

Worcestershire
Regulatory Services

Supporting and protecting you

2013 Air Quality Progress Report for Malvern Hills District Council

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

November 2013

Local Authority Officer	Land, Air and Water Quality Team
Department	Worcestershire Regulatory Services
Address	PO Box 866, Worcester WR1 9DP
Telephone	01527 881395
e-mail	wrsenquiries@worcsregservices.gov.uk
Report Reference number	MHDC/2013/V1
Date	November 2013

Executive Summary

This progress report presents the findings of Malvern Hills District Council's review and assessment of air quality within the district. Results from 2012 monitoring within the district are presented and evaluated in relation to the objectives; the likelihood of an exceedance at relevant locations is discussed, as is the requirement to proceed to a Detailed Assessment.

To date, no Air Quality Management Areas (AQMAs) have been declared.

Monitoring data for 2012 confirm that concentrations of nitrogen dioxide remain well below the annual mean objective, and that there are no locations requiring Detailed Assessment.

The progress report has not identified any significant changes in emissions sources within the Malvern Hills District Council area.

Table of Contents

1	Introduction	5
1.1	Description of Local Authority Area	5
1.2	Purpose of Progress Report	5
1.3	Air Quality Objectives	6
1.4	Summary of Previous Review and Assessments	8
2	New Monitoring Data	9
2.1	Summary of Monitoring Undertaken	9
2.2	Comparison of Monitoring Results with Air Quality Objectives	12
3	New Local Developments	17
4	Local / Regional Air Quality Strategy	18
5	Planning Applications	19
6	Air Quality Planning Policies	20
7	Local Transport Plans and Strategies	21
8	Climate Change Strategies	22
9	Implementation of Action Plans	23
10	Conclusions and Proposed Actions	24
10.1	Conclusions from New Monitoring Data	24
10.2	Conclusions relating to New Local Developments	24
10.3	Proposed Actions	24

List of Tables

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Table 2.1 Details of Non- Automatic Monitoring Sites

Table 2.2 Results of NO₂ Diffusion Tubes 2012

Table 2.3 Results of NO₂ Diffusion Tubes (2008 to 2012)

List of Figures

Figure 2.1 Non-Automatic Monitoring Sites in Malvern

Figure 2.2 Non-Automatic Monitoring Sites in Upton

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

Appendices

Appendix A: QA:QC Data

1 Introduction

1.1 Description of Local Authority Area

Lying on the western edge of Worcestershire and south of the West Midlands region, Malvern Hills district covers 577km². The area is dominated by the Malvern 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 visitors every year.

The district is mainly rural with three main centres of population, 74,600 based on 2011 census statistics: Malvern, in the centre of the district, is the main town and contains the majority of the district's industry; Tenbury Wells in the northwest grows hops, apples and soft fruits; Upton upon Severn in the southeast of the district is a tourist and marina town. In terms of employment, approximately 72% of employed residents are employed within the services sector.

Road traffic is the major source of pollutants within the Malvern Hills area, with nitrogen dioxide being the most significant and to a lesser extent, particulates (PM₁₀). Whilst there are two motorways which pass through the district, the M5 and the M50, there is no relevant exposure nearby. The principal exposure to road traffic emissions lie within Malvern itself.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management

Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

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

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m ³	Running annual mean	31.12.2003
	5.00 µg/m ³	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m ³	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m ³	Annual mean	31.12.2004
	0.25 µg/m ³	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM ₁₀) (gravimetric)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m ³	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/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 annually since 1998, producing Progress Reports or Updating and Screening Assessments as required by Defra.

The principal source of air pollution within the Malvern Hills district is related to road traffic emissions, and the principal pollutant of concern is nitrogen dioxide. This has been measured using diffusion tubes since 2001 at locations where, primarily, there is queuing or slow-moving traffic combined with relevant exposure in close proximity.

To date, there have been no exceedances of the air quality objectives identified at any of these worst-case locations. Air quality across the district is considered good. Since 2001 there have been no significant alterations to road layouts or traffic flows which has necessitated a change to the existing monitoring locations.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There are no automatic monitoring sites in the Malvern Hills District Council area.

