

Air Quality Annual Progress Report 2004 Final Edition



Issue 2
July 2005

Local Authority Information

Local Authority Service Manager Officer to contact Address	Blaby District Council Mr S. A. Beard - Head of Environmental Health Services David Gould - Senior Environmental Health Officer Environmental Health Services Division Blaby District Council, Council Offices, Desford Road, Narborough, Leicester, LE19 2EP
Phone number	0116 272 7546
Fax number	0116 272 7594
Email address	environmental.health@blaby.gov.uk
Minicom	0116 284 9786
Council website	www.blaby.gov.uk
Air quality website	http://www.blaby.gov.uk

This information can be made available on request, in other languages and formats (large print, Braille or on audio tape) by contacting us using the details above.

Air Quality Annual Progress Report.

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1.0 Nitrogen Dioxide

1.1. Diffusion Tubes

Since 1993, the Council has used diffusion tubes to monitor Nitrogen Dioxide on busy roads passing through the district. This is a well established method which provides reasonably accurate data at a low cost. Many tubes can be used to monitor levels for trends and to study the distribution of the pollutant over areas. They are limited in that they can only give an average level over the time period they are exposed for. In order to be used in Detailed Assessments, where comparison is made with the national objective, the bias adjustment procedure, outlined below, must be used.

Diffusion tubes have always been located where they can give an estimate of the exposure of residents to Nitrogen Dioxide. Many of them are now located on the façade of houses, or, if this is not possible, in positions which are an equivalent distance from the road source.

The tubes are sent to South Yorkshire Laboratories for analysis.

There is a triplicate set of tubes on the roof of the Council's existing Air Quality Monitoring Station (AQMS). This is used to compare the tube results to the data from the chemiluminescent analyser located in the AQMS, producing a bias adjustment (or correction factor). This factor is then applied to all of the tube results, improving their accuracy, as recommended by the Technical Guidance Note (LAQM.TG(03))

Below are the results for diffusion tube monitoring throughout 2004.

Tube No.	Month Location	01/09/2004	01/10/2004	01/11/2004	01/12/2004	Average	bias applied	Long term average
								0.9770958
2	Jordans	61	nr	nr	nr	61	46.97	45.89418973
3	Cleveleys Ave	34	42	44	50	42.5	32.725	31.97546006
1	Cyril Street	39	39	45	50	43.25	33.3025	32.53973288
4	Leicester Road	nr	53	73	60	62	47.74	46.64655349
5	County Arms	nr	63	53	69	61.6667	47.48333333	46.39576557
12	Kingsway North	47	44	54	62	51.75	39.8475	38.93482489
6	Hinckley Road/M1	70	65	70	82	71.75	55.2475	53.98210021
7	Forest Road/M69	40	42	35	37	38.5	29.645	28.96600499
8	Thorpe A	54	46	60	55	53.75	41.3875	40.43955242
9	K Edward	72	59	71	63	66.25	51.0125	49.8440995
10	The Osiers	53	42	64	74	58.25	44.8525	43.82518937
11	Branting Hill	45	60	69	56	57.5	44.275	43.26091655
16	Cumberwell drive	nr	48	72	60	60	46.2	45.14182596
13	Nox Box	45	60	69	56	57.5		
14	Nox Box	25	29	40	41	33.75		
15	Nox Box	25	30	40	45	35		
	Av of NOx box	31.6	39.6	49.6	47.3	Dm	53.4	
	Station AV	12.9	15.7	17.23	18.97	Cm	30.78	
						Bias		
		24.51	29.83	32.737	36.043	fact.	0.77	

Table above shows diffusion tube concentrations for 2004, the long term bias corrected figure is taken as the yearly average.

1.2 Interpretation of results.

As shown on the table above, the following observations with regard to declaration of new AQMA's (proposed in Blaby District Council's Detailed Assessment report) can be identified.

Jordans- is included in AQMA1
Leicester Road- the diffusion tube is located on a lamp post and the houses are more than 10 metres from the road.
County Arms- the distance of the receptor from the road is far enough to not be considered as a problem (confirmed by the results of a further diffusion tube on a house
Hinckley Road/M1-the diffusion tube is located directly adjacent to the road sources, but is not co-located with a receptor. The AQMA is proposed as incorporating the nearest receptor but not the actual tube site.
Thorpe A – the distance from the road, concerns us that the high readings are coming from a different source.
K Edward- is included in AQMA 2
The Osiers- this is a non residential area
Branting Hill- this is due to be declared as part of an AQMA
Cumberwell Drive- this is located within AQMA 2

Due to staffing problems during 2004, the diffusion tube network database is incomplete. When linked to the fact that the monitoring stations ozone generator and chemiluminescence analyser was not functioning correctly this resulted in a lack of data. The table of diffusion tube data shows that only four months of data was collected in 2004. As described above, the bias correction and long term averages were worked out for this diffusion tube data. Due to the lack of real time monitoring data, it is thought that the station averages are inaccurate. As a result of this the figures projected for long term averages are appeared to be erroneous, and not considered to be accurately representative of the year. The annual averages, obtained by using the methods set out in LAQM.TG (03) are included for completeness, but are indicative only. To try to resolve this problem a standard bias correction factor of 0.77 was used. This was obtained from South Yorkshire laboratories via defra.

