Appendix 1: 2004 Nitrogen Dioxide Diffusion Tubes Results – Bias corrected with extrapolated annual average where applicable.
All results as NO_2 μgm^3

Tube Location	Site Type	Bias Corrected Monthly Mean												Annual Mean	Data Capture (Months)
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec		
Staveley High Street	Roadside	23.1	27.0	23.9	23.1	19.3	13.1	19.3	21.6	22.3	23.1	28.5	12.3	**21.4**	12.0
Travel Lodge	Roadside	37.0	42.4	36.2	38.5	37.0	35.4	35.4	34.7	35.4	37.0	43.1	20.8	**36.1**	12.0
St Augustines Rain Pipe	Roadside	21.6	29.3	22.3	21.6	20.8	13.1	42.4	23.1	17.7	29.3	24.6	12.3	**23.2**	12.0
Derby Rd, St Augustines	Kerbside	39.3	48.5	45.4	46.2	23.9	39.3	19.3	43.1	37.7	48.5	38.5	27.0	**38.1**	12.0
Station Road, Barrow Hill	Kerbside	35.4	32.3	33.1	35.4	23.1	30.0	28.5	25.4	27.0	28.5	37.7	20.8	**29.8**	12.0
Staveley Stables	Industrial	14.6	23.9	22.3	22.3	18.5	11.6	15.4	16.9	16.2	23.9	25.4	9.2	**18.4**	12.0
Chesterfield Rd, Staveley	Roadside	30.8	37.0	37.0	37.7	34.7	29.3	36.2	37.0	20.8	35.4	35.4	Null	**33.7**	11.0
Middlecroft Road	Roadside	16.2	27.7	21.6	18.5	16.9	11.6	16.9	15.4	14.6	24.6	23.9	10.8	**18.2**	12.0
Triple Exp, Brimmington	Roadside	27.0	35.4	24.6	20.0	21.6	13.9	18.5	22.3	21.6	27.7	30.8	16.2	**23.3**	12.0
		27.7	34.7	24.6	25.4	21.6	15.4	20.8	19.3	21.6	29.3	29.3	14.6	**23.7**	12.0
		22.3	30.8	25.4	22.3	15.4	12.3	20.8	22.3	22.3	32.3	30.8	12.3	**22.5**	12.0
Jawbones Hill	Kerbside	43.1	52.4	44.7	37.7	Null	26.2	42.4	38.5	36.2	37.0	41.6	20.0	**37.7**	11.0
St Augustines Rd	Kerbside	31.6	Null	23.9	Null	29.3	23.9	21.6	26.2	24.6	34.7	34.7	13.9	**25.3**	10.0
Derby Rd, Lincoln St	Kerbside	50.1	67.8	55.4	61.6	40.0	36.2	Null	Null	39.3	50.8	43.9	27.0	**VOID**	10.0
Chesterfield Rd, Brimmington	Kerbside	33.1	39.3	35.4	33.1	33.1	Null	Null	31.6	33.1	34.7	41.6	20.0	**VOID**	10.0
Bell House Lane	Roadside	28.5	30.8	Null	Null	22.3	16.9	20.8	21.6	34.7	29.3	34.7	16.2	**25.4**	10.0
St Augustines Church	Roadside	21.6	29.3	Null	Null	Null	13.9	17.7	20.8	16.9	19.3	23.9	12.3	**19.4**	9.0
Triple Exp., Whittington Moor	Roadside				32.3	23.9	14.6	Null	Null	Null	Null	Null	16.2	**VOID**	4.0
					23.9	30.8	19.3	Null	Null	Null	Null	Null	15.4	**VOID**	4.0
					27.7	23.9	15.4	Null	Null	Null	Null	Null	13.9	**VOID**	4.0
Walton Rd	Roadside									15.4	Null	27.7	15.4	**VOID**	3.0
Queen Mary Rd	Kerbside									19.3	Null	30.0	15.4	**VOID**	3.0
Hasland By-Pass	Roadside									32.3	19.3	28.5	13.9	**VOID**	4.0
Chatsworth Rd	Kerbside									Null	Null	Null	Null	**VOID**	0.0
Vincent Crescent	Kerbside									Null	Null	Null	Null	**VOID**	0.0

Appendix 2: Calculations and Adjustment Factors

- **Laboratory Bias Adjustment Factor: Air Quality Review & Assessment Website**

Rotherham MBC/South Yorkshire laboratories: 50% TEA in acetone
Overall Bias Adjustment Factor (based on 2 studies) (A) = 0.77

- **Estimation of NO_2 annual mean concentrations from short-term monitoring data for Whittington Moor: LAQM.TG(03) Box 6.5**

