



Air Quality Review and Assessment

Progress Report

Environmental Protection Section
Planning and Environment
Council Offices, Coalville,
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May 2005

Executive Summary

The purpose of this report is to provide an update on air quality monitoring in the district and assess any changes that have taken place that may affect air quality, since the last Updating and Screening Assessment (USA) in June 2003.

The first phase of the second round of review and assessment, the USA, was completed in June 2003 and this provided an update with respect to air quality issues within the North West Leicestershire District on the conclusions of the previous round.

The USA indicates that the objective will not be met for nitrogen dioxide within the two AQMAs declared in the district. The Department of Food and Rural Affairs (DEFRA) has accepted the USA conclusions. The USA also concluded that a Detailed Assessment was required for PM₁₀ in the vicinity of Bradgate Drive, Greenhill Estate, Coalville. This location has been identified as a potential area where the UK Air Quality Objective for PM₁₀ may exceed the 24-hour mean of 50µgm⁻³ due to emissions from Bardon Quarry. A Detailed Assessment has been undertaken and should be read in conjunction with this report.

The continued monitoring of NO₂ concentrations in 2003 and 2004 indicates that four locations are likely to exceed the 40µgm⁻³ annual mean objective in 2005. A further location is likely to exceed 36µgm⁻³ annual mean concentration for NO₂. Further more detailed monitoring should be undertaken at these locations two of which are currently declared as AQMAs.

For PM₁₀ the number of exceedences recorded in 2004 at Tillson House on the Greenhill Estate, Coalville were below the permitted 35 per year, therefore an Air Quality Management Area will not need to be declared in the vicinity of Bradgate Drive, Greenhill Estate, Coalville.

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1. Introduction

1.1 Description of the District

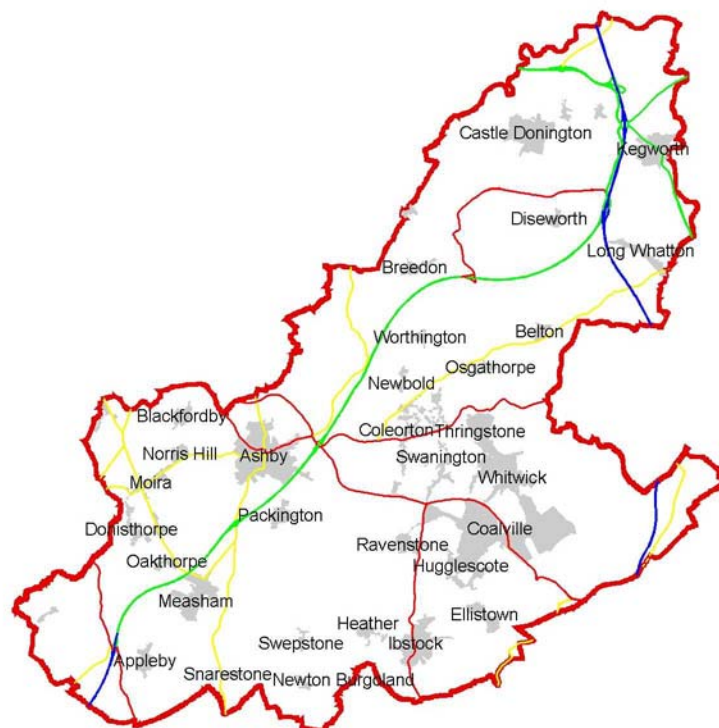


Figure 1.1 Map of North West Leicestershire District

North West Leicestershire lies in the East Midlands Region and is both the name and geographical location. The district is situated in the heart of the National Forest and lies between Leicester, Burton-on-Trent, Derby and Nottingham, covering 105 square miles. The district is mostly rural with a large extent of industry historically from coal mining, but more recently with Nottingham East Midlands Airport and large quarries. The population of 88,800 mainly live in the principle towns of Coalville and Ashby-de-la-Zouch, and within the large villages of Castle Donington, Kegworth and Ibstock. Three established main roads run through the district, the M42/A42 between Birmingham and Nottingham, the M1 and the A50/A511 from Leicester to Burton-on-Trent.

1.2 Background to Local Air Quality Management

In 1995 the Government published the Environment Act which introduced initiatives for the protection of air quality in the UK. It uses health-based standards to control

the levels of seven designated pollutants. It requires local authorities to conduct reviews and assessments and to identify the locations within their areas where the standards for pollution levels are 'not likely' to be met. If as a result of the review process, it appears that the air quality objectives are not, or are unlikely to be achieved in any area within the boundary of the local authority – then the local authority shall by order designate it as an 'Air Quality Management Area' (AQMA). Once such an area has been designated a more detailed assessment of the air quality shall be conducted.

In January 2001 North West Leicestershire District Council completed its Stage 3 review and assessment of air quality for the district. The purpose of the assessment was to determine whether the objectives set by the government for the seven pollutants, considered as being of most concern to public health and as detailed in the National Air Quality Strategy would be achieved. The seven pollutants are benzene, 1,3-butadiene, lead, carbon monoxide, nitrogen dioxide, particulate matter (PM₁₀) and sulphur dioxide. As a result 6 AQMAs were declared in North West Leicestershire District Council, due to predicted exceedences of the annual mean objective for nitrogen dioxide (40µgm⁻³).

In March 2003 Northwest Leicestershire District Council completed its Stage 4 review and assessment of air quality within its AQMAs. The Stage 4 report concluded that the annual mean objective for nitrogen dioxide will not be met within two of the AQMAs but the objective will be met within the remaining four AQMAs and elsewhere throughout the district. Four of the AQMAs were subsequently revoked, the boundaries of the M1 AQMA were re-defined and the A6 AQMA in Kegworth remained unchanged.

Following the Updating and Screening Assessment conducted in June 2003, one location, in the vicinity of Tillson House, Greenhill Estate, Coalville was identified as one area where the PM₁₀ objective may not be met due to the proximity of mineral processes. The Detailed Assessment produced in April 2005 concluded that the 50µgm⁻³ 24-hour mean was not exceeded more than 35 times, therefore an Air Quality Management Area will not need to be declared.