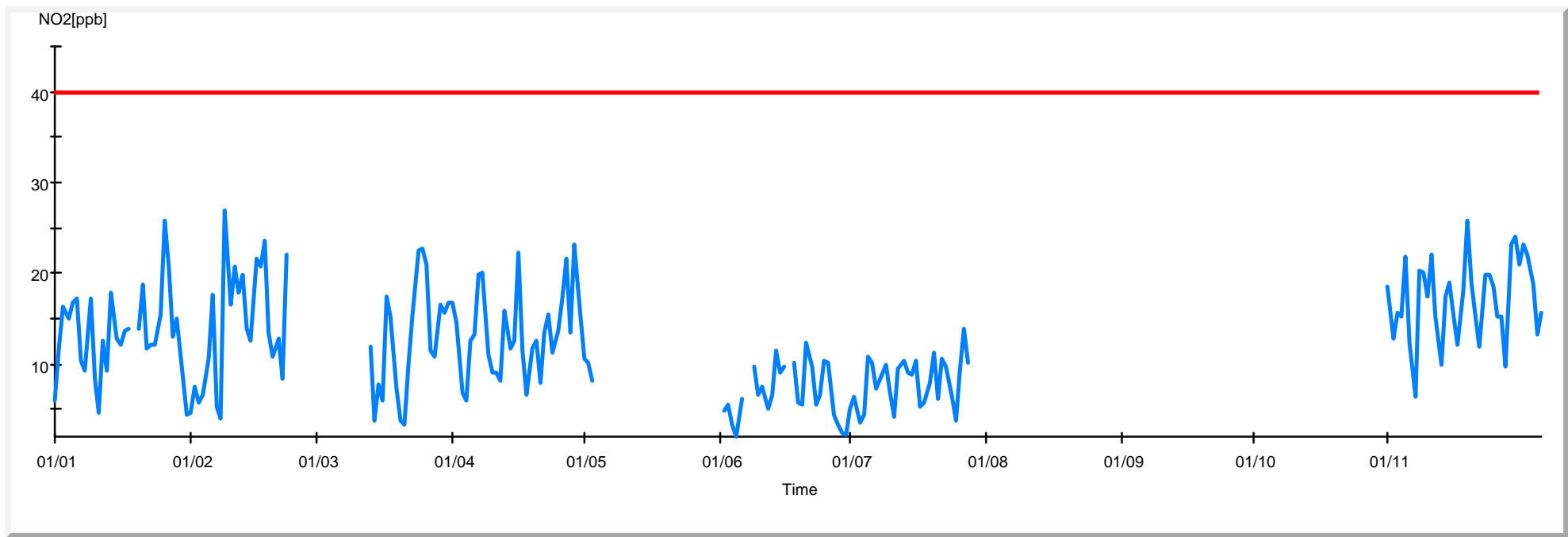
1.3 Chemiluminescent analyser

Blaby District Council had one chemiluminescent analyser during 2004, which is located in its Air Quality Monitoring Station (AQMS). The AQMS is portable and also contains a particulates analyser and weather monitors. Two additional AQMSs have now been commissioned.

During January to the 6th December 2004 the AQMS was located at Butler Fuels in Croft (see location map b, appendix 1). Since the 6th December 2004, the Air Quality Monitoring Station has been located at the junction of the A426 Blaby bypass and B582 Enderby Road, Whetstone, as part of the Detailed Assessment (see location map a, appendix 1). The raw data gathered is shown in Appendix 2).

