

HARBOROUGH DISTRICT COUNCIL

AIR QUALITY REVIEW AND ASSESSMENT

Annual Progress Report 2004

May 2004

INTRODUCTION

There is a requirement for all local authorities to assess existing local air quality and to predict future conditions against the National Air Quality Objectives.

The Review and Assessment takes place over several phases. The First Stage is a desktop analysis of each of the pollutants. Where this assessment indicated that the air quality objectives would not be met by national policy alone, the Local Authority is required to undertake a more detailed Stage 2 or Stage 3 assessment for the pollutants where the objective is not likely to be met. If the more detailed assessment confirms the findings of the earlier reviews then an Air Quality Management Area (AQMA) may be declared.

Following the declaration of the AQMA the Local Authority is required to carry out a further Stage 4 review to supplement the information previously collated from the earlier reviews and confirm the validity of the AQMA.

In addition to the Stage 1-4 Review and Assessments, every 4 years the local authority must carry out a complete Update and Screening Assessment (USA's). The purpose of the USA is to identify any changes that have occurred in the district which may effect local air quality and to take into account any improvements that have occurred in the prediction methods used for assessing future air quality.

As these detailed assessments are undertaken every 4 years, the development of annual Progress Reports have been introduced to provide the local authority with a means to present updated information on the their implementation of local air quality management and to report on the latest monitoring results. This document forms the first annual progress report for Harborough District Council

LATEST DEVELOPMENTS

The First Stage Review and Assessment carried out in Harborough district concluded that further investigation would be required for Carbon Monoxide, Lead, Particulates and Nitrogen Dioxide. The Second and Third Stage review concluded that with the exception of Nitrogen Dioxide all of the National Air Quality Objectives would be met within the appropriate time frame. As it was anticipated that the nation objective for Nitrogen Dioxide was unlikely to be met in Lutterworth Town Centre, an Air Quality Management Area was declared in July 2001.

Where an Air Quality Management Area has been declared, a Stage 4 assessment is required to give local authorities the opportunity to supplement any information they have already gathered in their earlier review and assessment work. A draft Stage 4 report was submitted to DEFRA in March 2004 and we will shortly be commencing a public consultation on this document.

The initial findings of the Stage 4 review confirm that the National Air Quality Objectives for Nitrogen Dioxide are unlikely to be achieved. In addition, due to the results of further monitoring and modelling, the extent of the original Air Quality Management Area was an under estimate of the extent of the area in which the national objectives will not be met. In view of this it is recommended that the existing Air Quality Management Area be extended and varied for Lutterworth town centre. The final extent of the AQMA will be dependant on the outcome of the forth coming consultation process.

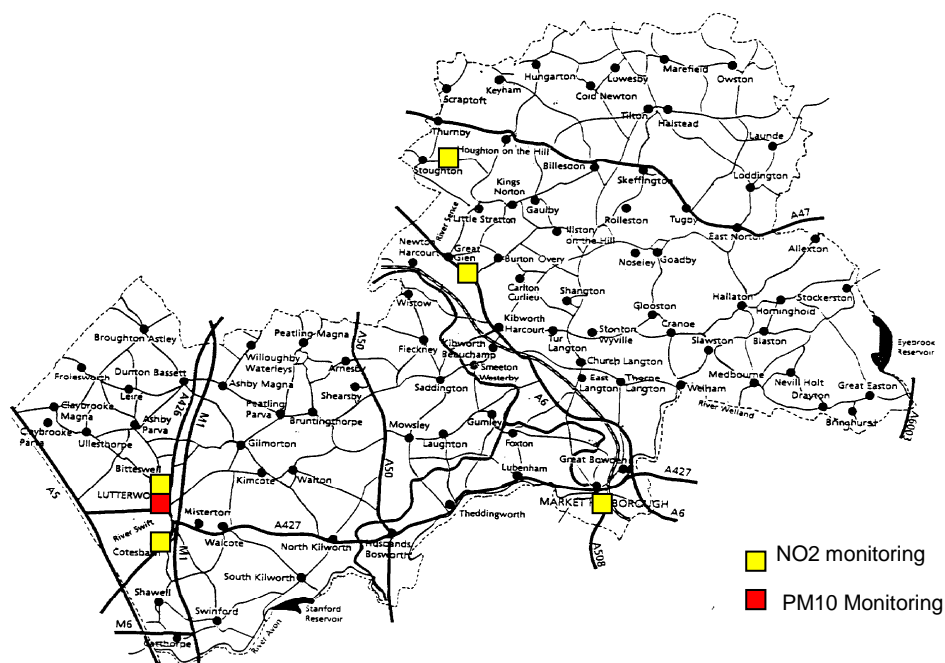
In 2003, the first Air Quality Update and Screening Assessment (USA) for Harborough was completed. This report demonstrated that for Benzene, 1,3 Butadiene, Carbon Monoxide, Lead and Sulphur Dioxide, it would be unlikely that there would be any breach of the National Air Quality Objectives. When this document was produced there was limited ratified monitoring data for Nitrogen Dioxide and Particulates and it was concluded that this information would form part of the first Progress Report.

MONITORING RESULTS

As part of the assessment of the local air quality, a number of diffusion tubes are located throughout the district. These diffusion tubes are a simple and cost effective method for screening air quality and provide a good indication of the average Nitrogen Dioxide levels.

In addition to the network of diffusion tubes, there is a “Real Time” monitor located in Lutterworth Town Centre that constantly monitors for PM₁₀'s and Nitrogen Dioxide.

The location of the monitoring points



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

The laboratory takes part in the NO₂ network field inter-comparison run by the Health and Safety Laboratory (HSL). Full documentation on the quality control and calibration system can be found in the Stage 4 Review and Assessment document and will not be included in this report.