Long-term data obtained from Sheffield Tinsley & Sheffield Centre AURN Sites

Annual mean Sheffield Centre 2004 = 29.78μgm^3 (AM1)
Annual mean Sheffield Tinsley 2004 = 38.42 μgm^3 (AM2)

Period mean Sheffield Centre 2004 = 29.47μgm^3 (PM1)
Period mean Sheffield Centre 2004 = 36.86μgm^3 (PM2)

(Monitoring Period: 14/04/04 – 31/12/04)

R1 = AM1/PM1	R2 = AM2/PM2
R1 = 29.78/29.47	R2 = 38.42/36.86
R1 = 1.01	R2 = 1.04

Average of Ratios Ra = R1+R2/2 = 1.03

Adjustment Factor Ra = 1.02

- **Correction factor to estimate annual average NO_2 concentrations in future years from measured data at roadside sites: LAQM.TG(03) Box 6.6**

Measured concentration in 2004 for Staveley High Street = 21.4μgm^3

Corrected concentration for 2005 = 21.4 x (0.892/0.915)
= 21.4 x 0.975
= 20.9μgm^3

Corrected concentration for 2010 = 21.4 x (0.734/0.915)
= 21.4 x 0.80
= 17.1μgm^3

- **Correction factor to estimate annual average NO_2 concentrations in future years from measured data at background sites. LAQM.TG(03) Box 6.7**

Measured concentration in 2004 for Staveley Stables Background = 18.4μgm^3

Corrected concentration for 2005 = 18.4 x (0.908/0.927)
= 18.4 x 0.98
= 18.0μgm^3

Corrected concentration for 2010 = 18.4 x (0.778/0.927)
= 18.4 x 0.839
= 15.4μgm^3

- **Estimation of PM_{10} annual mean concentrations from short-term monitoring data for Whittington Moor: LAQM.TG(03) Box 8.5**

Long-term data obtained from Sheffield Centre & Nottingham Centre AURN Sites

Annual mean Sheffield Centre 2004 = 21.74μgm^3 (AM1)
Annual mean Nottingham Centre 2004 = 22.51 μgm^3 (AM2)

Period mean Sheffield Centre 2004 = 21.46μgm^3 (PM1)
Period mean Nottingham Centre 2004 = 22.27μgm^3 (PM2)

(Monitoring Period: 14/04/04 – 31/12/04)

