



2015 Updating and Screening Assessment for Herefordshire Council

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

September 2015

Local Authority Officer	Philippa Hargraves
Department	Environmental Protection Team Environmental Health and Trading Standards
Address	Blueschool House Blueschool Street PO Box 233 Hereford HR1 2ZB
Telephone	01432 260917
e-mail	Philippa.hargraves@herefordshire.gov.uk Air&waterpollutionteam@herefordshire.gov.uk
Report Reference number	USA 2015
Date	September 2015

This report has been prepared by Worcester Regulatory Services (WRS) on behalf of Herefordshire Council, taking into account the agreed scope of works. Unless otherwise agreed, this document and all other Intellectual Property Rights remain the property of WRS.

In preparing this report, WRS has exercised all reasonable skill and care, taking into account the objectives and the agreed scope of works. WRS does not accept any liability in negligence for any matters arising outside of the agreed scope of works.

**Worcestershire Regulatory Services,
Wyre Forest House,
Fine Point Way,
Kidderminster,
Worcestershire
DY11 7WF**



Phone: 01905 822799
Email: wrsenquiries@worcsregservices.gov.uk

Executive Summary

Herefordshire Council have undertaken this Updating and Screening Assessment to fulfil requirements of Local Air Quality Management regime as set out in Part IV of the Environment Act 1995. The report provides an update on any relevant changes to local air quality that have occurred in Herefordshire since the 2013 Air Quality Progress Report.

Herefordshire Council have not identified a requirement to move to Detailed Assessment for any pollutants. The Council currently only monitor nitrogen dioxide levels within the County.

Since 2013, the Council have reduced the number of non-automatic monitoring sites within Herefordshire from 29 to 16. The 2014 monitoring results (adjusted for bias) indicate there are exceedances of the annual mean air quality objective of $40\mu\text{g}/\text{m}^3$ for Nitrogen Dioxide at two sites when taking into account the concentrations at the nearest receptors. Both of these sites are within existing AQMAs, which must be retained, and there is no requirement to move to detailed assessment of any other areas.

Data from monitoring locations across the County generally demonstrate a downward trend over the 5 year period to 2014 with the exception of two locations: Site 61 in Leominster AQMA and Site 75 (Barton Road, Hereford) which is currently outside the Hereford AQMA.

Herefordshire Council's assessment of sources has not identified any likely exceedances from new or significantly changed local developments.

However, the Council have identified a new location in Ross on Wye requiring consideration and erected NO_2 diffusion tube locations in May 2015 to monitor pollutant concentrations. Additionally, new locations have been erected to give a baseline of NO_2 along route of proposed Southern Link Road which forms part of the Council's long term strategic plan. It is anticipated this and another new road scheme will need to be considered in future rounds of review and assessment.

Table of contents

1	Introduction	7
1.1	Description of Local Authority Area	7
1.2	Purpose of Report.....	7
1.3	Air Quality Objectives	8
1.4	Summary of Previous Review and Assessments	10
2	New Monitoring Data	13
2.1	Summary of Monitoring Undertaken	13
2.1.1	Automatic Monitoring Sites	13
2.1.2	Non-Automatic Monitoring Sites	13
2.2	Comparison of Monitoring Results with Air Quality Objectives	16
2.2.1	Nitrogen Dioxide	16
2.2.2	PM ₁₀	26
2.2.3	Sulphur Dioxide.....	26
2.2.4	Benzene.....	26
2.2.5	Ozone	26
2.2.6	Summary of Compliance with AQS Objectives	27
3	Road Traffic Sources	28
3.1	Narrow Congested Streets with Residential Properties Close to the Kerb	28
3.2	Busy Streets Where People May Spend 1-hour or More Close to Traffic.....	28
3.3	Roads with a High Flow of Buses and/or HGVs.	29
3.4	Junctions.....	29
3.5	New Roads Constructed or Proposed Since the Last Round of Review and Assessment.....	29
3.6	Roads with Significantly Changed Traffic Flows.....	30
3.7	Bus and Coach Stations	30
4	Other Transport Sources.....	31
4.1	Airports.....	31
4.2	Railways (Diesel and Steam Trains)	31
4.2.1	Stationary Trains.....	31
4.2.2	Moving Trains	31
4.3	Ports (Shipping)	31
5	Industrial Sources.....	32
5.1	Industrial Installations	32
5.1.1	New or Proposed Installations for which an Air Quality Assessment has been Carried Out.....	32
5.1.2	Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced	32

5.1.3	New or Significantly Changed Installations with No Previous Air Quality Assessment.....	32
5.2	Major Fuel (Petrol) Storage Depots.....	32
5.3	Petrol Stations.....	33
5.4	Poultry Farms.....	33
6	Commercial and Domestic Sources	34
6.1	Biomass Combustion – Individual Installations	34
6.2	Biomass Combustion – Combined Impacts.....	34
6.3	Domestic Solid-Fuel Burning	34
7	Fugitive or Uncontrolled Sources.....	35
8	Conclusions and Proposed Actions.....	36
8.1	Conclusions from New Monitoring Data	36
8.2	Conclusions from Assessment of Sources	36
8.3	Proposed Actions.....	37
9	References.....	38

List of Tables

Table 1.1	Air Quality Objectives included in Regulations for the purpose of LAQM in England
Table 1.2	Summary of previous reports and outcomes
Table 2.1	Details of Non-Automatic Monitoring Sites for Nitrogen Dioxide
Table 2.2	Results of Nitrogen Dioxide Diffusion Tubes in 2014
Table 2.3	Results of Nitrogen Dioxide Diffusion Tubes (2010 to 2014)
Table 2.4	Table to show the concentration of Nitrogen Dioxide at the nearest receptor
Table A.1.	Annualisation calculations for 2013 data
Table B.1	Traffic Data for Herefordshire in 2013
Table D.1	Bias adjusted NO ₂ diffusion tube data 2014
Table D.2	Bias adjusted NO ₂ diffusion tube data 2013
Table D.3	Bias adjusted NO ₂ diffusion tube data 2012
Table D.4	Bias adjusted NO ₂ diffusion tube data 2011
Table D.5	Bias adjusted NO ₂ diffusion tube data 2010
Table E.1	Summary of estimations of concentrations at nearest receptor

List of Figures

Figure 1	Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites within Hereford AQMA
Figure 2	Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites within Hereford outside of the AQMA

Figure 3	Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites within Leominster AQMA.
Figure 4	Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites on A40.
Figure C.1	Map of Herefordshire Transport Network and Major Settlements
Figure C.2	Location of Herefordshire
Figure C.3	Hereford AQMA Boundary
Figure C.4	Hereford City (North) Monitoring Locations
Figure C.5	Hereford City (South) Monitoring Locations
Figure C.6	Whitecross Road, Hereford Monitoring Locations
Figure C.7	Leominster AQMA Boundary
Figure C.8	Leominster Monitoring Locations
Figure C.9	A40 Corridor, Ross-on-Wye Monitoring Locations
Figure E.1	Location 9 NO ₂ Distance from road calculation
Figure E.2	Location 10 NO ₂ Distance from road calculation
Figure E.3	Location 46 NO ₂ Distance from road calculation
Figure E.4	Location 61 NO ₂ Distance from road calculation
Figure E.5	Location 65 NO ₂ Distance from road calculation

Appendices

Appendix A	QA/QC Data including Annualisation
Appendix B	Traffic Data
Appendix C	Maps
Appendix D	Nitrogen Dioxide Data 2010 – 2013
Appendix E	Estimation of concentrations at nearest receptor calculations
Appendix F	Air Quality Action Plan Update

1 Introduction

1.1 Description of Local Authority Area

The County of Herefordshire lies in the Marches region of the UK, to the West of central England on the Welsh border, being neighboured by the counties of Powys, Monmouthshire, Shropshire, Worcestershire and Gloucestershire. It lies 26km (16 miles) east to the Welsh border and 34km (21 miles) southwest of Worcester, covering an area of approximately 217,973 hectares. Figure C2 in Appendix C shows the location of Herefordshire within the UK and where the County is situated within the Marches region.

Herefordshire has a relatively sparse population of about 183,500, with the largest settlement being the cathedral city of Hereford, which is located approximately at the centre of the county. Figure C.1 in Appendix C shows the locations of the major market towns and villages and road network within the County.

Herefordshire has only one motorway within its boundaries, the M50 travels only a short distance into the County to Ross-on-Wye from the border with Gloucestershire. A two lane motorway, the M50 has fairly low traffic flow compared to other motorways and currently there are no areas of concern regarding air quality along its stretch within Herefordshire.

The main trunk roads within the County are the A40 (Ross to Monmouth), A49 and M50. In addition to these, the principle A roads, the A465, A438 and A449 also record vehicle movements above 20,000 per day on certain stretches. Road traffic data is shown in Appendix B.

1.2 Purpose of 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 exceedances 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.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

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 exceedances 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	Running annual mean	31.12.2010
1,3-Butadiene	2.25 µg/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 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
Particles (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

Herefordshire has been monitoring its air quality for over 20 years. This began with nitrogen dioxide diffusion tube monitoring in 1993, the installation of a chemiluminescent (nitrogen dioxide) continuous analyser in Edgar Street, Hereford in 1995 and the installation of an adjacent BAM 1020 Beta Gauge (PM₁₀) continuous analyser in 1997.

Table 1.1 below shows the reports and outcomes of monitoring that have been carried out previously.