This report details all new monitoring data obtained since the publication of the Updating and Screening Assessment.

2. Aims and Objectives

The objectives of this progress report are to:

- Report the results of any monitoring that has taken place since the Updating and Screening Assessment in June 2003.
- Review any changes that have taken place which may have had an adverse effect on air quality in the North West Leicestershire District.
- Update members of the public on air quality in North West Leicestershire District and provide a yearly continuity of reports that satisfies the statutory requirements.

3. Monitoring Results

The following table specifies the Air Quality Objectives set out in the Air Quality Regulations (2000).

Table 3.1 Air Quality Objectives in the Air Quality Regulations (2000) for the purpose of Local Air Quality Management

Pollutant	Air Quality Objectives		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 μgm^{-3}	Running annual mean	31/12/2003
	5 μgm^{-3}	Annual mean	31/12/2010
1,3-Butadiene	2.25 μgm^{-3}	Running annual mean	31/12/2003
Carbon Monoxide	10.0 μgm^{-3}	Maximum, daily running 8 hour mean	31/12/2004
Sulphur Dioxide	350 μgm^{-3} not to be exceeded more than 24 times per year	1 hour mean	31/12/2004
	125 μgm^{-3} not to be exceeded more than 3 times per year	24 hour mean	31/12/2004
	266 μgm^{-3} not to be exceeded more than 35 times per year	15 minute mean	31/12/2005
Nitrogen Dioxide	200 μgm^{-3} not to be exceeded more than 18 times per year	1 hour mean	31/12/2005
	40 μgm^{-3}	Annual mean	31/12/2005
Particles (PM ₁₀)	50 μgm^{-3} not to be exceeded more than 35 times per year	24 hour mean	31/12/2004
	40 μgm^{-3}	Annual mean	31/12/2004

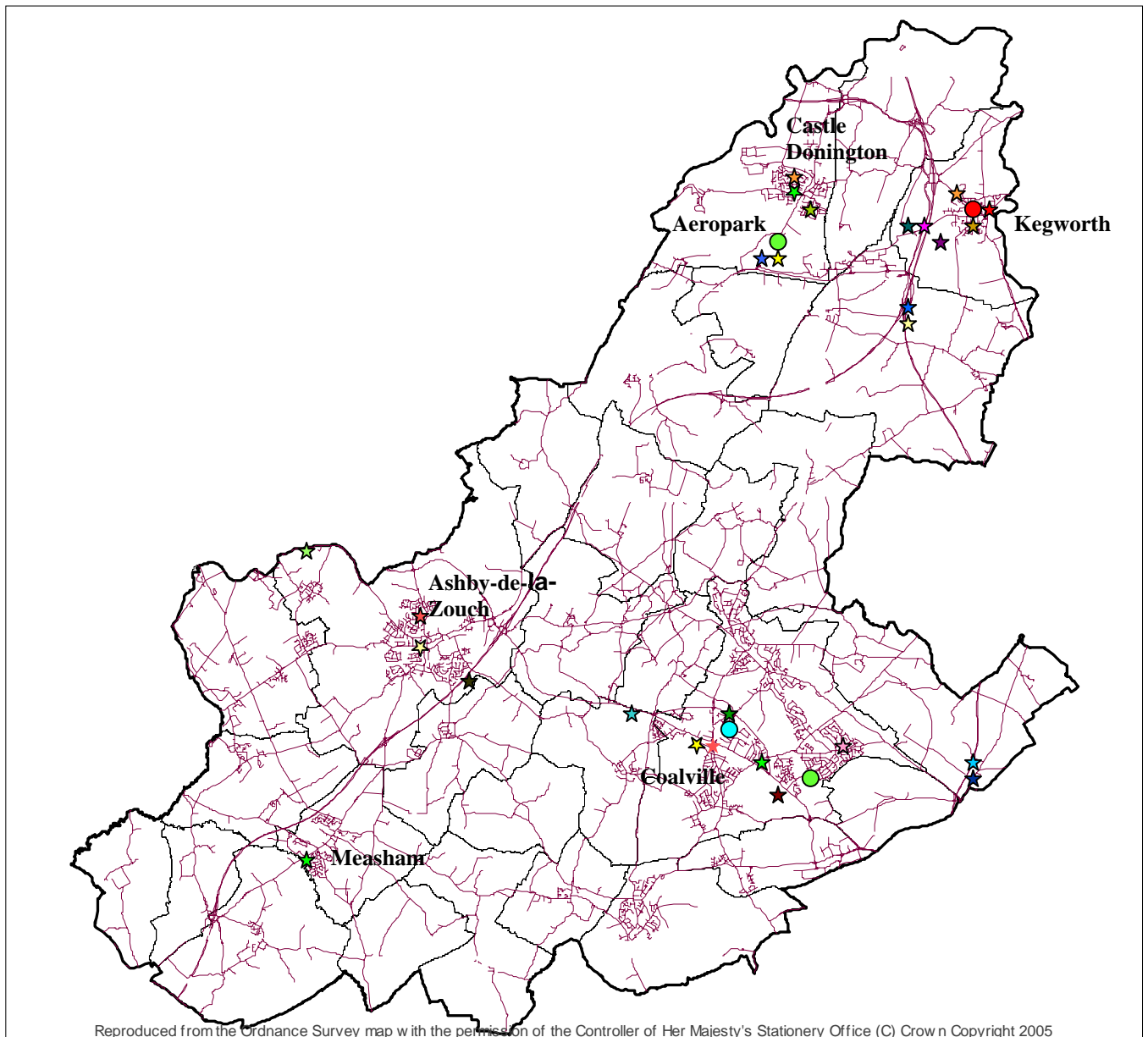


Figure 3.1 Location of NO₂ Diffusion Tubes and Air Quality Analysers

- | | | |
|---------------------|---------------------|----------------------------|
| ★ Belvoir | ★ CD Diseworth | ★ Copt Oak |
| ★ Jackson | ★ CD High St | ★ Charley |
| ★ Oxford St | ★ CD EMA | ★ Broomleys |
| ★ Abbotts Oak | ★ CD Station Rd | ★ Sinope |
| ★ Derby Rd Kegworth | ★ Kegworth A6 | ★ Molehill House |
| ★ Measham | ★ Kegworth EMA | ★ Aeropark |
| ★ Boundary | ★ Kegworth Molehill | ● NO ₂ Analyser |
| ★ Ashby Marlborough | ★ Long Whatton M1 | ● PM10 Analyser |
| ★ Ashby Market St | ★ Long Whatton West | ● SO ₂ Analyser |
| ★ Ashby A42 | ★ Bardon Rd | |

3.1 Monitoring Locations

North West Leicestershire District Council currently has twenty-six NO₂ Diffusion Tube sites, two Osiris PM₁₀ monitors, one real-time NO₂ monitor and one SO₂ bubbler within the district. Each of these monitoring locations is displayed in Figure 3.1.

