



2011 Air Quality Progress Report for *Redditch Borough Council – Worcestershire Regulatory Services*

In fulfillment of Part IV of the Environment Act 1995
Local Air Quality Management

March 2011

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Executive Summary

This report is the latest Progress Report on the assessment of air quality in Redditch. This is a continuation of a process to assess and review local air quality that began in 1999, with the last updating and screening assessment (USA) completed in 2009.

A detailed assessment was undertaken along Other Road based on concerns of high NO₂ levels identified on the previous USA. The detailed assessment concluded that there is no requirement to proceed to an AQMA for Other Road.

During 2010, there have also been further exceedences of the objective in the Other Road area, therefore another Detailed Assessment will be required.

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1 Introduction

1.1 Description of Local Authority Area

The Borough of Redditch is situated in the north east of the County of Worcestershire. It is bounded by three other local authorities, Bromsgrove District Council, Stratford District Council and Wychavon District Council. It lies 21 kilometres south of Birmingham within the green belt and covers an area of approximately 5435 hectares. The Borough is comprised of Redditch town, being an urban area and a rural area of roughly equal size containing the villages of Astwood Bank and Feckenham. Since the town was designated as a 'new town' in 1964 extensive development has taken place and the population has more than doubled to its present level of around 80,000.

Within the Borough there are 6 Part 'A' processes and 28 Part 'B' processes, all of which are regulated under the Environmental Protection Act 1990 and the Environmental Permitting Regulations 2010.

There are no busy roads in the borough.

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, mg/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 mg/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 (PM₁₀) (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 purpose of the previous rounds of review and assessments was to identify areas where it is possible that the air quality objectives may not have been met by the due date. The results of the review are summarised below.

Table 1.2 Summary of Previous R&A's

Pollutant	1st Round – Declare AQMA?	2nd Round – Declare AQMA?	3rd Round – Declare AQMA?	4th Round – Declare AQMA?	5th Round – Declare AQMA?
Carbon Monoxide	No	No	No	No	No
Benzene	No	No	No	No	No
1,3 Butadiene	No	No	No	No	No
Lead	No	No	No	No	No
Nitrogen Dioxide	No	No	No	<i>No – Detailed Assessment Undertaken</i>	No
Fine Particulates	No	No	No	No	No
Sulphur Dioxide	No	No	No	No	No

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There are no automatic monitoring sites in Redditch

2.1.2 Non-Automatic Monitoring

The Council has no automatic monitoring sites but undertakes Nitrogen Dioxide monitoring using diffusion tubes. The current objective is $40\mu\text{g}/\text{m}^3$. Recently, the diffusion tube network has been extended to monitor more areas of relevant exposure in the borough.

- 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 or a co-location study.
- The bias adjustment currently being applied is 0.95.
[<http://www.uwe.ac.uk/aqm/review/R&Asupport/diffusiantube>]
- 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]
- 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. [http://www.airquality.co.uk/archive/reports/cat05/0802141004_NO2_WG_PracticalGuidance_Issue1a.pdf]

