

# HARBOROUGH DISTRICT COUNCIL

## AIR QUALITY REVIEW AND ASSESSMENT

### Annual Progress Report 2005

**May 2005**



INVESTOR IN PEOPLE

## **1. Introduction**

1.1 There is a duty on all local authorities to carry out an assessment of the local air quality and compare it to the national objectives that have been set for various pollutants. Further information on the National Air Quality Objectives can be found in Harborough District Council's Stage 4 Review and Assessment, available on the web site [www.harborough.gov.uk](http://www.harborough.gov.uk) . Where it is anticipated that the national objectives will not be met by the prescribed target date, the local authority must declare an Air Quality Management Area and develop and implement Action Plans in an attempt to improve the situation.

1.2 The assessment of local air quality takes place over several phases. Initially a desktop exercise was undertaken to analyze the local effect of each of the pollutants described in the National Air Quality Strategy. This assessment was carried out using national background levels and where available local monitored data. Where it was anticipated that the national objectives would not be achieved by the target dates, a more detailed review was required to determine a more accurate assessment of the pollutant levels in the local area.

1.3 Within Harborough District, the First Stage Review and Assessment concluded that further investigation would be required for Carbon Monoxide, Lead, Particulates (PM<sub>10</sub>) and Nitrogen Dioxide (NO<sub>2</sub>). Subsequently the Second and Third Stage review concluded that, with the exception of Nitrogen Dioxide, it was likely that all of the National Air Quality Objectives would be met by the target date. With regards to Nitrogen Dioxide it was felt unlikely that the national objective would not be met for Lutterworth Town Centre, and Air Quality Management Area was declared in July 2001.

## **2. Latest Developments**

2.1 Following the declaration of the Air Quality Management Area (AQMA), the Local Authority is required to undertake a Stage 4 Review and Assessment. This allows the Local Authority to undertake a more details assessment of the particular pollutant(s) on which the AQMA was declared and to confirm and supplement any previous information they have already gathered in their earlier review and assessment work.

2.2 In 2004, Harborough District Council carried out a Stage 4 Review and Assessment. The initial findings of this assessment, confirmed the results of previous reports, and in addition it was felt that the extent of the existing AQMA did not reflect the true extent of the air quality problem in Lutterworth. Consequently the Stage 4 Assessment concluded that, following public consultation, the extent of the AQMA should be increased to incorporate residential properties not previously included. Appendix 1 shows the existing Air Quality Management Area and Appendix 2 highlights the area by which the AQMA will be extended.

## **3. Pollution Monitoring in Harborough District.**

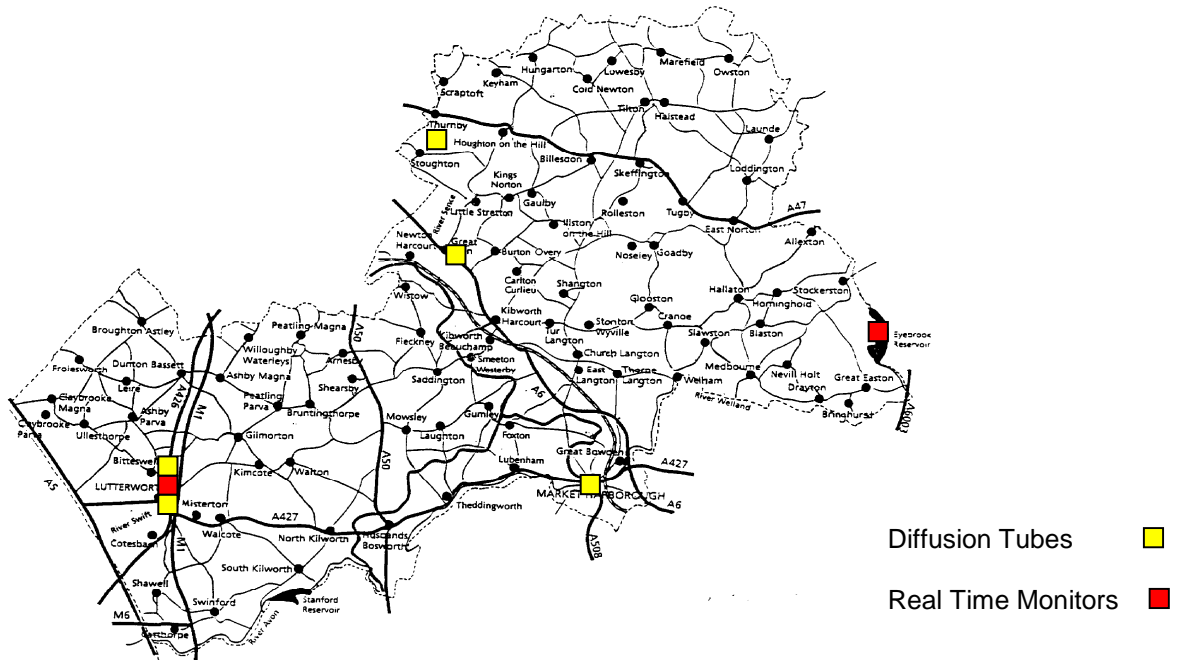
3.1 As part of the assessment of the local air quality, a number of diffusion tubes are located throughout the district. These tubes are a simple and cost effective method for screening air quality and provide a good indication of the annual average levels of Nitrogen Dioxide. It is anticipated that in 2005 the number of diffusion tubes used in the survey for Harborough District will be expanded.

3.2 In addition to the network of diffusion tubes, there is a real time monitoring station in Lutterworth, continuously measuring levels of Nitrogen Dioxide and PM<sub>10</sub>'s. The monitoring station is situated on the main road running through

Lutterworth. The station is located with the existing Air Quality Management Area and is on a roadside position approximately 3 metres from the kerbside of a busy road. There is a slight canyon effect from neighbouring buildings. The station has been situated in the same location since 1999, however ratified data has only been available since 2003. The raw data collected by the monitoring station is validated using consultants, Casella Eti.

3.3 There is a second automatic monitoring station in Harborough District and this forms part of DEFRA's UK national monitoring network. The location of this rural site is on arable farmland, approximately 300 metres from nearest small road and approximately 2km from the village of Stockerston. The pollutants measured at this site are Nitrogen Dioxide, Carbon Monoxide and Ozone. The monitoring station is maintained by Casella Stanger on behalf of DEFRA.

### Location of Monitoring Sites



## **4. Monitoring Results.**

### **Diffusion Tubes**

4.1 The diffusion tubes are analysed by Casella CRE Air. This laboratory has a defined quality system, which forms part of the UKAS accreditation programme. The tubes are prepared by spiking with 10% TEA in water.

4.2 The laboratory takes part in the NO<sub>2</sub> network field inter-comparison, co-ordinated by the Health and Safety Laboratory (HSL). Full documentation of the quality control and calibration system can be found in Harborough District Council's Stage 4 Review and Assessment ([www.harborough.gov.uk](http://www.harborough.gov.uk)) and will not be included in this report.

4.3 As discussed earlier in this report, diffusion tubes are a simple method to obtain information on the local pollution levels. There is a recognised inherent error in using diffusion tubes in that there is a tendency for them to either over or under estimate the actual pollution levels. There are a number of ways in which this error can be adjusted. The current recommended best practice is to use established bias correction factors, which are compiled from several different co-location studies throughout the country. Details of the bias correction factors can be found on [www.uwe.ac.uk/aqm/review/index.html](http://www.uwe.ac.uk/aqm/review/index.html). By taking into consideration Harborough District Council's diffusion tube supplier and preparation methods, the bias correction factor for 2004 is 0.85.

4.4 Table 1 gives the bias corrected data for the 2004 diffusion tube survey in Harborough district. The corrected results have been projected forward to the objective year of 2005 using the methodology described in the DEFRA technical guidance LAQM.TG(03).