4. Progress Report for Benzene

The Updating and Screening Assessment in 2003 concluded that the relevant Air Quality Objectives would be met locally.

Benzene is emitted primarily from petrol-engine vehicles, petrol refining, and petrol station forecourts and from specific industrial uses. There have been no developments locally since June 2003 which are likely to have any significant impact on the previous conclusion.

There is no requirement for further assessment.

5. Progress Report for 1,3-Butadiene

The national perspective on 1,3-Butadiene is that Air Quality Objectives will be met by the due date in all areas except for authorities with major industrial processes where the chemical is handled in bulk. There are no processes within North West Leicestershire that handle, store or emit 1,3-Butadiene at present.

There is no requirement for further assessment.

6. Progress Report for Lead

Emissions of lead to atmosphere are now restricted in the UK to specific industrial sources including battery manufacture, pigments for paints and glazes, alloys, radiation shielding, tank lining and piping.

Current levels of lead in the air at national monitoring sites indicate compliance with the Air Quality Objectives.

There is no requirement for further assessment.

7. Progress Report for Carbon Monoxide

The Updating and Screening Assessment report produced in 2003 concluded that there were no locations in the district where Carbon Monoxide was likely to exceed the relevant Air Quality Objectives. This is based on national guidance in relation to emissions from road traffic and the effects on people in the vicinity. There has been no significant increase in road traffic since 2003 that is likely to alter the previous conclusion.

There is no requirement for further assessment.

8. Progress Report for Sulphur Dioxide

8.1 Introduction

North West Leicestershire District Council currently has an 8-port SO₂ bubbler sited at the Council Offices in Coalville. Although this site is still in operation the data set is limited due to recurring problems with the monitor.

8.2 Results

Although the results from the 8-port sampler is not conclusive it does provide a coarse indication of the levels of sulphur dioxide within the district.

The Technical Guidance states that where the net acidity measurements are made then the measured maximum daily mean concentration should be multiplied by 1.25 to take account of a general tendency for bubblers to under-read at high concentrations. The results from the bubbler with the correction factor applied are shown in Table 8.1.

The Technical Guidance also details correction factors which can be used to convert the maximum daily mean to the 15 minute and the 1 hour objective, as detailed below;

99.9th percentile of 15 minute means = 1.8962 x maximum daily mean

99.7th percentile of 1 hour means = 1.3691 x maximum daily mean

Table 8.1 SO₂ Concentrations (µgm⁻³) Obtained from the 8-Port Bubbler Sited at the Council Offices Coalville

2003	Coalville Council Offices	Objective
Maximum Daily Mean (µgm ⁻³)	37.5µgm ⁻³	125µgm ⁻³
Maximum 15-min Mean (µgm ⁻³)	71.1µgm ⁻³	266µgm ⁻³
Maximum 1-hour Mean (µgm ⁻³)	51.3µgm ⁻³	350µgm ⁻³

As stated above whilst the results shown in Table 7.2 are of limited value they do indicate that the levels of sulphur dioxide within the district are much lower than the current objectives for the daily, 15-minute and 1-hour measurement periods.

8.3 Conclusions

North West Leicestershire is unlikely to exceed to objectives for sulphur dioxide therefore no further assessment is required.

9. Progress Report for Nitrogen Dioxide

9.1 Introduction

Nitrogen dioxide is monitored by diffusion tubes at 26 sites throughout the district, a summary of the results are presented in Table 8.3. In addition to the diffusion tube network a chemiluminescent continuous monitor has been commissioned within the boundaries of the AQMA at Molehill Farm.

The diffusion tubes are sent to Casella Stanger and analysis is conducted by Gradko International Analytical Laboratories. Gradko International is a UKAS recognised laboratory for the provision and analysis of diffusion tubes, and the analysis is

performed in accordance with guidelines set out by the UK Nitrogen Dioxide Diffusion Tube Network. The diffusion tubes are prepared using the 50% TEA in acetone method.

An NO₂ tube was placed alongside the real-time monitor at Kegworth between January 2003 and December 2003. This co-location arrangement allows a bias adjustment to be determined for the district. The calculation for the bias adjustment is shown below.

$$\text{Bias adjustment} = \frac{\text{Mean annual chemiluminescence concentration (CM)}}{\text{Mean annual diffusion tube concentration (DM)}}$$

$$\text{Bias adjustment} = \frac{42.99}{39.06}$$

$$\text{Bias adjustment} = 1.1006$$

9.1.1 Quality Assurance / Quality Control of Monitoring Data

The real time monitor was purchased from Enviro Technology and is an API M200A NO_x analyser. A service agreement is in place for the analyser. If the analyser malfunctions an engineer is called out immediately to minimise data loss. Every six months the equipment is serviced and calibrated by the manufacturer at which time preventative maintenance checks and reviews of the entire system and its operation are conducted.

The analyser performs an internal automatic daily calibration to check on instrument performance. An officer visits the site every fortnight, and a manual two-point (zero/span) calibration in accordance with the manufacturer specifications is conducted and filters are conducted. The results of the calibration are forwarded to Enviro Technology to ensure continuity.