Table 2.1 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?
24N Linton Mews	Roadside	X 407860 Y 266767	NO ₂	N	N	15m	Y
11N Astwood Bank Park	Kerbside	X 404367 Y 262449	NO ₂	N	N	0.5m	Y
12N 287 Birmingham Rd	Intermediate	X 403983 Y 268815	NO ₂	N	Y(0m)	20m	Y
17N Other Road	Kerbside	X 404625 Y 267479	NO ₂	N	N	0.5m	Y
18N Windsor Road	Kerbside	X 403743 Y 268408	NO ₂	N	N	1m	Y
19N Headless Cross Drive	Roadside	X 403785 Y 266071	NO ₂	N	N	3m	Y
1N Arrow Valley Park	Urban Background	X 406600 Y 267700	NO ₂	N	N	N/A	N
20N 2 Eadie Mews	Intermediate Relevant	X 403598 Y 266379	NO ₂	N	Y(0m)	16m	Y
21N 9 Lydham Close	Intermediate Relevant	X 404439 Y 268315	NO ₂	N	Y(0m)	16m	Y
25N 41 The Slough	Roadside Relevant	X 404415 Y 264384	NO ₂	N	Y(0m)	2m	Y
26N 14 Other Road	Roadside Relevant	X 404620 Y 267495	NO ₂	N	Y(0m)	3m	Y
27N 26 Other Road	Roadside Relevant	X 404610 Y 267522	NO ₂	N	Y(0m)	3m	Y
28N Other Rd Florist	Roadside Relevant		NO ₂	N	Y(0m)	1m	Y
29N Other Road Florist	Roadside Relevant		NO ₂	N	Y(0m)	1m	Y
2N 44 Feckenham High Street	Roadside Relevant	X 400700 Y 261400	NO ₂	N	Y(0m)	1m	Y
3N Rough Hill Drive Roundabout	Roadside	X 404312 Y 264419	NO ₂	N	N	2m	Y
5N Alvechurch Highway	Roadside	X 404400 Y 266200	NO ₂	N	N	1.6m	Y
9N o/s 287 Birmingham Rd	Kerbside	X 403998 Y 268824	NO ₂	N	N	1m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

The table below details the relevant key statistics for the diffusion tube results in Redditch 2010. A full dataset of diffusion tube results can be found at Appendix B.

Table 2.2 Key Statistics

Site ID	Location	Data Capture Year 2010%	Data Capture period 2010%	Annual Mean Concentrations 2010 ($\mu\text{g}/\text{m}^3$) Adjusted for bias (0.95)	Exceedence of Annual Mean	Exceedence of 1 hour mean
1N	Arrow Valley Park	75	100	17.2	NO	Not measured
2N	44 Feckenham High St	92	100	21.7	NO	Not measured
3N	Rough Hill Drive R-about	67	100	39.6	NO	Not measured
9N	o/s 287 Birmingham Rd	92	100	46.7	YES	Not measured
11N	Astwood Bank Park	83	100	31.6	NO	Not measured
12N	287 Birmingham Rd	75	100	24.1	NO	Not measured
17N	Other Road	92	100	45.7	YES	Not measured
18N	Windsor Road	58	100	31.1	NO	Not measured
19N	Headless Cross Dv	83	100	43.0	YES	Not measured
20N	2 Eadie Mews	92	100	23.8	NO	Not measured
21N	9 Lydham Close	92	100	25.9	NO	Not measured
24N	Linton Mews	92	100	27.7	NO	Not measured
25N	41 The Slough	83	100	32.6	NO	Not measured
26N	14 Other Road	92	100	41.6	YES [relevant]	Not measured
27N	26 Other Road	83	100	34.7	NO	Not measured
28N	Florist Other Rd	75	100	40.3	YES [relevant]	Not measured
29N	Florist Other Rd	92	100	38.3	NO	Not measured

Of the 5 sites where there have been exceedences, 2 were at relevant locations, i.e at residential properties. Both of these locations were along Other Road in Redditch, an area which has been subject to a detailed assessment in the 2009.

The detailed assessment was undertaken using a combination of monitoring data and modelled concentrations. Neither methods identified any exceedences of the nitrogen dioxide objectives in 2009 therefore an Air Quality Management Area was not declared.

The next Updated Screening Assessment may suggest the need for another Detailed Assessment in Other Road.

The table below shows the data trends from previous years.

Table 2.3 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Diffusion Tube Monitoring Sites.