Table 1.1 Summary of previous reports and outcomes

Date	Report/ Order	Outcomes
Mar 2014	Annual Progress Report	NO ₂ annual mean objective breached at: <ul style="list-style-type: none"> • Hereford AQMA • Leominster AQMA Redrafted Action Plan for Bargates, Leominster AQMA to be formally adopted
Dec 2012	Updating and Screening Assessment	NO ₂ annual mean objective breached at: <ul style="list-style-type: none"> • Hereford AQMA • Leominster AQMA Action Plan for Bargates AQMA to be reviewed and formally adopted Detailed Assessment to be considered for A40 corridor
Apr 2011	Annual Progress Report	NO ₂ annual mean objective breached at: <ul style="list-style-type: none"> • Hereford AQMA • Leominster AQMA Draft Action Plan for Bargates AQMA to be completed Detailed Assessment to be considered for A40 corridor
Sept 2010	Annual Progress Report	NO ₂ annual mean objective breached at: <ul style="list-style-type: none"> • Hereford AQMA • Leominster AQMA Draft Action Plan for Bargates AQMA to be completed
Dec 2009	Updating and Screening Assessment	NO ₂ annual mean objective breached at: <ul style="list-style-type: none"> • Hereford AQMA • Leominster AQMA A40 Wilton to Pencreig requires AQMA declaration

Date	Report/ Order	Outcomes
		Detailed assessment required for PM ₁₀ at poultry unit, Whittern Farms Ltd, Lyonshall, Kington Further information required regarding the impact of biomass combustion with the County
Apr 2008	Annual Progress Report	NO ₂ annual mean objective breached at: Hereford AQMA Leominster AQMA A40 Wilton to Pencraig requires AQMA declaration
Jan 2008	Action Plan for Hereford City	15 action points drawn up
Apr 2006	Detailed Assessment for A40	A40 Wilton to Pencraig requires AQMA declaration
Apr 2006	Updating and Screening Assessment	Detailed Assessment required for NO ₂ at A40/ M50 corridor Hereford AQMA may need to be extended
Jan 2006	AQMA Order for Leominster	-
Apr 2005	Annual Progress Report	NO ₂ annual mean objective breached at: Hereford AQMA Bargates, Leominster requires AQMA declaration
Jul 2004	Detailed Assessment for Leominster	Designating an AQMA in Leominster is recommended
Mar 2004	Updating and Screening Assessment	Detailed Assessment required for NO ₂ at Bargates in Leominster
Nov 2002	Stage Four Review and Assessment	Hereford AQMA boundary is still appropriate
Nov 2001	AQMA Order for Hereford	-
Feb 2001	Third stage Review and Assessment	Designating an AQMA in Hereford for NO ₂ is recommended
Mar 2000	Second stage Review and Assessment	A stage three review <i>may</i> be required for: Sulphur dioxide and PM ₁₀
May 1999	First stage Review and Assessment	Further investigation is recommended into: Carbon monoxide in Hereford NO ₂ in Hereford, Leominster and A40 PM ₁₀ in Hereford, M50/A449/A40 corridor and Perton and Leinthall Earls Quarries

Hereford AQMA

The Council's Progress Report 2013 stated that levels of NO₂ at all but 1 of the monitoring sites within the Hereford AQMA had increased in 2012 compared with 2011. There were 4 exceedances of the objective level at the roadside within the AQMA in 2012, and 3 of those locations (9, 10 and 81) indicated exceedances of the objective at the nearest receptor. It was noted that results at location 81 should be treated with caution as only 25% data capture was obtained in 2012.

No amendment of the AQMA boundary was required but further monitoring at a number of locations bordering the AQMA was required. The AQMA boundary is shown in Figure C.3, Appendix C.

Bargates (Leominster) AQMA

Two monitoring sites within the AQMA continued to demonstrate an exceedance of the annual average objective for NO₂. A further location, site 78, outside the AQMA continued to measure concentrations well below the objective. No amendment of the AQMA boundary was required. The AQMA boundary is shown in Figure C.7, Appendix C.

A40 Corridor

The Council's 2013 Progress Report stated that levels at three monitoring sites along the A40 decreased in 2012 to below the air quality objectives. Therefore it was considered unnecessary to proceed to detailed assessment, however those sites would continue to be closely monitored and the requirement for detailed assessment would be reviewed in the future.

Detailed assessment for PM₁₀

A poultry unit in Lyonshall had been identified as requiring a Detailed Assessment for PM₁₀ as it meets the criteria in LAQM.TG(09), however Defra have advised to currently take no further action until further advice is received from them.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Herefordshire Council previously had an automatic monitoring station located on Edgar Street roundabout within Hereford city centre measuring NO₂ and PM₁₀. The monitoring station was removed in preparation for the development work at the Edgar Street Grid in 2011 and relocated at end of 2013 to a new position in Victoria Street. However, since installation there have been continuing issues with access to any recorded data and no monitoring results for 2014 are available at this time. The location of the automatic monitor is shown on Figure C.5, Appendix C.

Defra has an AURN site adjacent to the Minster school in Leominster which continuously monitors Nitrogen dioxide and Ozone. Data is generally available via the UK-AIR website. Unfortunately The UK-AIR website was offline during production of this report.

2.1.2 Non-Automatic Monitoring Sites

In 2013, Herefordshire Council reduced the nitrogen dioxide diffusion tube network installed around the County from 29 to 16 tubes. Most diffusion tubes are located at house facades to correspond to relative public exposure, however some are adjacent to the roadside. All sites are shown on Figures C.4 – C.6 and C.8 – C.9 in Appendix C.

Results of non-automatic monitoring of nitrogen dioxide diffusion tubes for both 2013 and 2014 are presented within this report. 2014 data, adjusted for bias using a national correction factor derived from Defra of 0.91, is presented on the following pages.

In 2013 only 8 months monitoring results were collected. These have been annualised using the procedure outlined in Defra LAQM TG(09) and bias adjusted using a national correction factor derived from Defra of 0.95. The tabulated 2013 data is

included as Table D.2 in Appendix D and discussed below in terms of the observed long term trends summary.

QA/ QC information on the company and methods used is shown in Appendix A. This applies to both 2013 and 2014 diffusion tube data.

Previous annual periods of monitoring data and Defra reports are available from the Council's website at:

<https://www.herefordshire.gov.uk/environmental-protection/pollution-control/pollution-control-air-quality>

Table 2.1 Details of Non-Automatic Monitoring Sites for Nitrogen Dioxide

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
6	Broad Street, Hereford	Urban Background	350890	240000	N	N	Y (1m)	1.2m	N
9	Victoria St, Hereford (duplicate 1)	Urban Centre	350688	239864	Y	N	Y (1m)	2.3m	Y
10	Victoria St, Hereford (house façade)	Urban Centre	350677	240015	Y	N	Y (1m)	2.6m	Y
22	Edgar/ Moor St, Hfd façade (duplicate 1)	Urban Centre	350860	240615	Y	N	Y (1m)	2.0m	Y
32	Weir End house façade	Rural	357717	223736	N	N	Y (2m)	4.2m	N
33	Wilton house façade	Rural	358506	224214	N	N	Y (2m)	3.6m	N
46	Bengry's Lights, Leominster	Urban Centre	349409	259010	Y	N	Y (1m)	3.3m	Y
53	Cross St, Belmont, Hfd house façade	Urban Background	350723	239163	Y	N	Y (1m)	4.5m	Y
54	Holmer Rd, Hereford house façade	Urban Background	350602	241097	N	N	Y (1m)	9.6	Y
57	Eign St, Hereford shop flat façade	Urban Background	350499	240108	Y	N	Y (1m)	1.1m	Y
59	Elgars Rest, Widemarsh St, Hfd façade	Urban Centre	350987	240139	Y	N	Y (5m)	4.3m	N
61	29 Bargates, Leominster	Urban Centre	349363	259013	Y	N	Y (1m)	2.0m	Y
65	96 Whitecross Road, Hereford façade	Urban Background	350086	240296	N	N	Y (3m)	1.7m	N
74	140 Whitecross Road, Hereford	Urban Background	349985	240334	N	N	Y (2m)	8.8m	N
75	22 Barton Road, Hereford	Urban Background	350511	239740	N	N	Y (1m)	2.0m	N
79	76 Belmont Road	Urban	350472	238999	N	N	Y (7m)	2.1m	N

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

As discussed above no automatic monitoring data is available for the monitoring period at this time.

Diffusion Tube Monitoring Data

The annual mean concentrations of NO₂ at 16 sites in Herefordshire for 2014 are shown in Table 2 below. The full dataset of monthly results for 2010 to 2014 and annual mean adjusted for bias are shown in Tables D.1 to D.5 in Appendix D.

The results of these tubes in 2014 have been adjusted for bias using a national correction factor derived from Defra of 0.91. Annual mean concentrations of nitrogen dioxide ranged from 19.44 µg/m³ at 140 Whitecross Road, Hereford to 47.63 µg/m³ at 29 Bargates, Leominster.

The figures in bold below show those which exceed the Air Quality Objective.

Table 2.2 Monitoring results of Nitrogen Dioxide from 16 Diffusion Tubes in 2014

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture (%)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.91)
								2014 ($\mu\text{g}/\text{m}^3$)
6	Broad Street, Hereford	Urban Background	N	N	92	N	N	28.93
9	Victoria St, Hereford (duplicate 1)	Urban Centre	Y	N	92	N	N	40.25
10	Victoria St, Hereford (house façade)	Urban Centre	Y	N	100	N	N	43.71
22	Edgar/ Moor St, façade	Urban Centre	Y	N	92	N	N	30.59
32	Weir End house façade	Rural	N	N	100	N	N	36.07
33	Wilton house façade	Rural	N	N	100	N	N	36.27
46	Bengry's Lights, Leominster	Urban Centre	Y	N	100	N	N	38.43
53	Cross St, Belmont, Hfd house façade	Urban Background	Y	N	92	N	N	33.73
54	Holmer Rd, Hereford house façade	Urban Background	N	N	100	N	N	25.58
57	Eign St, Hereford shop flat façade	Urban Background	Y	N	100	N	N	34.05
59	Elgars Rest, Widemarsh St, Hfd façade	Urban Centre	Y	N	100	N	N	24.61
61	29 Bargates, Leominster	Urban Centre	Y	N	100	N	N	47.63

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture (%)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.91)
								2014 ($\mu\text{g}/\text{m}^3$)
65	96 Whitecross Road, Hereford façade	Urban Background	N	N	100	N	N	40.18
74	140 Whitecross Road	Urban Background	N	N	100	N	N	19.44
75	22 Barton Road, Hereford	Urban Background	N	N	100	N	N	36.70
79	76 Belmont Road	Urban	N	N	100	N	N	35.33

Exceedances of the NO₂ annual mean AQS objective of 40 $\mu\text{g}/\text{m}^3$ in **bold**.

