 hr Mean	31 December 2003
Lead	0.5 µg/m ³	Running Annual Mean	31 December 2004
Lead	0.25 µg/m ³	Running Annual Mean	31 December 2008
Nitrogen Dioxide	200 µg/m ³ (105ppb) Not to be exceeded more than 18 times a year	1 hour mean	31 December 2005

Nitrogen Dioxide	40 $\mu\text{g}/\text{m}^3$ (21ppb)	Annual Mean	31 December 2005
Respirable Particulates (PM₁₀)	50 $\mu\text{g}/\text{m}^3$ Not to be exceeded more than 35 times a year	24 hour mean	31 December 2004
Respirable Particulates (PM₁₀)	40 $\mu\text{g}/\text{m}^3$	Annual Mean	31 December 2004
Sulphur Dioxide	266 $\mu\text{g}/\text{m}^3$ (100ppb) Not to be exceeded more than 35 times a year	15 minute mean	31 December 2005
Sulphur Dioxide	350 $\mu\text{g}/\text{m}^3$ (132ppb) Not to be exceeded more than 24 times a year	1 hour mean	31 December 2004
Sulphur Dioxide	125 $\mu\text{g}/\text{m}^3$ (47ppb) Not to be exceeded more than 3 times a year	24 hour mean	31 December 2004

Conversions of ppm/ppb at 20°C and 1013mb

I.4 REVIEW AND ASSESSMENT TIMETABLE

LAQM Activity	Completion Date	Which Authorities?
Updating and Screening Assessment	End of May 2003	All authorities
Detailed Assessment	End of April 2004	Those authorities which have identified the need for a Detailed Assessment in their May 2003 Updating and Screening Assessment
Progress Report	End of April 2004	Those authorities which have identified no need for a Detailed Assessment in their May 2003 Updating and Screening Assessment
Progress Report	End of April 2005	All authorities
Updating and Screening Assessment	End of April 2006	All authorities
Detailed Assessment	End of April 2007	Those authorities which have identified the need for a Detailed Assessment in their May 2006 Updating and Screening Assessment
Progress Report	End of April 2007	Those authorities which have identified no need for a Detailed Assessment in their May 2006 Updating and Screening Assessment
Progress Report	End of April 2008	All authorities
Updating and Screening Assessment	End of April 2009	All authorities
Detailed Assessment	End of April 2010	Those authorities which have identified the need for a Detailed Assessment in their May 2009 Updating and Screening Assessment
Progress Report	End of April 2010	Those authorities which have identified no need for a Detailed Assessment in their May 2009 Updating and Screening Assessment

2. AIR QUALITY IN CHARNWOOD

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 has been agreed that this outstanding Detailed Assessment could be deferred until 2009 and is to be accompanied with a further Detailed Assessment in respect of the NO₂ results around the junction at Humberstone Lane, Thurmaston, which became evident when compiling our 2007 Report.

Therefore, we approach this next 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

3. AIMS AND OBJECTIVES OF THE AIR QUALITY PROGRESS REPORT

Progress Reports have been introduced into the Local Air Quality Management (LAQM) system following a detailed evaluation of the first round of local authority review and assessments.

A need was identified to develop a longer-term vision for both LAQM and the review and assessment process. The process was seen to be too 'stop-start', with some local authorities completing their first round of review and assessment and the then doing little for several years until the next round. This did not encourage the integration of LAQM into the routine work of local authorities.

The overall aims of the Progress Report should be to:

- Report progress on implementing local air quality management.
- Report progress in achieving, or in many cases maintaining, concentrations below the air quality objectives.

It is considered these aims can be best achieved by addressing two matters as a minimum requirement namely:

- New monitoring results
- New local developments that might affect local air quality

However, it is also a timely point to provide any further information related to additional elements including:

- Progress on implementation of action plans.
- An assessment of the monitoring data in relation to likely breaches of the objectives.
- Progress on local air quality strategies.
- A list of planning applications that have the potential to affect local air quality.
- Progress on implementing those elements of the local transport plan that might affect air quality.
- Any relevant updates on planning policies that relate specifically to air quality.
- Other area of local interest that the authority also wishes to incorporate in to its Progress Report.

4. MONITORING RESULTS

Since the late 1990s Charnwood Borough Council have been steadily expanding and improving the air quality monitoring network around the borough, focusing on areas where our investigations have led us to believe that poor air quality may be a threat to health.

Through this network we are seeing a picture of how air quality is changing and evolving. More importantly we are building up evidence and knowledge to allow us to positively influence the way in which changes in the area happen in order to protect and improve the air we all breathe.

Results of recent and historical data are published bi-monthly on the Councils website at:

www.charnwood.gov.uk/environment/pollutionmonitoringincharnwood.html

4.1 REAL TIME MONITORING

A chemiluminescent nitrogen oxide monitor, a TEOM PM10 monitor and a UV fluorescence sulphur dioxide monitor have been operating for a number of years within a Council owned residential area on Durham Road in Loughborough. The site is approximately 20 metres from the kerbside of the A6 and was chosen as a suitable monitoring location for possible human receptors of traffic pollution in the area. The monitor is actually located just outside of what was eventually designated as the Loughborough air quality management area. It has however proved a valuable tool in allowing validation of modelling data in scenarios beyond 10 metres from road kerbsides and as a source of bias correction factors for our network of diffusion tubes.

June 2007 saw the commissioning of 2 further NO₂ real-time monitors into our monitoring network:

- Baxter Gate, Loughborough [OS Ref 453681 319673]
- Melton Road, Syston [OS Ref 462533 311432]

Both sites were chosen as locations to monitor concentrations within existing NO₂ AQMA's and are co-located with diffusion tubes.

Annual results (full year) from these 2 new sites will be reported from 2009.

Summary of background air quality results (2003–2007)

4.1.1 Nitrogen Dioxide (Durham Road)

(A conversion factor of 1.91 has been applied to the raw data originally measured as ppb, as per Appendix B (pg A1-44) LAQM.TG assuming 20°C and 101.3 kPa)

Monitoring Year	Duration & data capture rate	Annual mean (ug/m ³)	Number of exceedences of the 1hr mean
2003	Whole Year – 96.8%	32.5	0
2004	Whole Year – 94.7%	27.7	0
2005	Whole Year ~ 65%*	30.8	0
2006	Whole Year – 91.7%	26.7	0
2007	Whole Year – 93.2%	30.6	0

*[As the ~65% data capture recorded for 2005 was <90%; LAQM.TG(03) Update – January 2006 guidelines state that the 99.8th percentile should be used rather than a count of exceedences].

From the 22,651 data points captured throughout 2005, the 99.8th percentile was calculated as being 91.9µgm⁻³

4.1.2 Sulphur Dioxide

(A conversion factor of 2.66 has been applied to the raw data originally measured as ppb, as per Appendix B (pg A1-44) LAQM.TG assuming 20°C and 101.3 kPa)

2003	
Maximum 15 minute mean concentration	193.4 $\mu\text{g}\text{m}^{-3}$
Exceedences of 15 minute concentration @ 266 $\mu\text{g}\text{m}^{-3}$	0
Maximum 1 hour mean concentration	158.8 $\mu\text{g}\text{m}^{-3}$
Exceedences of 1 hour concentration @ 350 $\mu\text{g}\text{m}^{-3}$	0
Maximum 24-hour mean concentration	48.2 $\mu\text{g}\text{m}^{-3}$
Exceedences of 24-hour concentration @ 125 $\mu\text{g}\text{m}^{-3}$	0
Data capture	97.7%

2004	
Maximum 15 minute mean concentration	135.9 $\mu\text{g}\text{m}^{-3}$
Exceedences of 15 minute concentration @ 266 $\mu\text{g}\text{m}^{-3}$	0
Maximum 1 hour mean concentration	71.3 $\mu\text{g}\text{m}^{-3}$
Exceedences of 1 hour concentration @ 350 $\mu\text{g}\text{m}^{-3}$	0
Maximum 24-hour mean concentration	16.5 $\mu\text{g}\text{m}^{-3}$
Exceedences of 24-hour concentration @ 125 $\mu\text{g}\text{m}^{-3}$	0
Data capture	96.6%

2005	
Maximum 15 minute mean concentration	191.3 $\mu\text{g}\text{m}^{-2}$
Exceedences of 15 minute concentration @ 266 $\mu\text{g}\text{m}^{-3}$	0
Maximum 1 hour mean concentration	73.2 $\mu\text{g}\text{m}^{-3}$
Exceedences of 1 hour concentration @ 350 $\mu\text{g}\text{m}^{-3}$	0
Maximum 24-hour mean concentration	19.2 $\mu\text{g}\text{m}^{-3}$
Exceedences of 24-hour concentration @ 125 $\mu\text{g}\text{m}^{-3}$	0
Data capture	~60%

As the ~60% data capture recorded for 2005 was <90%; LAQM.TG(03) Update – January 2006 guidelines state that a percentile calculation should be used rather than a count of exceedences:

15 Minute Mean Concentration (2005)

From the 21,140 data points captured throughout 2005, the 99.9th percentile is calculated as being 56.7 $\mu\text{g}\text{m}^{-3}$

1 Hour Mean Concentration (2005)

From the 5,943 data points captured throughout 2005, the 99.7th percentile is calculated as being 28.7 $\mu\text{g}\text{m}^{-3}$

24 Hour Mean Concentration (2005)

From the 248 data points captured throughout 2005, the 99th percentile is calculated as being 12.8 $\mu\text{g}\text{m}^{-3}$

2006	
Maximum 15 minute mean concentration	143.6 μgm^{-3}
Exceedences of 15 minute concentration @ 266 μgm^{-3}	0
Maximum 1 hour mean concentration	127.7 μgm^{-3}
Exceedences of 1 hour concentration @ 350 μgm^{-3}	0
Maximum 24-hour mean concentration	47.9 μgm^{-3}
Exceedences of 24-hour concentration @ 125 μgm^{-3}	0
Data capture	88%

As the 88% data capture recorded for 2006 was <90%; LAQM.TG(03) Update – January 2006 guidelines state that a percentile calculation should be used rather than a count of exceedences:

15 Minute Mean Concentration (2006)

From the 30,827 data points captured throughout 2006, the 99.9th percentile is calculated as being 66.5 μgm^{-3}

1 Hour Mean Concentration (2006)

From the 7,980 data points captured throughout 2006, the 99.7th percentile is calculated as being 42.6 μgm^{-3}

24 Hour Mean Concentration (2006)

From the 311 data points captured throughout 2006, the 99th percentile is calculated as being 18.6 μgm^{-3}

2007	
Maximum 15 minute mean concentration	127.7 μgm^{-3}
Exceedences of 15 minute concentration @ 266 μgm^{-3}	0
Maximum 1 hour mean concentration	95.8 μgm^{-3}
Exceedences of 1 hour concentration @ 350 μgm^{-3}	0
Maximum 24-hour mean concentration	18.6 μgm^{-3}
Exceedences of 24-hour concentration @ 125 μgm^{-3}	0
Data capture	86.9%

As the 86.9% data capture recorded for 2007 was <90%; LAQM.TG(03) Update – January 2006 guidelines state that a percentile calculation should be used rather than a count of exceedences:

15 Minute Mean Concentration (2007)

From the 30,446 data points captured throughout 2007, the 99.9th percentile is calculated as being 37.24 μgm^{-3}

1 Hour Mean Concentration (2007)

From the 7,628 data points captured throughout 2007, the 99.7th percentile is calculated as being 23.94 μgm^{-3}

24 Hour Mean Concentration (2006)

From the 325 data points captured throughout 2007, the 99th percentile is calculated as being 10.6 μgm^{-3}

4.1.3 Particulate Matter (PM10)

Monitoring Year	Duration & data capture rate	Annual mean ⁽¹⁾ (ug/m ³)	Number of exceedences of the 24hr mean
2001	Whole Year – 95%	22.6	7
2002	Whole Year – 97%	22.5	5
2003	Whole Year – 98%	24.4	20
2004	Whole Year – 98%	20.4	2
2005	Whole Year – 63%	21.8	4
2006	Whole Year – 92%	20.8	5
2007	Whole Year – 90%	19.5	8

¹ Based on the guidance within LAQM.TG(03) Box 8.4 approach 2 & 3 to factor for gravimetric concentrations

4.2 NON REAL TIME MONITORING

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

As of March 2008 we have:

- 42 nitrogen dioxide diffusion tubes deployed (3 of which are co-located at each of the real-time monitor locations i.e. 9 in total)
(A number of these tubes have been added to the network during the first quarter of 2008 and are not reported on below)
- 3 sulphur dioxide monitoring locations
- 4 benzene diffusion tube monitoring locations

Of the 30 nitrogen dioxide monitoring locations reported on below, 15 are located within our (NO₂) AQMAs, located as close as practicable to receptor locations – usually on the facades of residential properties.