Table 1

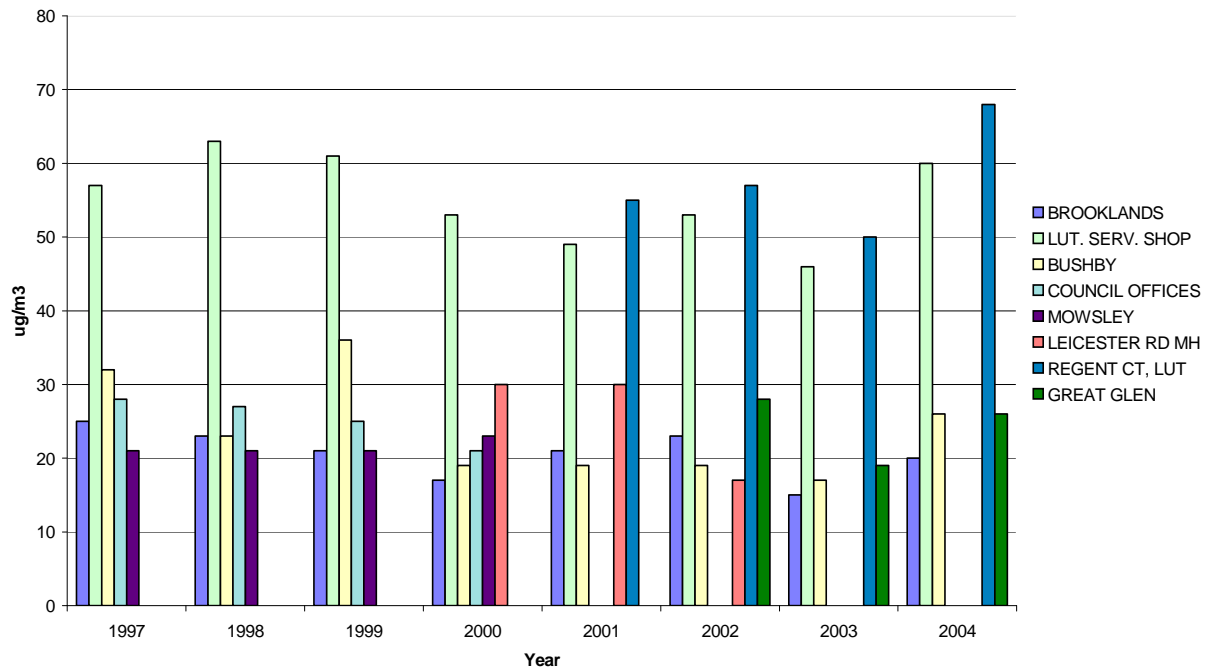
The Bias adjusted annual average results for Nitrogen Dioxide for 2004 and the predicted results for 2005

| <b>Tube Number</b> | <b>Location</b>          | <b>Bias adjusted results for 2004<br/>µg/m<sup>3</sup></b> | <b>Predicted levels for 2005<br/>µg/m<sup>3</sup></b> |
|--------------------|--------------------------|--|---|
| 1                  | Brooklands               | 17.2   | 15.5  |
| 2                  | Lutterworth Service Shop | 51.4   | 50.1  |
| 3                  | Bushby                   | 22   | 21.4  |
| 4                  | Regent Ct Lutterworth    | 57.8   | 56.3  |
| 5                  | Great Glen               | 22.5   | 21.9  |

4.5 The projected results for 2005 confirm that the annual average national objective for Nitrogen Dioxide levels would not be met within the existing and extended Air Quality Management Area in Lutterworth.

4.6 Diffusion tube monitoring has been undertaken throughout the district for several years. Graph 1 shows the trend in the levels of this pollutant across the district since 1997. It must be noted that these results are for uncorrected diffusion tube data and therefore just demonstrate trends and not confirmed results.

**Graph 1 – Trends in the Nitrogen Dioxide Levels in Harborough District  
1997-2004**



### Real Time Monitoring Station Results

4.7 Data from the real time monitor is stored on the logger as “raw” or “uncorrected” data, therefore it needs to be corrected or “validated” before it can be used. To validate the data, the analyzer needs to be checked against a referenced standard of “zero” air and “span” gas.

4.8 There are two methods available to correct data by using calibration checks to verify the analyzer is corrected for any response change: -

- Daily automatic calibration checks
- Fortnightly manual calibration checks

4.9 The monitoring station at Harborough uses the daily automatic calibration check as part of the validation process. However a manual calibration is carried out every fortnight to confirm the results.

4.10 Table 2 shows the corrected results of NO<sub>2</sub> and PM<sub>10</sub> for 2004. The results for NO<sub>2</sub> are based on the 1-hour mean data and for PM<sub>10</sub>, they are based on a 24-hour mean. These results are then compared to the National Air Quality Objectives for the respective pollutants to confirm as to whether there is an anticipated exceedance of the national objectives.

4.11 Data from the real time monitor confirmed that it is unlikely that the Air Quality Objective for Nitrogen Dioxide would not be met in Lutterworth. However based on the results from the PM<sub>10</sub> monitor it is not anticipated that there would be any exceedance of the nation objective for this pollutant. Appendix 3 shows the 2004 graphical results obtained from the monitoring station located in Lutterworth for Nitrogen Dioxide and PM<sub>10</sub>.

4.12 The rural monitoring station has been in operation since December 2003. Table 3 shows the results for this monitoring station during 2004.

Table 3

| Pollutant        | Objective   |                                     | Results for 2004 Rural Monitoring Station |
|------------------|---|-------------------------------------|---|
|                  | Concentration   | Measured As                         |   |
| Nitrogen Dioxide | 40µg/m <sup>3</sup>   | Annual Mean                         | 12.7µg/m <sup>3</sup>                     |
| Carbon Monoxide  | 11.6mg/m <sup>3</sup>   | Running 8hr Mean                    | 6.63mg/m <sup>3</sup>                     |
| Ozone            | 100µg/m <sup>3</sup> not to be exceeded more than 10 times a year | Daily maximum of a running 8hr mean | 18 exceedances                            |

4.13 Ozone is not one of the pollutants covered by the Local Air Quality Management process. It is recognised that due to the fact that much of the problem from Ozone stems from sources outside of the UK, there is little that the district councils could do to improve the local situation. The problem of Ozone is being addressed on an international scale.



**Table 2****Results of the Lutterworth Real Time Monitor - 2004**

The table shows the maximum and average values for Nitrogen Dioxide as a 1 hour mean. These are then compared to the NAQS Guideline values

| <b>Month</b> | <b>NO2 (<math>\mu\text{g}/\text{m}^3</math>)<br/>Monthly Maximum<br/>(1 Hour Avg.)</b> | <b>NO2 (<math>\mu\text{g}/\text{m}^3</math>)<br/>Monthly Average</b> | <b>PM10 (<math>\mu\text{g}/\text{m}^3</math>)<br/>Monthly Average</b> |
|--------------|--|--|---|
| January      | 118.9  | 28.9   | 19.3  |
| February     | 105  | 29.9   | 27.2  |
| March        | 112.9  | 30.4   | 28.4  |
| April        | 199.7  | 56.6   | 22.9  |
| May          | 133.6  | 51.4   | 26.2  |
| June         | 178.4  | 64.5   | 21.6  |
| July         | 217.7  | 52.9   | 22.9  |
| August       | 157.7  | 50   | 27.6  |
| September    | 164.4  | 48   | 19.8  |
| October      | 92.6   | 25.9   | 20.2  |
| November     | 106.4  | 45.1   | 25.1  |
| December     | 85.5   | 35.  | 27.4  |
|              | <b>NO. OF<br/>EXCEEDANCES</b>  | <b>AVERAGE</b>   | <b>AVERAGE</b>  |
|              | <b>1</b>   | <b>43.3</b>  | <b>24.1</b>   |

**National Air Quality Strategy Annual Mean Guideline Value for NO2 and PM10 - 40  $\mu\text{g}/\text{m}^3$**

**National Air Quality Strategy NO2 1 Hour Mean Guideline Value - 200  $\mu\text{g}/\text{m}^3$  (not to be exceeded more than 18 times in a year)**

## **5. New Local Developments**

5.1 The Annual Progress Report for 2004 advised that Leicestershire County Council had received an application for a new sand and gravel quarry within the district. However in February 2005 confirmation was received that this application had been withdrawn and therefore a detailed assessment would not be necessary.

5.2 An application for a Pollution Prevention and Control permit has recently been submitted to the Environment Agency for the continuation of a quarry to be used for inert landfill. As part of the application a detail risk assessment has been carried out on the potential effect of activities carried out on site on local receptors. Five residential properties are situated within a radius of the installation boundary, the closest residential property is approximately 45m from the boundary and access to this property is via the quarry site entrance. The site has been used as a quarry and landfill for approximately 15 years and in that time no complaints have been received regarding dust problems. As part of the Permit application the company provided a detailed risk assessment and management procedure for minimising the impact of dust. In view of the above it is not anticipated that a detailed assessment will be required at this stage however the situation will be monitored in the future to determine whether a more detailed assessment will be required.

