



## **2010 AIR QUALITY PROGRESS REPORT MALVERN HILLS DISTRICT COUNCIL**

In fulfilment of Part IV of the Environmental Act 1995

Local Air Quality Management

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## **EXECUTIVE SUMMARY**

The current and any proposed sources of air quality objective pollutants have been reviewed together with the results of the only pollutant measured, namely nitrogen dioxide.

Nitrogen dioxide continues to be below the objective level with results for 2009 showing a reduction in previous years.

Consequently it is not necessary to declare an air quality management area.

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## 1. INTRODUCTION

### 1.1 Description of Local Authority Area

Lying on the western edge of Worcestershire and south of the west midlands region, Malverns Hills district covers 577 square kilometres. The area is dominated by the Malverns Hills, designated as an area of outstanding natural beauty, which coupled with the rivers Severn and Teme which flow through the district provide a quality natural environment attracting over a million visits every year.

The district is mainly rural with three main centres of population. Malvern, in the centre of the district, is the main town and contains the majority of the district's industry. Tenbury Wells in the north-west grows hops, apples and soft fruits; Upton upon Severn in the south east of the district is a tourist and marina town.

In terms of employment 72% of employed residents within the services sector. There are no major industrial sources of the pollutants indicated in Table 1. Road traffic is a major source of pollutants with nitrogen dioxide being the most significant and to a lesser extent particulates (PM10). Whilst there are two motorways within the district, the M5 and the M50, there are no relevant exposures nearby such as residential properties. The principal sources of relevant exposure are all within Malvern itself and indicated in 1.4 of this report.

### 1.2 Purpose of Progress report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

### 1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) in **England** are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre  $\mu\text{g}/\text{m}^3$  (for carbon monoxide the units used are milligrammes per cubic metre,  $\text{mg}/\text{m}^3$ ). Table 1.1. includes the number of permitted exceedences in any given year (where applicable).

**Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.**

Pollutant	Concentration		Measured as	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$		Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$		Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$		Running annual mean	31.12.2003
Carbon monoxide	10.0 $\text{mg}/\text{m}^3$		Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$		Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$		Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year		1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$		Annual mean	31.12.2005
Particles ( $\text{PM}_{10}$ ) (gravimetric)	50 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year		24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$		Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 24 times a year		1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 3 times a year		24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year		15-minute mean	31.12.2005

## 1.4 Summary of Previous Review and Assessments

The Council has been reviewing air quality since 1998 and producing annual Progress Reports or Updating and Screening Assessments.

The principle source of air pollutants within this area is from vehicular traffic and in connection with this the only pollutant which has been measured is Nitrogen Dioxide. This has been measured non automatically using diffusion tubes since 2001 at locations where, primarily, there is queuing or slow moving traffic combined with proximity of premises where there is relevant exposure e.g. residential properties. (see Appendices at end of this Report for location of these sites).

Since 2001 there have been no significant alterations to road layouts or traffic flows which has necessitated a change to these locations. However the Worcester Road and Kempsey sites were discontinued from April 2008 as they were both well below 40 mg/m<sup>3</sup>. However following advice from DEFRA monitoring at these site was resumed from May 2009 in order to assess the overall trend in nitrogen dioxide at these sites

It can be seen in Table 2 the annual average results since 2001 have all been below 40mg/m<sup>3</sup>

**Table 2.1 showing microgrammes/m<sup>3</sup> of No<sub>2</sub> at 5 locations for years 2001 - 2008.**

	2001	2002	2003	2004	2005	2006	2007	2008	Tube to kerb distance
Graham Road	29.4	29.6	34.07	34.85	33.8	33.9	28.4	31.6	1.9m
Richmond Road	32.8	27.45	31.39	30.34	29.4	28.9	25.7	30.1	4.5m
Kempsey M5	20.6	23.1	25.66	24.96	24.2	23.1	19.4	Incomplete	68m
Barnards Green				28.7*	24.3	22.3	22.9	25.1	3.2m
Worcester Road				26.3*	21.5	19.6	15.9	Incomplete	5.4m

\*For September to December inclusive

In addition a screening assessment was carried out for particulates (PM<sub>10</sub>) in accordance with the procedure detailed in the "Design Manual For Roads and Bridges". This was carried out in July 2006 at the Graham Road/Church Street junction in Malvern which was considered to be the location most likely to have a particulate problem due to the presence of slow moving traffic, a street canyon effect combined with proximity of relevant exposure. The results were detailed in the 2007 Progress Report revealed that PM<sub>10</sub> levels were all well below the objective for this pollutant.

## 2. NEW MONITORING DATA

### 2.1 Summary of Monitoring Undertaken

#### 2.1.2 Automatic Monitoring Sites: NONE

#### 2.1.2 Non-automatic monitoring sites

**Table 2.2 Details of Non- Automatic Monitoring Sites**

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Teme Avenue M3N	Urban Background	X37971 Y24563	NO <sub>2</sub>	N	7m	1.0m	N
Westward Road M4N	Urban Background	X37732 Y24869	NO <sub>2</sub>	N	8m	1.5m	N
Richmond Road M5N	Traffic light controlled road junction	X37852 Y24775	NO <sub>2</sub>	N	0.5m	4.5m	Y
Graham Road M6N	Traffic light controlled road junction	X37774 Y24599	NO <sub>2</sub>	N	0.5m	1.9m	Y
Barnards Green M8N	Busy road	X37882 Y24563	NO <sub>2</sub>	N	0.3m	3.2m	Y
M5 Kempsey MHK	Rural	X38632 Y24833	NO <sub>2</sub>	N	68M	68M	N
Worcester Road	Busy Road	X37884 Y24806	NO <sub>2</sub>	N	1M	5.4M	Y

- The diffusion tubes are supplied and analysed by Gradko International Ltd, St. Martins House, 77 Wales Street, Hampshire, SO23 0RH
- Diffusion tubes are small plastic tubes containing a media, which upon exposure to pollutants passively absorbs them.
- Once returned to a laboratory for analysis, a calculation can be made of the mean pollutant concentration in the location of the tube from the duration of exposure and amount of pollutants absorbed. The laboratory uses a 20% Triethanolamine / Deionised Water preparation method.
- The Authority has not compared the diffusion tubes with a reference method at a co-location study.