It is recognised that diffusion tubes may under or over estimates the actual pollution levels. There are a number of ways that the bias in diffusion tubes can be corrected. Part IV of the Environment Act 1995 – Local Air Quality Management, Technical Guidance LAQM.TG (O3) makes provision for the calculation of a bias correction factor for diffusion tube results, from co-location studies where diffusion tubes are collated with an automatic chemiluminescence analyser.

The bias adjustment factor “A” is the ratio of the automatic analyser result to the collocated diffusion tube result is calculated by:

$$\text{Bias adjustment A} = \frac{\text{Mean annual chemiluminescence concentration}}{\text{Mean annual diffusion tube concentration}}$$

Table 1 gives the uncorrected “raw” and corrected data for the Nitrogen Dioxide survey for 2003. The diffusion tube collocated with the real time monitor was Tube 2 and the average result from this tube was 45µg/m².

The bias adjustment for Nitrogen Dioxide based on results of the collocation study –

$$\text{Bias Adjustment A} = \frac{\text{Mean annual chemiluminescence concentration}}{\text{Mean annual diffusion tube concentration}}$$

$$\text{Bias adjustment A} = \frac{53.4}{45}$$

$$\text{A} = 1.187$$

Table 1 Results of the Raw Data and Bias Adjusted Data of the Nitrogen Dioxide Diffusion Tube Survey 2003

All results are in $\mu\text{g}/\text{m}^3$

| Tube Number | Name | Easting | Northing | Jan 03 | Feb 03 | Mar 03 | April 03 | May 03 | June 03 | July 03 | Aug 03 | Sept 03 | Oct 03 | Nov 03 | Dec 03 | AVE |
|-------------|-----------------------|---------|----------|--------|--------|--------|----------|--------|---------|---------|--------|---------|--------|--------|--------|------|
| 1 | Brooklands | 4735 | 2871 | 19 | 17 | 22 | 16 | 6 | 13 | 10 | 12 | 16 | 19 | A | 22 | 16 |
| | | | | 22.5 | 20.2 | 26 | 19 | 7 | 15.4 | 11.9 | 14 | 19 | 22.5 | A | 26 | 19 |
| 2 | LASS Lutterworth | 4545 | 2842 | 31 | 49 | 39 | 33 | 26 | 50 | 40 | 59 | 60 | 54 | 56 | 43 | 45 |
| | | | | 36.7 | 58 | 46.3 | 39 | 31 | 59.3 | 47.5 | 70 | 71.2 | 64 | 66 | 51 | 53 |
| 3 | Bushby | 4653 | 2038 | 19 | A | 14 | 21 | 11 | 8 | 10 | 12 | A | 22 | 29 | 35 | 18 |
| | | | | 22.5 | A | 16.6 | 25 | 20.6 | 9 | 11.9 | 12 | A | 26 | 34 | 41.5 | 21.4 |
| 4 | Regent Ct Lutterworth | 4545 | 2842 | 42 | A | A | A | 44 | 17 | A | 72 | 66 | 55 | 59 | 50 | 51 |
| | | | | 49.8 | A | A | A | 52 | 20.2 | A | 85.5 | 78 | 65.3 | 70 | 59 | 60 |
| 5 | Gt Glen | 4656 | 2974 | 35 | 25 | 15 | 17 | 9 | 12 | 13 | 15 | 22 | A | A | 22 | 19 |
| | | | | 41.5 | 29.6 | 17.8 | 20.2 | 10.7 | 14 | 15.4 | 17.8 | 26 | A | A | 26 | 22.5 |

A = Tube missing

Bias Adjusted Data highlighted in Red

The adjusted measured concentrations of Nitrogen Dioxide have been projected forward to 2005 using the correction factor determined above. The results can be found in Table 2

Table 2

The Bias adjusted annual averages for Nitrogen Dioxide for 2003 and predicted levels for 2005

| Tube Number | Location | Bias adjusted results for 2003 µg/m³ | Predicted levels for 2005 µg/m³ |
|--------------------|--------------------------|--|---|
| 1 | Brooklands | 18.99 | 15.93 |
| 2 | Lutterworth Service Shop | 53.41 | 44.81 |
| 3 | Bushby | 21.36 | 17.93 |
| 4 | Regent Ct Lutterworth | 60.53 | 50.79 |
| 5 | Great Glen | 22.55 | 18.92 |

Based on the predictions from the monitoring data the annual average Nitrogen Dioxide level in 2005 is likely to be exceeded at two locations. One of these locations currently falls within the existing Air Quality Management Area (AQMA) and the second location falls within the proposed extension to the AQMA.

Appendix 1 shows the trend in Nitrogen Dioxide levels across the district since 1997. It must be noted that these results are for uncorrected diffusion tube data. Care must also be taken with interpretation of any trend as no account has been taken into consideration as to changes in meteorological conditions and national trends.

In addition to the general diffusion tube survey, detailed real time monitoring is carried out at Lutterworth, within the AQMA. Since 2003, CASELLA ETI Data Services have ratified the data from the analyser. Table 3 show the 2003 average values for NO₂ as a 1 hour mean and PM₁₀ as a 24 hour mean. These can be compared to the National Air Quality Standard Guideline Values for NO₂, 40µg/m³ and PM₁₀, 40µg/m³.

Data from the real time monitors confirmed that it is unlikely that the Air Quality Objective for Nitrogen Dioxide will not be met in Lutterworth town centre. However based on the results from the PM₁₀ monitor it is not anticipated that there will be any exceedance of the Air Quality Objective for this pollutant.