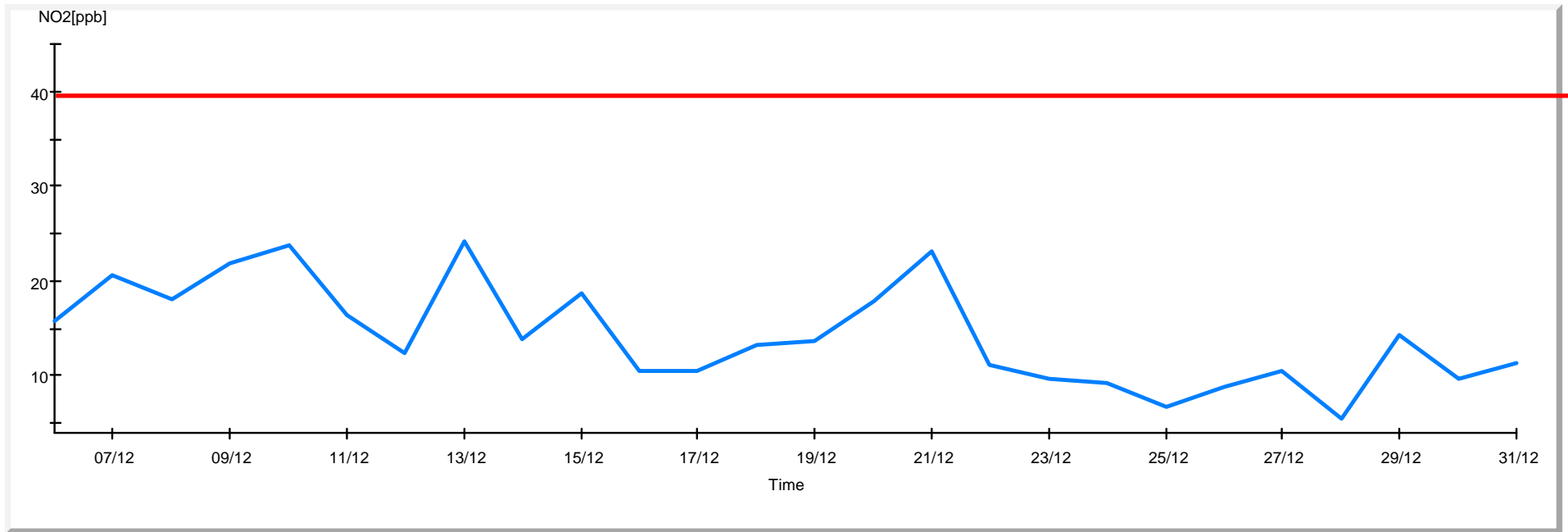
Graph 1

NO2[ppb] Periodic Station Report Blaby 1 (Mobile) 01/01/2004 24:00 - 06/12/2004 24:00 Interval 24 Hour



Graph 2

NO2[ppb] Periodic Station Report Blaby 1 (Mobile) 06/12/2004 24:00 - 31/12/2004 24:00 Interval 24 Hour



Graphs 1 and 2 illustrate the monthly and daily averages for nitrogen dioxide as measured by the AQMS. Graph 1 illustrates from January 2004 to 6th December 2004 when the monitoring station was relocated, results from this are shown on graph 2. This data was converted to $\mu\text{g}/\text{m}^3$ from ppb. The red line demonstrates the government objective, as cited below:

Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ (105ppb) not to be exceeded more than 18 times a year	1 hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$ (21ppb)	annual mean	31.12.2005

You can see from the red line and the table below that this was not exceeded. The graph also demonstrates the seasonal variation with lower levels of nitrogen dioxide being measured in the summer months.

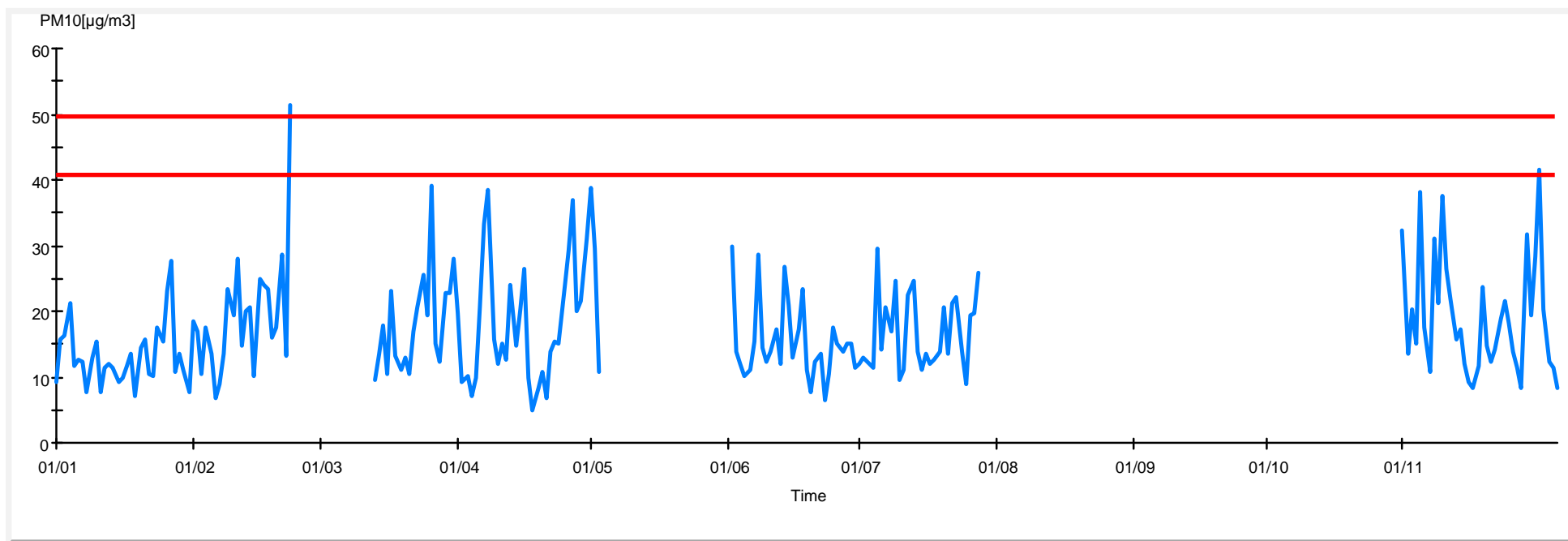
The yearly average for NO_2 in 2004 was 20.16 $\mu\text{g}/\text{m}^3$, although this will represent the levels for the complete year, as opposed to an average for the 2 monitored locations.