R1 = AM1/PM1	R2 = AM2/PM2
R1 = 21.74/21.46	R2 = 22.51/22.27
R1 = 1.01	R2 = 1.01

Average of Ratios Ra = R1+R2/2 = 1.01

Adjustment Factor Ra = 1.01

- **Estimation of PM_{10} Concentration in2010. LAQM.TG(03) Box 8.6**

1. Annual Mean 2004 = 22.3μgm^3 GRAV EQ

2. Secondary PM_{10} from internet maps at http://www.airquality.co.uk
   = 7.32μgm^3 GRAV EQ

3. Local secondary PM_{10} in 2004 using correction factors in Box 8.7
   = 0.932 x 7.32
   = 6.82μgm^3 GRAV EQ

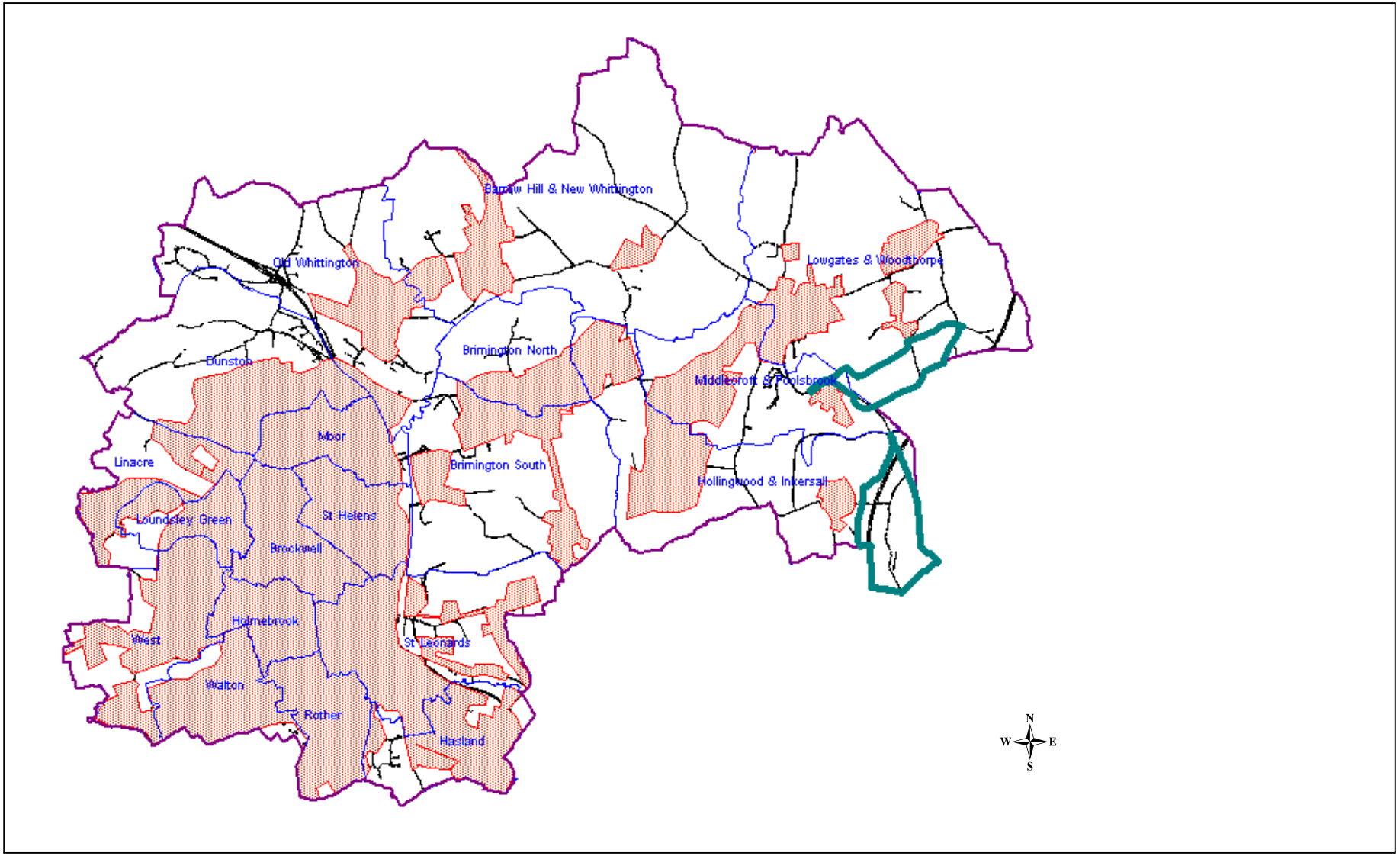
4. Local primary PM_{10} in 2004 by subtracting the secondary concentration and the PM10 coarse concentration from the measured concentration.
   = 22.3 - (10.5 + 6.82)
   = 4.98μgm^3 GRAV EQ

5. Adjust local primary PM_{10} concentration in 2004 to 2010 using correction factors in box 8.7.
   = 4.98 x (0.815/0.930)
   = 4.36μgm^3 GRAV EQ

6. Calculate secondary PM_{10} in 2010 using correction factors in Box 8.7
   = 7.32 x 0.795
   = 5.82μgm^3 GRAV EQ

7. Calculate the total estimated PM_{10} in 2010 by adding steps 4 and 6 and the assumed coarse concentration.
   = 4.98 + 5.82 + 10.5
   = 21.3μgm^3 GRAV EQ

Appendix 3: Map showing approximate location of the Markham Employment Growth Zone, highlighted in green, which received outline planning permission in 2004.



Appendix 4

Chesterfield Borough Council Air Quality Strategy – 2003

Introduction

Good Air Quality is something to which everyone has a right. Chesterfield Borough Council is committed to doing all it can to manage the quality of the air within the Borough to keep it as free of risk, to human health, as possible.

The National Air Quality Strategy provides an overall guide to local authorities on Air Quality Management, and imposes a legal requirement to take steps to ensure that Air Quality Standards are met. Chesterfield Borough Council's Air Quality Strategy translates the national requirements and guidelines to the local level.

The Community Strategy also sets a Key Objective to "Reduce the levels of pollution in *the* air".

This Air Quality Strategy sets out the Council's approach to delivering the Community Strategy objective.

It sets out the Council's aims, the principles via which it will pursue them and some of the major landmarks in progress towards these aims.

Aims

That the air people breathe, within the Borough, is of good quality and enables healthy living.

That, for the purpose of this strategy, the definition of good air quality is the avoidance of any breaches of the Air Quality Objectives, set by central government.

That the Council communicates the facts about air quality to the public in order to achieve a widespread understanding of the issues and status of air quality within the Borough.

Approach

There are three logical, and to some extent sequential, phases of action towards achieving the Council's strategic goals namely;

Information Gathering,

Planning and Partnership Working,

Potential Intervention,

The other activity which should be continuous over all phases is publicity and communication.

Information Gathering

Information gathering began in earnest in 1998. Air quality monitoring equipment is established at various locations around the Borough and information is collected continuously for a range of pollutants.