9.1.2 Diffusion Tube Network

Diffusion tubes are a relatively basic method of monitoring nitrogen dioxide. They will not register short-term pollution episodes of a few hours or days, hence can not be used to give a direct indication of whether the hourly standard for NO₂ has been exceeded. However, they are inexpensive and so can be deployed at a relatively large number of sites. The results of which can be averaged over a calendar year to estimate whether the annual objective has been exceeded.

The diffusion tubes are sent to Casella Stanger and Gradko International Analytical Laboratories conduct the analysis. Gradko International is a UKAS recognised laboratory for the provision and analysis of diffusion tubes, and the analysis is performed in accordance with guidelines set out by the UK Nitrogen Dioxide Diffusion Tube Network. The diffusion tubes are prepared using the 50% TEA in Acetone method and generally have a margin of error of $\pm 1.67\%$. The distribution of the 26 diffusion tubes across the district are displayed in Figure 2.1.

9.2 Results

Ratified data from January 2003 to December 2003 from the real-time analyser sited outside the Parish Council Offices next to the A6 in Kegworth is presented in Table 9.1. An AQMA is currently declared covering approximately 60 properties along the A6 in Kegworth. The annual air quality objective for NO₂ of $40\mu\text{g}\text{m}^{-3}$ was exceeded in 2003 with the annual mean for the year being $42.99\mu\text{g}\text{m}^{-3}$. This data was used in conjunction with a co-located diffusion tube to produce the bias adjustment factor which was subsequently applied to all the diffusion tube data obtained in 2003 and 2004.

Table 9.1 Ratified NO₂ Concentrations (µgm⁻³) Obtained from a Real-time Monitor Sited at Kegworth Parish Council Offices

Date	Ratified Monitor Data (µgm⁻³)
January 2003	40.67
February 2003	52.58
March 2003	42.98
April 2003	38.79
May 2003	42.72
June 2003	36.22
July 2003	34.18
August 2003	35.51
September 2003	52.52
October 2003	41.93
November 2003	49.33
December 2003	48.48
Mean	42.99

Bias adjusted annual average concentrations between January 2003 and December 2004 in North West Leicestershire District and predictions for 2005 are presented in Table 9.3.

Monitoring sites can be classified according to the type of environment in which they are located (DEFRA, 2003). The site descriptions are provided in Table 9.2, with the appropriate abbreviation being used to categorise the diffusion tube locations in Table 9.3.

The Stage 4 report stated that all roads predicted to be above 36µgm⁻³ (40µgm⁻³ – 1 Standard Deviation) but below the 40µgm⁻³ at relevant locations in 2005 were incorporated into AQMAs. Values above 36µgm⁻³ have been highlighted in blue in Table 9.3, whilst those values which exceed the annual mean objective of 40µgm⁻³ are highlighted in yellow.

The annual mean NO₂ concentrations obtained in 2003 show four locations which exceed 36µgm⁻³. These locations are Belvoir, Castle Donington Station Road, Kegworth A6 and Copt Oak. When the 2003 data was bias adjusted the concentrations obtained at these four locations all exceeded the annual mean objective

of $40\mu\text{gm}^{-3}$. Currently only Kegworth A6 has a declared Air Quality Management Area.

In terms of meteorology 2003 was considered a poor year for air quality. The data obtained in 2004 may give a clearer indication of the likelihood of meeting the annual mean objective in 2005. In 2004 three sites recorded annual mean concentrations greater than $36\mu\text{gm}^{-3}$, Bardon Road, Kegworth A6 and Broomleys Road. When the bias adjustment factor was applied a further two sites, Castle Donington High Street and Copt Oak exceeded $36\mu\text{gm}^{-3}$. Following bias adjustment four sites exceeded the annual mean objective of $40\mu\text{gm}^{-3}$. These being Bardon Road, and Broomleys Road along with the current AQMA locations of Kegworth A6 and Kegworth Molehill Farm. The data obtained from Copt Oak exceeded $36\mu\text{gm}^{-3}$ following bias adjustment and is predicted to still be above this concentration in 2005.

Four locations are predicted to exceed the annual mean objective of $40\mu\text{gm}^{-3}$ in 2005. These are the two current AQMA's at Kegworth A6 and Kegworth Molehill House along with Bardon Road Coalville and Broomleys Road Coalville.

The results obtained during the diffusion tube survey indicate that more detailed monitoring should be undertaken at Copt Oak, Bardon Road Coalville and Broomleys Road Coalville.

[Table 9.2 Monitoring Location Descriptions](#)

Site Type	Description
(UC) Urban Centre	An urban location representative of typical population exposure in towns or city centres e.g. pedestrian precincts and shopping malls.
(UB) Urban Background	An urban location distanced from sources and therefore broadly representative of city-wide background condition e.g. urban residential areas.
(S) Suburban	A location type situated in a residential area on the outskirts of a town or city.
(R) Roadside	A site sampling between 1m of the kerbside of a busy road and the back of the pavement. Typically this will be within 5m of the road, but could be up to 15m.
(O) Other	Any special source-orientated or location category covering monitoring undertaken in relation to specific emission sources such as power stations, car-parks, airports or tunnels.

Table 9.3 NO₂ Diffusion Tube Mean Concentrations (μgm^{-3}), Bias Adjusted and Predicted Concentrations in 2005