2.0 Particulate Matter PM₁₀

2.1 TEOM data

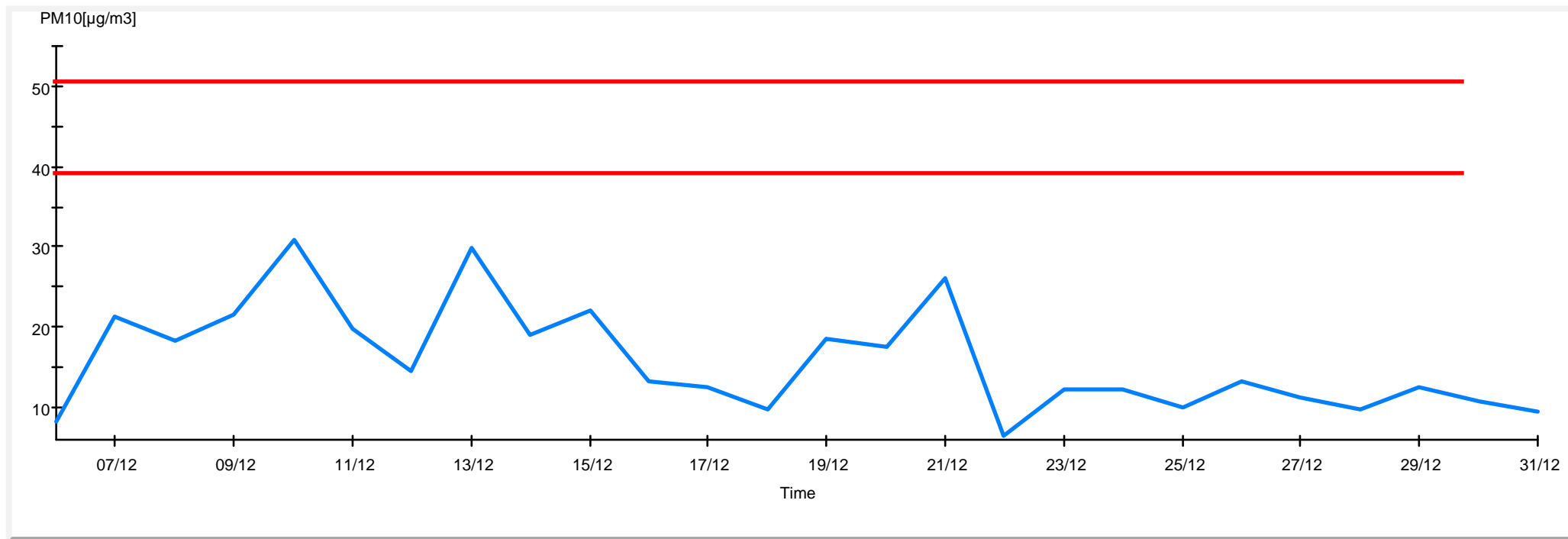
Graph 3

PM10[$\mu\text{g}/\text{m}^3$] Periodic Station Report Blaby 1 (Mobile) 01/01/2004 24:00 - 06/12/2004 24:00 Interval 24 Hour



Graph 4

PM10[$\mu\text{g}/\text{m}^3$] Periodic Station Report Blaby 1 (Mobile) 06/12/2004 24:00 - 31/12/2004 24:00 Interval 24 Hour



Graphs 3 and 4 illustrate the monthly and daily averages for PM₁₀ as measured by the AQMS. Graph 3 illustrates from January 2004 to 6th December 2004 when the monitoring station was relocated, results from this are shown on graph 4. The red line demonstrates the government objectives, as cited in the following table:

Particles (PM ₁₀)	50 µg/m ³ (gravimetric) not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
	40 µg/m ³ (gravimetric)	annual mean	31.12.2004

The annual PM₁₀ average for 2004 was 17.0 µg/m³ (TEOM), equivalent to 22.1 µg/m³ (GRAV). You can see from the red line and the table above that the annual mean objective was not exceeded. However, the 24 hour mean objective was exceeded on 1 occasion, which is permitted (being less than 35)

A lack of data was due to the breakdown of the ozone generator, which meant that the monitoring station, including the TEOM had to be turned off for a considerable period during the year.

3.0 Solution to problems which resulted in a lack of data

The staffing problems were addressed by the re-organisation of the Environmental Health Services Division, and recruitment towards the end of 2004. The air quality monitoring regime is now operating as intended, collecting accurate data.

4.0 New Local Developments

An arrangement has been established with the Development Control Section of the Council whereby any planning applications which are within, or in close proximity to an Air Quality Management Area (AQMA) are routinely referred to the Environmental Health Services Division for consideration.

In many cases, such applications are subject to an assessment by the Highways Authority. The applicant is often required to submit information as to the likely impact of the development on the local road network. This information, together with the comments of the Highways Authority is used to formulate Environmental Health observations.

Where a significant impact is indicated, amelioration measures, including section 106 agreements are considered.

If the development is likely to be affected by the elevated nitrogen dioxide levels in the AQMA, mitigation measures are required of the applicant, including separation from the road, and appropriate landscape planting schemes.

For AQMA1, there were no significant new or significantly changed local developments which would have an impact upon traffic levels on the A4560 Narborough Road South (the significant source of NO₂ in this AQMA). A limited log of planning applications for 2004 is provided in appendix 3.