Appendix 2 shows the graphical results for 2003 for Nitrogen Dioxide and PM₁₀'s

Table 3 Annual Average Results for 2003 for Nitrogen Dioxide and PM10's

| Month | NO2 (µg/m³) Monthly Average | PM10 (µg/m³) Monthly Average |
|----------------|---|--|
| January | 45.3 | 20.5 |
| February | 52.3 | 28.7 |
| March | 47.3 | 32.8 |
| April | 42.9 | 28.7 |
| May | 44.8 | 21.2 |
| June | 44.3 | 25.1 |
| July | 62.1 | 24.9 |
| August | 58 | 28.9 |
| September | 73.2 | 28 |
| October | 53 | 21.4 |
| November | 58.8 | 24.4 |
| December | 58.9 | 23.6 |
| AVERAGE | 53.4 | 25.7 |

NEW LOCAL DEVELOPMENTS

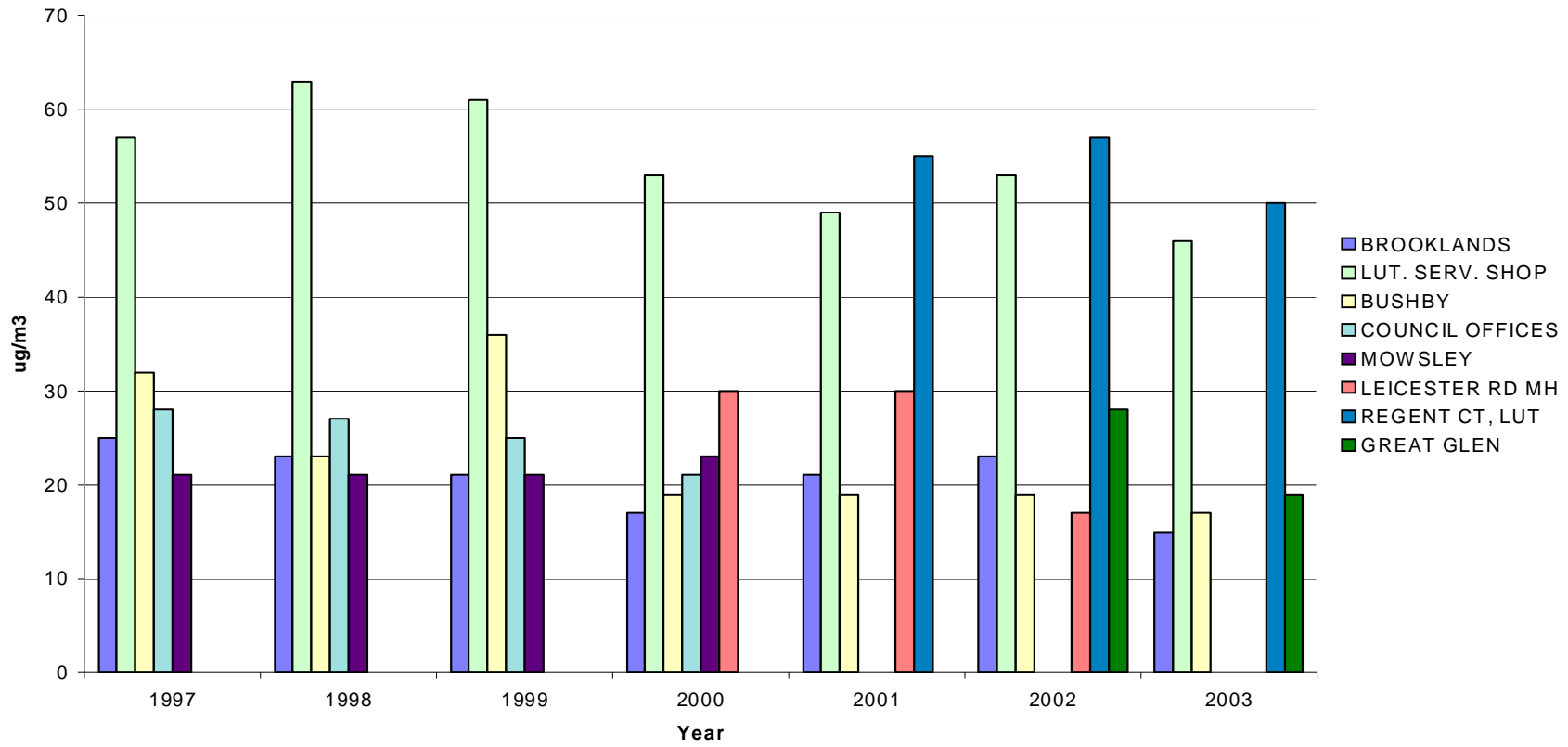
There have been no new industrial processes in the district that are likely to have a significant impact on local air quality. However Leicestershire County Council has recently received planning applications for extensions to existing sand and gravel quarries within the district and an application for a new sand and gravel quarry. It is not anticipated that these developments will have an impact on the local air quality however should these developments proceed, they will be considered more thoroughly in the next complete review and assessment process.

ACTION PLAN

Harborough District Council is currently developing an Action Plan to investigate the various options available to reduce the pollution levels in the local area. This action plan will provide the mechanism by which the Council, in collaboration with national agencies and other interested bodies, will state their intentions for working towards achieving the air quality objectives.