Table 2.3 Annual Mean Concentration of Nitrogen Dioxide from Diffusion Tubes at 16 sites (2010 to 2014)

Site ID	Site Address	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
				2010 (Bias = 0.95)	2011 (Bias = 0.91)	2012 (Bias = 0.97)	2013a (Bias = 0.95)	2014 (Bias = 0.91)
6	Broad Street, Hereford	Urban Background	N	30.18	30.5	30.4	37.17a	28.93
9	Victoria St, Hereford (duplicate2)	Urban Centre	Y	46.94	42.3	44.7	54.38a	40.25
10	Victoria St, Hereford (house façade)	Urban Centre	Y	49.15	45.9	46.9	50.40a	43.71
22	Edgar/ Moor St, Hereford	Urban Centre	Y	37.90	35.0	35.7	42.58a	30.59
32	Weir End house façade	Rural	N	42.07	41.7	37.3	48.75a	36.07
33	Wilton house façade	Rural	N	39.09	41.1a	38.7	50.11a	36.27
46	Bengry's Lights, Leominster	Urban Centre	Y	42.78	39.1	40.3	49.33a	38.43
53	Cross St, Belmont, Hereford	Urban Background	Y	36.74	35.1	34.1	41.71a	33.73
54	Holmer Rd, Hereford	Urban Background	N	36.71a	26.7	27.9	31.59a	25.58
57	Eign St, Hereford shop flat façade	Urban Background	Y	43.21	37.9	38.3	43.94a	34.05
59	Elgars Rest,Widemarsh St,Hereford	Urban Centre	Y	27.47a	26.6a	28.1	37.11a	24.61
61	29 Bargates, Leominster	Urban Centre	Y	46.53	50.2	54.4	60.02a	47.63
65	96 Whitecross Road, Hereford	Urban Background	N	49.44	42.0	39.5	51.87a	40.18
74	Whitecross	Urban Background	N	25.08	20.0	21.9	25.65a	19.44
75	22 Barton Road, Hereford	Urban Background	N	32.90	27.1	28.7	48.38a	36.70
79	76 Belmont Road, Hereford	Urban	N	43.49	38.6	38.5	47.50a	35.33

a Means annualised according to Defra guidelines in box 3.2 of TG(09)

Figure 1. Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites within Hereford AQMA .

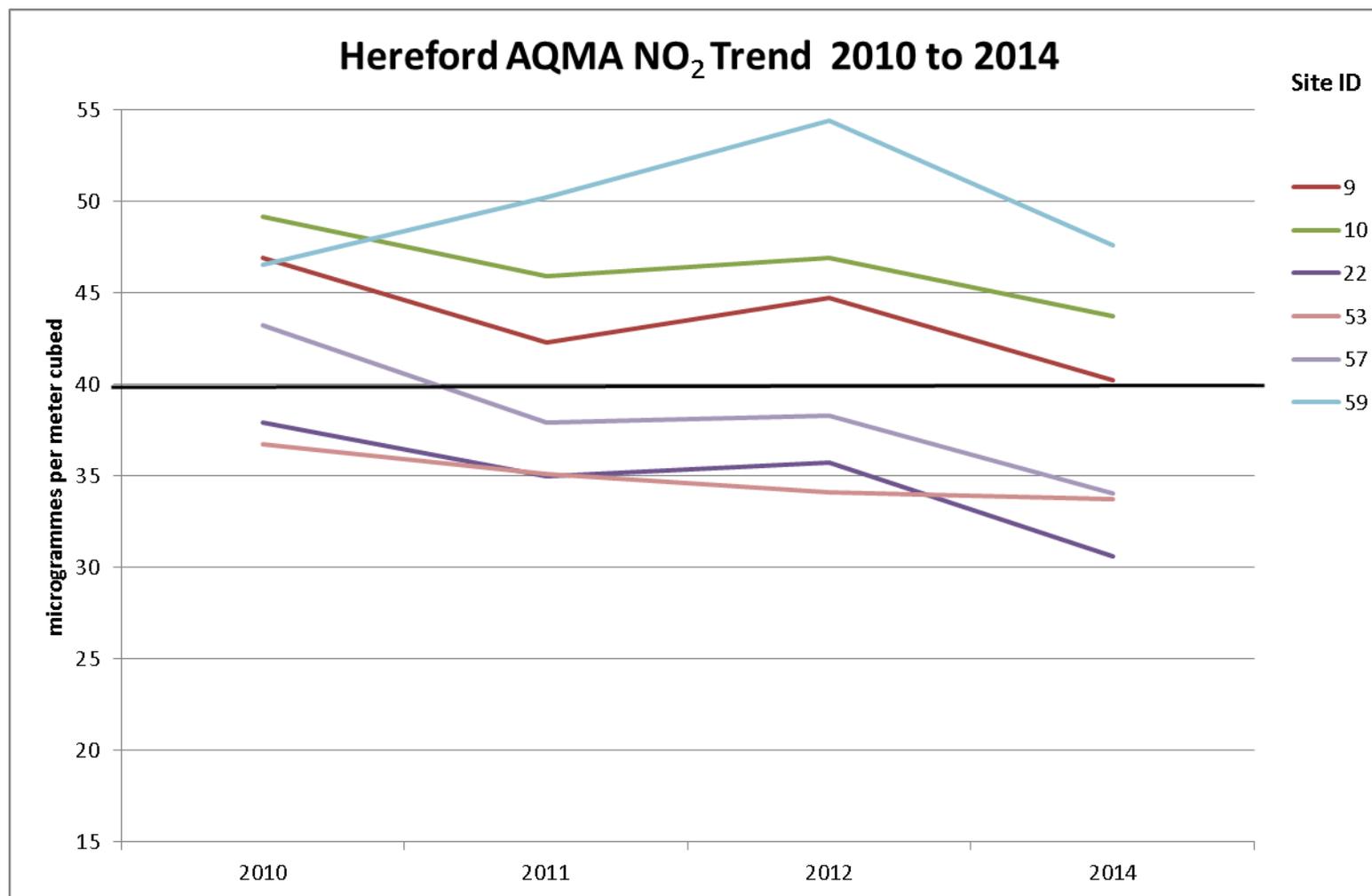


Figure 2. Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites within Hereford outside of the AQMA .

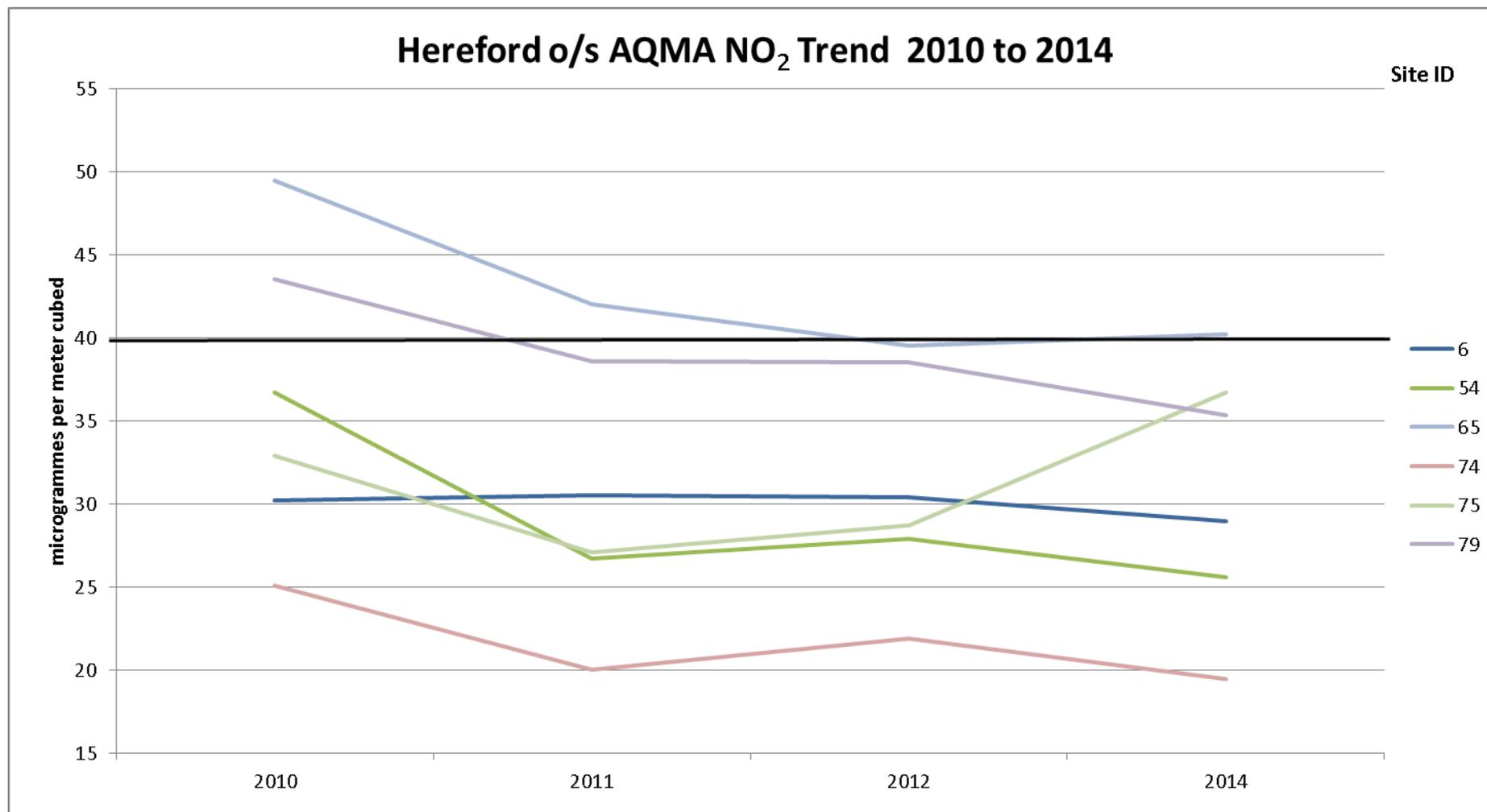


Figure 3. Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites within Leominster AQMA.