For AQMAs 2 and 3, the predominant source of NO₂ is the M1 motorway. There were no new or significantly changed local developments in 2004 which are likely to have a significant impact upon traffic levels on the M1. It is not considered feasible to provide a log of planning applications within the catchment area of the M1 in Blaby District.

5.0 Implementation of Air Quality Action Plan

5.1 Summary

The Air Quality Action Plan, adopted in May 2004, included an initial plan for resourcing which recommended the provision of an additional member of staff and 2 additional Air Quality Monitoring Stations. This element has now been completed.

The initial implementation plans for improving air quality in the declared AQMAs have been progressed by liaison with the Highways Agency and the County Council. There are some elements which have not been completed and will be taken forward to 2005/2006.

5.2 Implementation

For ease of reference the initial implementation plans contained in the Air Quality Action Plan are reproduced below with comments. The original text can be found starting on page 30 of the Air Quality Action Plan.

5.2.1 Initial implementation plan for AQMA2 and AQMA3

The following actions specific to the M1 AQMAs are proposed for Blaby District Council:

Action Plan Measure/ Target	Original Timescale	Progress	Comments
Clarify extent of improvements in air quality required when results are available from the Stage 4 Air Quality Detailed Assessment	December 2004	The Stage 4 confirmed that “ the reduction needed in annual mean NO ₂ concentrations to ensure that concentrations at all relevant receptors in the AQMAs did not exceed 40 µg/m ³ was 10µg/m ³ for AQMA 1, 10µg/m ³ for AQMA 2 and 12µg/m ³ for AQMA 3	
Working with the Highways Agency define the timescales for existing improvement plans	December 2004	Liaison with Highways Agency has continued but timescales have yet to be determined.	
In collaboration with the Highways Agency, assess the impact of widening the M1 on traffic flows in and around AQMA 1	April 2005	The Highways Agency proposals for widening the M1 motorway are being developed.	An Environmental Impact Assessment is expected towards the end of 2005
Assess the potential for improvement in air quality from existing plans, when further information is available on their effectiveness	Dependent on trials	None to date	No further information to date.
Reconsider the need for additional measures beyond those recommended in this plan in the event that existing plans are insufficient to meet air quality standards		This is still to be undertaken	

5.2.2 Initial implementation plan for AQMA1-specific options

Action Plan Measure/ Target	Original Timescale	Progress	Comments
Liaise with bodies which have responsibilities in this area to clarify roles and define how it will operate with existing bodies.	September 2004	Liaison continues with County Council regarding joint working on related Local Transport Measures	
Identify major fleet operators, operating locally	September 2004	Liaison continues with County Council regarding joint working on related Local Transport Measures	
Liaise with those implementing government initiatives to see how they can be targeted on the Blaby AQMAs	December 2004	Liaison continues with County Council regarding joint working on related Local Transport Measures	
Identify or develop a concise guide to cleaning up vehicle emissions aimed initially at fleet operators, but with later application to other drivers.	December 2004	Liaison continues with County Council regarding joint working on related Local Transport Measures	
Develop plans with individual fleet operators with respect to government and other initiatives	April 2005	Liaison continues with County Council regarding joint working on related Local Transport Measures	Prioritise with those that operate the largest fleet.
Provide driver training to its own staff and consider how driver training programmes may be implemented more widely in the district.	April 2005	Liaison continues with County Council regarding joint working on related Local Transport Measures	
Develop a plan for future	April 2005	This is being developed but will	

implementation.		depend on comments from this report and revisions to the Air Quality Action Plan, following the proposed changes to Air Quality Management Areas.	
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5.2.3 Initial implementation plan for 'general measures'

Action Plan Measure/ Target	Original Timescale	Progress	Comments
District Council to liaise with bodies that have responsibilities in this area to clarify roles and define how it will operate with existing forum in the future.	September 2004.	liaison continues to develop through the meetings of the County Air Quality forum, Highway Forum and Local Strategic Partnership	
Collaborate with these bodies to define targets and timescales for implementation	December 2004.	associated targets and timescales are being developed	
Review local planning guidance to define how it can be made more robust with respect to air quality improvement	December 2004	The Local Development Plan is currently under review.	Air quality management is likely to feature more prominently in the replacement plan.
Based on information gathered during the first year of plan implementation, the District Council to develop a plan for implementation in future years	April 2005	This is being developed, but will be influenced by comments on this Progress Report and revisions to the Air Quality Action Plan, following the proposed changes to Air Quality Management Areas.	
Identify the measures included in the LTP and the Leicestershire Community Strategy that will have the		The Council is working with the local transport authorities on the second round of Local Transport Plans	The new shared objective for air quality should ensure a greater emphasis on tackling these items

greatest benefit to air quality in the Blaby AQMAs. Assess progress on these actions and seek to accelerate progress where appropriate.			
Identify any measures in the LTP that may cause a worsening of air quality in the Blaby AQMAs. Assess ways of mitigating these problems		The Council is working with the local transport authorities on the second round of Local Transport Plans.	The new shared objective for air quality should ensure a greater emphasis on tackling these items
Ensure that those implementing the Air Quality Action Plan are kept informed of progress on both the LTP and the Leicestershire and Blaby Community Strategies		The Council is working with the local transport authorities on the second round of Local Transport Plans.	The new shared objective for air quality should ensure a greater emphasis on tackling these items
Closure of the quarry and activities carried out at it		Given the likely extent of the problem this measure seems disproportionate and is not recommended here.	Given the likely extent of the problem this measure seems disproportionate and is not recommended here.
Restriction of activities at the quarry to take account of the influence of weather conditions on pollutant concentrations.		A plan is currently being devised by the quarry to deal with all processes. This plan will be produced by July 2005 and implemented as soon as reasonably practicable after.	An increased level of air quality monitoring around the quarry may help to identify the activities and climatic conditions that are associated with the highest concentrations of pollutants in the surrounding