5.3 There have been no further developments in the district where it is felt that there would be an adverse impact on the local air quality.

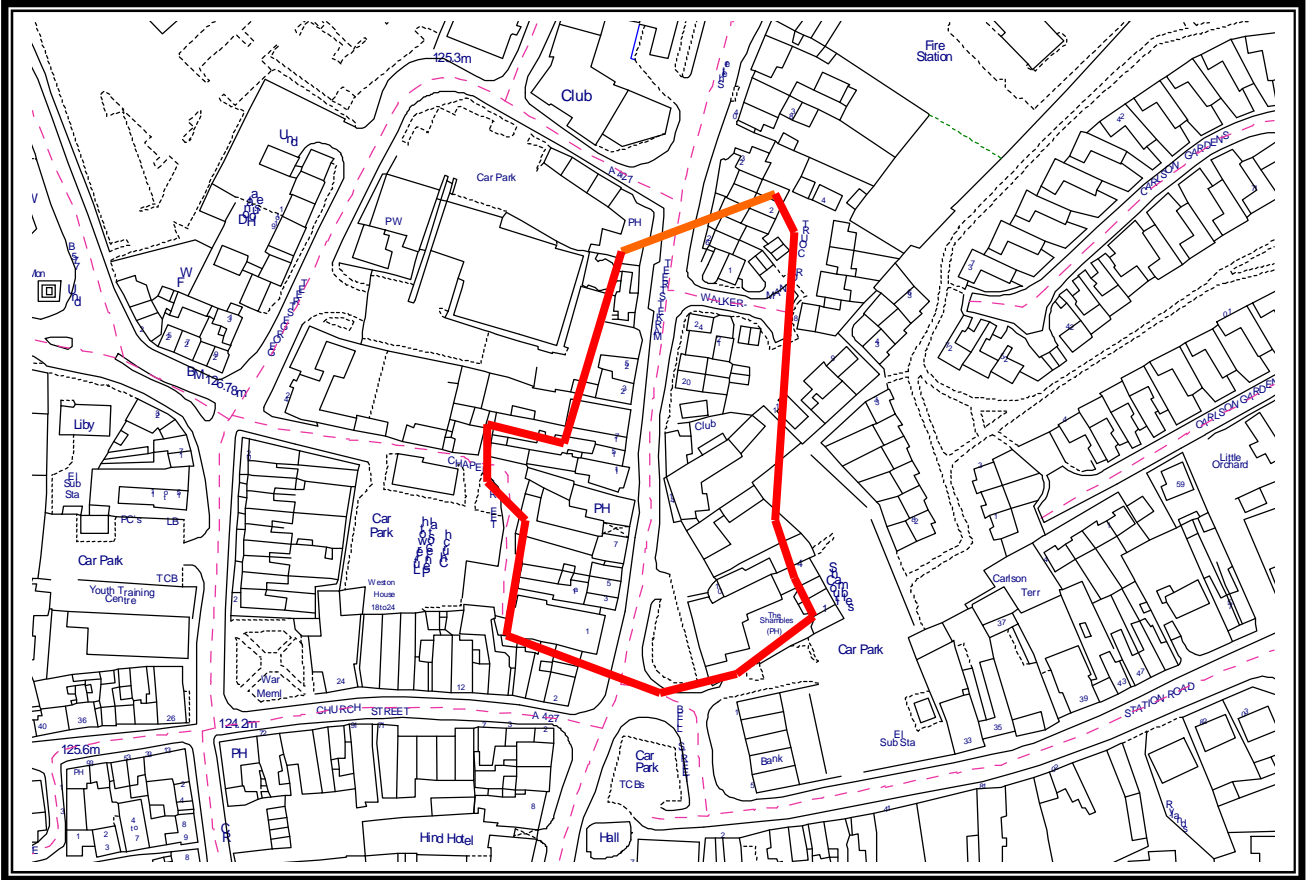
## **6. Action Plan**

6.1 A draft Action Plan has been developed and an initial consultation process has been undertaken. Appendix 4 shows the measures identified in the initial plan. The feedback from the consultation process confirmed the findings of the Stage 4 Review and Assessment procedure in that road traffic was the cause of the adverse pollution conditions in Lutterworth. The final Action Plan will

concentrate on measures that can be undertaken to reduce the impact of road traffic in Lutterworth taking into consideration the cost of implication of measures.

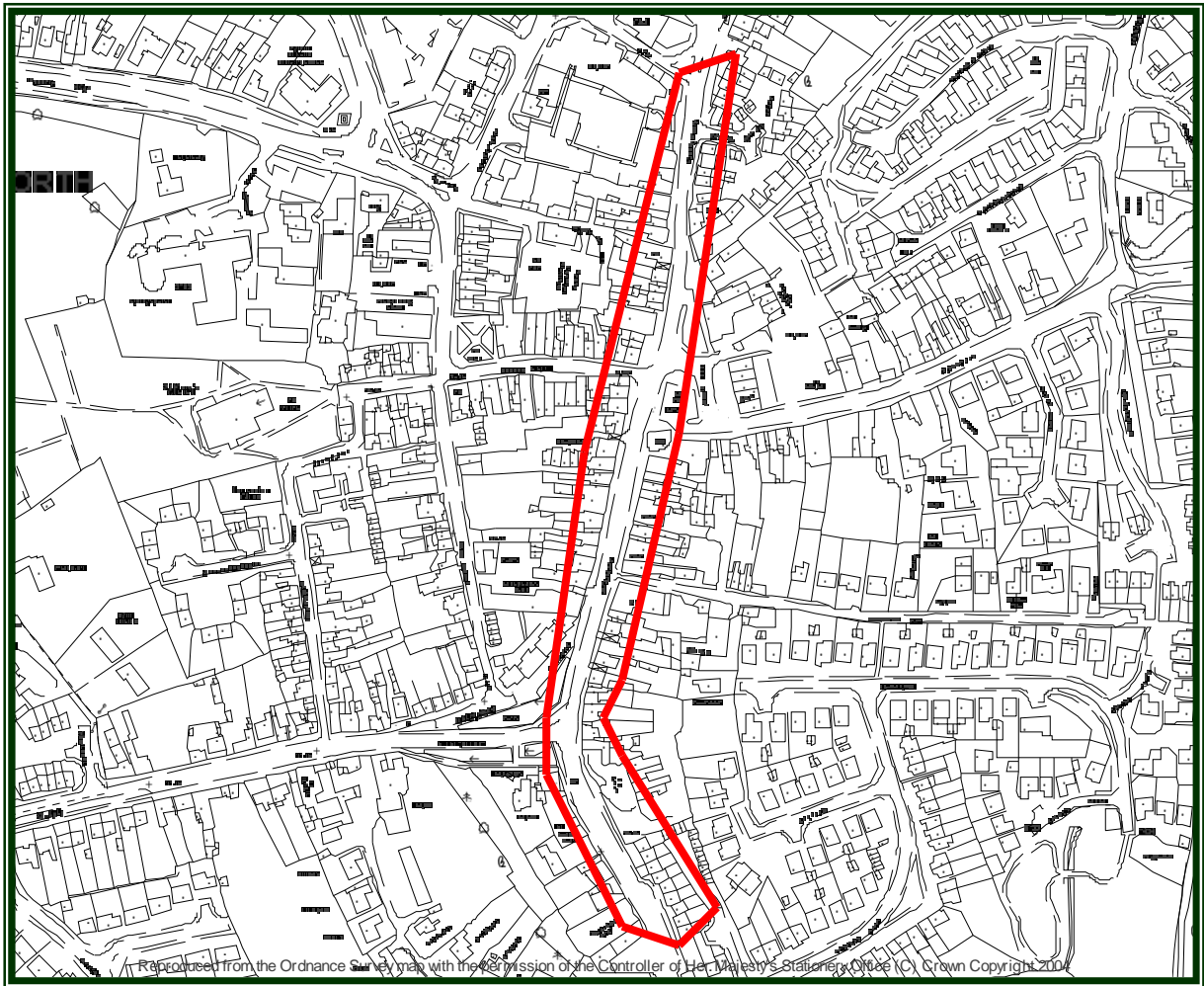
6.2 Leicestershire County Council is currently developing the Local Transport Plan (LTP) and one of the over arching objectives for and LTP is the improvement of local air quality. The Air Quality Management Area in Lutterworth has been identified as a priority to be included in the LTP for action. One particular option that is being considered is the removal of lorries from the town centre. Information obtained from recent traffic counts undertaken by the District Council will be used and incorporated into a model to assess the likely impact of diverting HGV's away from the town centre. Harborough District Council and Leicestershire County Council are currently discussing various options available.