Appendix 1

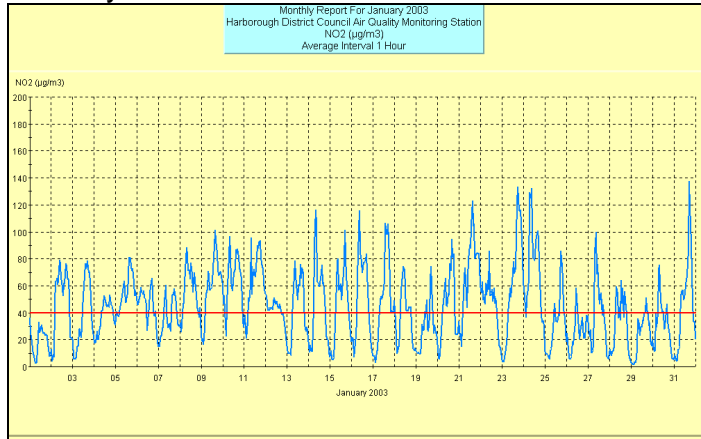
NO2 Trends 1997-2003



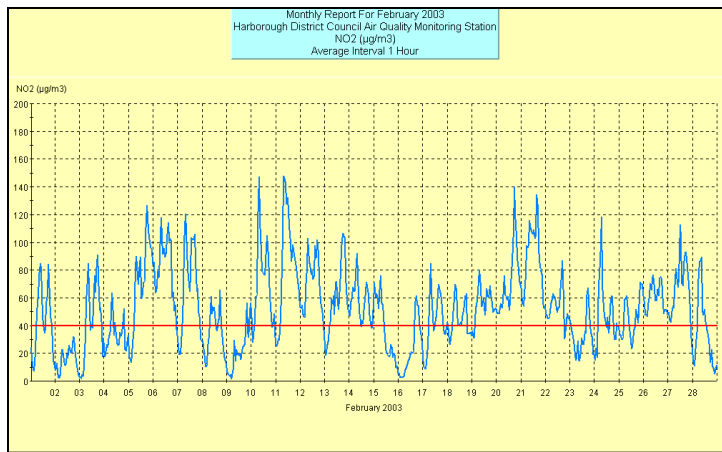
Appendix 2

Monthly Results from the Real Time Monitoring Station – 2003 Nitrogen Dioxide Levels

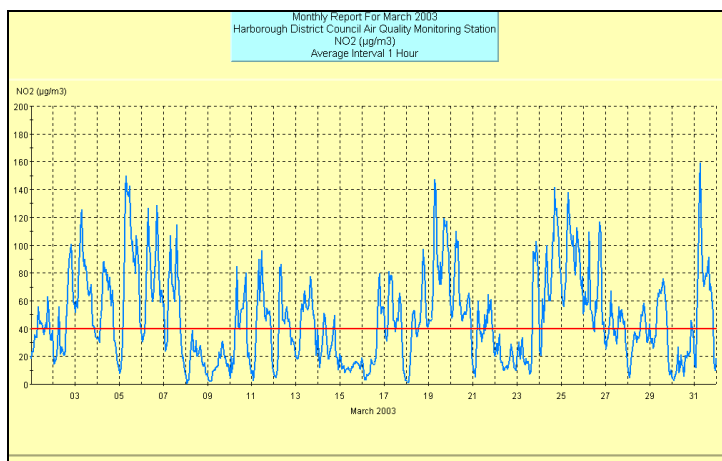
January



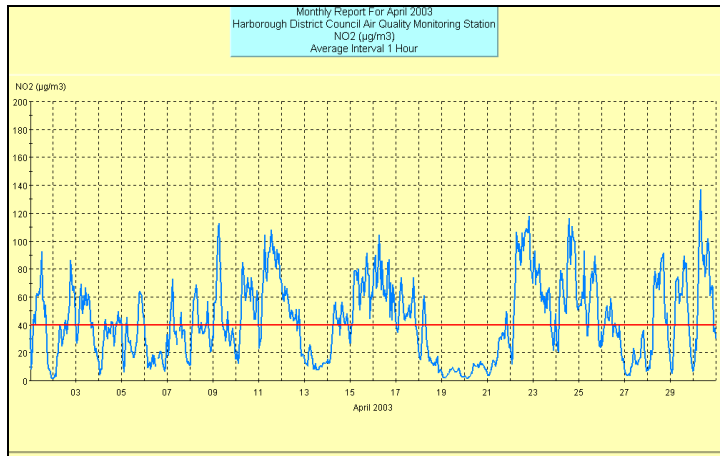
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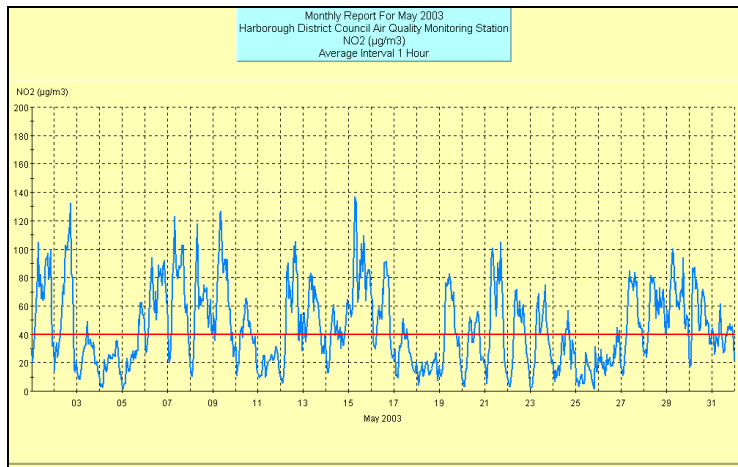
March