			<p>ambient air.</p> <p>A study of the impact of the quarry has been completed as part of the Council's Detailed Assessment. This concluded that the operations were not significantly contributing to PM₁₀ levels. An AQMA is not being proposed for this area and this element of the action plan will therefore not be required</p>
<p>Enclosure of activities to shield materials from the wind and to contain suspended dusts.</p>		<p>A plan is currently being devised by the quarry to deal with all processes. This plan will be produced by July 2005 and implemented as soon as reasonably practicable after.</p>	<p>An increased level of air quality monitoring around the quarry may help to identify the activities and climatic conditions that are associated with the highest concentrations of pollutants in the surrounding ambient air.</p> <p>A study of the impact of the quarry has been completed as part of the Council's Detailed Assessment. This concluded that the operations were not significantly contributing to PM₁₀ levels. An AQMA is not being proposed for this area</p>

			and this element of the action plan will therefore not be required
Control of moisture content of dusty materials		A plan is currently being devised by the quarry to deal with all processes. This plan will be produced by July 2005 and implemented as soon as reasonably practicable after.	<p>An increased level of air quality monitoring around the quarry may help to identify the activities and climatic conditions that are associated with the highest concentrations of pollutants in the surrounding ambient air.</p> <p>A study of the impact of the quarry has been completed as part of the Council's Detailed Assessment. This concluded that the operations were not significantly contributing to PM₁₀ levels. An AQMA is not being proposed for this area and this element of the action plan will therefore not be required</p>
Use of filtration systems to extract dusts from the air.		A plan is currently being devised by the quarry to deal with all processes. This plan will be produced by July 2005 and implemented as soon as reasonably practicable after.	An increased level of air quality monitoring around the quarry may help to identify the activities and climatic conditions that are associated with the highest concentrations

			<p>of pollutants in the surrounding ambient air.</p> <p>A study of the impact of the quarry has been completed as part of the Council's Detailed Assessment. This concluded that the operations were not significantly contributing to PM₁₀ levels. An AQMA is not being proposed for this area and this element of the action plan will therefore not be required</p>
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5.2.4 Initial implementation plan on Resourcing

Action Plan Measure/ Target	Original Timescale	Progress	Comments
A full time Scientific Officer post was added to the establishment of the Council during a restructure of the Environmental Health Services Division. Recruitment to this post will commence shortly.		A new Scientific Officer is in position	
The Council has applied to DEFRA for financial assistance in purchasing additional monitoring equipment. The actual specification will be determined by the outcome of the current detailed assessment work.		Two new monitoring stations have been purchased and have both been commissioned. One will monitor PM ₁₀ , both will monitor NO ₂	
District Council to investigate all possible sources of funding for the measures listed in the plan, including (e.g.) government grants for cleaner vehicles.		This element will be taken forward to the implementation plan for the current year.	

Appendices

Appendix 1

Location Map of Blaby District Council's AQMS (a) Enderby Road, Whetstone.

Location Map of Blaby District Council's AQMS (b) Butler Fuels, Croft.