4.2.1 Nitrogen Dioxide results in Charnwood (2003-2007)

[A map of the Loughborough monitoring locations is included as Appendix 1]

[Trends have not been calculated for sites with less than 5 years data. Trend graphs can be seen under Appendix 2]

Location	OS Reference (Position)	Monitored Annual Means μgm^{-1}					Compliant 2007	5 Year Trend
		2003	2004	2005	2006	2007		
Ratcliffe Road, Loughborough*	454087 320392	44.8	41.3	36.4	43.7	51.0	✘	↑
Shelthorpe Road, Loughborough	454250 318665	39.7	30.0	28.8	29.9	33.3	✓	↓
Forest Road, Loughborough	452833 318776	40.7	33.6	32.9	34.9	38.0	✓	↓
Nottingham Road, Loughborough	454209 320193	40.1	36.0	35.7	35.9	42.3	✘	↑

Haydon Road, Loughborough*	452312 319620	42.0	38.0	34.5	35.2	37.7	✓	↓
Alan Moss Road/Epinal Way, Loughborough *	452176 319923	41.3	36.0	30.7	31.7	34.7	✓	↓
Ling Road/Epinal Way Loughborough	453677 318190	39.3	36.5	33.0	34.9	37.3	✓	↓
Leicester Road, Loughborough *	454002 319253	41.8	40.1	40.3	43.8	48.9	✗	↑
Derby Road, Loughborough *	453297 319945	45.5	43.7	47.0	43.7	46.2	✗	↑
Derby Road/Briscoe Avenue Loughborough * (2005 onwards)	452702 320499	-	-	26.3	31.4	39.5	✓	-
Durham Road, Loughborough Background	452358 320712	30.6	28.3	26.6	27.2	30.8	✓	↓
Durham Road 2, Loughborough (2005 onwards) Background	452358 320712	-	-	26.3	25.2	30.4	✓	-
Durham Road 3, Loughborough (2005 onwards) Background	452358 320712	-	-	26.7	27.8	30.2	✓	-
Durham Road, Loughborough Background – Real Time	452358 320712	32.5	27.7	30.8	26.7	30.6	✓	↓
Alan Moss Road/A6 Derby Road Loughborough *	452909 320209	48.0	45.7	37.0	40.1	42.8	✗	↓
High Street, Loughborough *	453731 319589	69.7	67.7	63.2	70.4	78.2	✗	↑

Market Place, Loughborough* Background	453605 319532	32.8	29.4	29.4	27.4	32.7	✓	↓
Ashby Road, Loughborough *	453190 319710	50.1	42.8	42.0	45.8	48.3	✗	↔
Beacon Road, Loughborough Background	453458 318813	24.2	25.1	22.9	23.4	25.6	✓	↑
Rosebery Street, Loughborough Background	452692 319921	26.6	24.4	24.0	26.3	29.1	✓	↑
Melton Road Town Centre, Syston *	462772 311689	37.9	30.7	34.2	40.3	42.3	✗	↑
Melton Road/St Peters Road, Syston *	462367 311251	42.4	37.0	33.1	35.8	38.2	✓	↓
Melton Road, Syston * (2005 onwards)	462350 311211	-	-	36.6	38.5	43.6	✗	-
Loughborough Road, Birstall	459233 309560	41.0	33.0	36.6	40.5	43.7	✗	↑
A6, Birstall	459179 309862	44.8	38.5	39.9	41.3	44.5	Kerbside	↑
Humberstone Lane, Thurmaston	460813 308756	45.4	42.1	39.9	46.2	48.3	✗	↑
Ashby Road Central, Shepshed	448086 318256	43.3	40.6	39.1	40.2	50.7	Kerbside	↑
Loughborough Road, Hathern	450253 321928	43.9	37.7	37.1	40.3	45.9	Kerbside	↑
Baxter Gate, Loughborough (2006 onwards) *	453681 319673	-	-	-	53.2	57.8	Kerbside	-
Barrow Street, Loughborough (2006 onwards)	453902 319489	-	-	-	32.2	37.6	✓	-
School Street, Loughborough (2006 onwards)	453949 319624	-	-	-	30.4	35.9	✓	-

Fennel Street, Loughborough (2006 onwards)	453693 319896	-	-	-	33.3	37.0	✓	-
High Street, Syston * (Aug 2006 onwards)	462370 311809	-	-	-	27.1 calculated for partial year (as per TG Box 6.5)	40.8	✗	-

*** - Monitoring sites within a current AQMA**

Notes :

The figures in the above table are shown including correction factors used to amend the (raw) monitored diffusion tube data.

These factors are as follows:

2003⁽¹⁾ – multiplied by 0.96 for Gradko 20% TEA in water for 2003

2004 – multiplied by 1.1315 as the local diffusion tubes under-read by 13.1%

2005⁽¹⁾ – multiplied by 0.99 for Gradko 20% TEA in water for 2005

2006 – multiplied by 1.1400 as the local diffusion tubes under-read by 14.0%

2007 – multiplied by 1.1200 as the local diffusion tubes under-read by 12.0%

⁽¹⁾For 2003 & 2005 the factor was determined by application of the Bias Correction Spreadsheet (ver 03/06) from www.uwe.ac.uk/aqm/review due to insufficient data capture rates from the Durham Road real-time monitor.

4.2.2 Sulphur Dioxide results in Charnwood

a) 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 recently declared 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.

b) Non-AQMA Monitoring

In addition to the UV fluorescence real-time analyser results shown above (4.1.2); we continue to monitor SO₂ at 3 other sites within the borough, by using diffusion tubes:

- Durham Rd, Loughborough (co-located with the real time monitor)
- Market Pace, Loughborough
- Wolsey Way, Loughborough (located near to the GCR engine sheds)

LAQM.TG(03) guidance however specifically states that SO₂ diffusion tube data should not be included in the reporting process.

4.2.3 Benzene results in Charnwood

Location	OS Grid	Historical calculated annual means from measured data (ug/m3)										Compliant 2007	9 Year Trend
		1999	2000	2001	2002	2003	2004	2005	2006	2007			
High St (Loughborough)	453731 319589	4.5	5.4	5.2	4.2	3.28	3.18	2.61	2.08	2.06	✓	↓	
Shelthorpe Rd (Loughborough)	454250 318665	3.9	4.5	4.6	3.2	2.25	1.77	1.52	1.29	1.36	✓	↓	
Market Place (Loughborough)	453605 319532	2.3	1.7	2.0	1.5	1.63	1.37	1.12	0.89	1.09	✓	↓	
Ratcliffe Rd (Loughborough)	454087 320392	3.6	3.3	3.4	2.8	2.41	2.23	1.84	1.59	1.65	✓	↓	

4.3 COMMENTARY ON RESULTS

Benzene

The 2007 monitoring results presented above show that the air quality objective for benzene is not currently being breached. Furthermore, although monitoring during 2007 reported a small increase on the 2006 figures, all benzene monitoring sites within the Borough are continuing to show a long-term downward trend in terms of measured concentration (annual mean). Full compliance with the 2010 objective of $5\mu\text{g}/\text{m}^3$ is therefore expected.

Sulphur Dioxide

As LAQM.TG(03) guidance specifically states that SO_2 diffusion tube data should not be included in the reporting process; we have to believe that the general air quality of the borough is broadly in line with the real-time SO_2 monitoring carried out at Durham Road, Loughborough. This monitor has not reported any breach of the National Air Quality Objective (15 min, 1 hour, 24 hour means) since 2003.

In terms of the specific area previously identified as having elevated SO_2 emissions (namely the vicinity GCR railway), the results from the four month monitoring exercise conducted between December 2004 and April 2005, suggests that there may well be more than 35 instances where the 15 minute SO_2 objective is exceeded at nearby receptor locations. This suggests that the declaration of the AQMA around the sheds was appropriate.

Nitrogen Dioxide

The latest monitoring results show that the $40\mu\text{g}/\text{m}^3$ annual mean objective was exceeded at 12 locations (+4 kerbside sites) during 2007:

9 of the 12 sites are already situated **within** existing AQMAs for NO_2 :

- 1) Ratcliffe Rd, Loughborough
- 2) Leicester Rd, Loughborough
- 3) Derby Rd, Loughborough
- 4) Alan Moss Rd/A6 Derby Rd, Loughborough
- 5) High St, Loughborough
- 6) Ashby Rd, Loughborough
- 7) Melton Rd (Town Centre), Syston
- 8) Melton Rd, Syston
- 9) High St, Syston

The remaining 3 sites are **outside** of an existing AQMA for NO_2

- 1) Humberstone Ln, Thurmaston
This site is subject to a Detailed Assessment to be submitted in 2009
- 2) Loughborough Rd, Birstall
This site was an AQMA until 2004 when a Detailed Assessment led to it being revoked. The data at this site in the last few years has been pretty variable.

On advice from DEFRA following a reported $0.5\mu\text{g}\text{m}^{-3}$ breach for 2006 we are continuing to monitor this site.

As a result of current long-term localised roadworks in respect of a large residential development at the A6/A46 junction throughout 2006/2007; traffic backing up on the approach to the roundabout towards Loughborough Rd is thought to have had a significant impact on the last 2 years results.

We would thus recommend that a further years' data is collated to see if this is likely to be a long term issue justifying further work, or a result of the temporary traffic issues associated with the current construction work. Work at the site is due to be completed around mid-2008.

3) Nottingham Rd, Loughborough

2007 data showed annual NO_2 exposure to be $42.3\mu\text{g}\text{m}^{-3}$ compared to values in the region of $36\mu\text{g}\text{m}^{-3}$ for the 3 previous years.

Nottingham Road was identified in modelling work carried out as part of the Loughborough Inner Relief Road (LIRR) planning application to be a route that will have significant (i.e. >10%) traffic volume reduction once the LIRR was constructed.

The Local Air Quality sub-objective for the IRR Business Case, using traffic data provided by Leicester County Council and calculated from the output of DMRB model and Transport Analysis Guidance (TAG) worksheet, indicated that there would be a net positive improvement in NO_2 concentrations for all relevant receptors within 0-50m, 50-100m, 100-150m and 150-200m bands from the route.

As planning permission for the LIRR was granted in May 2007 (see Section 5 – New developments) and with consideration to both the historical NO_2 levels at this site and the anticipated benefits as predicted by the TAG analysis, Charnwood Borough Council will not be progressing to a Detailed Assessment in respect of this site at this time.

Particulate Matter (PM10)

For the third consecutive year a reduction in the annual mean value has been reported by our real-time monitor at Durham Road. This pattern continues a downward trend seen since 2001.

As neither the annual mean for 2007 nor the number of 24hr breaches are in exceedance of the Air Quality Objectives no further action needs to be taken in respect PM10 monitoring in the Borough at this time, further than the Detailed Assessment in respect of Mountsorrel Quarry outlined below under Future Monitoring.