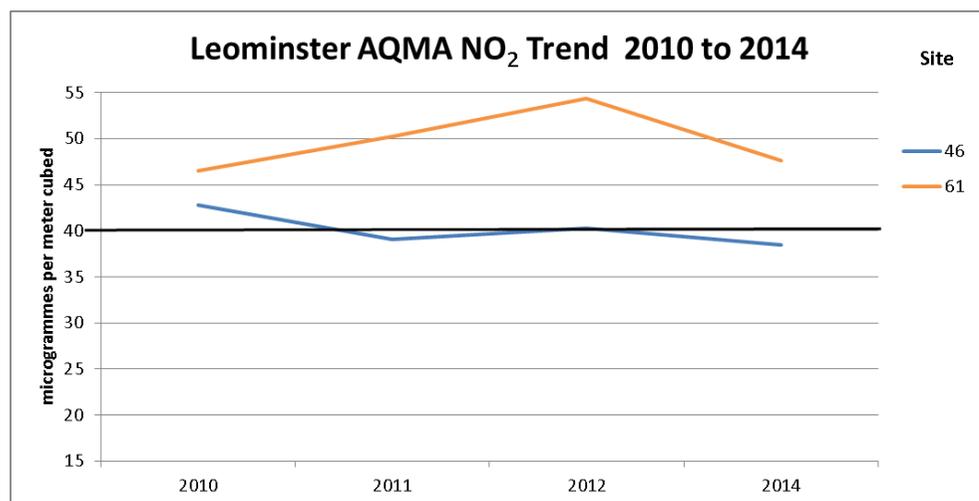
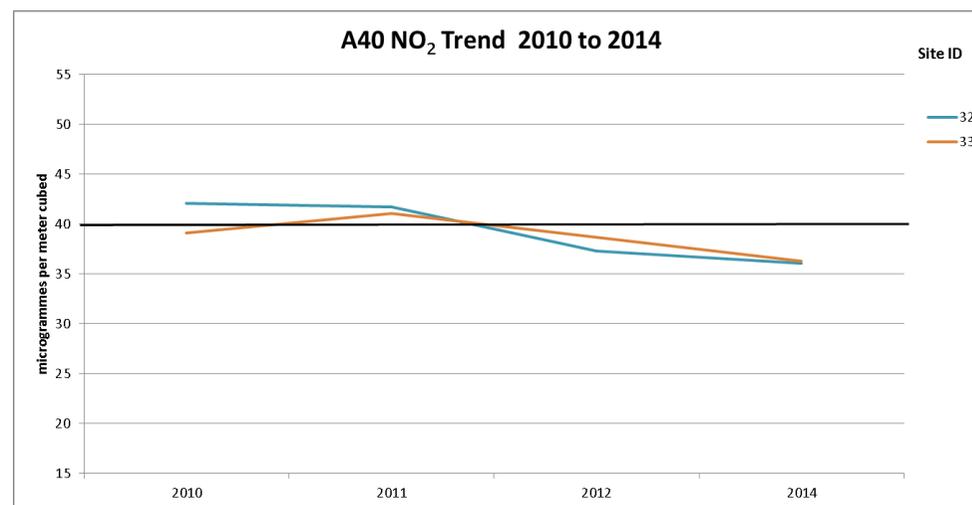


Figure 4. Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites on A40.



Exceedances

The 2014 monitoring results (adjusted for bias) indicate there are exceedances of the annual mean air quality objective of $40\mu\text{g}/\text{m}^3$ for Nitrogen Dioxide at four sites, with one more that could be considered to be borderline. Four of these five sites are within existing AQMA's. Table 2.4 below summarises the exceedances of nitrogen dioxide concentrations and the estimate of the concentration at the nearest receptor during 2014. The calculations for Table 2.4 are shown in Appendix E.

Table 2.4 Table to show the concentration of Nitrogen Dioxide at the nearest receptor

Site ID	Location	In AQMA	Roadside measurement?	Estimation of concentration at nearest receptor
9	Victoria St, Hereford	Y	40.25	38.4
10	Victoria St, Hereford	Y	43.71	41.7
46	Bengry's Lights, Leominster	Y	38.43	37.1
61	29 Bargates, Leominster	Y	47.63	45.0
65	96 Whitecross Road, Hereford	N	40.18	37.5

Taking into account the concentrations at the nearest receptors, this indicates that only 2 sites are above the annual mean objective for NO_2 . Both these sites are within existing AQMAs and thus there is no requirement to move to detailed assessment of any other areas. No sites have been identified as exceeding the 1 hour mean of $200\mu\text{g}/\text{m}^3$.

Trends

The 2013 results, presented in Table 2.3, are noticeably higher at every monitoring location than in the other years shown in the five year trend. It is considered this is due to only 8 months data being recorded and the requirement to annualise that data. Although the data has been annualised in line with Defra guidance (Box3.2 of TG(09)), automatic data from only two appropriate monitors within a 50 mile radius is available from Defra to include in the annualisation process (see Appendix A). The Council consider the annualised 2013 results should be regarded with caution.

It is therefore considered more appropriate to review the long term trend of monitoring results between 2010-12 and 2014. All monitoring locations show a general downward trend between 2012 and 2014 with the exception of two locations: Site 65 – 96 Whitecross Road, which demonstrates a marginal increase, and Site 75 – 22 Barton Road, Hereford which demonstrates a substantial increase.

Additionally, all monitoring locations show a general downward trend over the 5 year period to 2014 with the exception of two locations: Site 61 – 29 Bargates, Leominster and Site 75 – 22 Barton Road, Hereford.

Hereford AQMA

In 2013 the Council reduced the number of sites within the AQMA and removed locations that were either deemed unrepresentative of relevant exposure or were recording concentrations well below the air quality objective. There are currently 6 monitoring locations (9, 10, 22, 53, 57 and 59) within the Hereford AQMA and of these only 1 (Site 10) demonstrates an exceedance of the annual mean objective for NO₂ of 40µg/m³ after calculating results back to positions of relevant exposure (Table 2.4 above). The AQMA must therefore be retained. All 6 monitoring sites indicate a general downward trend in concentrations and have reduced from 2012 to 2014 by between 0.37 and 5.11 µg/m³.

Herefordshire Council have discontinued a number of sites that were previously located immediately outside of the AQMA to ascertain if a requirement to extend the AQMA is necessary. These were discontinued in 2013 as the locations were either deemed unrepresentative of relevant exposure or were recording concentrations well below the air quality objective. Two sites were retained, site 54 – Holmer Road and site 65 – 96 Whitecross Road. Site 54 continues to demonstrate concentrations well below the air quality objective in line with previous year's results and the Council will consider discontinuing this monitoring location at the end of 2015.

Site 65 is a kerbside monitoring location and the results have been calculated back to position of nearest receptor to compare with air quality objective, see Table 2.4 above. The estimation of concentration at the nearest receptor, 37.5µg/m³, is below

the air quality objective confirming no extension of the AQMA boundary is required at this time. Site 65 will continue to be closely monitored in 2015.

3 of the 4 sites (6, 74 and 79) in Hereford located further afield of the AQMA have followed the general downward trend seen across the County between 2010 and 2014. The exception is site 75 – 22 Barton Road which is an Urban Background monitoring location. This site has demonstrated a significant increase of $8\mu\text{g}/\text{m}^3$ between 2012 and 2014 representing a 22% increase in measured concentrations. However, the measured concentration of $36.7\mu\text{g}/\text{m}^3$ in 2014 is below the air quality objective. The Council will continue to closely monitor this location in 2015.

Bargates (Leominster) AQMA

Site 46 – Bengry's Lights, was below the air quality objective in 2014 recording concentrations of $38.43\mu\text{g}/\text{m}^3$ which reduces to $37.1\mu\text{g}/\text{m}^3$ when calculated back to position of nearest receptor. This continues the general downward trend in measured NO_2 levels at this location in the last 5 years.

By contrast Site 61 – 29 Bargates continues to record the highest concentrations of NO_2 in the County, $47.63\mu\text{g}/\text{m}^3$ in 2014 which reduces to $45.0\mu\text{g}/\text{m}^3$ when calculated back to position of nearest receptor. However it is noted concentrations have reduced by almost $7\mu\text{g}/\text{m}^3$ between 2012 and 2014.

A further site (78 – 46 Broad Street) outside the AQMA was discontinued by the Council in 2013 as previous measured levels were well below the air quality objective.

A40 corridor

The two roadside locations along this corridor, Sites 32 – Wier End House and 33 – Apple Tree Cottage, continue to follow the general downward trend seen across the County measuring $36.07\mu\text{g}/\text{m}^3$ and $36.27\mu\text{g}/\text{m}^3$ in 2014 respectively. Both these sites will continue to be monitored closely in 2015.

A further site (71 – Goodrich, Gate House) was discontinued by the Council in 2013 as previous measured levels were well below the air quality objective.

Other Market Towns and Villages

Monitoring is no longer undertaken in Bromyard, Kington, Ledbury, Pembridge, Ross-on-Wye and Woebley.

2.2.2 PM₁₀

PM₁₀ was previously measured by the Council at the automatic monitoring station at Edgar Street. The site, which was not relevant to public exposure, was decommissioned in 2011 due to redevelopment of the site on which it is located. The monitor was repositioned in Victoria Street in 2013 but as discussed above in section 2.1.1 no data is available for the monitoring period in 2014.

2.2.3 Sulphur Dioxide

Sulphur Dioxide is no longer monitored by Herefordshire County Council as of January 2011. Results of monitoring previously undertaken by the Council are presented in previous annual reports submitted to Defra.

2.2.4 Benzene

No Benzene monitoring has been undertaken by Herefordshire County Council in the monitoring period since the 2013 Progress Report.

2.2.5 Ozone

Ozone is no longer monitored by Herefordshire County Council as of January 2011. Results of monitoring previously undertaken by the Council are presented in previous annual reports submitted to Defra.

2.2.6 Summary of Compliance with AQS Objectives

Herefordshire Council has examined the results from monitoring in the County. Concentrations outside of the existing AQMA's are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

Concentrations at one site within the Hereford AQMA and one site within the Bargates(Leominster) AQMA still exceed the annual mean objective for nitrogen dioxide at relevant locations and both AQMA's should remain.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Herefordshire Council have identified a location in Ross on Wye with residential properties proximal to a number of bus stops in a narrow congested street. The daily traffic flow is likely less than the criteria outlined within in section A.1 of Box 5.3 of TG(09), however for information the Council are erecting 2 new diffusion tube monitoring locations in May 2015 to inform a detailed assessment following the procedure outlined in the guidance.