2.1.2 Non-Automatic Monitoring Sites

During 2012, Malvern Hills District Council monitored annual mean nitrogen dioxide concentrations using passive diffusion tubes at six locations across its area (Figures 2.1 and 2.2). Table 2.1 provides details of each of the monitoring sites.

For the first three months of 2012 the diffusion tubes were prepared and analysed by Gradko using the 20% TEA in water method. A change in supplier was implemented in April 2012 and the diffusion tubes for the remaining nine months of 2012 were prepared and analysed by ESG also using the 20% TEA in water method. Tubes are changed on a monthly basis. Further details of the diffusion tube QA/QC are presented at Appendix A.

Figure 2.1 Non-Automatic Monitoring Sites in Malvern



Contains Ordnance Survey Data © Crown Copyright and Database right 2013

Figure 2.2 Non-Automatic Monitoring Sites in Upton



Contains Ordnance Survey Data © Crown Copyright and Database right 2013

Table 2.1 Details of Non- Automatic Monitoring Sites

Site ID	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
M3N	Urban Background	379790	245677	NO ₂	No	No	Y (7m)	1.0m	N
M5N	Roadside (Junction)	378520	247754	NO ₂	No	No	Y(<1m)	4.5m	Y
M6N	Roadside (Junction)	377711	245979	NO ₂	No	No	Y(<1m)	1.9m	Y
UP1	Roadside	385171	240555	NO ₂	No	No	Y(<1m)	2m	Y
UP2	Roadside	385201	240646	NO ₂	No	No	Y(<1m)	1.5m	Y
M9N	Roadside	378771	247926	NO ₂	No	No	Y(<1m)	4m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO₂)

Automatic Monitoring Data

There are no automatic monitoring locations within the Malvern Hills DC area.

Diffusion Tube Monitoring Data

Measured concentrations at the six diffusion tube monitoring sites in 2012 are presented in Table 2.2. Concentrations since 2008, at all sites where monitoring data are available, are presented in Table 2.3.

Due to a change in tube supplier the first three months of data have been excluded from the reporting year following advice from the LAQM helpdesk, the remaining nine months of data have been bias adjusted using the national bias adjustment factor. The data has been annualised where there is less than nine months i.e. <75% data capture.

Further details are provided in Appendix A.

Measured concentrations in 2012 were well below the annual mean objective at all monitoring locations, including worst-case locations adjacent to junctions of busy roads.

Concentrations have reduced in 2012 relative to 2011 concentrations at all monitoring locations where data is available. Figure 2.3 presents data for those sites where at least five years of data are available and where there are monitoring tubes located in 2012. A rationalisation of tubes was undertaken in early 2012 hence the limited number of tubes presently. Overall, between 2008 and 2012, concentrations have remained fairly stable at all long-term sites.

Table 2.2 Results of NO₂ Diffusion Tubes 2012

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months) ^a	2012 Annual Mean Concentration (µg/m ³) - Bias Adjustment factor = 0.69
M3N	Teme Avenue Malvern	Urban Background	N	N	7	9.56
M5N	Richmond Road Malvern	Roadside (Junction)	N	Y	9	22.19
M6N	Graham Road Malvern	Roadside (Junction)	N	Y	9	24.76
UP1	2 Old Street Upton	Roadside	N	N	8	36.02
UP2	Junction of London lane/High Street Upton	Roadside	N	N	8	21.75
M9N	188 Worcester Road Malvern	Roadside	N	Y	9	21.33
Objective						40

In bold, exceedence of the NO₂ annual mean AQS objective of 40µg/m³

Underlined, annual mean > 60µg/m³, indicating a potential exceedence of the NO₂ hourly mean AQS objective

^a Annualised mean [as in Box 3.2 of TG\(09\)](http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38>), where full calendar year data capture is less than 75%

Table 2.3 Results of NO₂ Diffusion Tubes (2008 to 2012)