4.4 FUTURE MONITORING

Following outcomes of the 2007 Progress Report:

Following the submission of our 2007 Progress Report to DEFRA the following 2 outcomes have been agreed:

PM10, Mountsorrel

The results of a screening survey published in Charnwood's 2004 Detailed Review and Assessment in respect of particulates (PM10) around Mountsorrel's Lafarge (granite) Quarry identified that receptors on Hawcliffe Road were potentially being exposed to breaches of the daily mean air quality objective. This screening survey, using a light scatter device (Turnkey Equipment – Osiris), identified 33 breaches of the daily mean objective over a year (65% data capture) of which 21 exceedences occurred when the prevailing wind direction was from the direction of the quarry.

In addition to the quarry there are also other potential sources of particulate matter in the immediate vicinity; a County Council owned depot for highways vehicles, a plant hire company, and a waste transfer station.

Due to the potential mix of contributory sources it is unclear, without provision of **(an economically significant)** further investigation, to be in a position to ascertain the primary source of these potential breaches. The scope of this investigation would entail the use of type-tested sampling equipment and source apportionment by X-ray diffraction and scanning electron microscopy.

It has been agreed with DEFRA that our Detailed Assessment in respect of this matter will be submitted in 2009.

At the time of preparing this report we are awaiting the outcome of a ~£12,000 grant bid submitted to DEFRA seeking part assistance in meeting the costs of undertaking this study.

Humberstone Lane, Thurmaston

In light of results, Charnwood Borough Council have agreed to proceed to a Detailed Assessment for nitrogen dioxide (the annual mean objective) at Thurmaston.

Further to discussions with DEFRA and their consultants during February/March 2008; it has been agreed that due to insufficient data being available for us to satisfactorily interpret the impact on local residents, that this report will now be submitted in 2009.

Further diffusion tubes around the area of the junction have been introduced into the monitoring network since February. These additional tubes will allow us to gather a greater knowledge of the spatial awareness and the extent of the problem, aiding any modelling that will be necessary.

General Monitoring

As stated in section 4.1 June 2007 saw the commissioning of 2 further NO₂ real-time monitors into our monitoring network:

- Baxtergate, Loughborough [OS Ref 453681 319673]
- Melton Road, Syston [OS Ref 462533 311432]

Both sites were chosen as locations to monitor concentrations within existing NO₂ AQMA's and are co-located with diffusion tubes.

The Baxtergate station is seen as a 'key' monitor in that it is located to collect comparable pre and post data in respect of the Loughborough Inner Relief Road construction.

Although some initial teething troubles were experienced with both of these new stations, which impacted on data integrity for a significant period of 2007, we are now in a position to align the data with our reporting schedule. Annual results (full year) from these 2 new sites will be reported from 2009.

We will continue to monitor and review our current diffusion tube network and make amendments to the number and positioning as necessary.

5. NEW DEVELOPMENTS

This section considers any recent developments (since the 2006 Updating & Screening Assessment) which may impact on air quality, especially those that will significantly change traffic flows, within the Borough.

Guidance states that only those developments which have been granted planning permission need to be considered, and in the event of new landfill sites, quarries etc. only those which have nearby relevant exposure.

New Part A Processes

There have been no new Part A processes, nor changes/planning permissions granted to those already in existence at the time of the 2006 USA.

New Part B Processes

The following Part B process is new since 2006:

Charnwood Permit Reference I30

Dunlop Bestobell of Ashby Road, Shepshed, Leicestershire, LE12 9EQ

Issued under the Pollution Prevention and Control (England and Wales) Regulations 2000 for Rubber Conversion Processes (PG 6/28)

Full process description and Permit conditions can be viewed at:

www.charnwood.gov.uk/uploads/permitref.no.I30dunlopbestobell.pdf

New Retail Developments

There have been no new retail developments since the 2006 USA

New Road Schemes

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.

Subject to satisfactory completion of the statutory procedures and government money being made available, construction of the relief road and junction improvements are scheduled to commence in 2009. Once traffic is diverted to this new route by summer 2010, works will commence on the town centre transport improvements, thus minimising disruption to the town. It is anticipated that the town centre works will be complete by spring 2011.

An indicative scheme plan of the Loughborough Town Centre Transport Scheme can be seen in Appendix 3

New Mineral Developments

There have been no new mineral developments since the 2006 USA

New Landfill Developments

Biffa Waste Services Limited have been granted planning permission in respect of operating an installation involving land-filling of non-hazardous wastes at Newhurst Quarry, Ashby Road East, Loughborough, Leicestershire, LE12 9BU

At the time of compiling this report, the application in respect of the PPC Permit for the operation of the site is still undetermined.

Mixed-Use Development (residential/commercial)

There have been no new mixed-use developments since the 2006 USA

AIR QUALITY ACTION PLANNING

Air quality action plans provide a means by which a local authority through joint working with the County Council, national agencies and other relevant bodies, deliver viable measures that will work towards achieving the air quality objectives within an AQMA. The Aim is to also to encourage active participation in the achievement of action plan measures by consulting the local community and raising awareness of air pollution issues.

6.1 Work to Date

The Charnwood Borough Council Air Quality Action Plan which was required as part of the local authority's statutory duties as defined within Part IV of the Environment Act 1995 was first approved as a draft in August 2004. A final consultation draft was then produced following revisions in the technical findings of air quality reports produced in the autumn of 2004. The consultation draft was subject to a public and stakeholder consultation during February to May 2005. That version was the final draft following the outcomes of the public consultation and most critically takes account of the outcomes of the Leicestershire Local Transport Plan 2006-2011, which was published in May 2006.

September 2006 saw the publication of the Final Action Plan, the core of which consists of an extensive 'menu' of over 40 potential actions that have been considered as possible ways of improving air quality. The Plan summaries the outcomes of the LTP by Leicestershire County Council and evaluates the remaining potential actions to establish if they will make a meaningful difference in a cost effective manner and in a way that does not create social, economic or social problems that outweigh the benefit.

The Plan then summarises the outcomes of these evaluations and proposes a process by which the delivery of the actions selected from the 'menu' can be monitored. Many of the existing policies and commitments have been influencing policy and decision making for sometime and have been developed with the benefit of good air quality information being available locally.

Existing commitments were able to be brought together under one umbrella in the Plan which enables air quality problems within Charnwood to be addressed without the need for any dramatic new interventions, with the view to ensure that effective communication ensures that air quality information remains at the heart of policy making and seeking to influence public and business behaviour in a way which benefits the environment.

The full text of the Action Plan can be viewed at:

<http://www.charnwood.gov.uk/uploads/draftairqualityactionplan.pdf>

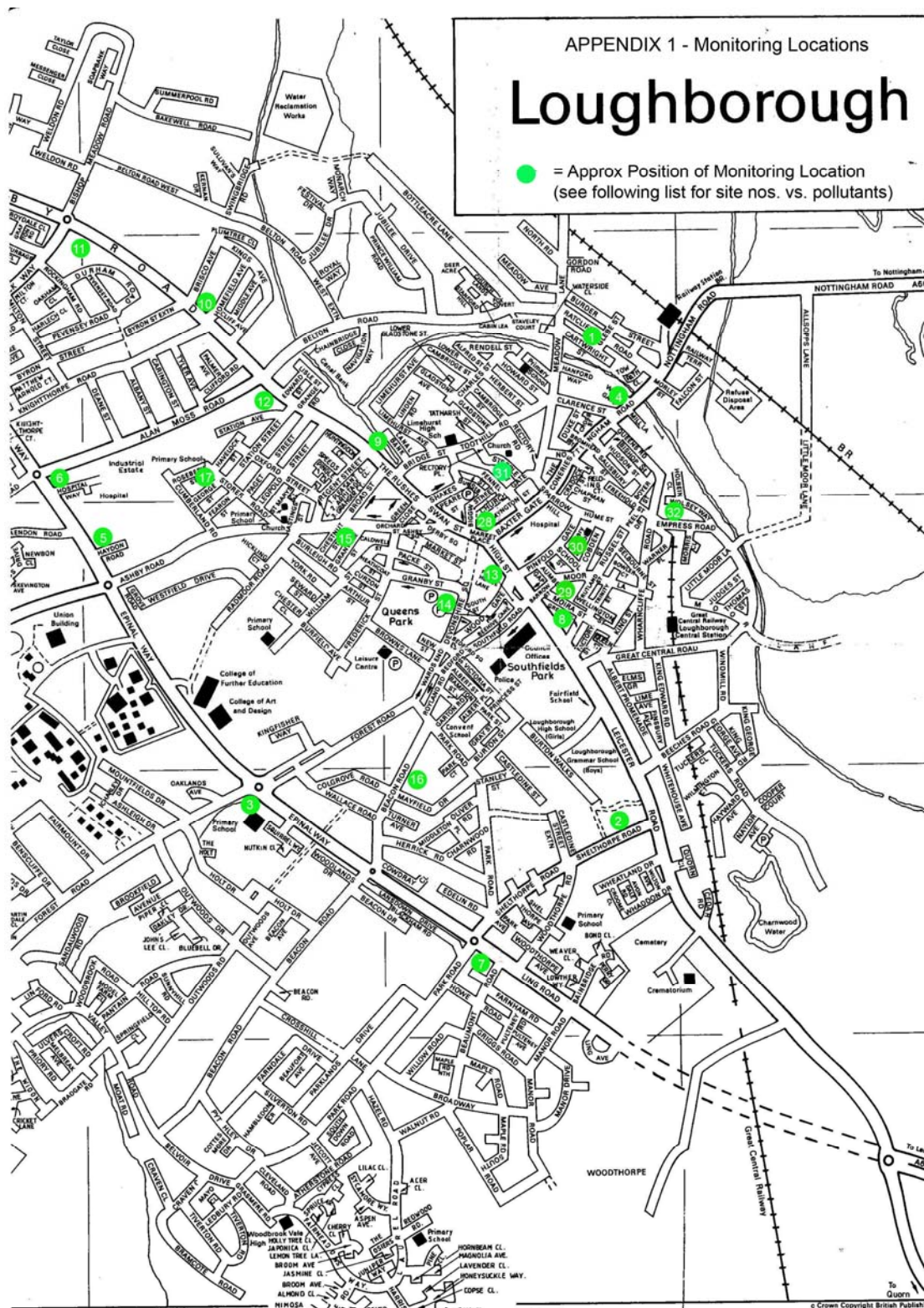
In achieving the aims of the Action Plan which result primarily from vehicle movements throughout the Borough, Charnwood Borough Council continues to work closely with local partners, and specifically Leicestershire County Council Highways Department, to influence transport policy and delivery.

Charnwood's Action Plan options have been integrated into the Leicestershire's Local Transport Plan 2006-2011 who themselves, at the insistence of the Department for Transport, also submit a County Authority Report on Air Quality to DEFRA which includes a full current 'itemised' progress report of all the Districts in the County.

Further to recent communications between Leicestershire County Council and DEFRA, raising the issue of clarity in respect of better reporting alignment from both District and County level for the 2008 submission of the reports, it has been advised by DEFRA (to LCC) that as the individual district reports cover a hugely similar area and issues then a single progress report from the upper tier LTP authority should be submitted.

On the basis of this information, Charnwood Borough Council will be working with LCC to provide a comprehensive update on current progress with respect to the Action Plan, for inclusion in their July submission.