Herefordshire Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Herefordshire Council have identified and considered a café with outdoor seating close to a busy junction within the Hereford AQMA. The location is proximal to a previous monitoring location, Site 1 – Garrick House, which was discontinued in 2013 as it was unrepresentative of relevant exposure. Between 2008 and 2012, the location recorded concentrations of 34.5 – 53.8 $\mu\text{g}/\text{m}^3$ (average 42.04 $\mu\text{g}/\text{m}^3$)². This is well below the level of concentration (60 $\mu\text{g}/\text{m}^3$) at which Defra guidance indicates the 1-hour objective for nitrogen dioxide needs to be considered and therefore the Council are not proposing to move to detailed assessment at this time.

Herefordshire Council has assessed new/newly identified busy streets where people may spend 1 hour or more close to traffic, that were not assessed in previous rounds of Review and Assessment, and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.3 Roads with a High Flow of Buses and/or HGVs.

Herefordshire Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

Herefordshire Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

Hereford currently has a regeneration project to redevelop an area of the city which includes an entire new stretch of road and will significantly change traffic flows along a stretch of the current AQMA. This area, known as the Edgar Street Grid (ESG) received planning permission in April 2010 and construction works are currently at an early stage. This has been considered in previous rounds of review and assessment.

Herefordshire Council's long term strategic plan includes the building of another two new roads, the 'Southern Link Road' and the 'Western Relief Road'. At this time, the former has had some assessment and consultation work but planning permission has not yet been granted, and the latter is only at the design stage. Therefore, neither of these schemes require further consideration within this report in line with the procedure outlined in Section A.6 of Box 5.3 of TG(09). It is anticipated these schemes will need to be considered in future rounds of review and assessment.

Herefordshire Council are erecting 3 new NO₂ diffusion tube monitoring locations in May 2015 in the vicinity of the proposed Southern Link Road to provide baseline data.

Herefordshire Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

Herefordshire Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

Herefordshire Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Herefordshire Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Herefordshire Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

Herefordshire Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

Herefordshire Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

Herefordshire Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been introduced

Herefordshire Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Hereford Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Herefordshire Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

Herefordshire Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Herefordshire Council have recorded a number of applications for new biomass installations within the County. These have been considered following the procedure set out in Section D.1a of chapter 5 TG(09) where information required is available.

Herefordshire Council has assessed the biomass combustion plants, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

Hereford Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

Herefordshire Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Herefordshire Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

The 2014 monitoring results (adjusted for bias) indicate there are exceedances of the annual mean air quality objective of $40\mu\text{g}/\text{m}^3$ for Nitrogen Dioxide at four sites, with one more that could be considered to be borderline. Four of these five sites are within existing AQMA's. However, when taking into account the concentrations at the nearest receptors, only two of the sites are above the annual mean objective for NO_2 . Both of these sites are within existing AQMAs, which must be retained, and there is no requirement to move to detailed assessment of any other areas.

All monitoring locations show a general downward trend in mean annual concentrations of nitrogen dioxide over the 5 year period to 2014 with the exception of two locations: Site 61 – 29 Bargates, Leominster where concentrations have noticeably reduced by almost $7\mu\text{g}/\text{m}^3$ between 2012 and 2014, and Site 75 – 22 Barton Road, Hereford. This urban background site has demonstrated a significant increase of $8\mu\text{g}/\text{m}^3$ between 2012 and 2014 representing a 22% increase in measured concentrations. However, the measured concentration of $36.7\mu\text{g}/\text{m}^3$ in 2014 is below the air quality objective.

In 2013 the Council reduced the number of monitoring sites within Herefordshire and removed locations that were either deemed unrepresentative of relevant exposure or were recording concentrations well below the air quality objective.

8.2 Conclusions from Assessment of Sources

Herefordshire Council's assessment of sources has not identified any likely exceedances from new or significantly changed local developments.

8.3 Proposed Actions

Herefordshire Council have not identified a requirement to move to Detailed Assessment for any pollutants.

Herefordshire Council have identified a location in Ross on Wye with residential properties proximal to a number of bus stops in a narrow congested street and the Council are erecting 2 new NO₂ diffusion tube locations in May 2015 to monitor pollutant concentrations.

Herefordshire Council's long term strategic plan includes the building of two new roads, the 'Southern Link Road' and the 'Western Relief Road'. At this time, the former has had some assessment and consultation work but planning permission has not yet been granted, and the latter is only at the design stage. It is anticipated these schemes will need to be considered in future rounds of review and assessment. Herefordshire Council are erecting 3 new NO₂ diffusion tube monitoring locations in May 2015 in the vicinity of the proposed Southern Link Road to provide baseline data.

9 References

1. DEFRA (2002) 'The Air Quality (England) (Amendment) Regulations 2002' (SI 3043)
2. DEFRA (2007) 'The Air Quality Strategy for England, Scotland, Wales and Northern Ireland', HMSO
3. DEFRA (2009) 'Local Air Quality Management Technical Guidance LAQM.TG(09)'
4. DEFRA (2015) 'National Diffusion Tube Bias Adjustment Factor Spreadsheet v.03/15'
5. DETR (2000) 'Air Quality (England) Regulations 2000' (SI 928)
6. Herefordshire Council (May 1999) 'First Stage Air Quality Review and Assessment'
7. Herefordshire Council (Mar 2000) 'Second Stage Air Quality Review and Assessment'
8. Herefordshire Council (Feb 2001) 'Third Stage Air Quality Review and Assessment,
9. Herefordshire Council (Nov 2002) 'Stage Four Air Quality Review and Assessment'
10. Herefordshire Council (Mar 2004) '2004 Updating and Screening Assessment Report'
11. Herefordshire Council (Jul 2004) 'Detailed Assessment Report'
12. Herefordshire Council (Apr 2005) '2005 Annual Progress Report'
13. Herefordshire Council (Apr 2006) '2006 Updating and Screening Assessment Report'
14. Herefordshire Council (Jan 2008) 'Hereford City Air Quality Action Plan'
15. Herefordshire Council (Apr 2008) '2008 Annual Progress Report'
16. Herefordshire Council (Dec 2009) '2009 Updating and Screening Assessment'
17. Herefordshire Council (Sep 2010) '2010 Annual Progress Report'
18. Herefordshire Council (Apr 2011) '2011 Annual Progress Report'
19. Herefordshire Council (Dec 2012) '2012 Updating and Screening Assessment'
20. Herefordshire Council (Mar 2014) '2013 Annual Progress Report'
21. Herefordshire Council, Local Transport Plan 2013/14 – 2015/16
22. Office for National Statistics (ONS) (July 2012) 'Mid-year estimates of population 2011'

Appendices

Appendix A: QA/QC Data including Annualisation

Appendix B: Traffic Data

Appendix C: Maps

Appendix D: Nitrogen Dioxide Data 2010 – 2013

Appendix E: Estimation of concentrations at nearest receptor calculations

Appendix F – Air Quality Action Plan Update

Appendix A: QA/QC Data

Factor from Local Co-location Studies (if available)

No local co-location studies for nitrogen dioxide have been undertaken in 2013 and 2014.

Diffusion Tube Bias Adjustment Factors

The following UKAS accredited company provides Herefordshire Council with nitrogen dioxide diffusion tubes and analysis:

Gradko Environmental,
St Martins House,
77 Wales Street,
Winchester,
Hampshire, SO23 0RH
Tel 01962 860331
diffusion@gradko.co.uk

The 20% Triethanolamine (TEA) / De-ionised Water preparation methods is used.

The bias adjustment factor applied to the results in 2014 was 0.91 (Spreadsheet Version No. 03/15) and in 2013 was 0.95 (Spreadsheet Version No. 03/14) which were derived from the national studies. All sites are shown in Appendix B.

QA/QC of Diffusion Tube Monitoring

Under the WASP Scheme Gradko performed 100% satisfactory for all periods during 2013 and 2014. Tube precision was generally 'Good' throughout 2013 and 2014.

Short-term to Long-term Data Adjustment

No annualisation of 2014 data in accordance with Box 3.2 of TG(09) was required. Annualisation details for all monitoring locations within 2013 is presented below in Table A.1

Table A.1. Annualisation calculations for 2013 data

Site	Site Type	Annual Mean	Period Mean	Ratio
Aston Hill	Background Rural	4.921169	3.503513002	1.404638329
Cwmbran	Background Urban	13.12206304	1.174098325	1.174098325
			Average	1.289368327

QA/QC of Automatic Monitoring

No Automatic Monitoring Data is available for 2013 or 2014.

Appendix B: Traffic Data

Available Traffic Data from the Department of Transport for Herefordshire in 2013 is presented in Table B.1 below. 2014 Traffic Data was unavailable at the time this report was produced.

Table B.1 Traffic Data for Herefordshire in 2013

Year	Road	Easting	Northing	Cyclists	Motorcycles	Cars and Taxis	Buses	LGVs	HGVs	Total
2013	A49	350800	241000	154	146	19133	100	3503	847	23729
2013	A417	355183	251034	4	25	2780	7	693	462	3967
2013	A438	370000	238600	10	63	5908	85	1321	517	7894
2013	A438	348000	241200	226	101	8403	106	1626	409	10645
2013	A449	362135	227307	0	36	4246	23	906	156	5367
2013	A456	353680	268141	9	42	3970	30	956	414	5412
2013	A465	350339	238893	121	195	16948	291	2751	371	20556
2013	A4103	371564	247469	0	14	5070	18	1131	468	6701
2013	A4103	347650	242400	133	120	6914	12	1017	291	8354
2013	A4112	355000	263280	0	8	1670	15	317	50	2060
2013	A4113	339273	272785	4	20	1472	7	354	123	1976
2013	A438	375496	236638	46	33	1434	15	267	45	1794
2013	A44	343994	257020	2	22	4601	27	965	573	6188
2013	A49	350330	259000	2	79	8851	37	2008	1094	12069
2013	A44	340000	258170	6	38	3356	42	774	371	4581
2013	A417	365340	240000	0	37	4848	48	1261	607	6801
2013	A438	358400	240344	8	33	6187	62	1189	316	7787
2013	A40	360420	225400	1	137	20849	94	3182	3480	27742
2013	A465	351860	240509	136	85	12041	244	1805	322	14497
2013	A466	349300	231000	6	48	2043	25	397	109	2622
2013	A4103	353000	241830	61	97	11385	60	2477	580	14599
2013	A4111	331400	248000	16	52	3505	28	917	486	4988
2013	A4112	340800	253960	1	14	2541	27	590	238	3410
2013	A4137	355250	220000	2	30	2968	18	725	502	4243
2013	M50	365600	225670	0	70	17208	121	3928	3541	24868
2013	A49	350000	247300	13	80	9224	66	1731	639	11740
2013	A49	355000	225130	0	47	5707	86	1476	726	8042
2013	A438	350000	240300	450	177	12413	221	2296	478	15585
2013	A449	364000	229000	4	41	2214	5	438	143	2841
2013	A465	359750	247310	1	86	2827	89	696	200	3898
2013	A4103	350000	242200	46	82	11591	56	2089	350	14168
2013	A40	366000	221760	4	91	3450	60	824	280	4705
2013	A49	350510	258276	6	57	6361	23	1521	772	8734
2013	A438	370700	238600	19	25	5338	54	939	330	6686