Diffusion Tube Location	2003			2004		
	Mean (μgm^{-3})	Bias Adj. (μgm^{-3})	Predicted for 2005	Mean (μgm^{-3})	Bias Adj. (μgm^{-3})	Predicted for 2005
Belvoir (R)	38.09	41.92	39.74	28.34	31.19	30.41
Jackson (UC)	31.94	35.15	33.33	26.20	28.84	28.11
Oxford (UB)	27.19	29.93	28.37	19.48	21.44	20.90
Abbotts (S)	23.08	25.40	24.08	22.57	24.84	24.22
Bardon (R)	35.01	38.53	36.53	38.83	42.74	41.67
Derby Rd	30.72	33.81	32.05	31.12	34.25	33.39
Keg (R)						
Measham (R)	27.47	30.23	28.66	26.39	29.04	28.32
Boundary (R)	24.51	26.98	25.57	20.67	22.75	22.18
Ash Marl (S)	24.16	26.59	25.21	22.69	24.97	24.35
Ash Mark (R)	28.58	31.46	29.82	32.44	35.70	34.81
Ash A42 (R)	28.41	31.27	29.64	28.46	31.32	30.54
CD High (R)	34.31	37.76	35.80	34.64	38.12	37.17
CD EMA (O)	19.62	21.59	20.47	22.32	24.57	23.95
CD Stat (R)	37.97	41.79	39.62	29.47	32.43	31.62
CD Dise (O)	22.67	24.95	23.65	26.51	29.18	28.45
Keg A6 (R)	39.06	42.99	40.75	37.47	41.24	40.21
Keg EMA (S)	25.63	28.21	26.74	22.80	25.09	24.47
Keg Mole (R)	49.68	54.68	51.83	58.82	64.74	63.12
LW M1 (R)	28.92	31.83	30.17	25.45	28.01	27.31
LW West (R)	27.81	30.61	29.02	32.05	35.27	34.39
Copt Oak (R)	37.02	40.74	38.63	35.76	39.36	38.37
Charley (R)	33.58	36.96	35.04	31.96	35.18	34.30
Broomleys (R)	41.75	45.95	43.56	39.32	43.28	42.19
Sinope (R)	28.13	30.96	29.35	29.21	32.15	31.34
Molehill House (R)	28.62	31.50	29.86	31.47	34.64	33.77
Aeropark (O)	24.69	27.17	25.76	19.17	21.10	20.57

To enable trends in annual NO₂ concentrations from the diffusion tube survey in North West Leicestershire District to be analysed Figures 8.1 and 8.2 have been produced. Data is available from 1994 onwards for six diffusion tube locations, the results of which are plotted in Figure 9.1. All six locations show a general downward trend from 1994 to 2001. However since 2001 all six locations have shown increases in annual mean concentrations with one site, Kegworth A6 being above the 40 μgm^{-3} annual mean objective in 2004.

The remaining 16 diffusion tube locations have data available from 1998 to 2004 with the data being presented in Figure 9.2. These tubes again show a general downward trend from 1998 to 2001 after which the majority have shown gradual increases in concentrations. The annual mean concentration of NO₂ exceeds the air quality objective at three locations, Bardon Road Coalville, Broomleys junction Coalville and

Molehill Farm Kegworth which is situated next to the M1. Out of all the tube locations only one has shown significant increases in NO₂ concentrations since monitoring began. This is Molehill Farm Kegworth which is situated next to the M1 between junctions 23a and 24.



Figure 9.1 Trends in NO₂ Diffusion Tube Concentrations (µgm⁻³)

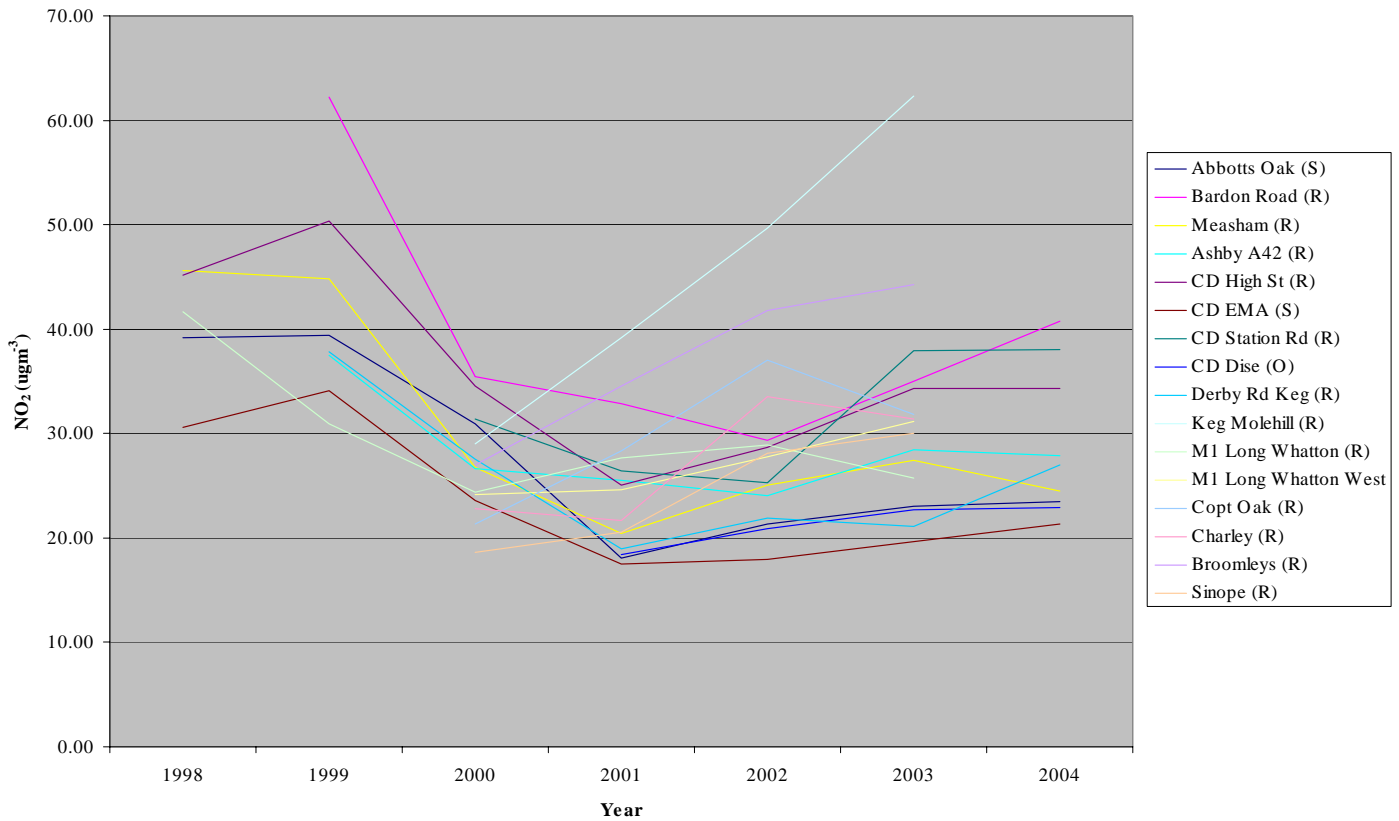


Figure 9.2 Trends in NO₂ Diffusion Tube Concentrations (µgm⁻³)