APPENDIX I: Monitoring Site Locations within Loughborough



(See following page for site identification list)

Tube Site Locations (for use with Appendix 1)

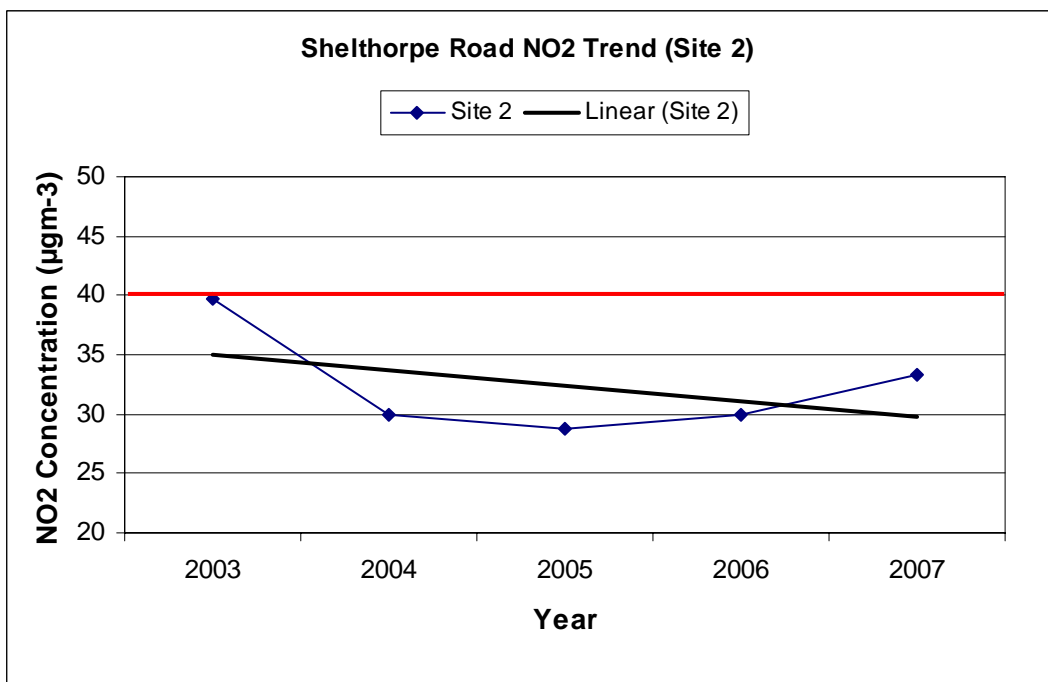
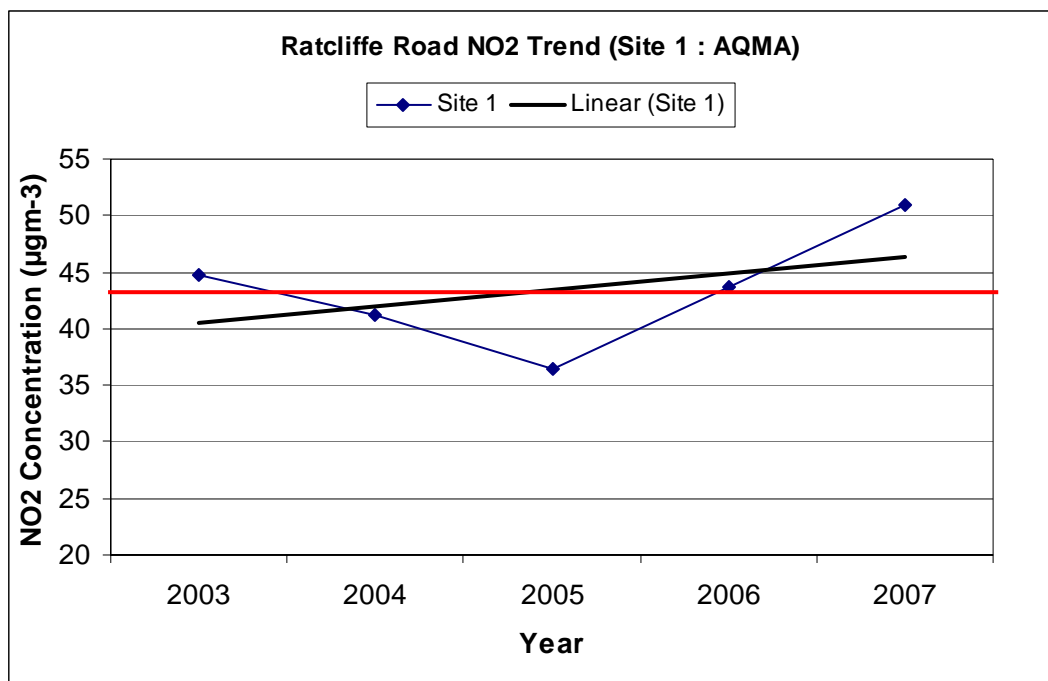
	Location	OS Grid Reference	Pollutant(s)
1.	Ratcliffe Road, Loughborough	454087 320392	NO ₂ CH ₄
2.	Shelthorpe Road, Loughborough	454250 318665	NO ₂ CH ₄
3.	Forest Road, Loughborough	452833 318776	NO ₂
4.	Nottingham Road, Loughborough	454209 320193	NO ₂
5.	Haydon Road, Loughborough	452312 319620	NO ₂
6.	Alan Moss Road/Epinal Way, Loughborough	452176 319923	NO ₂
7.	Ling Road/Epinal Way Loughborough	453677 318190	NO ₂
8.	Leicester Road, Loughborough	454002 319253	NO ₂
9.	Derby Road, Loughborough	453297 319945	NO ₂
10.	Derby Road/Briscoe Avenue Loughborough	452702 320499	NO ₂
11	Durham Road, Loughborough	452358 320712	NO ₂ SO ₂
12.	Alan Moss Road/A6 Derby Road Loughborough	452909 320209	NO ₂
13.	High Street, Loughborough	453731 319589	NO ₂ CH ₄
14.	Market Place, Loughborough	453605 319532	NO ₂ CH ₄ SO ₂ O ₃
15.	Ashby Road, Loughborough	453190 319710	NO ₂
16.	Beacon Road, Loughborough	453458 318813	NO ₂
17.	Rosebery Street, Loughborough	452692 319921	NO ₂
28.	Baxtergate, Loughborough	453687 319673	NO ₂
29.	Barrow Street, Loughborough	453902 319489	NO ₂
30.	School Street, Loughborough	453949 319624	NO ₂
31.	Fennel Street, Loughborough	453693 319896	NO ₂
32.	Wolsey Way, Loughborough	454367 319673	SO ₂

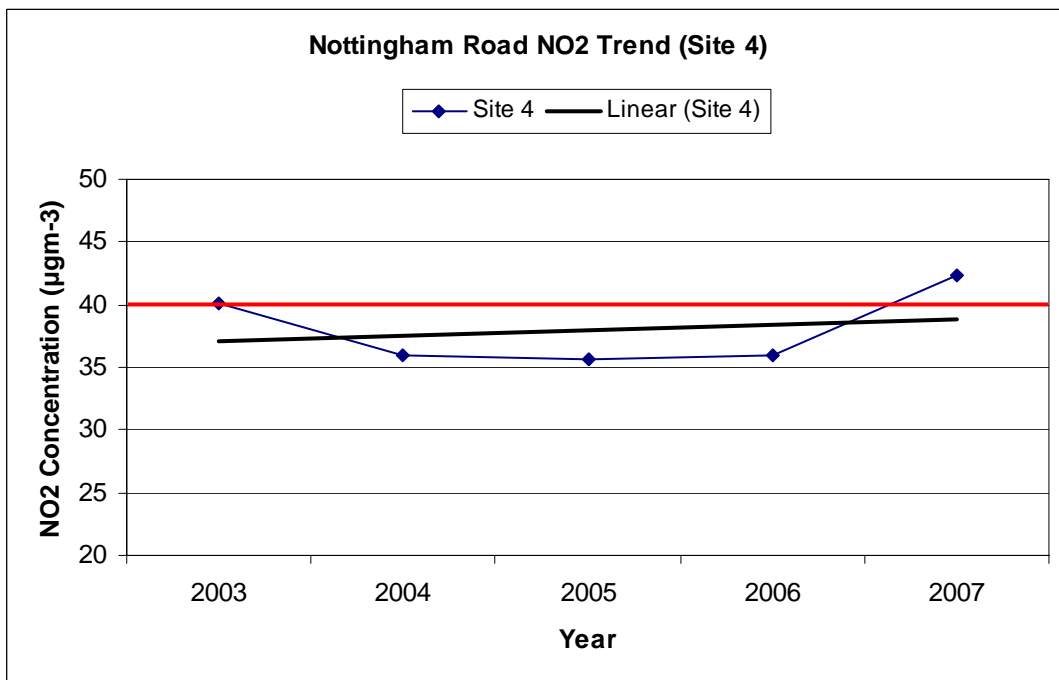
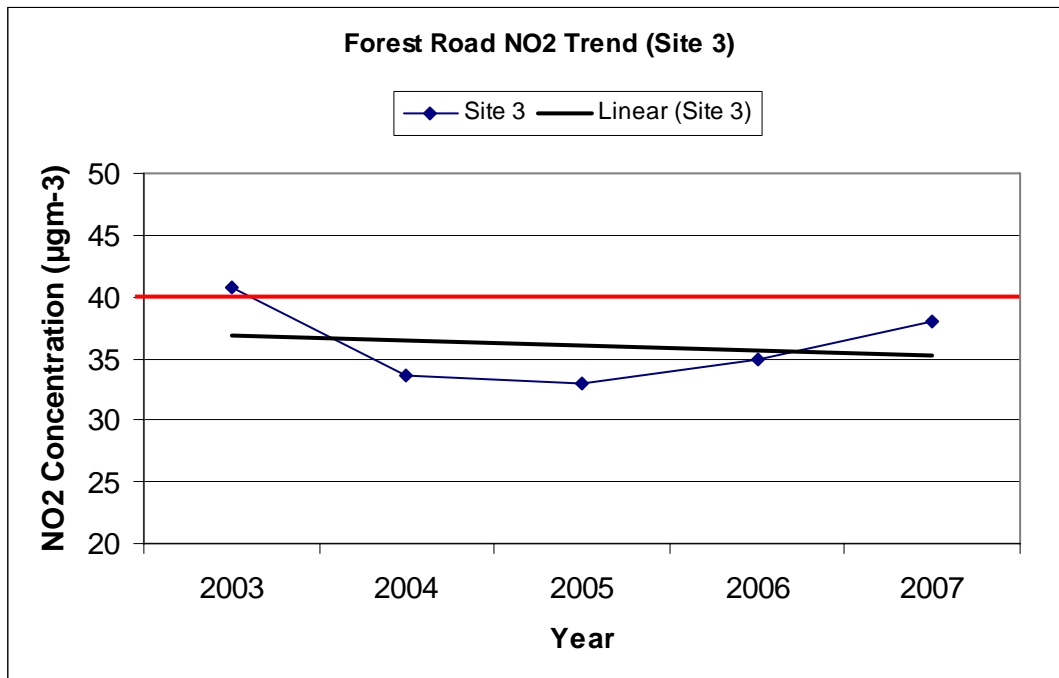
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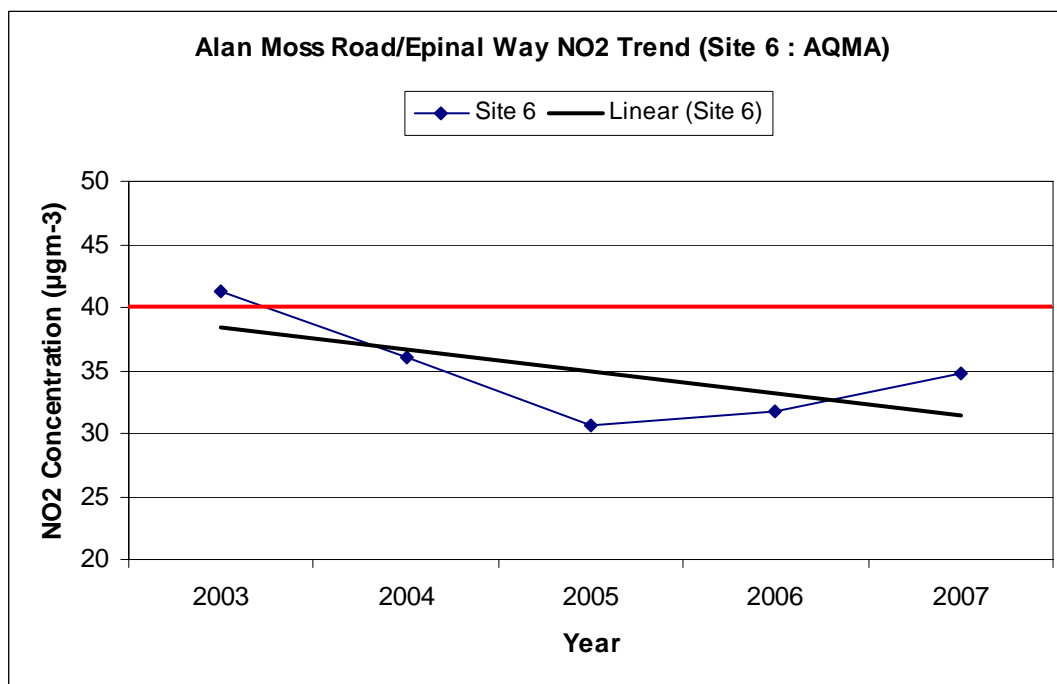
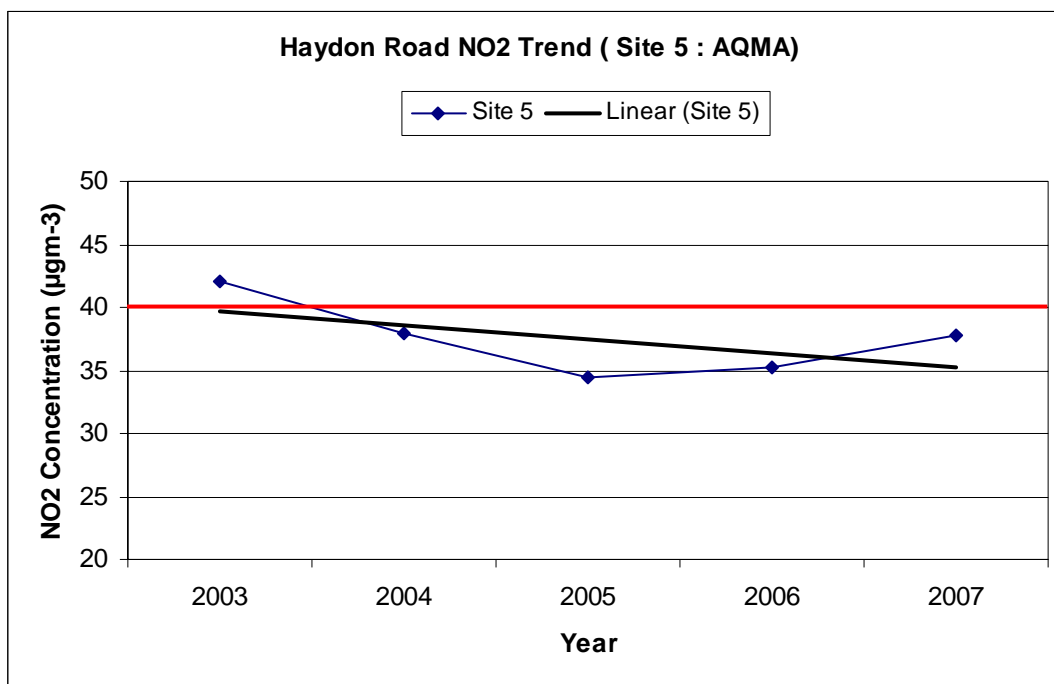
Site 11 is the location of the Durham Rd real-time analyser and 3 * NO₂ diffusion tubes.