# Appendix 1 The Air Quality Management Area in Lutterworth Town Centre



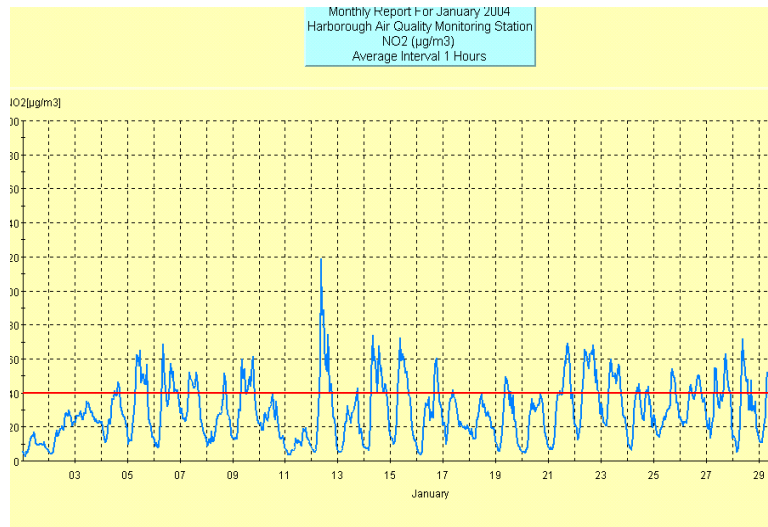
## Appendix 2

### Proposed Extended Air Quality Management Area for Lutterworth

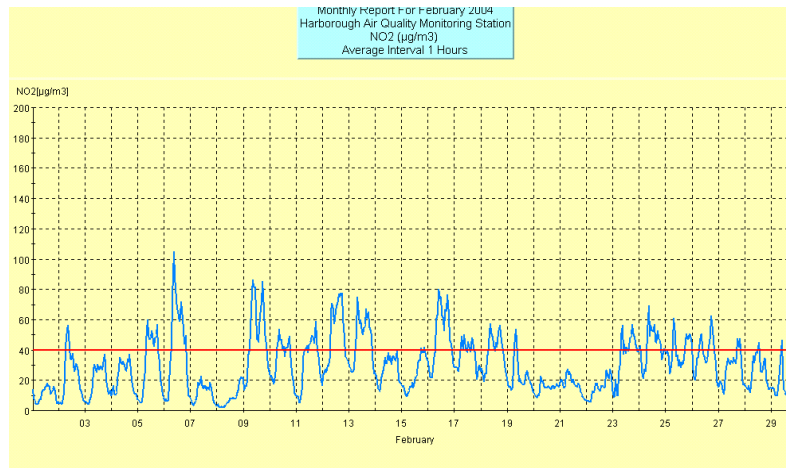


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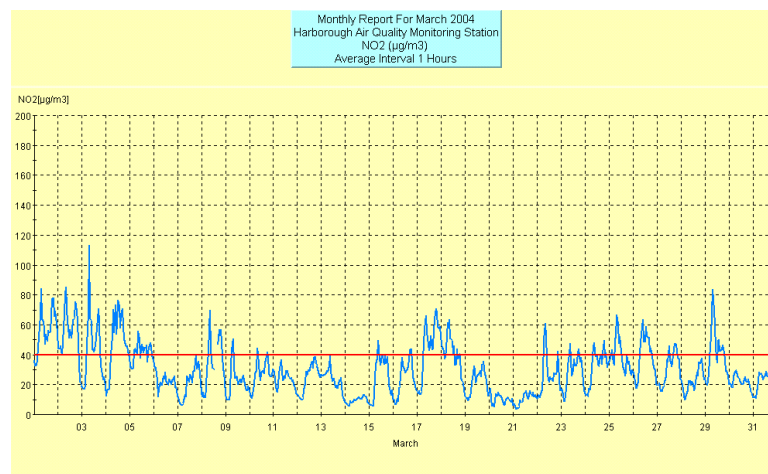
# Appendix 3 Monthly Results from Lutterworth Real-time Monitor 2004 Nitrogen Dioxide