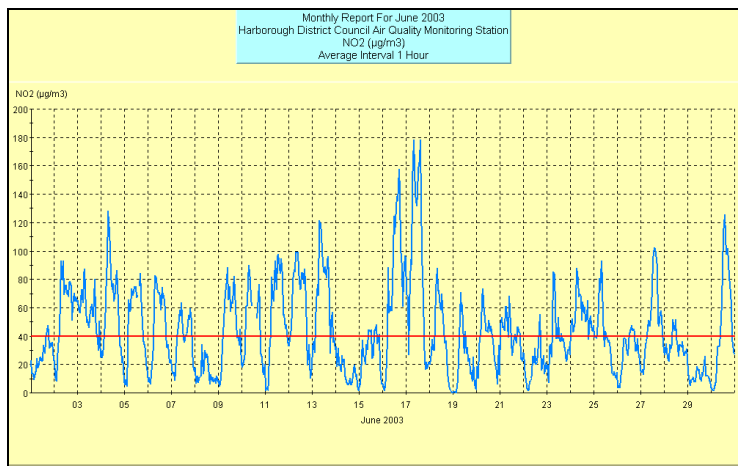
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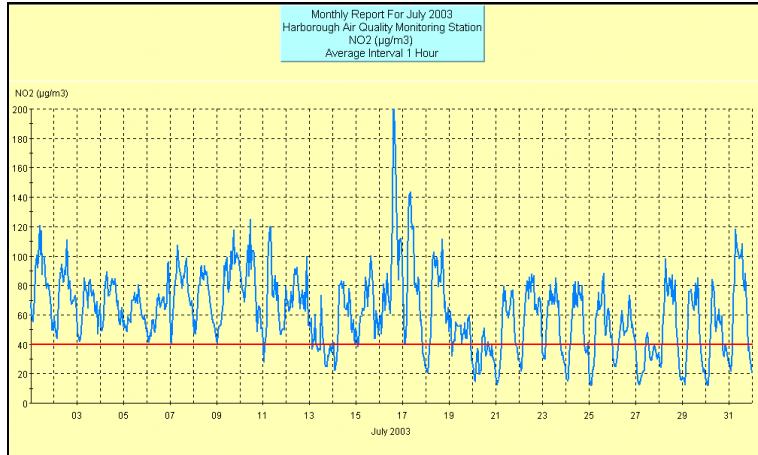
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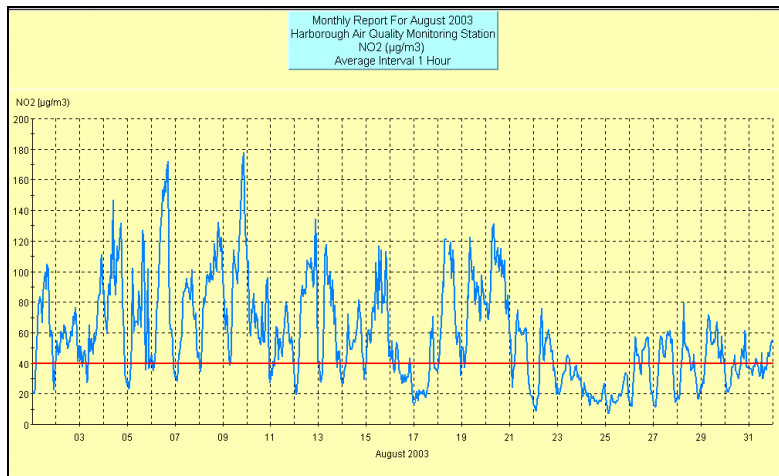
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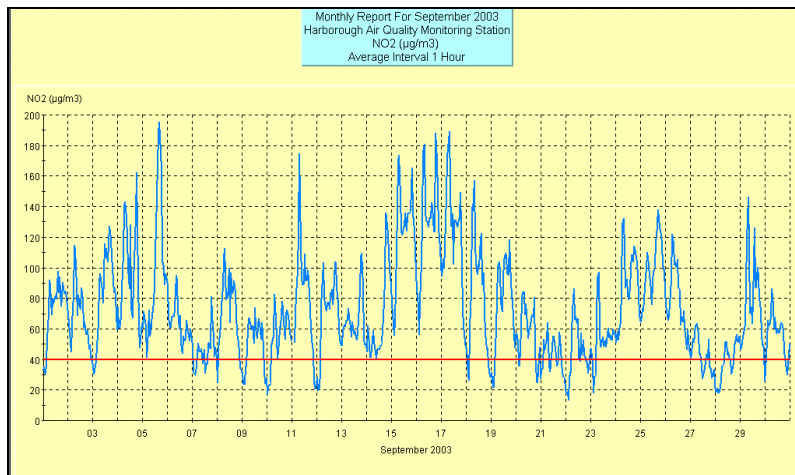