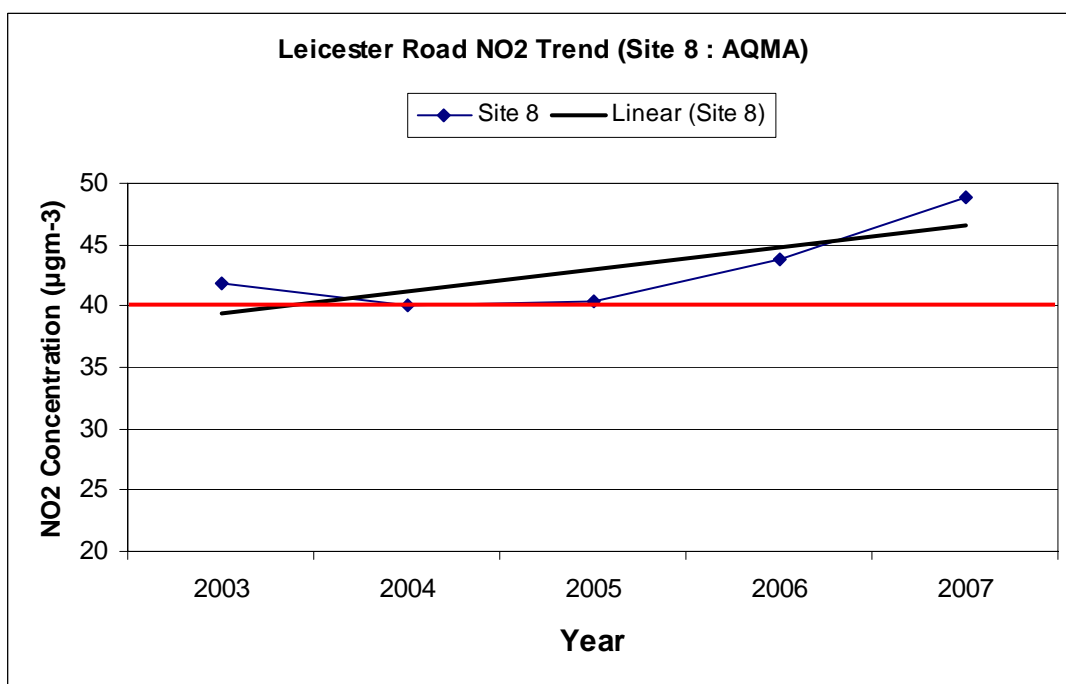
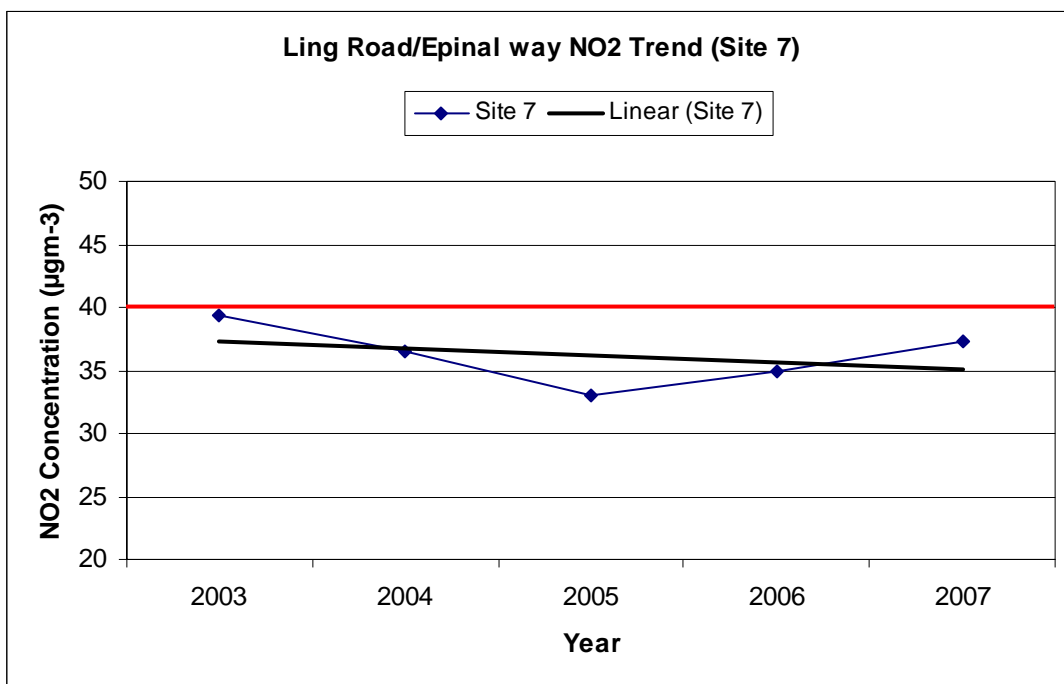
Site 28 is the location of the Baxtergate real-time analyser and 3 * NO₂ diffusion tubes.

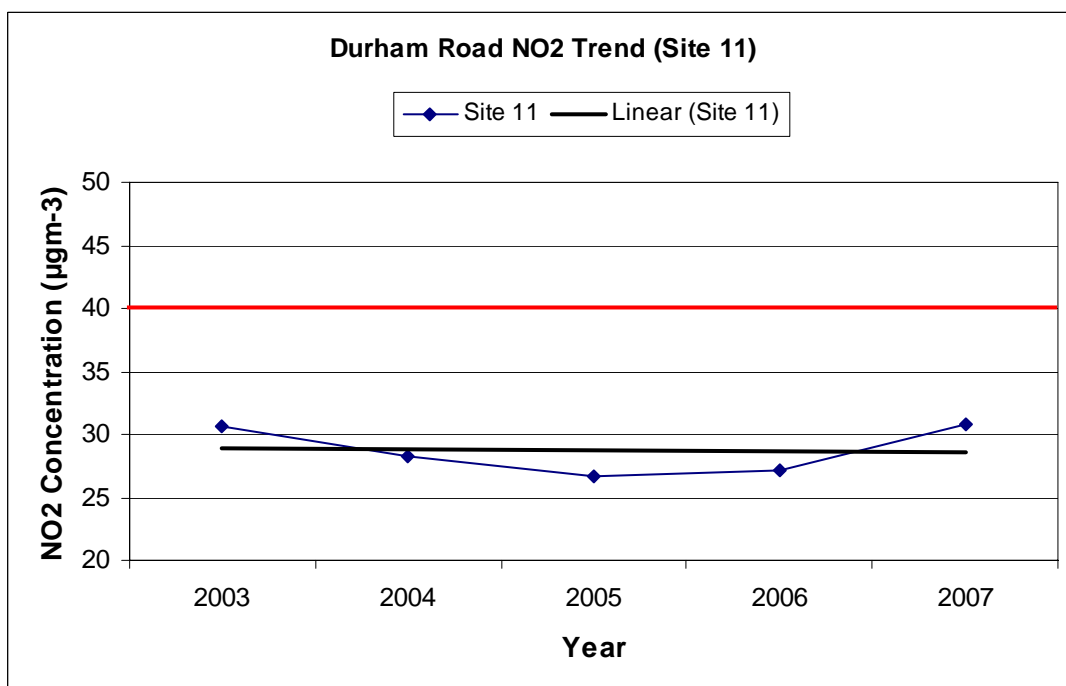
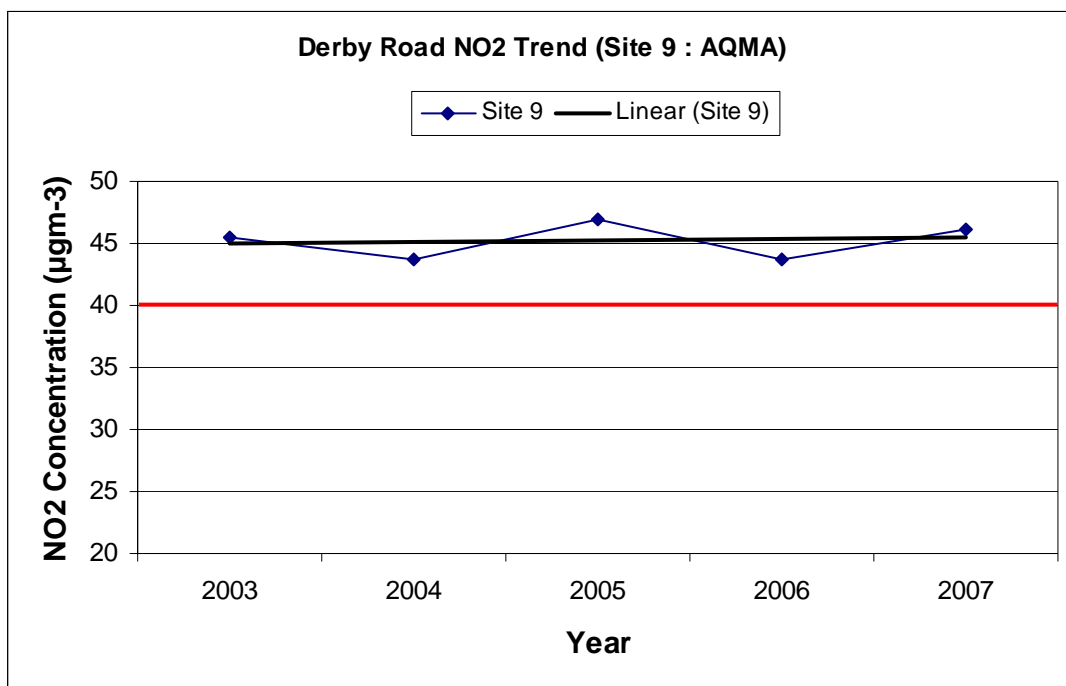
APPENDIX 2: NO₂ Trend Graphs