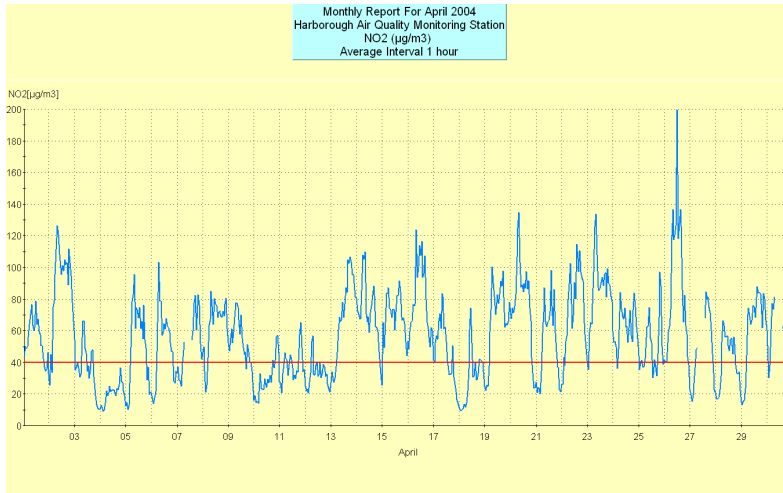
January



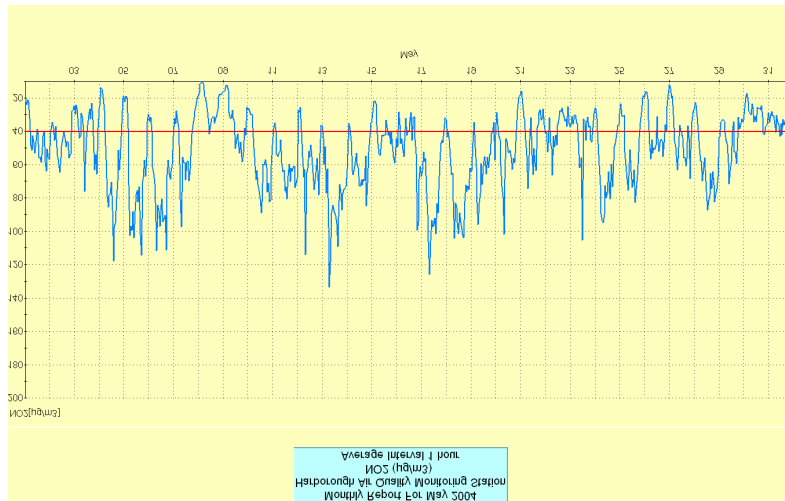
February



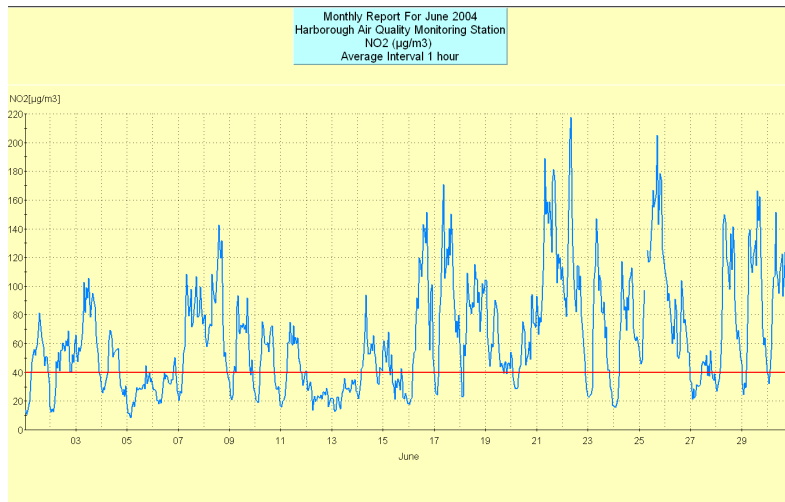
March



April

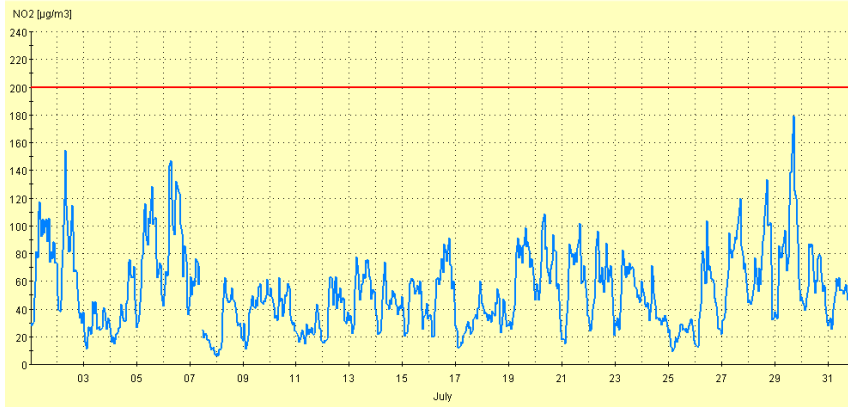


May

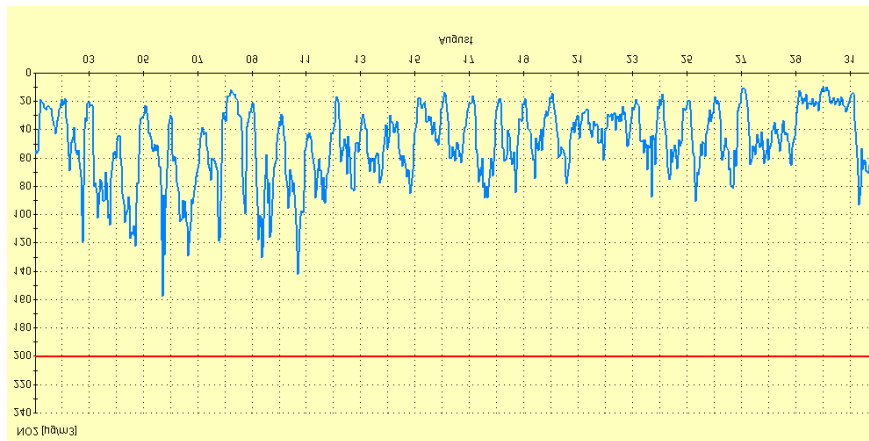


June

Monthly Report for July 2004  
Harborough Air Quality Monitoring Station  
NO2 ( $\mu\text{g}/\text{m}^3$ )  
Average Interval 1 Hour



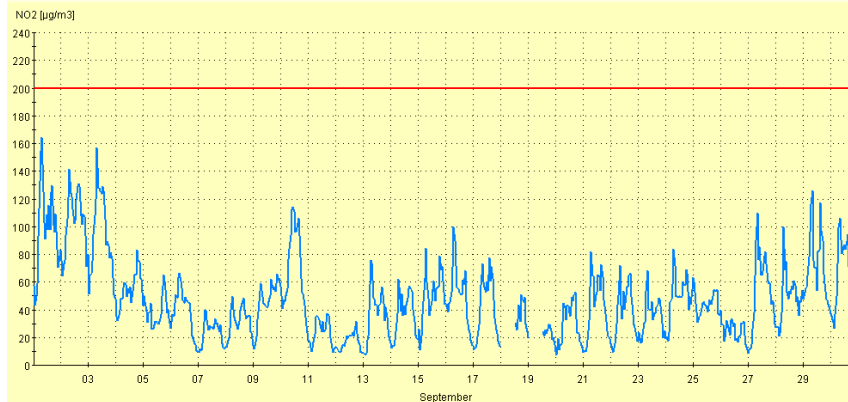
July



Monthly Report for August 2004  
Harborough Air Quality Monitoring Station  
NO2 ( $\mu\text{g}/\text{m}^3$ )  
Average Interval 1 Hour

August

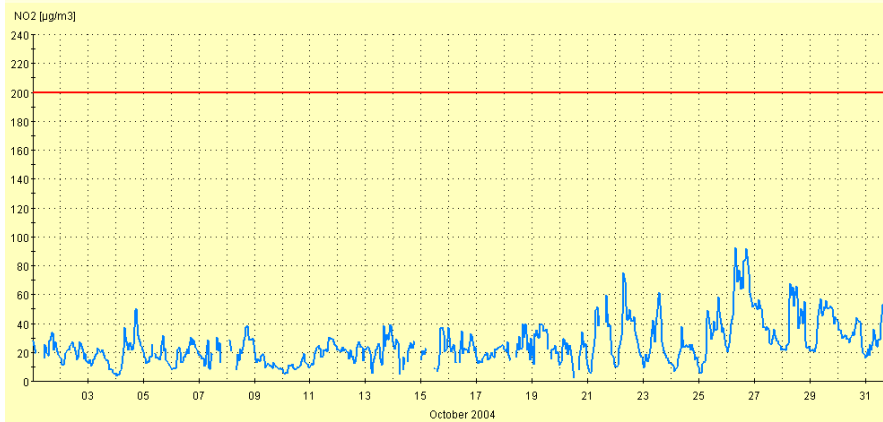
Monthly Report for September 2004  
Harborough Air Quality Monitoring Station  
NO2 ( $\mu\text{g}/\text{m}^3$ )  
Average Interval 1 Hour



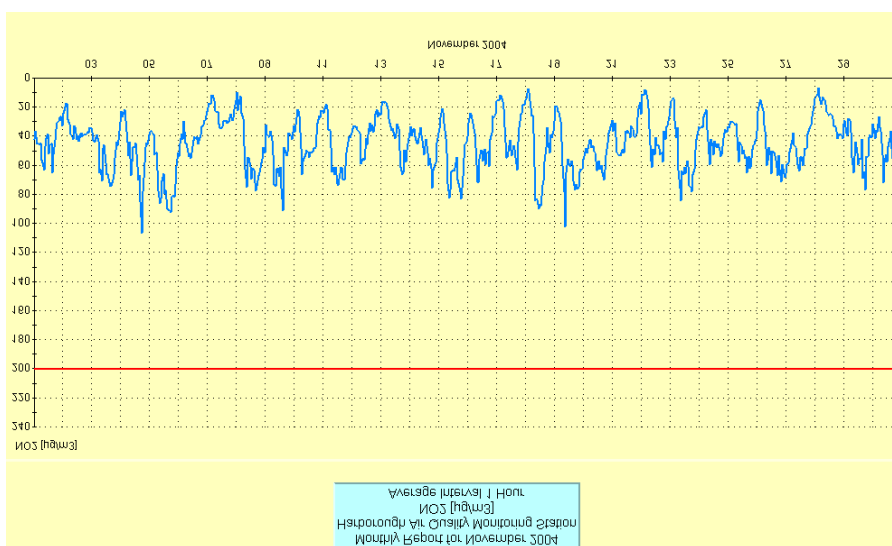
September



Monthly Report for October 2004  
Harborough Air Quality Monitoring Station  
NO2 [ $\mu\text{g}/\text{m}^3$ ]  
Average Interval 1 Hour