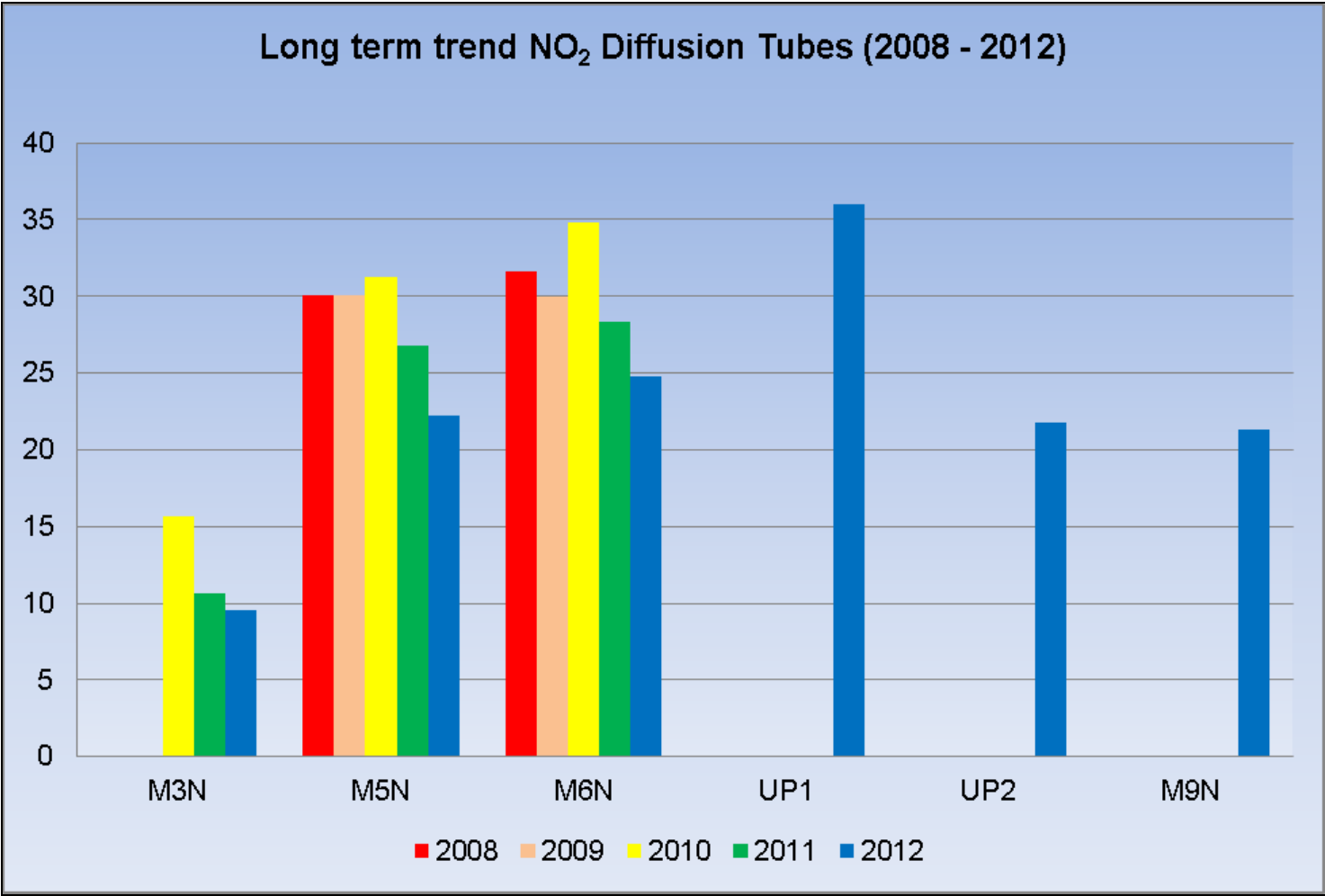
Site Name	Site Type	In AQMA?	Annual Mean Concentration (µg/m ³) - Adjusted for Bias ^a				
			2008 (Bias Adjustment Factor = 0.92)	2009 (Bias Adjustment Factor = 0.90)	2010 (Bias Adjustment Factor = 0.95)	2011 (Bias Adjustment Factor = 0.89)	2012 (Bias Adjustment Factor = 0.69)
M3N	Urban Background	N	-	-	15.7	10.6	9.56
M5N	Roadside (Junction)	N	30.1	30.1	31.3	26.8	22.19
M6N	Roadside (Junction)	N	31.6	30.0	34.8	28.3	24.76
UP1	Roadside	N	-	-	-	-	36.02
UP2	Roadside	N	-	-	-	-	21.75
M9N	Roadside	N	-	-	-	-	21.33
Objective			40	40	40	40	40