Herefordshire Council

Year	Road	Easting	Northing	Cyclists	Motorcycles	Cars and Taxis	Buses	LGVs	HGVs	Total
2013	A49	351600	265000	8	74	6005	21	1435	895	8430
2013	A49	350720	239600	119	387	36256	314	6354	1495	44806
2013	A417	360000	246770	3	25	2712	17	790	468	4012
2013	A438	346500	241800	38	152	6191	157	1221	389	8110
2013	A449	374300	240000	19	36	5200	20	642	90	5988
2013	A4103	360000	243500	2	113	5237	34	1392	519	7295
2013	A4110	349070	242000	88	79	8400	68	1465	214	10226
2013	A4111	330000	253000	8	22	1857	26	543	231	2679
2013	A44	330000	257060	3	9	2252	10	753	495	3519
2013	A44	345000	257340	3	39	4432	12	1018	381	5882
2013	A44	331500	256200	3	17	3138	57	741	443	4396
2013	A49	350000	230900	13	35	6878	25	1554	834	9326
2013	A438	351100	240220	106	218	22156	472	2918	647	26411
2013	A438	330000	247030	11	101	4290	24	1055	376	5846
2013	A449	370000	236720	25	28	4139	20	1027	366	5580
2013	A466	350000	217600	17	43	1403	13	247	20	1726
2013	A480	346800	242000	60	45	2934	89	518	140	3726
2013	A4103	352000	241940	25	44	7690	19	1880	467	10100
2013	A4110	343870	260000	0	14	1786	25	463	236	2524
2013	A4112	335300	250000	3	37	1669	10	409	215	2340
2013	A4113	345000	276030	4	11	1353	12	342	117	1835
2013	A40	355000	217500	1	77	18241	69	3997	3961	26345
2013	A44	360000	256935	1	11	2627	10	776	280	3704
2013	A49	350000	235760	13	66	7474	118	2023	944	10625
2013	A449	371900	238300	20	78	5063	103	1111	177	6532
2013	A480	340000	246770	12	10	1562	31	291	160	2054
2013	A438	370960	238000	80	103	7135	69	1133	99	8539
2013	A438	351380	240000	155	136	12591	250	2039	262	15278
2013	A465	340950	228880	2	61	3833	56	1248	440	5638
2013	A4110	345760	250000	3	31	3160	33	649	191	4064
2013	A4113	340400	274000	25	22	2574	17	616	204	3433
2013	A4172	366000	238810	6	19	3324	27	831	481	4682
2013	A449	361000	225670	6	65	21711	126	3883	3427	29212
2013	A40	360840	225000	0	26	5736	38	1252	454	7506
2013	A449	371350	236994	77	77	5279	76	914	100	6446
2013	A417	370030	238000	16	69	4798	31	970	466	6334
2013	A449	371000	236560	6	101	5090	45	956	754	6946
2013	A417	371900	235000	4	100	4849	23	1053	563	6588
2013	M50	367000	226420	0	41	14478	267	3925	3544	22255
2013	A40	366600	221330	5	50	2894	43	752	219	3958
2013	A456	353483	268253	7	18	2709	10	624	515	3876
2013	A44	366730	254210	1	105	6839	69	1544	405	8962
2013	A4103	375870	249210	9	43	4661	45	1125	489	6363
2013	A49	350720	240140	172	297	35479	411	4988	1295	42470

Herefordshire Council

Year	Road	Easting	Northing	Cyclists	Motorcycles	Cars and Taxis	Buses	LGVs	HGVs	Total
2013	A4112	337070	250740	14	52	3484	67	764	277	4644
2013	A49	350700	238500	59	90	10602	142	2534	1027	14395
2013	A438	352340	240000	305	100	9174	62	1207	204	10747
2013	A49	350610	242200	14	89	10239	73	1921	711	13033
2013	A4103	348900	242310	147	133	7674	13	1129	323	9272
2013	A438	349000	240840	189	82	9799	90	1579	371	11921
2013	A465	345940	235000	1	86	5493	50	1223	540	7392
2013	A44	348600	258850	48	102	12604	130	2569	517	15922
2013	A40	356700	220000	3	150	15573	116	2877	3238	21954
2013	A465	355000	243000	4	11	3171	26	702	92	4002
2013	A480	335000	253100	2	13	1159	17	283	77	1549
2013	A438	340000	243100	20	25	4861	17	897	363	6163
2013	A49	350540	260000	4	71	7873	65	1583	958	10550