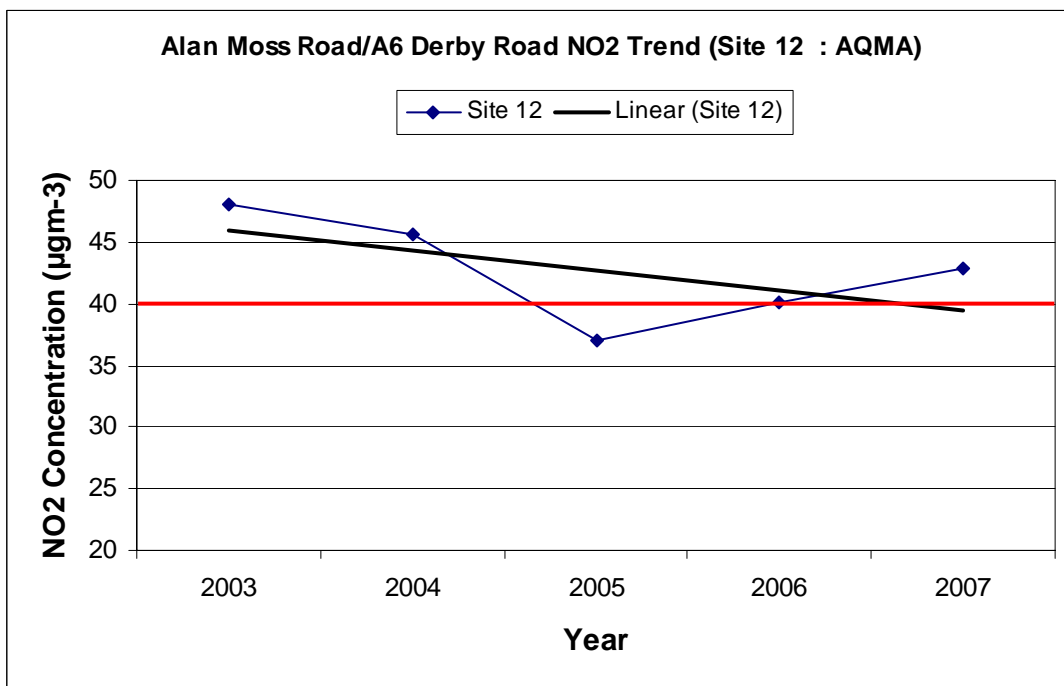
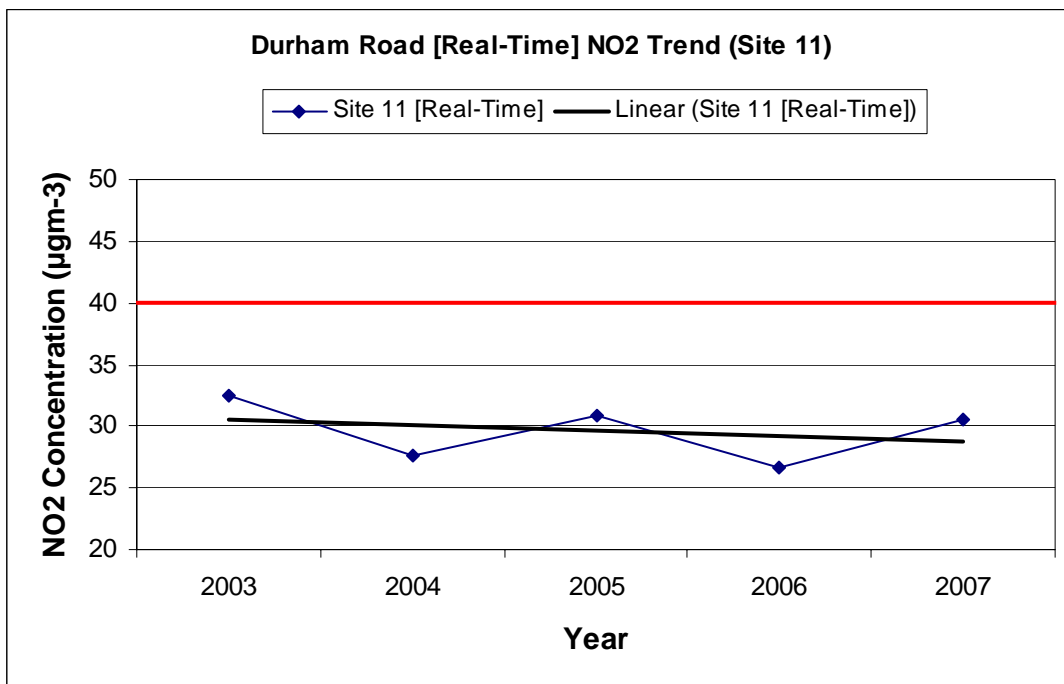


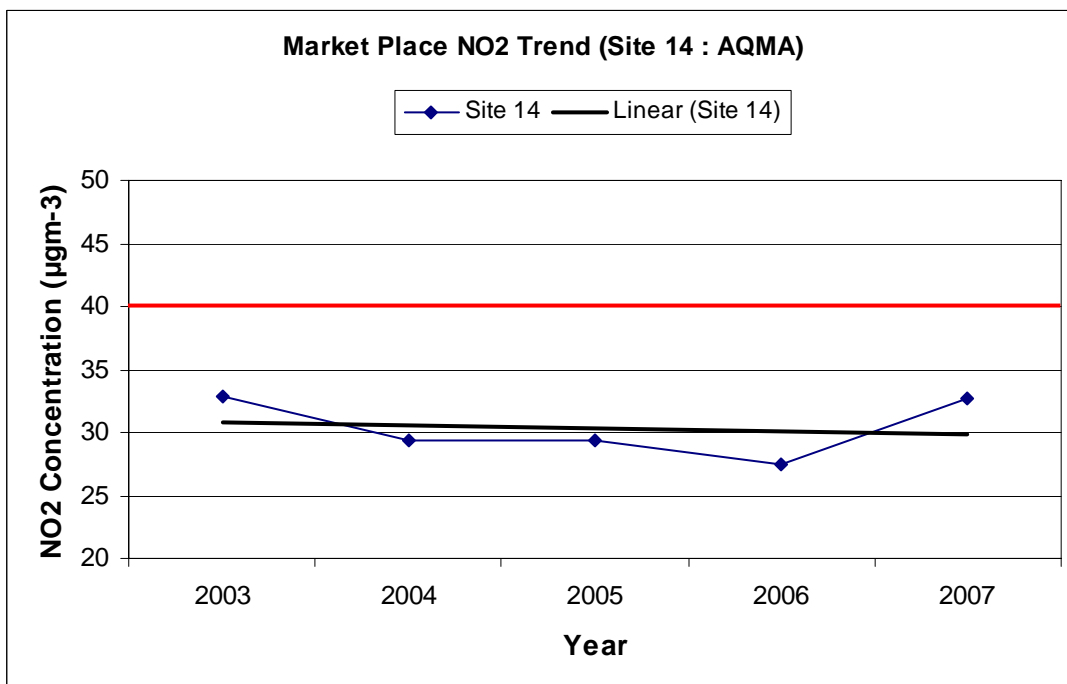
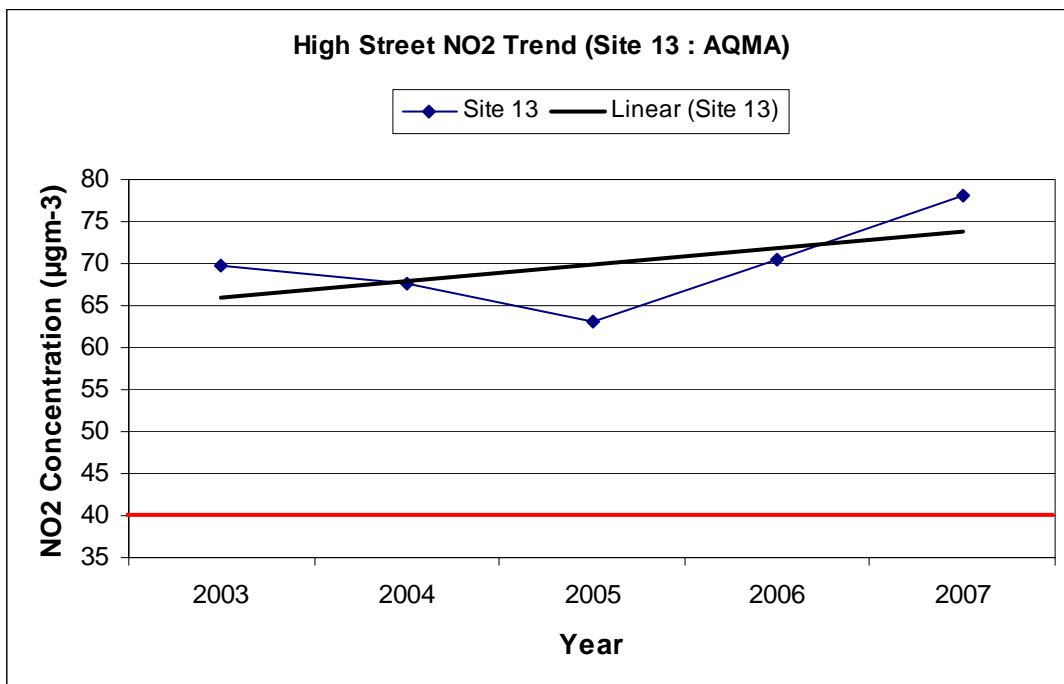