In bold, exceedence of the NO₂ annual mean AQS objective of 40µg/m³

Underlined, annual mean > 60µg/m³, indicating a potential exceedence of the NO₂ hourly mean AQS objective

^a Means "annualised" as in Box 3.2 of TG(09) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38>), where full calendar year data capture is less than 75% .

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



2.2.2 Particulate Matter (PM₁₀)

PM₁₀ is not monitored within the Malvern Hills District Council area.

2.2.1 Sulphur Dioxide

Sulphur Dioxide is not monitored within the Malvern Hills District Council area.

2.2.2 Benzene

Benzene is not monitored within the Malvern Hills District Council area.

2.2.3 Other pollutants monitored

No other pollutants are measured within the Malvern Hills District Council area.

2.2.4 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

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

Malvern Hills District Council confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Local / Regional Air Quality Strategy

In 2008 the Herefordshire Council and the local authorities of Worcestershire set out a unified approach to managing local air quality across the two Counties in three documents:

- Herefordshire and Worcestershire Air Quality Strategy
- Herefordshire and Worcestershire Air Quality Planning Protocol
- Herefordshire and Worcestershire Air Quality Supporting Documents

The general aims of the strategy is to raise profile of air quality as an issue for consideration within a wide range of local government and regional policies and frameworks including local planning, transport planning, health, industry, housing and environmental protection. Additionally the strategy provides a framework for a consistent approach to local air quality considerations in development control (planning) processes and links to other initiatives such as Climate Change programmes and future Local Transport Plans. The strategy set out a number of commitments under different subject areas including Planning, Transport, Climate Change and Energy, Health, Industry and domestic sources to achieve those aims. The full document is available to download from the Pollution pages of the WRS website <http://www.worcsregservices.gov.uk>

It is noted that since production in 2008 many local and national policies and guidelines referred to in the H & W AQ Strategy and Planning Protocol documents have changed and that an update of these documents is now due. However at this time it is considered appropriate to focus WRS resources on the Countywide Action Plan. Amendment to these documents will occur at a later date.

5 Planning Applications

Malvern Hills District Council confirms that there are no new or newly identified Planning Applications which may have an impact on air quality within the Local Authority area. Two applications the first at Lawn Farm, Welland for 60 dwellings and the second at Astley Cross on the border of Malvern Hills District Council for 106 dwellings have been considered for potential impacts and dismissed as negligible.

6 Air Quality Planning Policies

Malvern Hills District council adopted the Hereford & Worcestershire Planning Protocol in November 2008.

http://www.herefordshire.gov.uk/docs/Hford_and_Worc_AQ_Strategy_2009_Planning_protocol.pdf

This Air Quality and Planning Protocol is intended to support local planning decision-making in respect to all future developments within the local authorities of Herefordshire and Worcestershire, and to ensure a consistent process is used to assess the likely impact of development on local air quality.

In March 2012 the existing Planning Policy Guidance notes were superseded by the National Planning Policy Framework (NPPF). This document sets out the Government's requirements for the planning system with an emphasis on enabling local people and councils to produce their own local and neighbourhood plans.