Bias adjusted data obtained during 2004 from all 26 diffusion tube locations has been projected forward using the method described in LAQM.TG (03), (DEFRA, 2003) to predicted NO₂ concentrations in 2005 and 2010. This data is presented in Figure 9.3. Based on the bias adjusted data from 2004 the annual mean objective of 40µgm⁻³ will be exceeded at three locations in 2005, Bardon Road Coalville, Kegworth Molehill Farm next to the M1 and Broomley Road a busy crossroads in Coalville.

However, by 2010 the predicted data indicates that only one location will exceed the annual mean objective of 40µgm⁻³ that is at Kegworth Molehill Farm next to the M1.

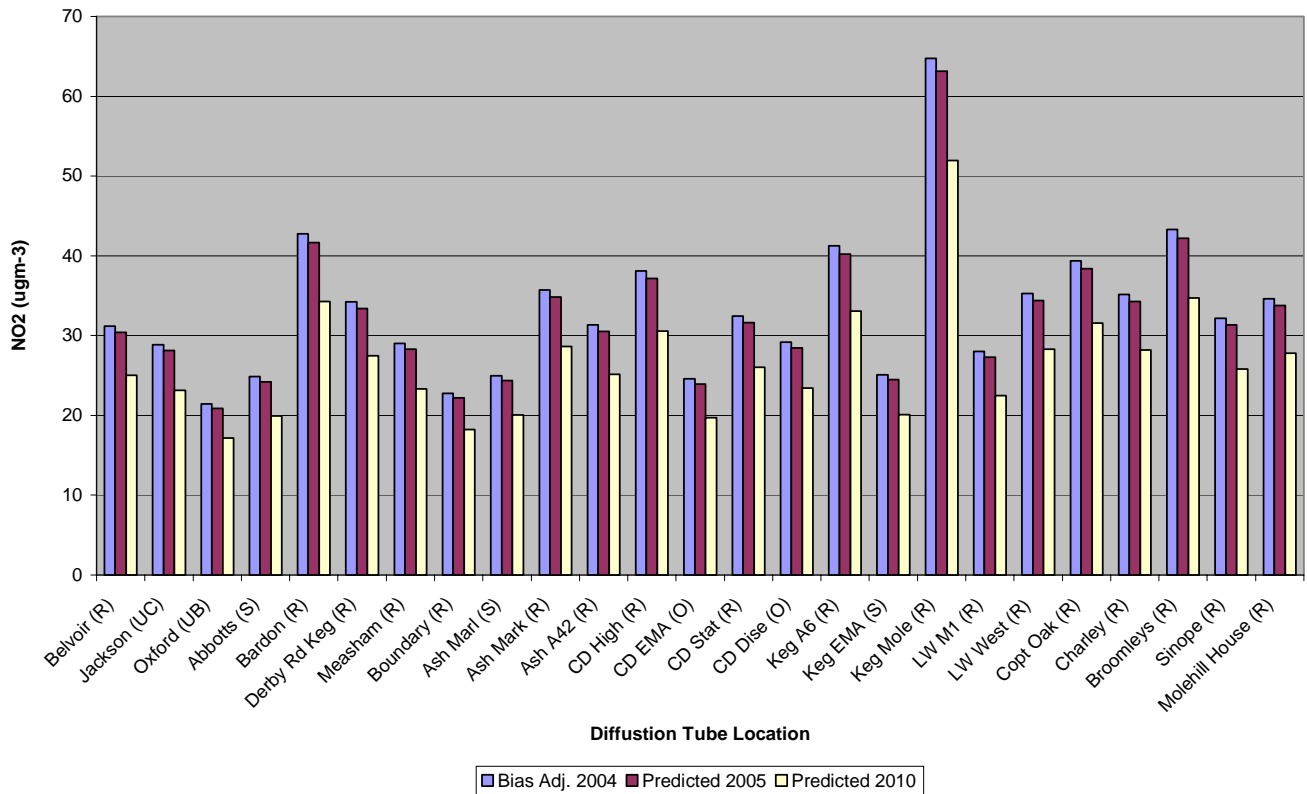


Figure 9.3 Bias Adjusted Diffusion Tube Concentrations (μgm^{-3}) and Predicted Concentrations in 2005 and 2010

Aircraft are significant sources of nitrogen dioxide emissions, especially during take off. Nottingham East Midlands Airport is located in the north of the district. The airport has an extensive NO_2 diffusion tube survey along with operating a real-time analyser sited at the Aeropark. The monitoring results for 2004 are reported in Table 9.4. The nearest relevant exposures from the boundary of the airport are several residential properties located approximately 250m from the northern edge of the runway. The closest monitoring points to these properties are the Aeropark diffusion tube and the real-time analyser, which is co-located. Both these methods indicate that the NO_2 objectives are being met.