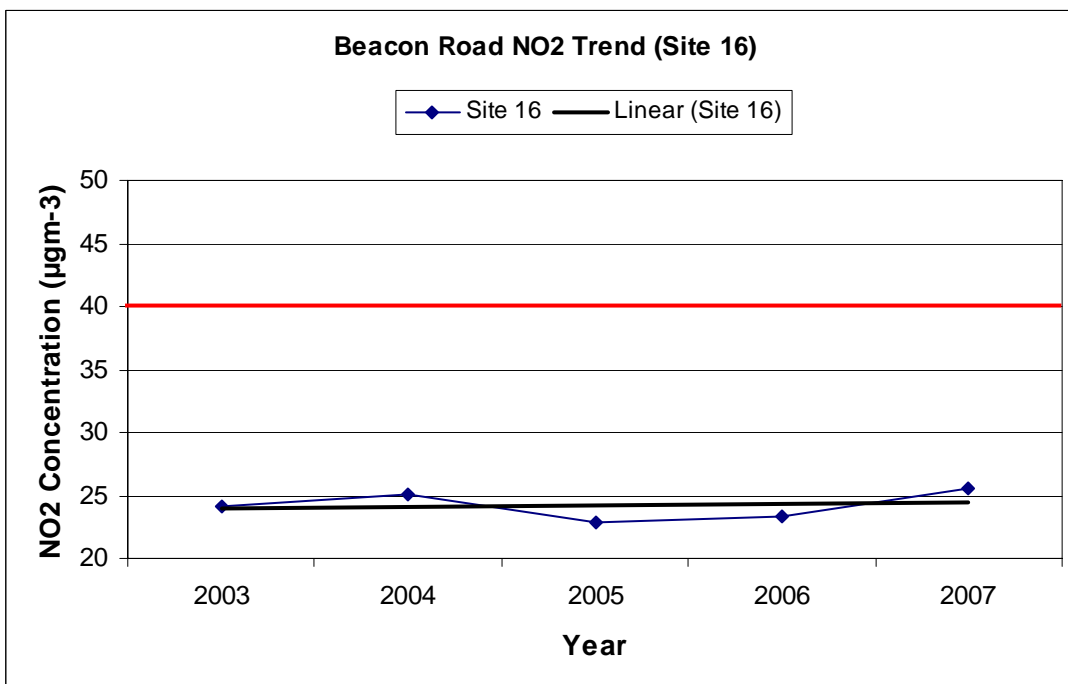
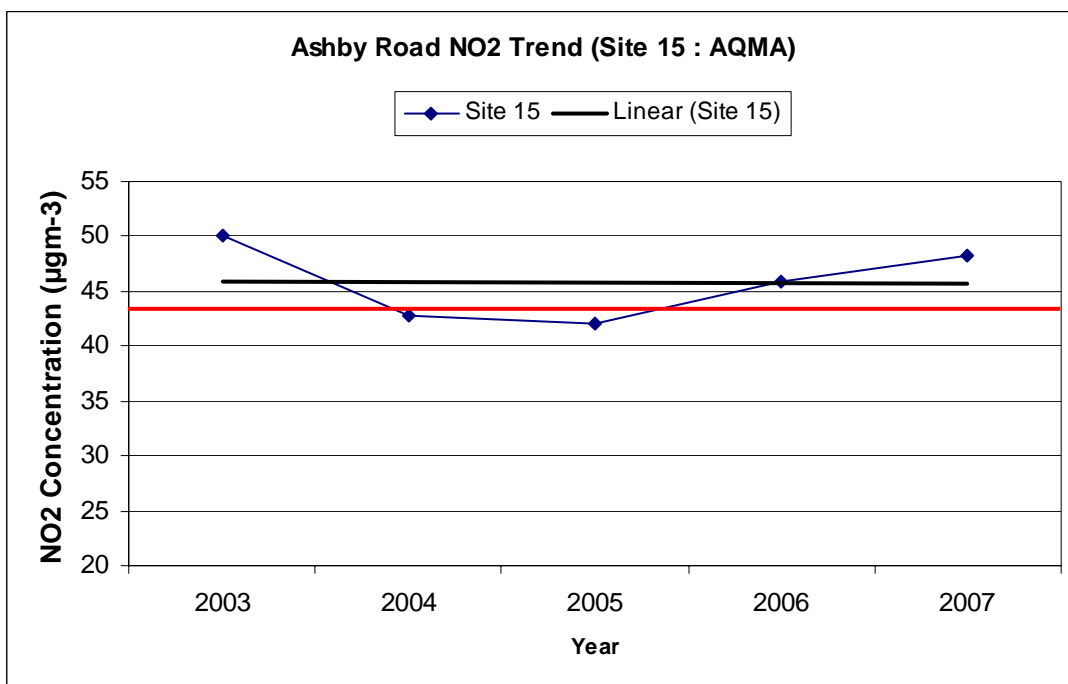


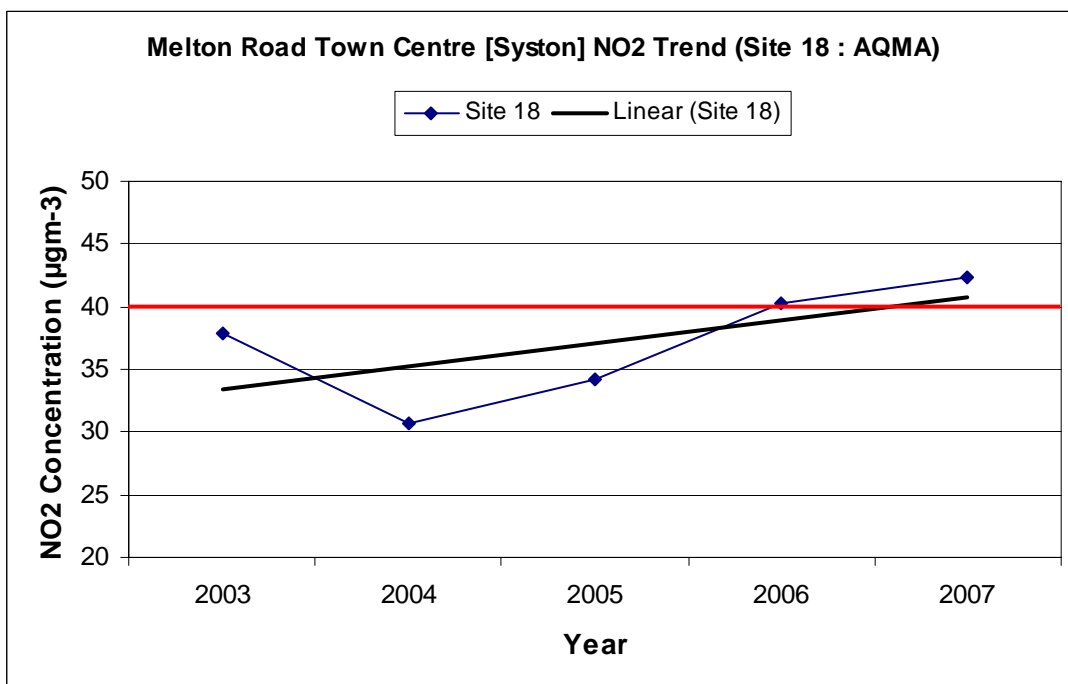
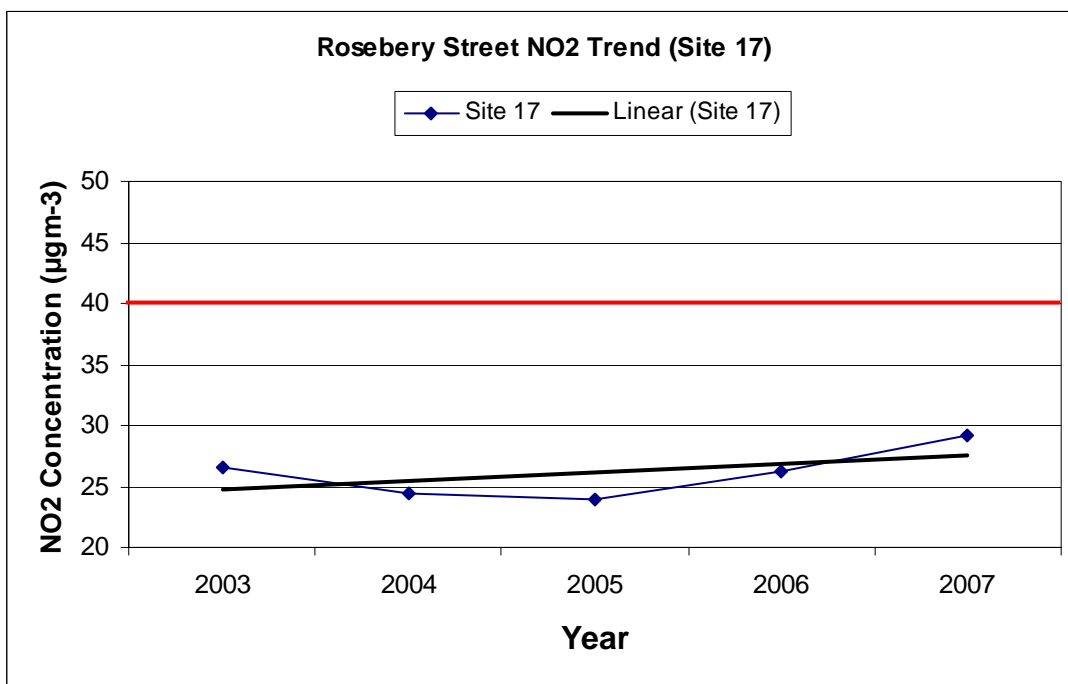


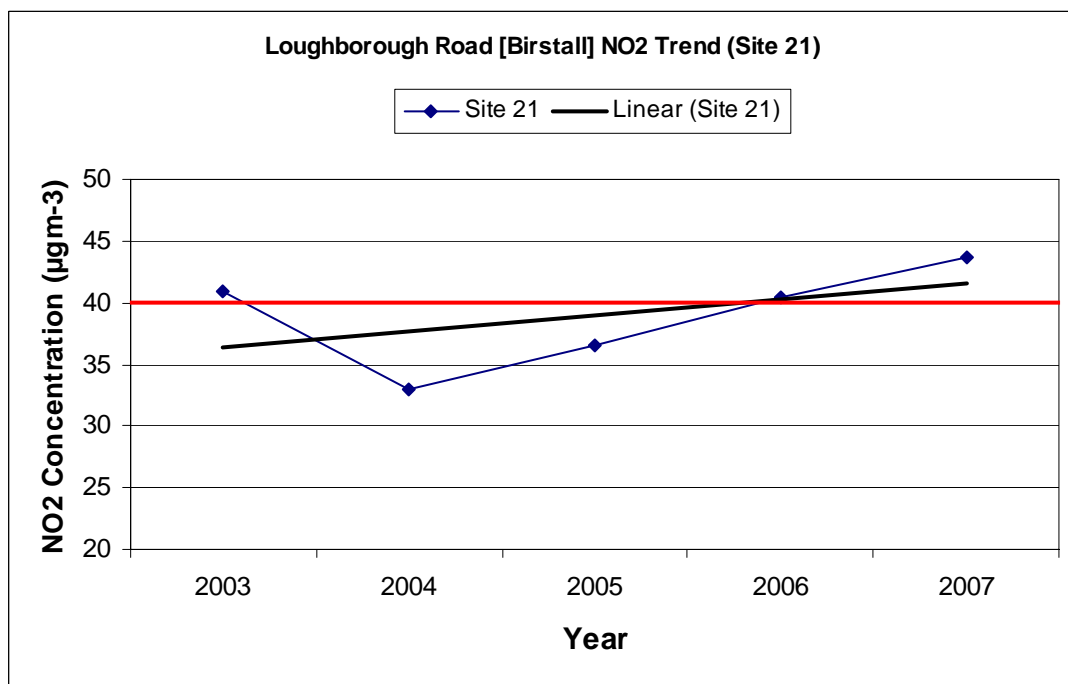
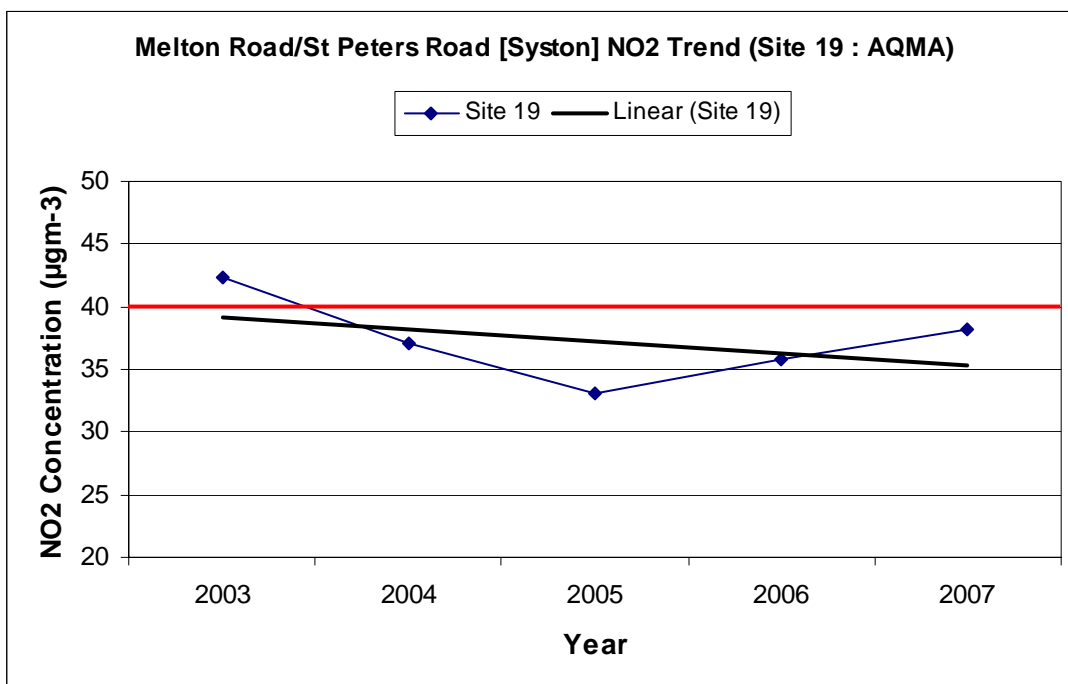