Appendix C: Maps

Figure C.1 – Map of Herefordshire Transport Network and Major Settlements

Figure C.2 – Location of Herefordshire

Figure C.3 – Hereford AQMA Boundary

Figure C.4 – Hereford City (North) Monitoring Locations

Figure C.5 – Hereford City (South) Monitoring Locations

Figure C.6 – Whitecross Road, Hereford Monitoring Locations

Figure C.7 – Leominster AQMA Boundary

Figure C.8 – Leominster Monitoring Locations

Figure C.9 – A40 Corridor, Ross-on-Wye Monitoring Locations

Figure C.1 – Map of Herefordshire Transport Network and Major Settlements

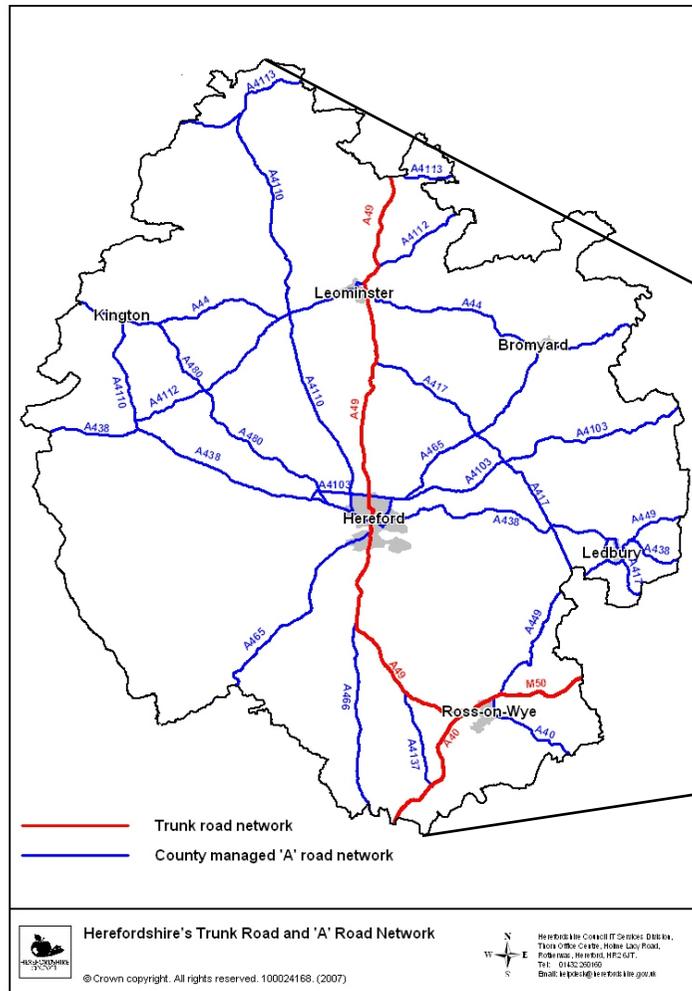


Figure C.2 – Location of Herefordshire

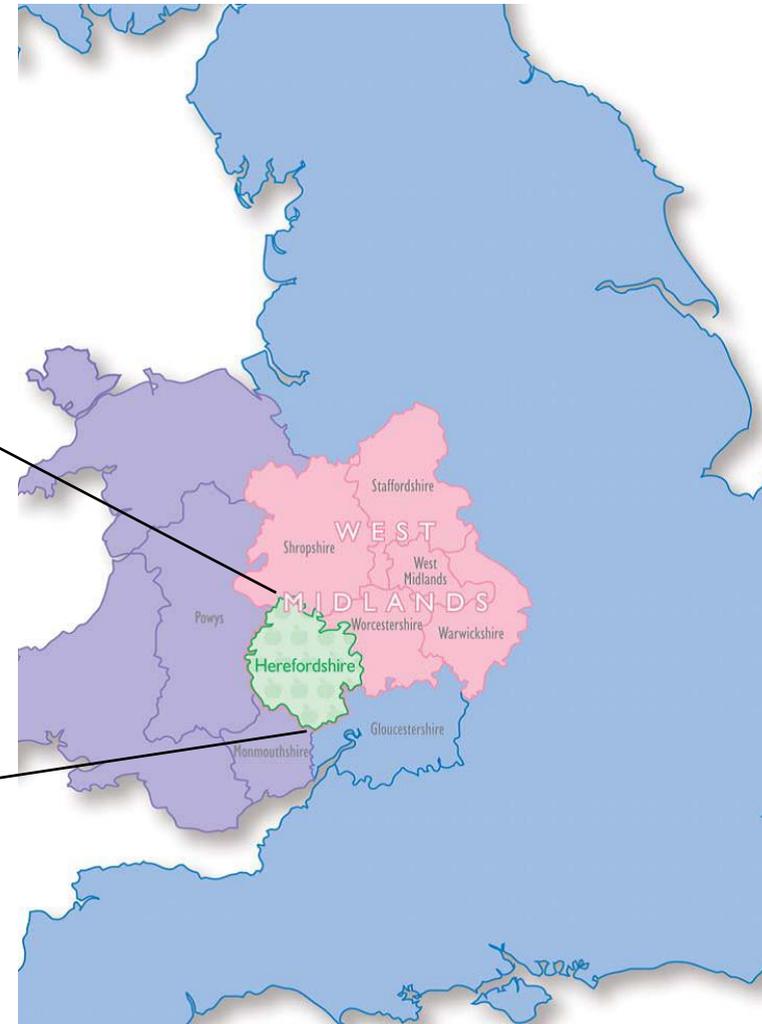
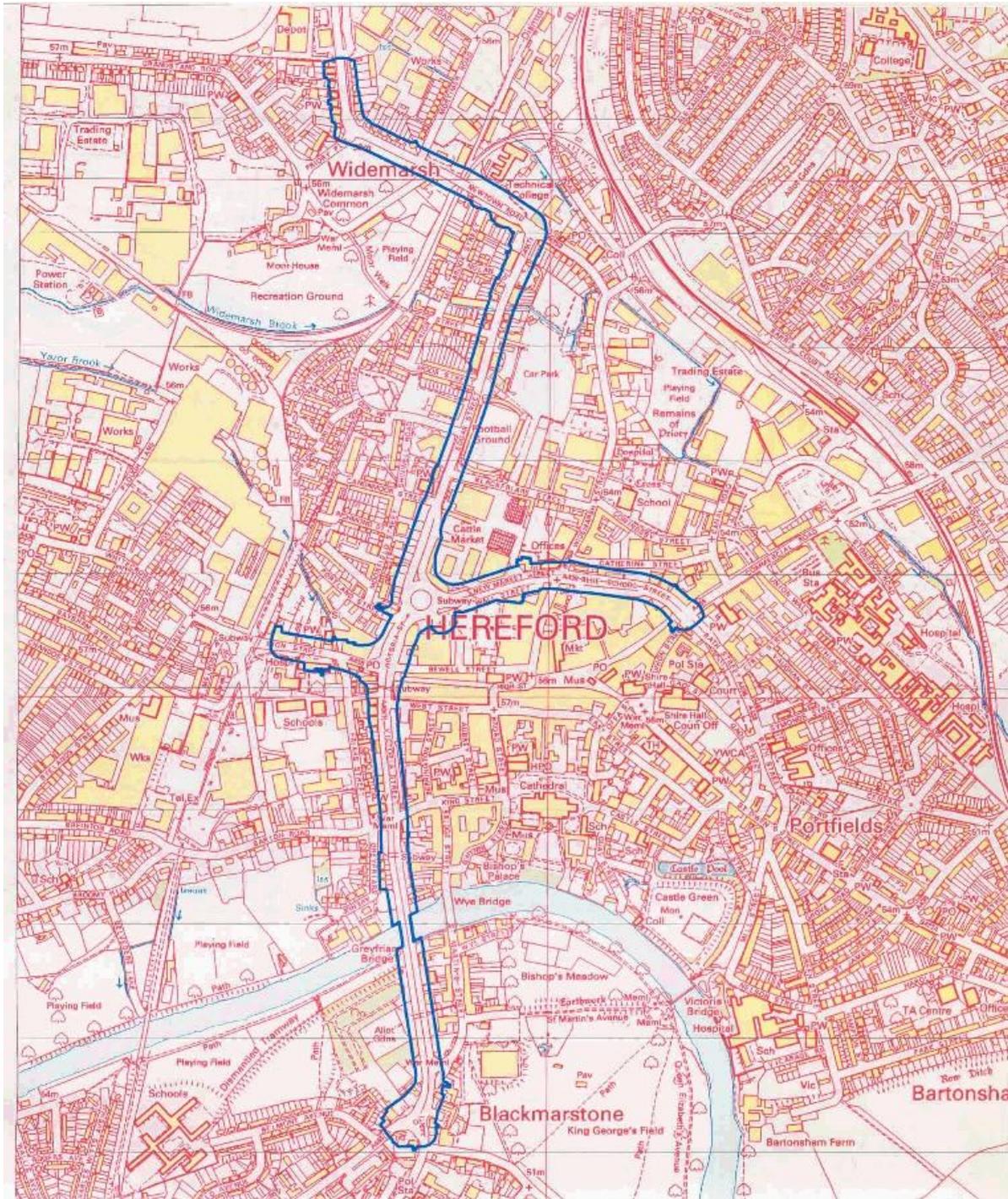


Figure C.3 – Hereford AQMA Boundary



	<p>THE HEREFORD CITY AIR QUALITY MANAGEMENT AREA (NITROGEN DIOXIDE)</p>	<p>Herefordshire Council County Offices Bath Street Hereford Tel.: (01432) 260000</p>
	<p>Designated in November 2001</p>	
	<p>SCALE 1:10000</p>	
<p><small>Reproduced from Ordnance Survey mapping with the permission of the Controller of Her Majesty's Stationary Office. Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. ©4998981</small></p>		