Table 9.4 NO₂ Concentrations (µgm⁻³) recorded at sites within the Boundaries of Nottingham East Midlands Airport

2004	Stand 15 (µgm ⁻³)	Crash Gate 27 ILS (µgm ⁻³)	Crash Gate 4 (µgm ⁻³)	Central IRVR (µgm ⁻³)	Western Perimeter Fence (µgm ⁻³)	Aeropark (µgm ⁻³)	Ambassador Rd (µgm ⁻³)	Real Time Analyser (µgm ⁻³)
Jan	17.19	26.74	19.10	34.38	24.38	-	22.92	26.74
Feb	53.48	26.74	28.64	32.47	30.56	30.56	26.74	28.64
Mar	36.29	24.83	21.01	30.56	19.10	17.19	13.37	32.47
April	45.83	32.47	24.83	36.29	22.92	22.92	-	26.74
May	42.02	34.38	24.83	30.56	21.01	19.10	30.56	22.92
June	19.10	22.92	22.92	21.01	15.28	19.10	17.19	17.19
July	45.83	30.56	21.01	24.83	22.92	19.10	30.56	17.19
Aug	38.20	30.56	32.47	32.47	19.10	22.92	30.56	-
Sep	36.29	28.64	30.56	30.56	21.01	-	28.64	21.01
Oct	55.39	42.02	42.02	45.83	30.56	32.47	38.20	24.83
Nov	49.66	34.38	51.57	43.93	36.29	42.02	45.83	26.74
Dec	51.57	36.29	47.75	28.64	32.47	42.02	38.20	32.47
Mean	40.11	30.56	30.56	32.47	24.83	26.74	28.65	24.83

9.3 Conclusions

Monitoring has been conducted throughout the district by the use of both diffusion tubes and a real-time analyser. The NO₂ concentrations obtained during 2003 and 2004 indicate that exceedences of the annual mean objective of 40µgm⁻³ are occurring at four locations within the district, with a further location exceeding 36µgm⁻³. Of these, two sites at Kegworth A6 and Kegworth Molehill Farm next to the M1, are currently within established AQMA's for which an Action Plan has been submitted to DEFRA. Of these two locations, Molehill Farm located next to the M1 shows the highest concentrations of NO₂ within the district. To obtain more detailed data the real-time NO₂ analyser previously located next to the A6 in Kegworth has been relocated next to the M1 at Molehill Farm between junctions 23a and 24. This site should be operational from April 2005. The remaining three locations Bardon Road Coalville, Broomley Road crossroads Coalville and Copt Oak have not been declared as AQMA's. More detailed monitoring of NO₂ concentrations will now be undertaken. This will include increasing the number of diffusion tubes currently in use and from June 2005 a mobile air quality van will be sited for 3-month periods at each location. Whilst a 3 month period will not be sufficient to obtain annual mean data it will show the real-time situation that is occurring. The data obtained will enable validation of the diffusion tubes to be undertaken. As well as a real-time NO₂ analyser the unit also contains real-time SO₂, CO and PM₁₀ analysers.

10. Progress Report for PM₁₀

10.1 Introduction

Two Osiris PM₁₀ monitors have been operated within the district. These monitors are both Turnkey monitors, which determine particulate concentrations by measuring the degree of laser light scatter that occurs when the particulate stream is passed through a beam of laser light.

10.2 Results

One monitor is situated at the Aeropark, Diseworth Road, Castle Donington (Figure 3.1) immediately north of Nottingham East Midlands Airport. This monitor was installed at the beginning of 2004 and has suffered from continuing software problems since July of that year. Therefore a full years data set was not obtained. All data available is presented in Figure 10.1. All 24-hour mean concentrations obtained from this site were below the 50µgm⁻³ objective.

The second monitor is operated by Aggregate Industries and is located in the grounds of a residential care home, Tillson House, Greenhill Estate, Coalville, located 200m from the boundary of the quarry. The annual mean results obtained from the Osiris monitor at Tillson House is presented in Table 10.1. Within the Updating and Screening Assessment produced by the district council in 2003, the 2002 annual mean was predicted forward to 2004 and 2010 using the method described in LAQM.TG(03), (DEFRA, 2003). The 2002 annual mean of 37.53µgm⁻³ was predicted to decrease to 36.25µgm⁻³ in 2004 with 51 exceedences of the 24-hour mean and to 32.76µgm⁻³ in 2010 with 39 exceedences of the 24-hour objective. This resulted in a detailed assessment for PM₁₀ being conducted. The detailed assessment should be referred to for detailed analysis of the results obtained. This document will provide an overview of the conclusions reached by the detailed assessment.

The extended period of gravimetric sampling in conjunction with real time data and wind data commenced in August 2004. The results of the monitoring are displayed in Figure 10.1. During the 6-month study period the Partisol PM₁₀ analyser recorded

16 exceedences of the $50\mu\text{g}\text{m}^{-3}$ limit as set within the UK National Air Quality Strategy. During the same period the Osiris PM_{10} analyser recorded 17 exceedences of the $50\mu\text{g}\text{m}^{-3}$ limit of which 5 exceedences were recorded during the same 24hr period by both the Partisol and Osiris. Overall for the monitoring period January 2004 to January 2005 the Partisol recorded 21 exceedences of the $50\mu\text{g}\text{m}^{-3}$ limit whilst the Osiris recorded 23 exceedences.

Table 10.1 Annual Mean PM_{10} ($\mu\text{g}\text{m}^{-3}$) Concentrations measured at Tillson House Coalville

Year	Annual Mean ($\mu\text{g}\text{m}^{-3}$)	Number of Exceedences
2002	37.54	33
2003	26.52	31
2004	25.67	21