Appendix 2

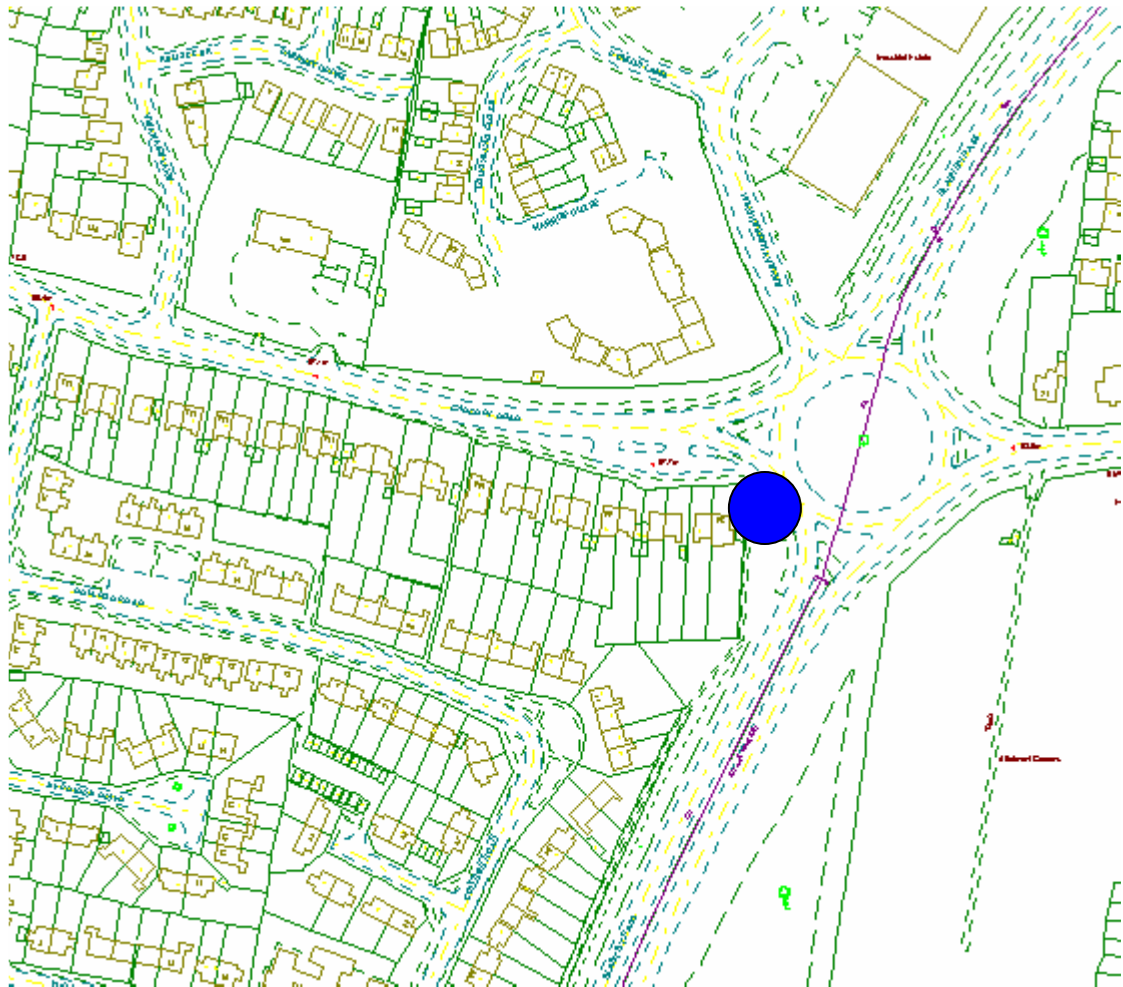
Teom and Chemiluminescent analyser raw data.

Appendix 3

Print out of relevant Planning Applications

Appendix 1 (a)

Location of Air Quality Monitoring Station (a), Enderby Road, Whetstone.



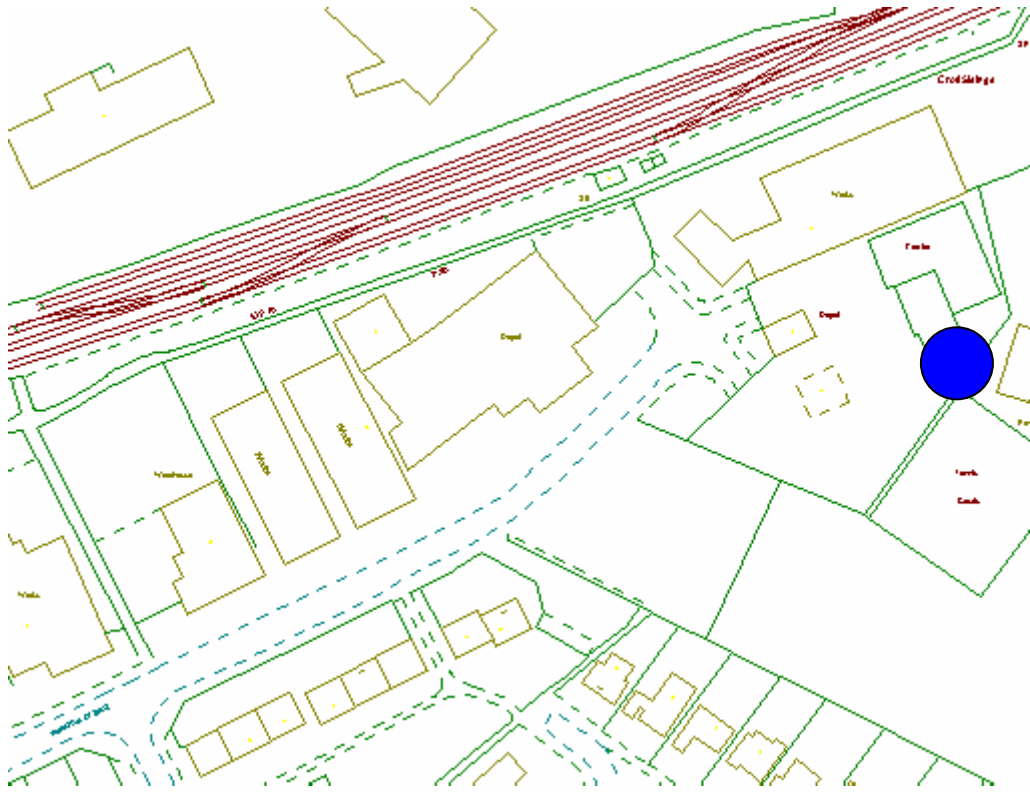
Key

Air Quality Monitoring Station



Appendix 1 (b)

Location of Air Quality Monitoring Station (b), Butler Fuels, Croft.