- The bias adjustment currently being applied is 0.90. (<http://www.uwe.ac.uk/aqm/review/R&Asupport/diffusiontube.xls>)
- Results from the WASP scheme show that Gradko Laboratories demonstrated good performance. ([http://www.laqmsupport.org.uk/Summary\\_of\\_laboratory\\_Performance\\_in\\_WASP\\_R98-102.pdf](http://www.laqmsupport.org.uk/Summary_of_laboratory_Performance_in_WASP_R98-102.pdf))

Gradko is also part of the Working Group on harmonisation of preparation and analysis methods and follows the procedures set out in the Harmonisation Practical Guidance.

## 2.2 Comparison of Monitoring results with Air Quality Objectives

### 2.2.1 Nitrogen dioxide

From Table 2.3 it can be seen that no site had an annual mean of above 40 mg/m<sup>3</sup>. The background sites (M3N & M4N) are on housing estates whilst M5N, M6N & M7N are on shop facades above which there are residential properties. M7N is located at a residential property close to a road & to traffic lights whilst MHK is in a rural location near a motorway. Triplicate tubes are provided at all sites.

**Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes**

Site ID	Location	Within AQMA?	Data Capture 2009 % *	Annual mean concentrations
				2009 (µg/m <sup>3</sup> ) Adjusted for bias
M3N	Teme Avenue	N	100	12.33
M4N	Westward Road	N	91.7	10.7
M5N	Richmond Road	N	100	30.1
M6N	Graham Road	N	100	30
M8N	Barnards Green	N	100	23.9
M7N	Worcester Road	N	66.6	18.45
MHK	Kempsey	N	66.6	21.24

### 2.2.2 Summary of Compliance with AQS Objectives

Malvern Hills District Council has examined the results from monitoring in the district. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.



### **3. NEW LOCAL DEVELOPMENTS**

#### **3.1 Commercial and Domestic Sources Including Transport**

Malvern Hills District Council confirms that there are no new or newly identified local developments or road traffic sources which may have an impact on air quality within the Local Authority area.

#### **4. LOCAL/REGIONAL AIR QUALITY STRATEGY**

An Air Quality Strategy and planning protocol has been drawn up collectively for all the district councils in Worcestershire together with Herefordshire Council. This Strategy came into effect from November 2009.

The Strategy provides for a unified approach to air quality and in the Malvern Hills area and has resulted in improved communication between the planning department and environmental health concerning applications where air quality is of significance.

The Strategy to be reviewed annually and place on the Council's website.

## **5. PLANNING APPLICATIONS LIKELY TO AFFECT AIR QUALITY**

The only application which could impact upon air quality is one which concerns a large-scale residential development together with industrial land. The actual application details are as follows:

Outline planning application for the construction of up to 3950 dwellings (Use Class C3), 14 hectares of employment land (Use Class B1/B2), community infrastructure, retail, education and leisure uses (Use Classes A1-A5, C2, D1, D2). Laying out of green infrastructure, amenity open space, structural landscaping, areas of equipped play, sports pitches and associated infrastructure. Means of access on to Bromyard Road (A44), Martley Road (B4204) and Oldbury Road. Matters of Appearance, Landscaping, Layout and Scale reserved for subsequent approval.

## **6. LOCAL TRANSPORT PLANS AND STRATEGIES**

The Worcestershire LTP 2006-2011 acknowledges that it must be intrinsically linked to the County wide air quality strategy and to strategies to combat congestion.

A principal aim of the LTP is to try and ensure that no new air quality management areas are declared as a result of increasing traffic levels and also to implement measures that will enable the removal of AQMA designation from sites already declared.

## **7. CONCLUSIONS AND PROPOSED ACTIONS**

### **7.1 Conclusions from New Monitoring Data**

Whilst there has been a significant variation in data since monitoring for nitrogen dioxide commenced recent trend is downwards, perhaps associated with better vehicle engine technology. Results at all monitoring locations are below the objective level.

### **7.2 Conclusions Relating to New Local Developments**

The planning application referred to in Section 4 for a very large residential development will need detailed consideration, in the event of it being given permission. However, the location of this site is such that its influence on existing monitoring sites nitrogen dioxide is likely to be minimal.

### **7.3 Proposed Actions**

To continue monitoring for nitrogen dioxide at existing locations and to review the results together with any developments which may affect air quality in the 2011 Progress Report.

## 8. REFERENCES

Part IV of the Environment Act 1995

- Local Air Quality Management, Technical Guidance LAQM.TG(09), February 2009
- Local Air Quality Management, Policy Guidance (PG09), February 2009
- <http://www.uwe.ac.uk/aqm/review/>
- <http://www.laqmsupport.org.uk/>