The NPPF is based on 12 core planning principles. Three of these are relevant to local air quality management and are summarised below:

Core principle number 7 states that planning should “...*contribute to conserving and enhancing the natural environment and reducing pollution...*”

Core principle number 9 states that planning should “...*actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling...*”

Core principle number 10 states that planning should “...*take account of and support local strategies to improve health, social and cultural wellbeing for all...*”

Further detail can be found in the Air Quality Action Plan for Worcestershire at

<http://www.worcsregservices.gov.uk/> and full details can be found at

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

7 Local Transport Plans and Strategies

The third Worcestershire Local Transport Plan (LTP3) 2011-2026 outlines strategic transport planning for the county and recognises the critical importance of efficient transport networks for the social and economic wellbeing of Worcestershire.

http://www.worcestershire.gov.uk/cms/pdf/LTP3_MAIN_DOC_PUBLIC_FINAL.pdf

8 Climate Change Strategies

Malvern Hills District Council have signed up to the Worcestershire Climate Change Pledge, as part of this pledge, they have committed to a number of actions to tackle climate change.

- Raise awareness of climate change issues with our staff and in our activities.
- Monitor and reduce our energy use
- Insulate our buildings and encourage our staff to do so.
- Minimise our waste by using less and recycling more.
- Set ourselves a target to reduce carbon emissions.
- Assess likely impacts of climate change and make plans to adapt.
- Implement a staff travel plan.
- Operate a sustainable purchasing policy.
- Use renewable energy

Additionally the Council and its partners have committed to a plan of action to bring about a significant reduction in the district's dependence on fossil fuels by identifying practical actions that will reduce carbon emissions and build greater resilience and self-reliance in key fields such as food and energy supply. Local communities together with Malvern Hills District council under the initiative of "Transition Malvern" are working together on this project and more information can be obtained from www.transitionmalvern hills.org.uk

9 Implementation of Action Plans

A new action plan¹ encompassing the six district councils of Worcestershire has been produced and has been consulted on; the final plan was adopted in October & November by the Local Authorities. The Steering Group to move the Action Plan forward is currently being prepared.

¹ Worcestershire Air Quality Action Plan September, 2013 www.worcsregservices.gov.uk

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

Concentrations of nitrogen dioxide measured at six monitoring sites across the Malvern Hills District Council area were well below the annual mean objective in 2012.

Concentrations have remained similar at all sites over a five year period (2008 - 2011) where data is available, although there was a reduction in concentrations at all sites in 2012 relative to 2011 data.

A Detailed Assessment is not required based on monitoring data.

A rationalisation of monitoring sites within the area was carried out in early 2012, and a number of locations were decommissioned and one relocated. In addition, two new monitoring sites have been established within Upton upon Severn.

10.2 Conclusions relating to New Local Developments

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

10.3 Proposed Actions

Malvern Hills District Council confirms that there is no requirement to proceed to a detailed assessment for any pollutant.

Malvern Hills District Council proposes to submit its action plan shortly as part of a county wide action plan.

Malvern Hills Council confirms it will submit a 2013 Progress report in 2014.

References

- Peter Brett Associates – Malvern Hills District Council USA Report: July 2012.
- Air Quality Review & Assessment Helpdesk.
- Defra (2009) Review & Assessment: Technical Guidance LAQM.TG(09), available at:
<http://archive.defra.gov.uk/environment/quality/air/airquality/local/guidance/documents/tech-guidance-laqm-tg-09.pdf>
- Defra (2012) Data Archive, available at: <http://uk-air.defra.gov.uk/data>
- H&W Councils (2009) Herefordshire & Worcestershire Air Quality Planning Protocol
- Worcestershire Air Quality Action Plan September, 2013
- H&W Councils (2009b) Herefordshire & Worcestershire Air Quality Strategy
H&W Councils (2009c)
- WCC (2011) Worcestershire Local Transport Plan 3:
- NPPF
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

The diffusion tubes are supplied and analysed by ESG, Didcot utilising the 20% TEA² in water preparation method. ESG participates in the Workplace Analysis Scheme for Proficiency (WASP) for NO₂ diffusion tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre.

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent HSL WASP NO₂ PT rounds and the percentage (%) of results submitted which were subsequently determined to be satisfactory.

Table A1 Details of WASP rounds for 2012.