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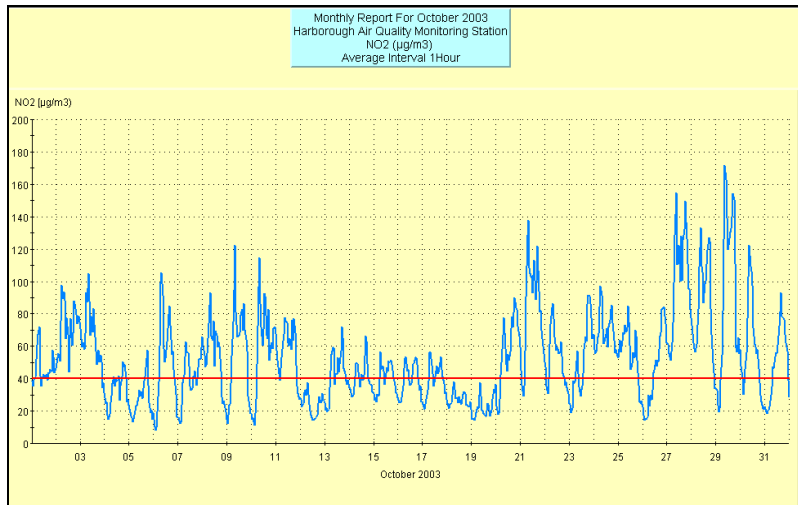
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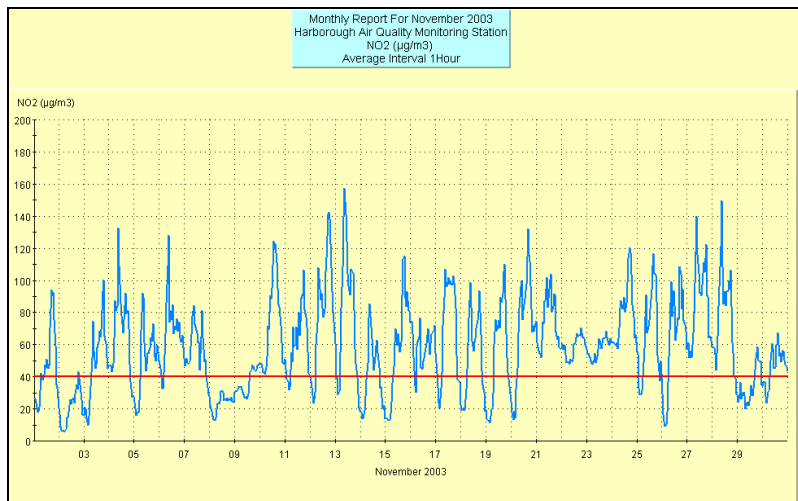
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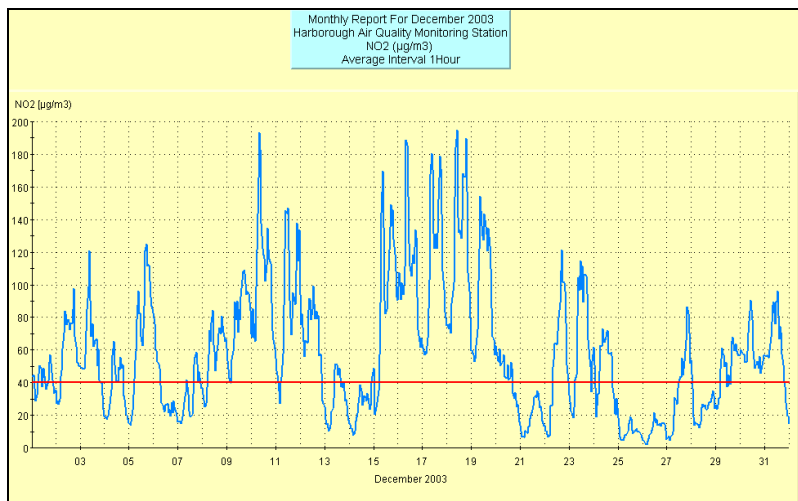
October