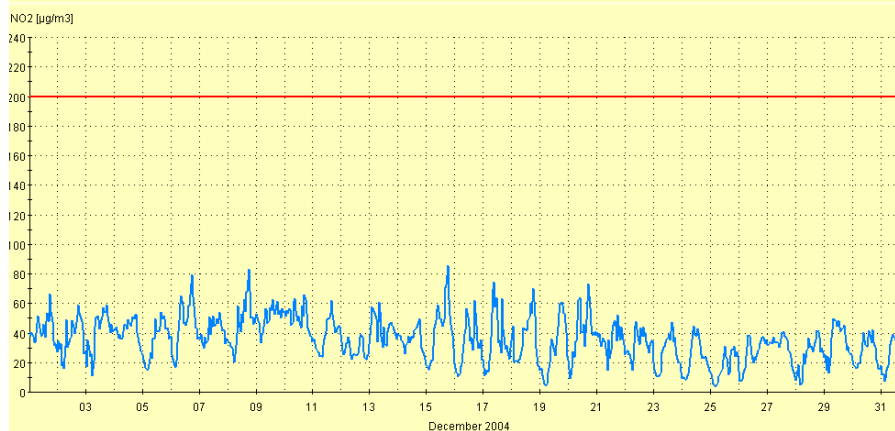


October



November

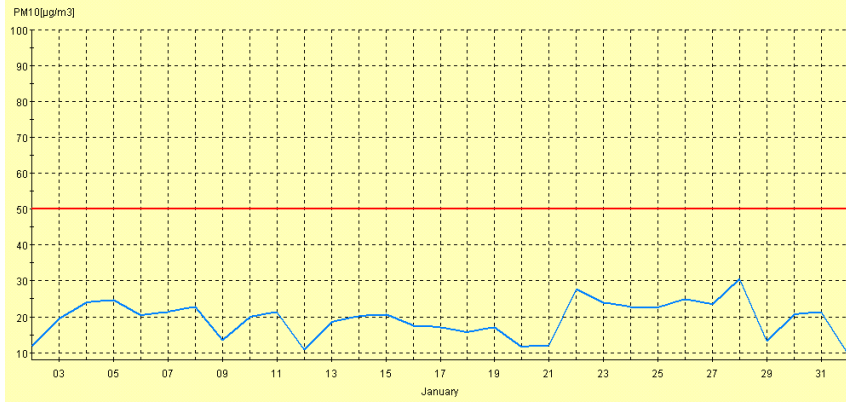
Monthly Report for December 2004  
Harborough Air Quality Monitoring Station  
NO2 [ $\mu\text{g}/\text{m}^3$ ]  
Average Interval 1 Hour



December

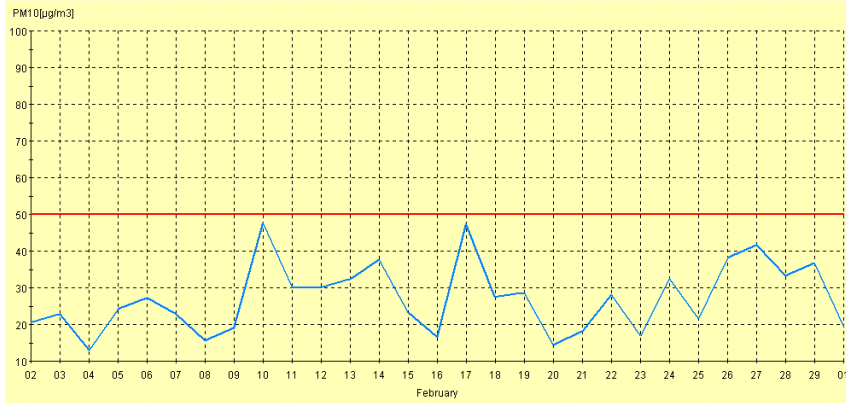
# PM<sub>10</sub>'s

Monthly Report For January 2004  
Harborough Air Quality Monitoring Station  
PM<sub>10</sub> (µg/m<sup>3</sup>)  
Average Interval 24 Hours



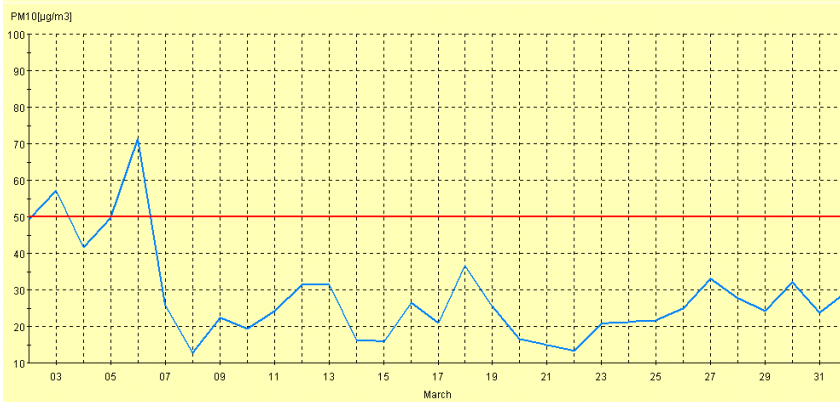
January

Monthly Report For February 2004  
Harborough Air Quality Monitoring Station  
PM<sub>10</sub> (µg/m<sup>3</sup>)  
Average Interval 24 Hours



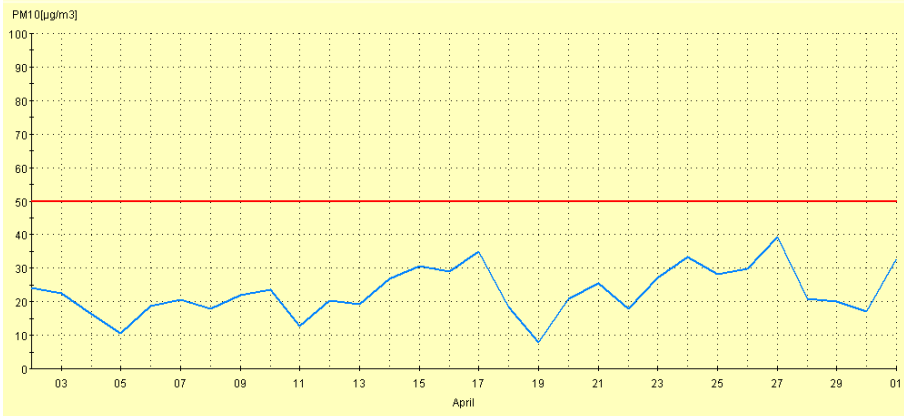
February

Monthly Report For March 2004  
Harborough Air Quality Monitoring Station  
PM<sub>10</sub> (µg/m<sup>3</sup>)  
Average Interval 24 Hours



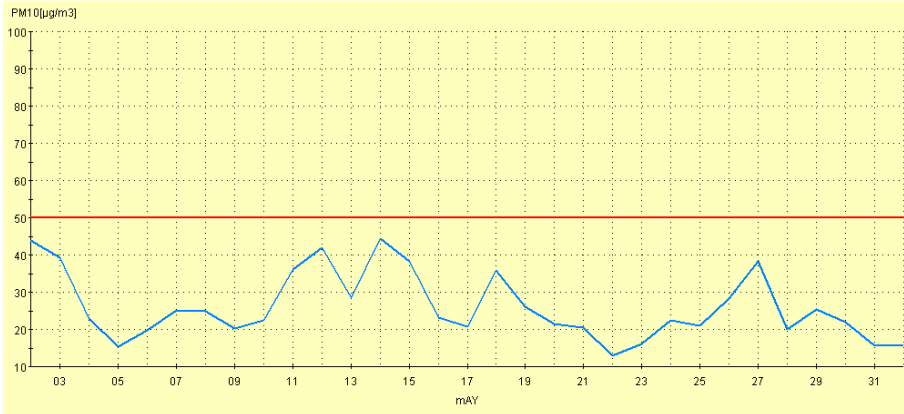
March

Monthly Report For April 2004  
Harborough Air Quality Monitoring Station  
PM10 ( $\mu\text{g}/\text{m}^3$ )  
Average Interval 24 hour



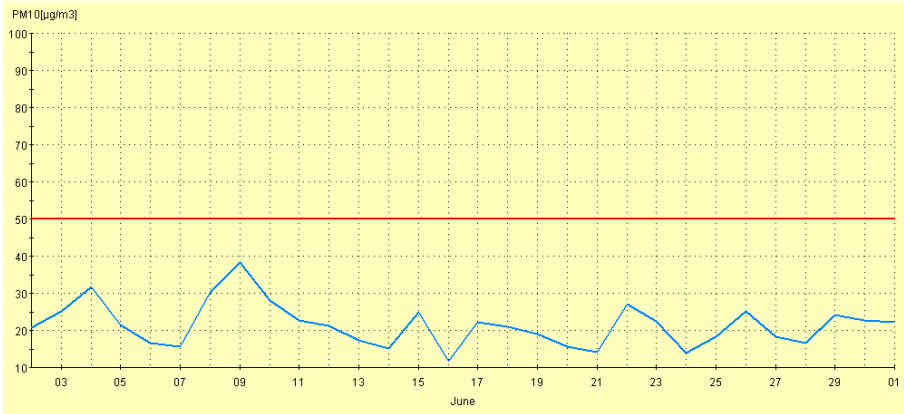
April

Monthly Report For May 2004  
Harborough Air Quality Monitoring Station  
PM10 ( $\mu\text{g}/\text{m}^3$ )  
Average Interval 24 hour