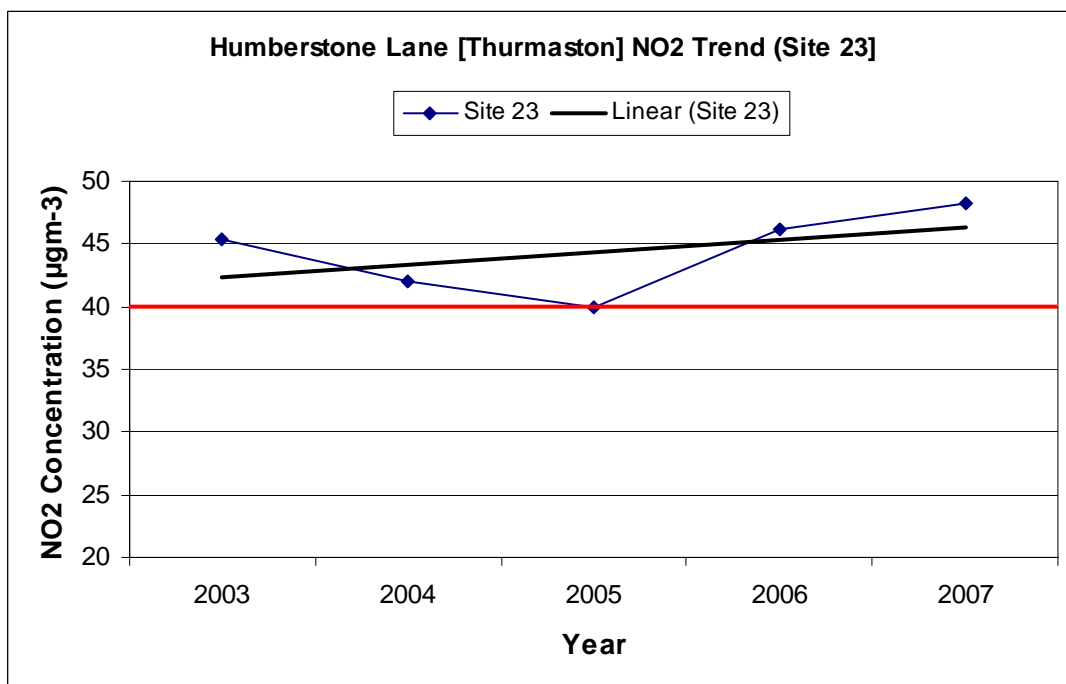
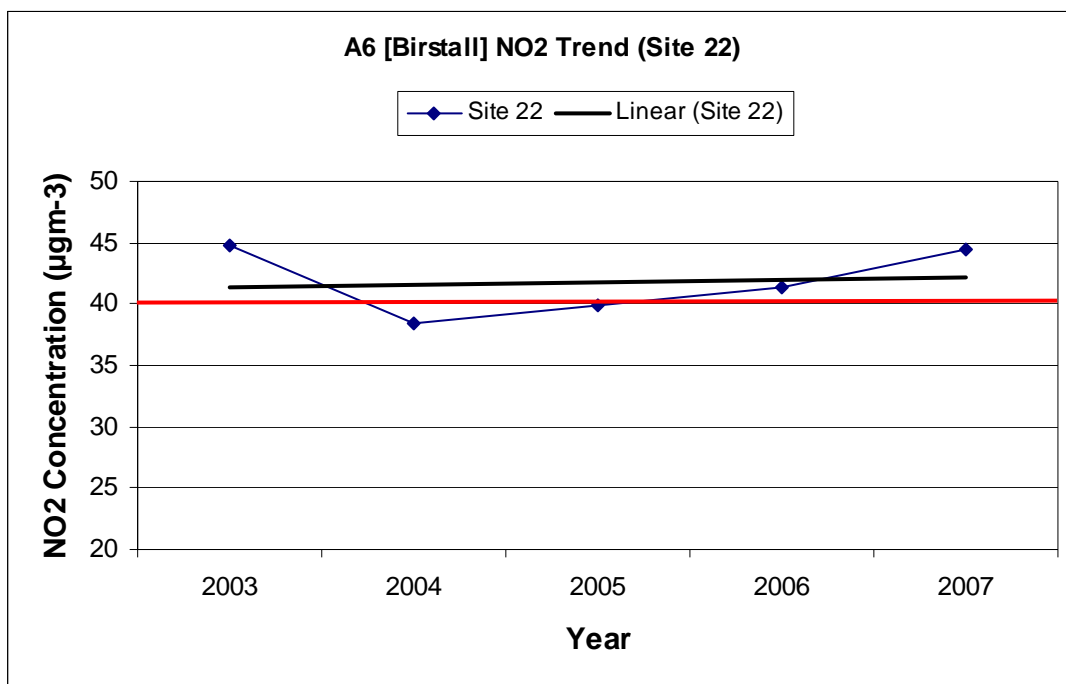


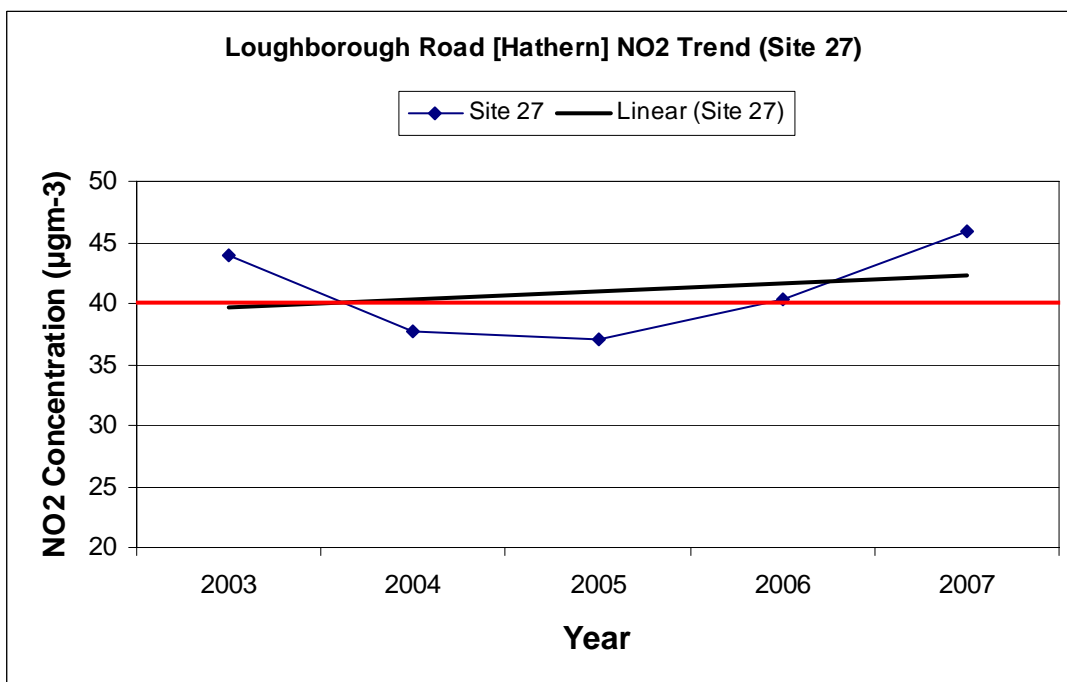
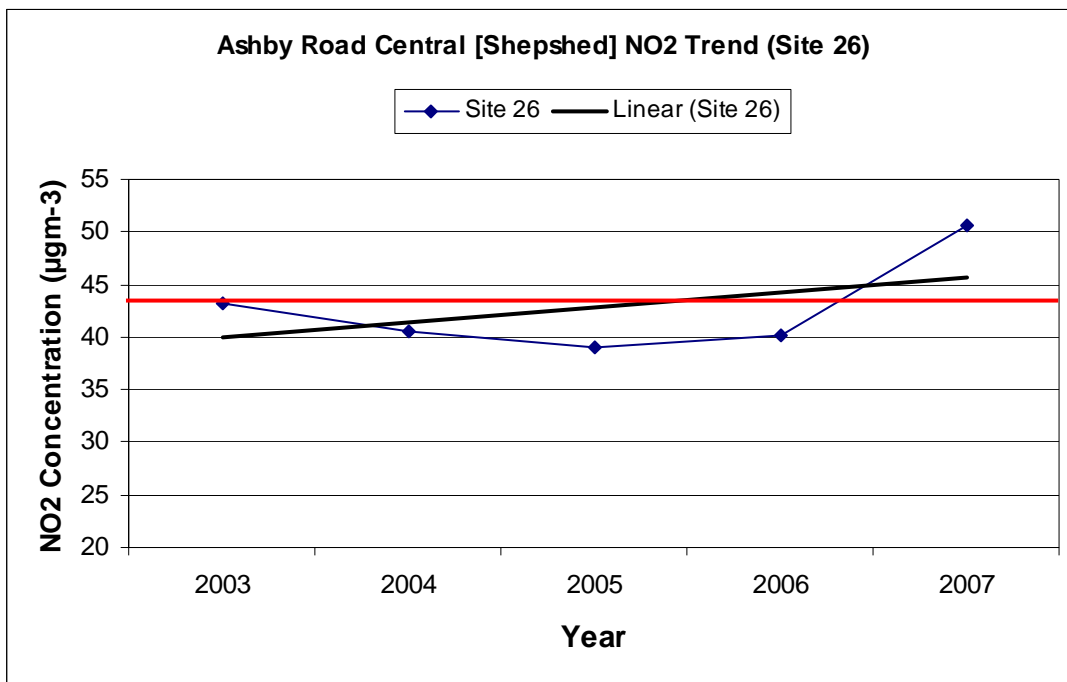












APPENDIX 3: Indicative Scheme Plan of the Loughborough Town Centre Transport Scheme.