November

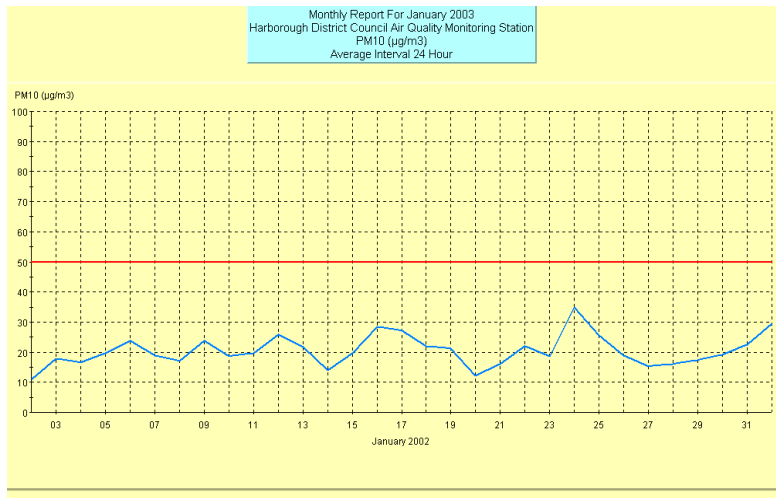


December

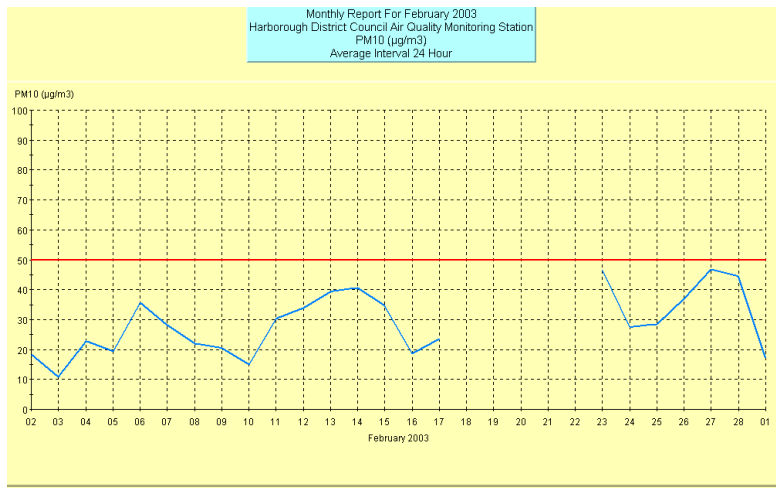


PM10 Results

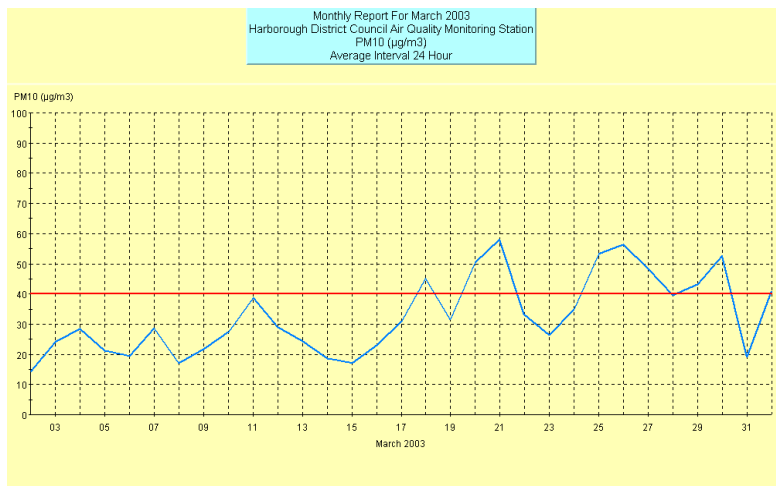
January



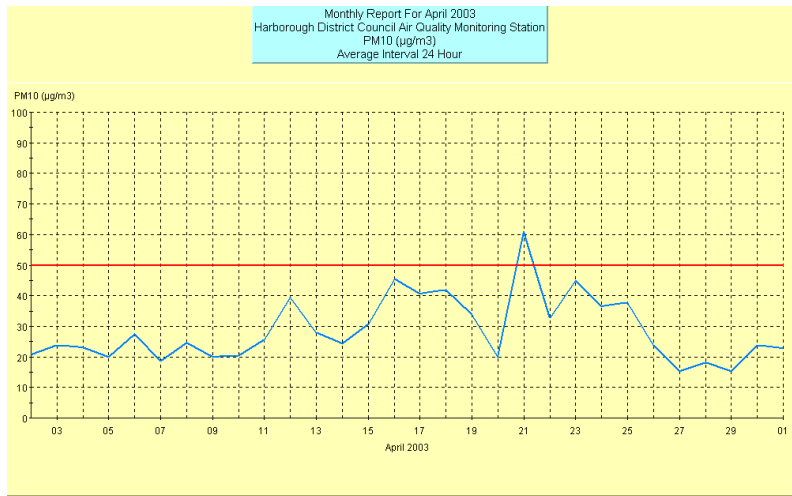
February



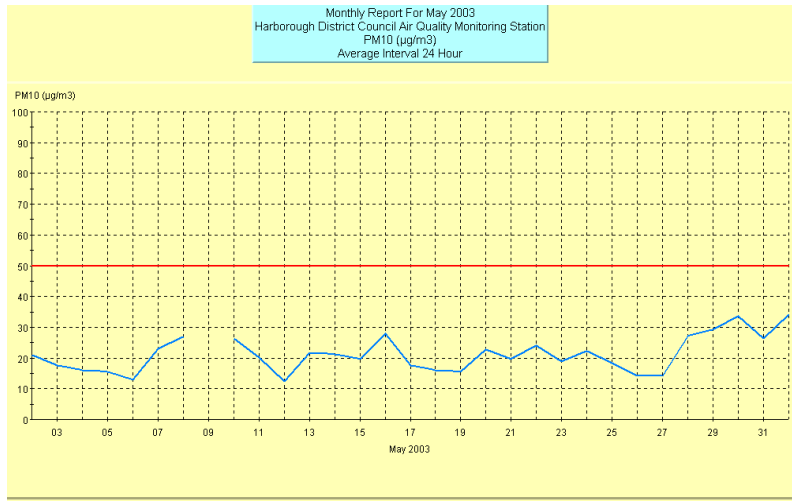
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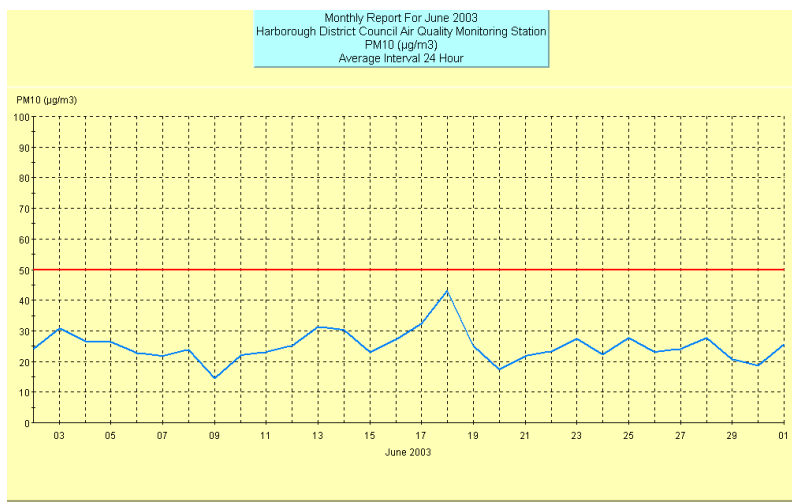
April