Site ID	Location	Annual Mean Concentrations ($\mu\text{g}/\text{m}^3$) Adjusted for bias					
		2005	2006	2007	2008	2009	2010
1N	Arrow Valley Park	17.1	14.84	16.6	15.2	13.9	17.2
2N	44 Feckenham High St	23.3	16.48	20.0	19.3	18.5	21.7
3N	Rough Hill Drive R-about	39.7	39.8	40.1	39.0	36.2	39.6
9N	o/s 287 Birmingham Rd	53.2	46.5	50.7	45.7	37.3	46.7
11N	Astwood Bank Park	23.7	29.6	31.1	31.0	26.0	31.6
12N	287 Birmingham Rd	33.9	25.7	26.7	22.6	20.5	24.1
17N	Other Road	52.5	33.2	39.8	45.4	37.4	45.7
18N	Windsor Road	29.3	26.5	26.7	30.8	25.1	31.1
19N	Headless Cross Drive	34.7	25.48	26.7	38.7	37.0	43.0
20N	2 Eadie Mews	26.5	19.2	23.1	21.4	16.5	23.8
21N	9 Lydham Close	26.6	24.9	26.3	24.8	20.6	25.9

24N	Linton Mews		23.96	25.6	26.9	23.1	27.7
25N	41 The Slough				25.3	25.6	32.6
26N	14 Other Road				39.5	32.8	41.6
27N	26 Other Road				35.8	26.4	34.7
28N	Florist Other Rd						40.3
29N	Florist Other Rd						38.3

2.2.2 Summary of Compliance with AQS Objectives

Redditch Borough Council WRS has examined the results from monitoring in the Redditch District. There have been two exceedences of the objective, therefore there is a need to proceed to a Detailed Assessment.

3 New Local Developments

Redditch Borough Council [WRS] confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area. There are however, plans to build 171 dwellings in the Redditch/Bromsgrove border in 2011-2012. It is not expected that this will significantly affect air quality in the area.

4 Local / Regional Air Quality Strategy

Whilst fulfilling statutory responsibilities and obligations to identify local air quality hot spots, the local authorities have recognised a need to develop a more holistic and unified approach to managing local air quality across the two Counties. Herefordshire and Worcestershire Pollution Group, consisting of environmental health professionals, have thereby initiated the preparation of a cross-County Herefordshire and Worcestershire Air Quality Strategy and Planning Protocol. The improvement of air quality requires input from a wide range of planning and other professions. Therefore this Strategy identifies broad actions, particularly for communication and co-operation within and between local authorities and wider bodies and the community.

The Strategy provides a unified approach to Air Quality, which is clearly a cross boundary issue. The strategy assists in the implementation of the statutory requirement to assess air quality within the Borough.

The strategy is a 'live' document and is be available online and will be reviewed annually.

5 Local Transport Plans and Strategies

The Worcestershire LTP 2006-2011 acknowledges that it must be intrinsically linked to the county wide air strategy and to strategies to combat congestion. The LTP lists 2 policies that are relevant:

Policy AQ1: Implement measures that will enable the removal of Air Quality Management Area designation from the existing sites identified.

Policy AQ2: Ensure that no new AQMA's are declared during the LTP2 period as a result of increasing traffic levels.

6 Climate Change Strategies

A draft joint Climate Change Strategy for Bromsgrove and Redditch action plan has been written. This strategy will allow the Authorities to deliver on our National Indicator targets and LAA obligations but also allows flexibility to deliver on locally important priorities. The objectives are as follows:

- Measure and monitor our current carbon emissions baseline as organisations and communities and set targets to reduce them
- Identify the likely changes in climate locally and risk assess against them
- Communicate widely and promote active engagement; support innovative change and the development of a greener local economy
- Embed strategic climate change activity (mitigation, adaptation and raising awareness) across the Council and its partners

6.1 Local CO2 information

In 2008, Redditch Borough Council's carbon footprint as a result of running our services and organisation was 3'637 tonnes. We intend to reduce this by 2% year on year in the future. In 2006, Redditch Borough's carbon footprint was 622'000 tonnes – that's a footprint of 7.9 tonnes for each person who lives here. We want to try and reduce this by 9% over the next 3 years.