Key

Air Quality Monitoring Station



Appendix 2

Teom and chemiluminescent analyser raw data

Station: Blaby 1 (Mobile)
Date: 01/01/2004 24:00 - 31/12/2004 24:00
Report
Type: Mean
Time
Base: 24 Hour

Date	Time	NO2 ppb	PM10 µg/m3
01/01/04	24:00	6.1	9.3
02/01/04	24:00	11.6	15.7
03/01/04	24:00	16.3	16.4
04/01/04	24:00	15.1	21.2
05/01/04	24:00	16.7	11.8
06/01/04	24:00	17.2	12.5
07/01/04	24:00	10.4	12.2
08/01/04	24:00	9.3	7.6
09/01/04	24:00	17.2	12.8
10/01/04	24:00	8.3	15.4
11/01/04	24:00	4.6	7.6
12/01/04	24:00	12.7	11.5
13/01/04	24:00	9.3	12.1
14/01/04	24:00	17.9	11.2
15/01/04	24:00	12.8	9.1
16/01/04	24:00	12.2	9.7
17/01/04	24:00	13.7	11.8
18/01/04	24:00	13.9	13.6
19/01/04	24:00	Samp<	7.1
20/01/04	24:00	13.9	14.6
21/01/04	24:00	18.7	15.6
22/01/04	24:00	11.8	10.4
23/01/04	24:00	12	10.2
24/01/04	24:00	12.2	17.4
25/01/04	24:00	15.6	15.4
26/01/04	24:00	25.7	23.2
27/01/04	24:00	20.8	27.6
28/01/04	24:00	13.1	10.8
29/01/04	24:00	15	13.7
30/01/04	24:00	10.7	11.2
31/01/04	24:00	4.4	7.6
01/02/04	24:00	4.6	18.6
02/02/04	24:00	7.6	16.9
03/02/04	24:00	5.7	10.3
04/02/04	24:00	6.5	17.6
05/02/04	24:00	10.7	13.5
06/02/04	24:00	17.6	6.9
07/02/04	24:00	5.3	8.8
08/02/04	24:00	4.1	13.7

09/02/04	24:00	26.9	23.4
10/02/04	24:00	16.5	19.3
11/02/04	24:00	20.8	27.9
12/02/04	24:00	18	14.6
13/02/04	24:00	19.8	20.1
14/02/04	24:00	13.9	20.6
15/02/04	24:00	12.6	10.1
16/02/04	24:00	21.6	24.9
17/02/04	24:00	20.7	23.9
18/02/04	24:00	23.6	23.5
19/02/04	24:00	13.4	16.1
20/02/04	24:00	10.8	17.5
21/02/04	24:00	12.8	28.5
22/02/04	24:00	8.5	13.4
23/02/04	24:00	22	51.3
24/02/04	24:00	Samp<	Samp<
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01/03/04	24:00	NoData	NoData
02/03/04	24:00	NoData	NoData
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14/03/04	24:00	3.7	13.6
15/03/04	24:00	7.8	17.9
16/03/04	24:00	6	10.6
17/03/04	24:00	17.4	23.2
18/03/04	24:00	15.3	13.2
19/03/04	24:00	7.3	11
20/03/04	24:00	3.7	12.8
21/03/04	24:00	3.4	10.6
22/03/04	24:00	9.8	17
23/03/04	24:00	15.4	20.6
24/03/04	24:00	22.5	25.7
25/03/04	24:00	22.8	19.3
26/03/04	24:00	21	39.1
27/03/04	24:00	11.5	15
28/03/04	24:00	10.8	12.4
29/03/04	24:00	16.6	22.8
30/03/04	24:00	15.8	22.7
31/03/04	24:00	16.8	27.9
01/04/04	24:00	16.8	19.6
02/04/04	24:00	14.6	9.2

03/04/04	24:00	6.9	10.3
04/04/04	24:00	6.1	7
05/04/04	24:00	12.5	9.8
06/04/04	24:00	13.3	20.8
07/04/04	24:00	19.8	33.2
08/04/04	24:00	20.1	38.4
09/04/04	24:00	11.2	15.8
10/04/04	24:00	9.1	11.9
11/04/04	24:00	9.1	14.9
12/04/04	24:00	8.2	12.6
13/04/04	24:00	15.9	24.1
14/04/04	24:00	11.6	14.8
15/04/04	24:00	12.6	20.2
16/04/04	24:00	22.3	26.5
17/04/04	24:00	11.6	9.8
18/04/04	24:00	6.6	4.8
19/04/04	24:00	11.7	8.3
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Appendix 3
Print out of relevant Planning Applications

References

- (1) Defra (2003) Review and Assessment: Technical Guidance. Part IV of the Environment Act 1995. Local Air Quality Management. LAQM.TG(03) January 2003;
- (2) Defra (2003) Review and Assessment: Technical Guidance. Part IV of the Environment Act 1995. Local Air Quality Management. LAQM.PG(03) January 2003;
- (3) Advance Environmental (2005): Report on PM10 and characterisation of samples in the vicinity of Croft Village, south of Croft Quarry, Leicestershire