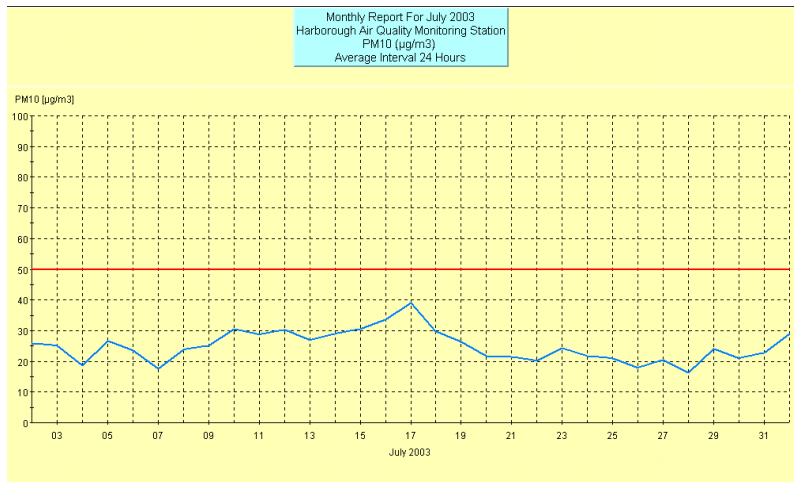
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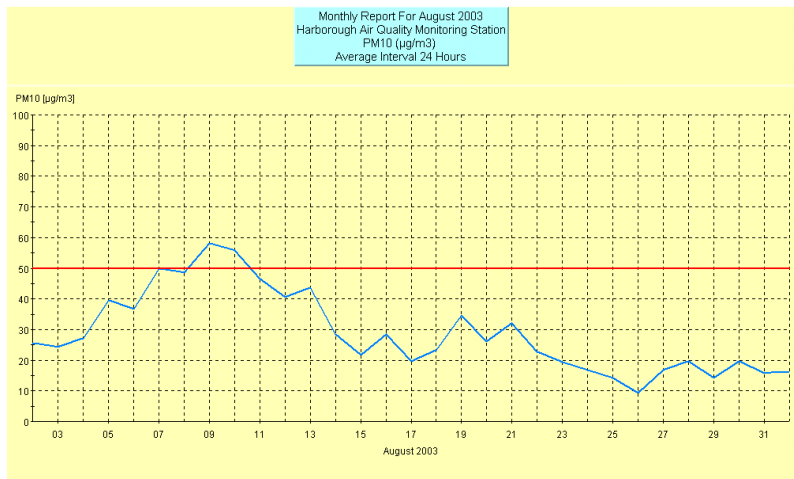
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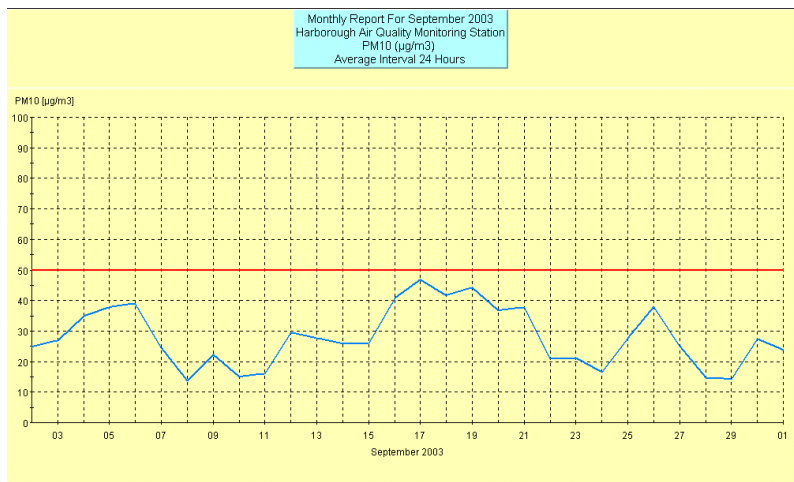
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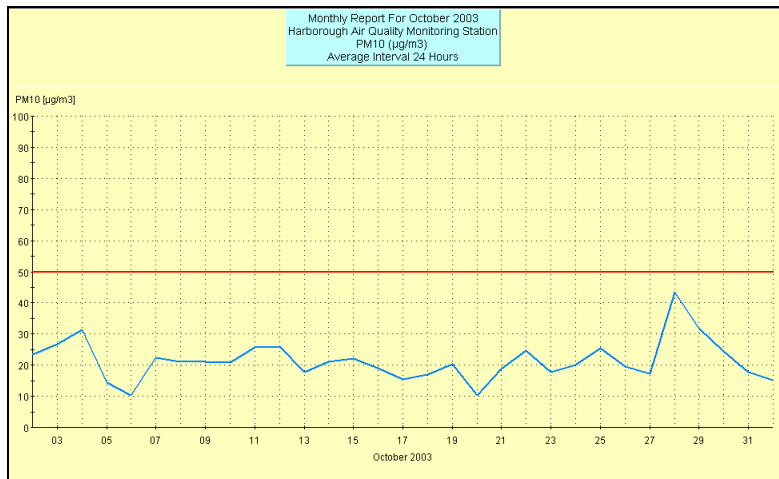
August



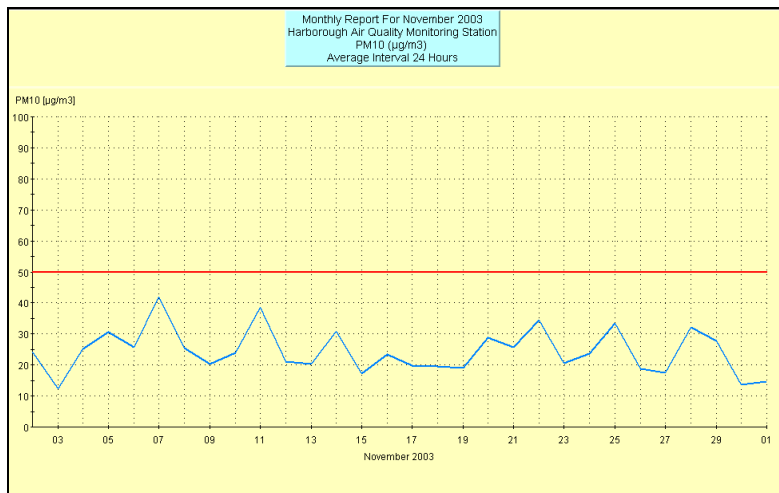
September



October



November



December