Redditch Borough Council are signatories to the [Nottingham Declaration on Climate Change](#) and the Worcestershire Climate Change Pledge. We are also a partner within the [Worcestershire Partnership Climate Change Strategy](#) (2005-2011)

7 Conclusions and Proposed Actions

7.1 Conclusions from New Monitoring Data

There have been exceedences of the objectives in the Other Road area. Whilst they are only marginal, it will be necessary to carry out another Detailed Assessment in the area.

7.2 Proposed Actions

A detailed assessment will be undertaken in the Other Road area. This is a relevant location with idling traffic and close to a roundabout. Since the last round of review and assessment, more emphasis has been placed on monitoring the air quality in this location. There now 5 tubes situated along the Other Road and as expected, the results indicate that the air quality objective for NO₂ will be exceeded.

The Authority will be required to undertake a Detailed Assessment. The aim of the Detailed Assessment should be to identify with reasonable certainty whether or not a likely exceedence will occur.

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.airquality.co.uk/archive/actionplan.php>
- <http://www.laqmsupport.org.uk/>

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

- The diffusion tubes are supplied and analysed by Gradko International Ltd, St. Martins House, 77 Wales Street, Hampshire, SO23 0RH. The laboratory uses a 20% Triethanolamine / Deionised Water preparation method.
- The bias adjustment currently being applied is 0.95.
[<http://www.uwe.ac.uk/aqm/review/R&Asupport/diffusiontube>]
- 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]
- 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.
[http://www.airquality.co.uk/archive/reports/cat05/0802141004_NO2_WG_PracticalGuidance_Issue1a.pdf]

Appendix B

Diffusion Tube Results – Full Dataset

Tube Number	January	February	March	April	May	June	July	August	September	October	November	December	Mean	Bias Adj Mean
1N	27.6	28.6			7.8	12.4	9.1	11.3	15.2		22.9	28.1	18.1	17.2
2N	29.3	31.9	22.6	20.8	16.5	17.4	15.2	14.5	18.5		27.8	35.9	22.8	21.7
3N		60.9	47.0	43.0	43.6	41.6	29.1	34.8	33.3				41.7	39.6
9N	69.8	53.5	48.4	41.5	45.3	44.3	37.2	40.6	45.4		50.2	64.7	49.2	46.7
11N	40.8	44.8	32.2	27.3	28.4	26.9	29.2	30.1	28.7			44.8	33.3	31.6
12N	37.1	39.3	25.8	27.5	24.1	21.8	15.6	18.7	18.7				25.4	24.1
17N	55.37	60.6	51.4	50.6	55.8	45.3	35.7	41.0	37.0		48.1	48.1	48.1	45.7
18N	39.1	46.2	34.0		29.3		23.05	21.9	24.5		34.1		32.7	31.1
19N	51.9	51.8	41.5	38.9	46.4	41.4		37.4	42.4		44.0	56.8	45.3	43.0
20N	33.8	37.0	23.4	25.3	23.7	21.5	11.5	16.3	18.5		29.0	36.3	25.1	23.8
21N	37.3	40.4	27.5	23.5	20.7	19.3	16.7	18.8	22.6		33.2	40.1	27.3	25.9
24N	37.6	40.2	31.6	25.5	24.1	21.7	19.9	20.1	26.5		34.6	38.9	29.2	27.7
25N	43.1	44.7	33.5	28.2	25.6	24.5	24.7		27.7		35.4	55.1	34.3	32.6
26N	52.8	57.1	46.8	42.3	45.9	40.1	30.4	35.7	32.6		41.6	56.2	43.8	41.6
27N	45.9	47.8	37.5	34.3	34.0	31.0	22.3	27.7	30.4		38.8	51.8	36.5	34.7
28N	47.3	58.4	44.5	38.6	46.4	38.8	29.0	32.7			45.7		42.4	40.3
29N	44.7	54.4	39.6	39.4	41.7	41.9	26.1	31.3	31.6		40.4	52.7	40.3	38.3

Sites numbered 26N and 28N are both at relevant location points, i.e. the façade of residential properties along Other Road, Redditch.