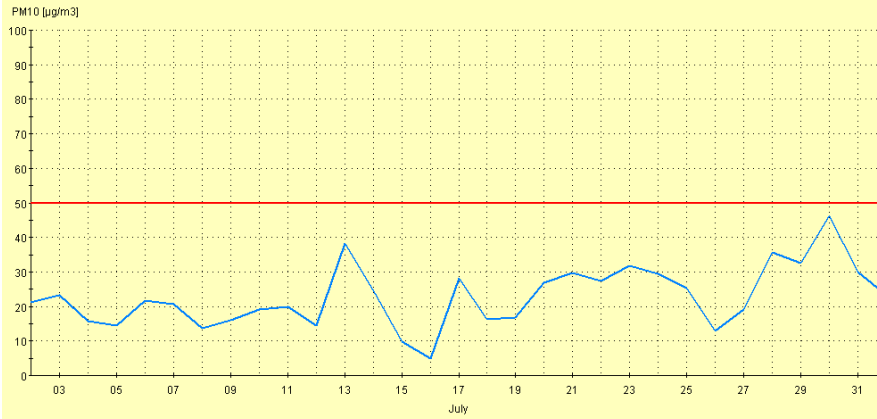
May

Monthly Report For June 2004  
Harborough Air Quality Monitoring Station  
PM10 ( $\mu\text{g}/\text{m}^3$ )  
Average Interval 24 hour



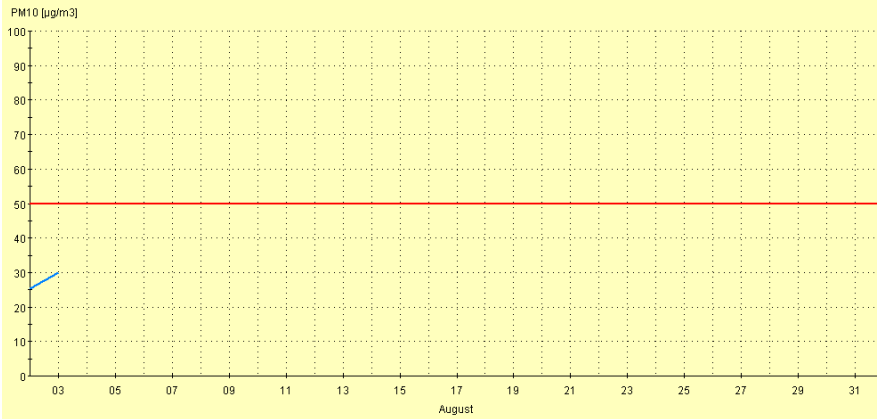
June

Monthly Report for July 2004  
Harborough Air Quality Monitoring Station  
PM10 [ $\mu\text{g}/\text{m}^3$ ]  
Average Interval 24 Hours



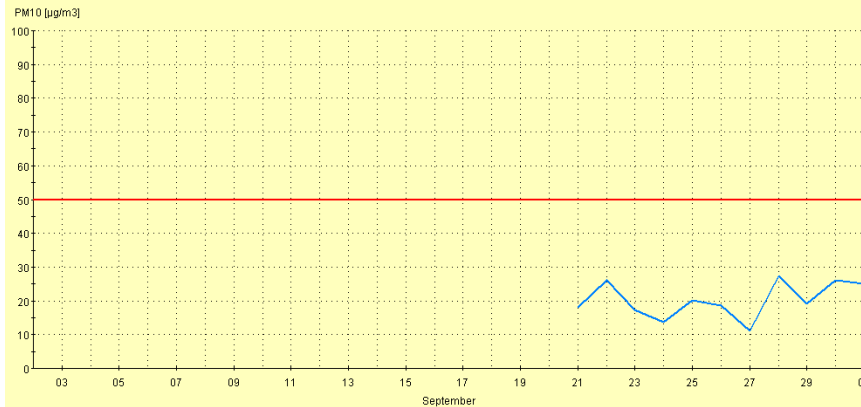
July

Monthly Report for August 2004  
Harborough Air Quality Monitoring Station  
PM10 [ $\mu\text{g}/\text{m}^3$ ]  
Average Interval 24 Hours



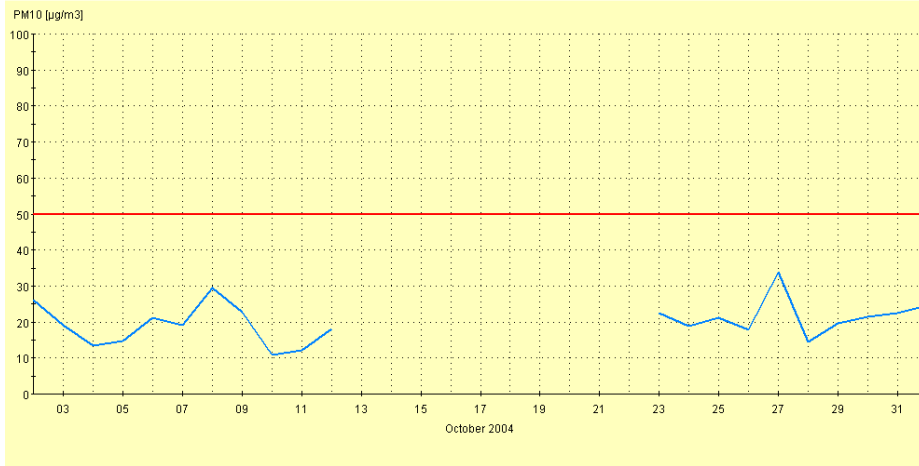
August

Monthly Report for September 2004  
Harborough Air Quality Monitoring Station  
PM10 [ $\mu\text{g}/\text{m}^3$ ]  
Average Interval 24 Hours



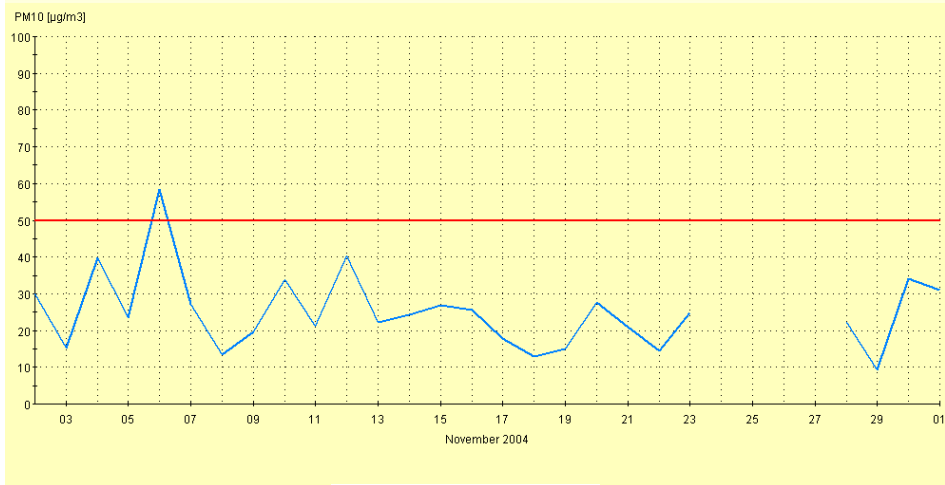
September

Monthly Report for October 2004  
Harborough Air Quality Monitoring Station  
PM10 [ $\mu\text{g}/\text{m}^3$ ]  
Average Interval 24 Hours



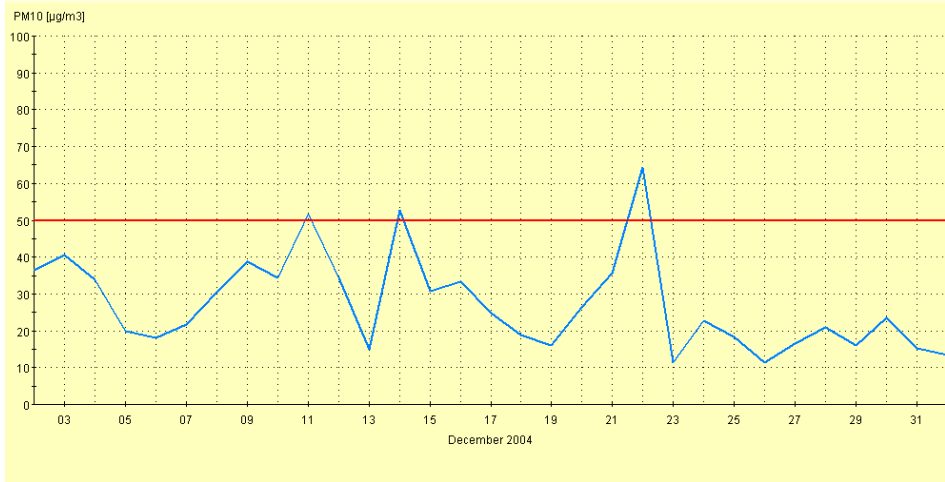
October

Monthly Report for November 2004  
Harborough Air Quality Monitoring Station  
PM10 [ $\mu\text{g}/\text{m}^3$ ]  
Average Interval 24 Hours