Wasp Round	WASP R116	WASP R117	WASP R118	WASP R119
Round conducted in the period	January – March 2012	April – June 2012	July – September 2012	October – December 2012
Aberdeen Scientific Services	100 %	100 %	100 %	100 %
Bristol City Council [5]	-	-	-	-
Cardiff Scientific Services	100 %	100 %	100 %	100 %
Edinburgh Scientific Services	100 %	100 %	100 %	100 %
Environmental Services Group, Didcot (formerly Bureau Veritas Laboratories, Glasgow and Harwell Scientifics) [1] [2]	100 %	100 %	100 %	100 %
Exova (formerly Clyde Analytical)	0 %	0 %	100 %	25 %
Glasgow Scientific Services	100 %	50 %	100 %	100 %
Gradko International [2]	100 %	100 %	100 %	100 %
Kent Scientific Services	75 %	100 %	75 %	100 %
Kirklees MBC	100 %	100 %	75 %	100 %
Lambeth Scientific Services	75 %	100 %	0 %	100 %
Lancashire County Analysts [3]	-	-	-	-
Milton Keynes Council	100 %	100 %	75 %	100 %
Northampton Borough Council	100 %	100 %	100 %	100 %
Somerset Scientific Services [4]	100 %	100 %	100 %	100 %
South Yorkshire Air Quality Samplers	100 %	100 %	100 %	100 %
Staffordshire County Council	100 %	100 %	75 %	100 %
Tayside Scientific Services (formerly Dundee CC)	100 %	100 %	100 %	100 %
West Yorkshire Analytical Services	75 %	75 %	50 %	100 %

Tube results are then bias adjusted annually using the AEAT calculator³ provided by the air quality helpdesk funded by DEFRA.

² TEA-Triethanolamine

³ Version 07/13

Table A2: Bias adjustment spread sheet.

Analysed By ¹	Method	Year ⁵	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (mg/m ³)	Automatic Monitor Mean Conc. (Cm) (mg/m ³)	Bias (B)	Tube Precision ⁶	Bias Adjustment Factor (A) (Cm/Dm)
ESG Didcot	20% TEA in water	2012	KS	SOUTH LAKELAND DISTRICT COUNCIL	9	45	29	54.8%	G	0.65
ESG Didcot	20% TEA in Water	2012	KS	Marylebone Road Intercomparison	11	129	95	36.2%	G	0.73
ESG Didcot	20% TEA in water	2012		Overall Factor³ (2 studies)				Use		0.69

Short-term to Long-term Data adjustment

The tubes supplier was changed from Gradko International Limited to a new supplier ESG in April 2012 and following advice from the LAQM helpdesk the data from the tubes for 2012 for Jan to March was discounted and only the nine months of data from 1st April 2012 was considered representative for the year. Nine months data is 75% data capture for the year and where less than nine months data has been available the data has been annualised using the adjustment factor calculated from data as shown in the following table.

Table A.3 Short-Term to Long-Term Monitoring Data Adjustment

Site	Site Type	Annual Mean (µg/m ³)
Birmingham Acocks Green	Urban Background	31.75
Birmingham Tyburn	Urban Background	30.78
Leominster	Suburban Background	8.78
Leamington Spa	Urban Traffic	20.52

Malvern	ID	Excluding Month Number	PM Acocks Green	PM Tyburn	PM Leominster	PM Leamington	AM/PM Acocks Green	AM/PM Tyburn	AM/PM Leominster	AM/PM Leamington	Average Adjustment factor
	UP1	4	28.04	29.30	8.26	17.69	1.13	1.05	1.06	1.16	1.10
	UP2	4	28.04	29.30	8.26	17.69	1.13	1.05	1.06	1.16	1.10
	M3N	6 12	27.36	29.96	8.27	17.24	1.16	1.03	1.06	1.19	1.11
	M9N	4 9 10	28.53	28.40	8.01	17.53	1.11	1.08	1.10	1.17	1.12
	M9N	4	28.04	29.30	8.26	17.69	1.13	1.05	1.06	1.16	1.10
	M9N	4 10	27.45	28.00	7.77	17.46	1.16	1.10	1.13	1.18	1.14