By June 2003 three detailed assessments of air quality had been completed. These assessments began by considering a wide range of potential pollutants and through

a process of modelling, supported by measurements of the actual pollutants present in the air, it has been demonstrated that within the Borough of Chesterfield that;

a) the air quality throughout the Borough is generally good, and there will not be any widespread exceedence of the Government set, health-based air quality standards.

b) at a limited number of hot spots, there are only three pollutants that approach levels that are at risk of exceeding the health based standards, namely Oxides of Nitrogen, Sulphur Dioxide and Particulate Matter.

c) The significant hotspots are associated with road traffic pollution rather than industrial sources.

The Council will continue to monitor air quality into the future. This effort will be focussed according to known risks relative to the air quality objectives.

For the foreseeable future this will mean focusing on the road traffic hot spots and the pollutants identified as having the potential to exceed the standard.

Nevertheless as scientific knowledge moves on it may be necessary to review those pollutants under consideration.

Planning and Partnership Working

Based on the data collected and the predictions this allows, the Council is aware of potential hot spots where exceedence of the Air Quality Standards might occur.

The Council will work proactively to reduce the chances of exceedence of the air quality standards by;

- Working with Planners to influence development e.g. at the Borough Council level via the Local Plan,
- At the County Council level with the Transport Planners to influence the likely traffic flows.
- The Council will raise the profile of Air Quality issues with its partners at every opportunity to ensure it is given full consideration

Potential Intervention

In the event that air quality does, or is demonstrably likely to, fall below the required standards an Air Quality Management Area must be declared by the Authority. This would bring certain additional powers to initiate special projects and campaigns to improve air quality. These powers bring certain extra powers of limited practicality, which have not been used by any authority outside London. However, Air Quality Management Areas also bring considerable extra bureaucracy and the potential to blight the properties included in the area. Consequently the initial premise of this strategy is to work vigorously to keep within the air quality standards and avoid the need for an Air Quality Management if at all possible.

Legal Basis

The management of air quality is carried out under the provisions of the Environment Act 1995.

Delivery Action Plan

This document sets out the Councils long term Strategy including its goals and approach which should remain consistent for a number of years. The detailed plans for delivering the Strategy will have to change fairly frequently in response to changes in scientific knowledge, trends in vehicle ownership and other local circumstances. The Air Quality Action Plan is therefore kept as an appendix to this document which will be updated periodically, about once a year, without affecting the contents of the overall strategy. See Appendix A Chesterfield Borough Council's Air Quality Action Plan.

Appendix A

Chesterfield Borough Council's Air Quality Action Plan

Chesterfield Borough Council's Air Quality Action Plan establishes priority actions which will deliver the aims and objectives of its Air Quality Strategy. These actions will be reviewed and reprioritised in line with changing local and national priorities. It is recommended that an Air Quality Strategy Steering Group is established to oversee this, involving all relevant Services within the Council and partner organisations that will have an impact on air quality.

Chesterfield Borough Council will:

1. Establish a detailed understanding of how traffic pollution effects air quality in Chesterfield, by validating the traffic emission modelling used in the 2003 review and assessment. It has been agreed in principle that a joint traffic and air quality impact assessment will take place in partnership with Derbyshire County Council. Capital expenditure necessary for the project will be applied for by an SCA bid. The project planning is already underway, new equipment should be deployed in 2004 and results should be available in 2004/2005.

2. Work in partnership with other agencies to identify future development of road traffic schemes that could result in exceedence of air quality standards in Chesterfield. The widening of the M1, the creation of junction 29A and redevelopment of the Brian Donkin Industrial all have the potential to make such and impact over the next decade. The impacts of these developments must be fully understood and managed. Derbyshire County Council has undertaken to assist in the assessment of impacts on Chesterfield.

3. Work in partnership with other agencies to ensure that air quality issues are considered at a local policy formation level. This is to be achieved by engaging actively through the community strategy. Partnership working with Derbyshire County Council in monitoring and modelling exercises which will raise the profile of Air Quality with them as the Transport Planning Authority.

4. Identify and support projects and green transport initiatives to achieve reductions in traffic generated pollution both within the Council and in partnership with other agencies. This is to be achieved through;

   The Councils Green Transport plan
   The Councils Green Procurement Principles
   Contributing actively to the Local Transport Plan.

5. Develop the capacity to monitor PM 2.5 concurrently with PM10. This is necessary because it is anticipated that EU legislation will be reviewed to include the assessment of this fine fraction of dust in the near future. Furthermore the local Primary Care Trust has also commented that the PM 2.5 fraction has the greatest potential to impact on health. Funding will be sought for the equipment needed to monitor PM2.5 with the aim of commencing monitoring during 2004.