November

Monthly Report for December 2004  
Harborough Air Quality Monitoring Station  
PM10 [ $\mu\text{g}/\text{m}^3$ ]  
Average Interval 24 Hours



December



## Appendix 4 – Draft Action Plan

| Alteration to the Road Network                    |   |  |            |           |
|---|---|--|------------|-----------|
| Option  | Organisation Responsible                                    | Environmental, Social and Economic Effects   | Cost       | Timescale |
| Western Relief Road                               | LCC Traffic planners, Traffic management                    | <ul style="list-style-type: none"> <li>• Diversion of traffic from the town centre</li> <li>• Reduced congestion</li> <li>• Improved town centre environment</li> <li>• Improved general health</li> </ul> | HIGH       | LONG      |
| Weight Restrictions on High Street/ Market Street | LCC Traffic planners, Traffic management                    | <ul style="list-style-type: none"> <li>• Reduction of HGV's in town</li> <li>• Improved town centre environment</li> <li>• Reduced congestion</li> <li>• Improved general health</li> </ul>                | MEDIUM (?) | LONG      |
| Traffic Calming measures                          | LCC Traffic planners, Traffic management, Highway Engineers | <ul style="list-style-type: none"> <li>• Improved town centre environment</li> <li>• Possible increase in emissions</li> <li>• Reduction in vehicle speed</li> <li>• Increased public safety</li> </ul>    | HIGH       | LONG      |
| Improvements to the M1/M6/A14                     | Highways Agency   | <ul style="list-style-type: none"> <li>• Reduced motorway congestion</li> <li>• Reduced through traffic in Lutterworth</li> <li>• Improvement to background air quality</li> </ul>                         | HIGH       | LONG      |
| Reduction of Emissions                            |   |  |            |           |
| Options   | Organisation Responsible                                    | Implications   | Cost       | Timescale |
| Car Free Days                                     | HDC Corporate, Env. Health Local businesses                 | <ul style="list-style-type: none"> <li>• Reduced congestion</li> <li>• Increased awareness</li> <li>• Improved health</li> </ul>   | LOW/MEDIUM | Short     |

|   |                                 |  |              |                  |
|---|---------------------------------|--|--------------|------------------|
| Support Green Transport Week                                    | HDC Env Health                  | <ul style="list-style-type: none"> <li>• Reduced congestion</li> <li>• Increased awareness</li> <li>• Improved health</li> <li>• Raised publicity</li> </ul>                 | LOW          | SHORT            |
| Promotion of car sharing scheme                                 | HDC Corporate                   | <ul style="list-style-type: none"> <li>• Reduced congestion</li> <li>• Reduced cost to employees</li> </ul>  | LOW          | SHORT            |
| Improved efficiency/ fuel type of HDC/contractor fleet vehicles | HDC Corporate                   | <ul style="list-style-type: none"> <li>• Reduced emissions</li> <li>• Reduced costs to employers and contractors</li> <li>• Increased general health</li> </ul>              | LOW/MEDIUM   | MEDIUM           |
| Provision of Low Emission Zones                                 | LCC                             | <ul style="list-style-type: none"> <li>• Reduced emissions</li> <li>• Enhanced local environment</li> <li>• Increase general health</li> <li>• Reduced congestion</li> </ul> | MEDIUM/ HIGH | MEDIUM           |
| Promotion of alternative fuel uses                              |                                 | <ul style="list-style-type: none"> <li>• Raise public awareness</li> <li>• Reduced emissions</li> </ul>  | LOW          | SHORT/MEDIUM     |
| <b>Statutory Powers</b>   |                                 |  |              |                  |
| <b>Options</b>  | <b>Organisation Responsible</b> | <b>Implications</b>  | <b>Cost</b>  | <b>Timescale</b> |
| Lobby Govt for alternative fuel promotions                      | HDC Corporate                   | <ul style="list-style-type: none"> <li>• Raise public awareness</li> <li>• Reduced emissions</li> </ul>  | LOW          | SHORT            |



|   |  |  |        |       |
|---|--|--|--------|-------|
| Lobby Leicestershire County Council to include provision of Western Relief Road development in the next LTP | HDC Corporate                            | <ul style="list-style-type: none"> <li>• Reduced congestion</li> <li>• Enhanced town centre environment</li> <li>• Increased general health</li> </ul>               | LOW    | SHORT |
| Publicise the role of the LA in Air Quality Management  | Env Health                               | <ul style="list-style-type: none"> <li>• Raise public awareness</li> </ul>   | LOW    | SHORT |
| Use of planning controls to reduce impact of new development on AQMA  | HDC Planning and Env Health              | <ul style="list-style-type: none"> <li>• Reduce emissions</li> <li>• Reduced congestion</li> <li>• Increased awareness of Air Quality issues</li> </ul>              | LOW    | SHORT |
| Introduction of speed restrictions  | Transport planning, Transport management | <ul style="list-style-type: none"> <li>• Improved safety for road users and pedestrians</li> <li>• Reduced congestion</li> <li>• Could increase pollution</li> </ul> | MEDIUM | LONG  |
| Provision of on street parking restrictions   | Transport planning, Transport management | <ul style="list-style-type: none"> <li>• Improved safety</li> <li>• Reduced congestion</li> <li>• Possible impact on local businesses</li> </ul>                     | MEDIUM | LONG  |

|  |   |  |             |                  |
|--|---|--|-------------|------------------|
| Restriction of business delivery times   | Transport planning, Transport management          | <ul style="list-style-type: none"> <li>• Reduction of congestion</li> <li>• Possible problems for local businesses</li> <li>• Reduction of number of vehicles during peak times</li> </ul>                                     | MEDIUM      | MEDIUM           |
| Road Side emission testing               | Env Health.                                       | <ul style="list-style-type: none"> <li>• Improved maintenance of vehicles</li> <li>• Reduction of emissions</li> <li>• Time consuming for LA staff</li> <li>• Increased public awareness</li> </ul>                            | HIGH        | MEDIUM           |
| <b>Alternative Forms of Transport</b>    |   |  |             |                  |
| <b>Options</b>                           | <b>Organisation Responsible</b>                   | <b>Implications</b>  | <b>Cost</b> | <b>Timescale</b> |
| School and business travel plans         | Education Authority, Env Health, Traffic planners | <ul style="list-style-type: none"> <li>• Reduction of congestion</li> <li>• Raise public awareness</li> <li>• Promotion of alternative forms of transport</li> <li>• Safety implications</li> <li>• Improved health</li> </ul> | LOW         | MEDIUM           |
| Promotion of cycle plans                 | Traffic Planning, Highways engineers              | <ul style="list-style-type: none"> <li>• Reduction of congestion</li> <li>• Improved health</li> <li>• Raise public awareness</li> </ul>   | LOW         | MEDIUM           |
| Development of cycle routes              | Traffic Planning, Highways engineers              | <ul style="list-style-type: none"> <li>• Reduced congestion</li> <li>• Improved health</li> <li>• Increase safety</li> </ul>   | HIGH        | LONG             |
| Promotion of Safe Route to School scheme | Education Authority, Traffic Planners, Env Health | <ul style="list-style-type: none"> <li>• Reduced congestion</li> <li>• Improved health of children</li> <li>• Increased safety</li> </ul>  | LOW         | MEDIUM           |

|                                      |  |   |      |        |
|--------------------------------------|--|---|------|--------|
| Promotion of use of public transport | Traffic Planners, Public transport providers | <ul style="list-style-type: none"><li>• Reduced congestion</li><li>• Increased public awareness</li></ul> | LOW  | MEDIUM |
| Improved public transport provision  | Traffic Planners, Public Transport providers | <ul style="list-style-type: none"><li>• Reduced congestion</li></ul>                                      | HIGH | MEDIUM |