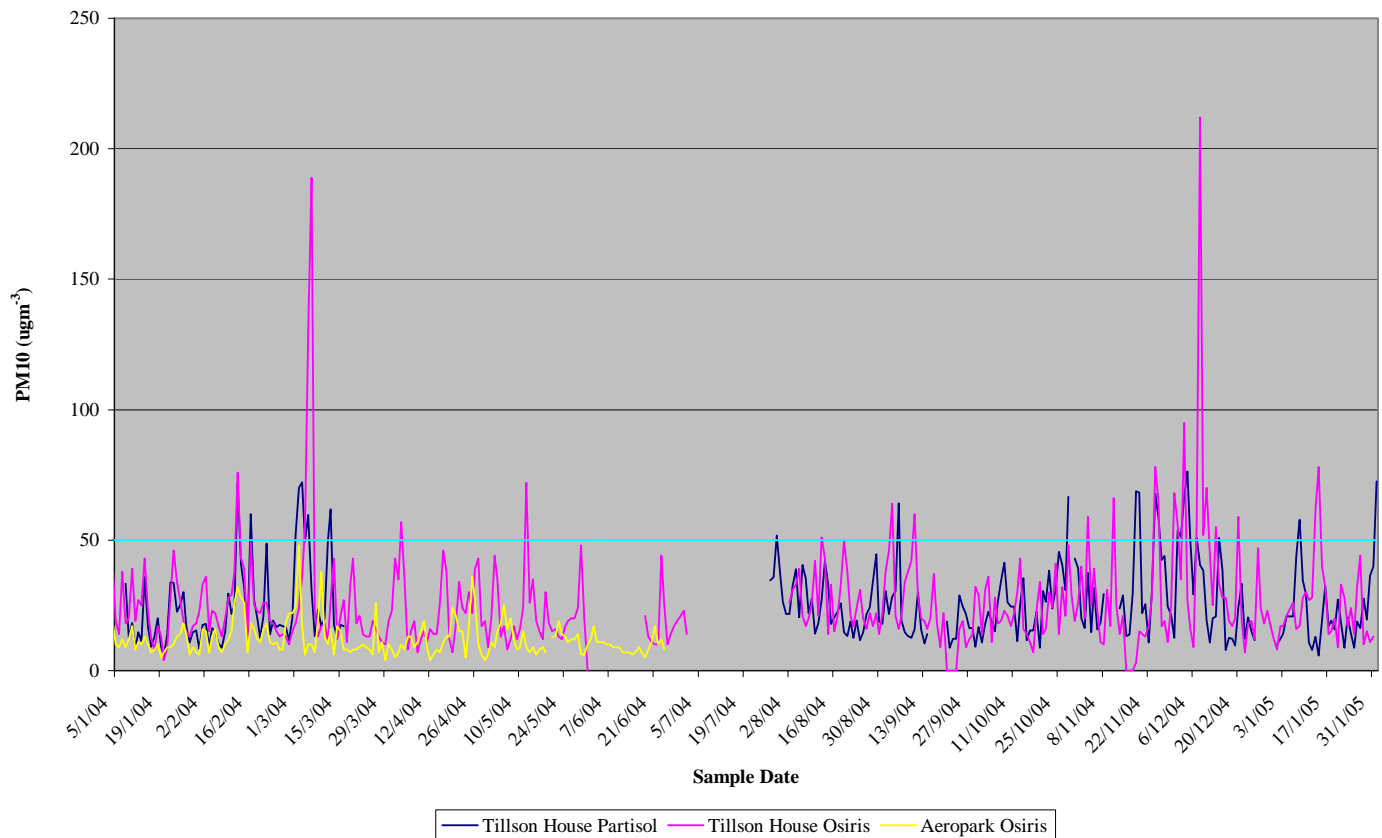


Figure 10.1 PM_{10} ($\mu\text{g}\text{m}^{-3}$) Concentrations Obtained from Osiris and Partisol Monitors

10.3 Conclusions

The main conclusions that can be drawn from this Detailed Assessment which was conducted at Tillson House, Coalville are detailed below:

There were 21 exceedences of the $50\mu\text{g}\text{m}^{-3}$ 24-hour limit for PM_{10} as set within the UK National Air Quality Strategy and EU Air Quality Daughter Directive during the 9 months of the study. These exceedences were recorded by the Partisol gravimetric PM_{10} monitor sited at Tillson House, Bradgate Drive, Coalville. The $50\mu\text{g}\text{m}^{-3}$ 24-hour mean was not exceeded more than 35 times, therefore an Air Quality Management Area will not need to be declared. Whilst PM_{10} emissions from Bardon Quarry may be the dominate source in the vicinity of Tillson House this contribution is likely to reduce as more of the measures detailed in Appendix 1 are introduced.

Monitoring will continue at both Tillson House, Coalville and the Aeropark using Turnkey Osiris monitors.

Current concentrations of PM_{10} indicated compliance with the Air Quality Objectives.

11. Local Developments

11.1 New Industrial Processes

The following Part B installations have been permitted since the previous Stage 4 report was published:

Table 11.1 PG Note, Process and Location of Part B Installations Permitted since the Stage 4 Report

PG Note and Process	Location
PG 3/15a(04) Roadstone Coating Processes	(Mobile) based at Bardon Quarry, Coalville currently in Swansea
PG 3/15a(04) Roadstone Coating Processes	Bardon Quarry, Coalville
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood
PG 6/29(04) Di-isocyanate Processes	Castle Donington
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood
PG 3/1(04) Use of Bulk Cement	(Mobile) based at Newbold Quarry, Barton Under Needwood

All but two of the processes are based outside the district. No new A2 Installations have been permitted within the North West Leicestershire District.

11.2 New or Proposed Roads

Since the last round of Review and Assessment no new roads have been proposed or constructed.

12. Progress on Action Plan

In line with DEFRA guidance this document should also report progress with the Action Plan produced by the district council. Following the results of consultation with DEFRA a number of recommendations have been made which should be incorporated into the Action Plan. North West Leicestershire District Council has to the end of August to produce the finalised version of the Action Plan; therefore the progress in implementing the Action Plan has been limited. All options are detailed in Table 12.1 along with time scales and details of progress made.

[Table 12.1 Action Plan Options, Time-scales and Progress with Implementation](#)

Options	Original Timescale	Progress with Measure	Outcome to Date
Roadside Emission Testing	To be undertaken in September 2005	Roadside emissions testing programme to commence in September 2005	No outcome to date
Publicise Air Quality information on the website	Commence implementation in April 2005	Website currently being redesigned	Once redesign completed all new Air Quality Information will be disseminated via website
Information and awareness raising	Implemented by June 2005	In conjunction with publicity for Vehicle Emissions Testing	No outcome to date
Presentations to Schools	Undertaken by July 2005		
Produce a Travel Plan for the Council			
Safer routes to Schools			
Introduce car parking charges	Implemented on 1 st Nov 2004		
Reopen Ivanhoe Railway Line – Loughborough/ Leicester/Coalville/ Ashby/Burton on Trent	Still at planning stage	None to date	N/A
Promote home working for council officers	Commenced implementation in January 2005		

13. References

DEFRA (2003) LAQM.TG (03) Local Air Quality Management Technical Guidance.