Figure C.4 – Hereford City (North) Monitoring Locations

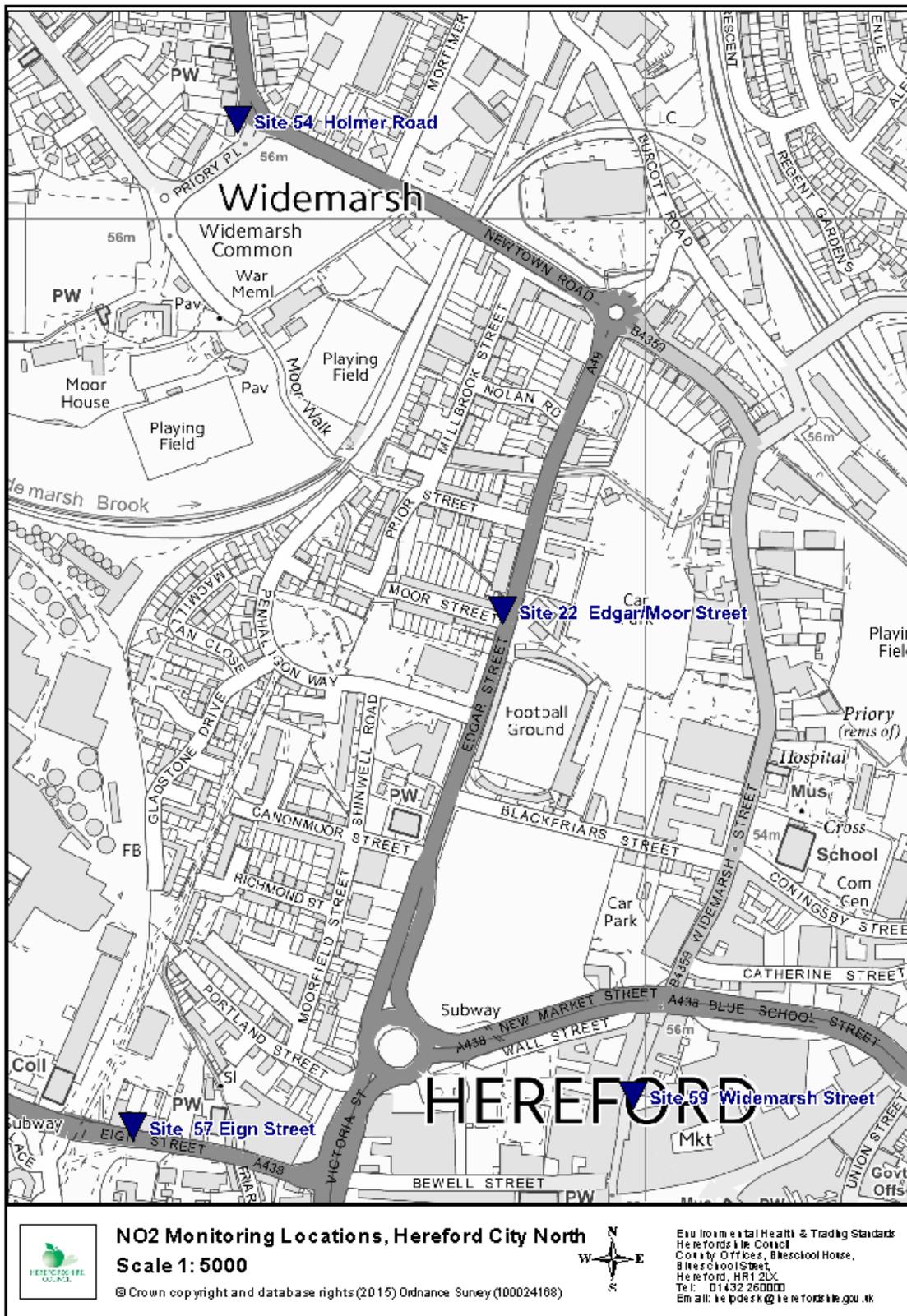


Figure C.5 – Hereford City (South) Monitoring Locations

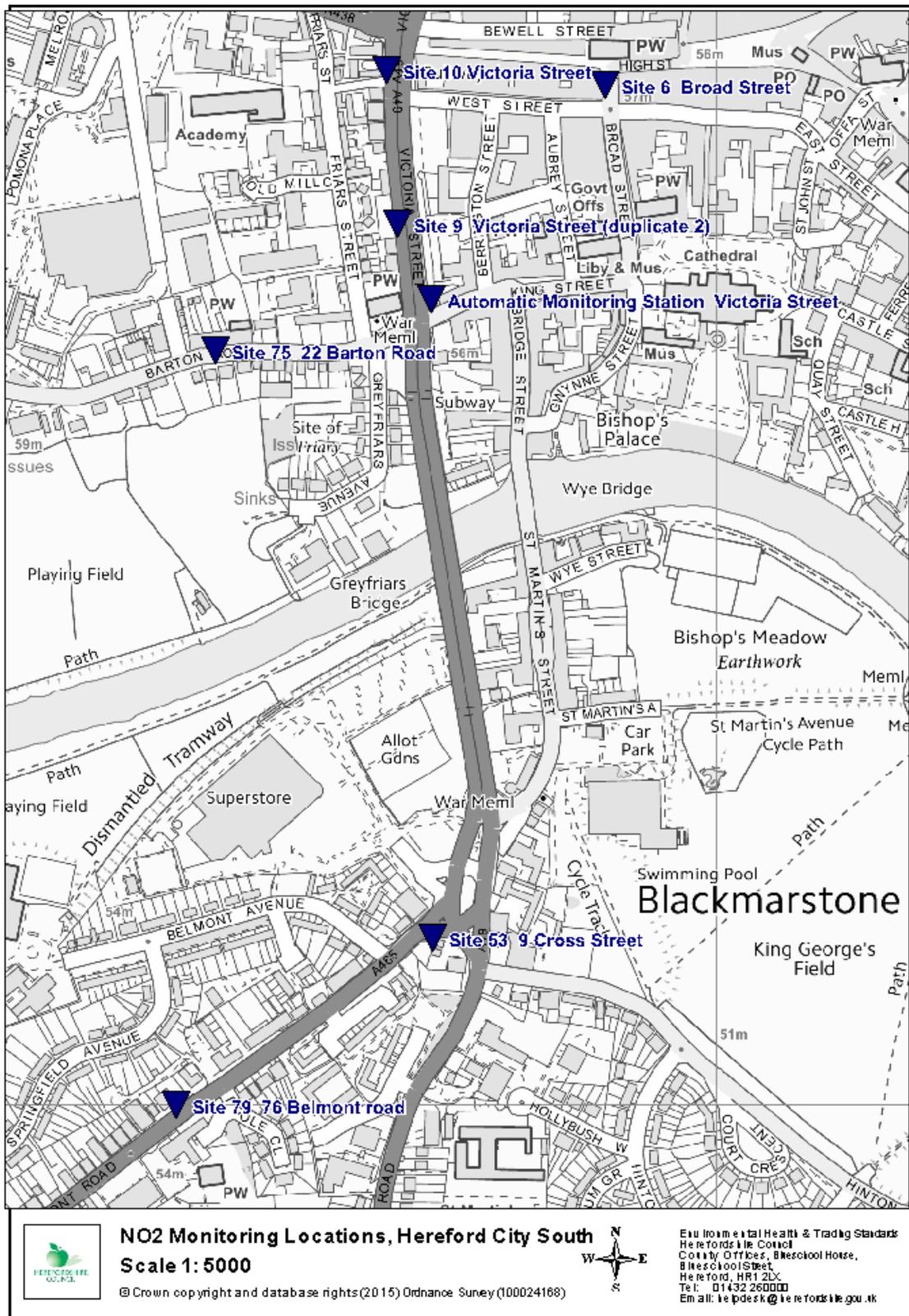


Figure C.6 – Whitecross Road, Hereford Monitoring Locations

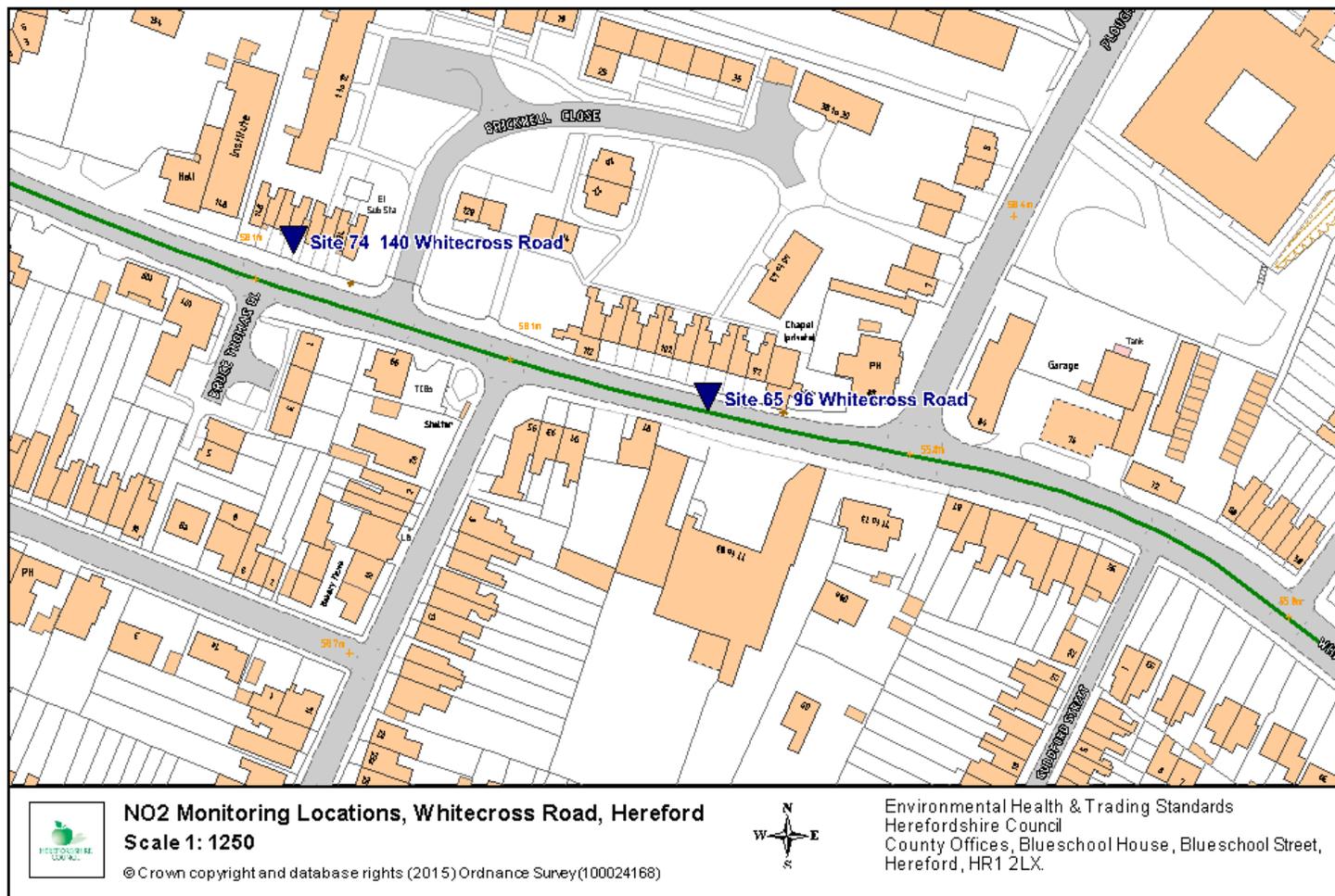


Figure C.7 – Leominster AQMA Boundary

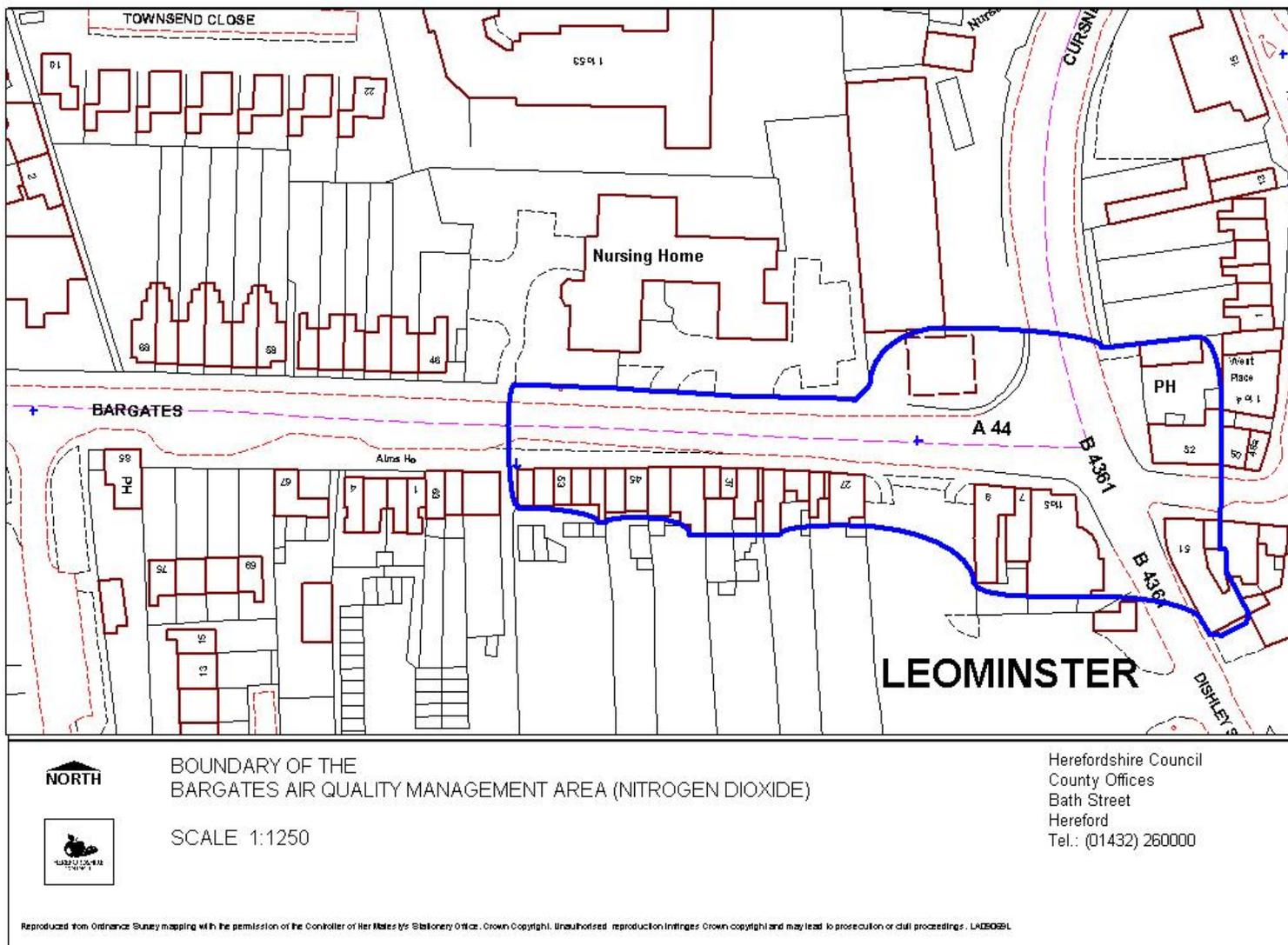


Figure C.8 – Leominster Monitoring Locations

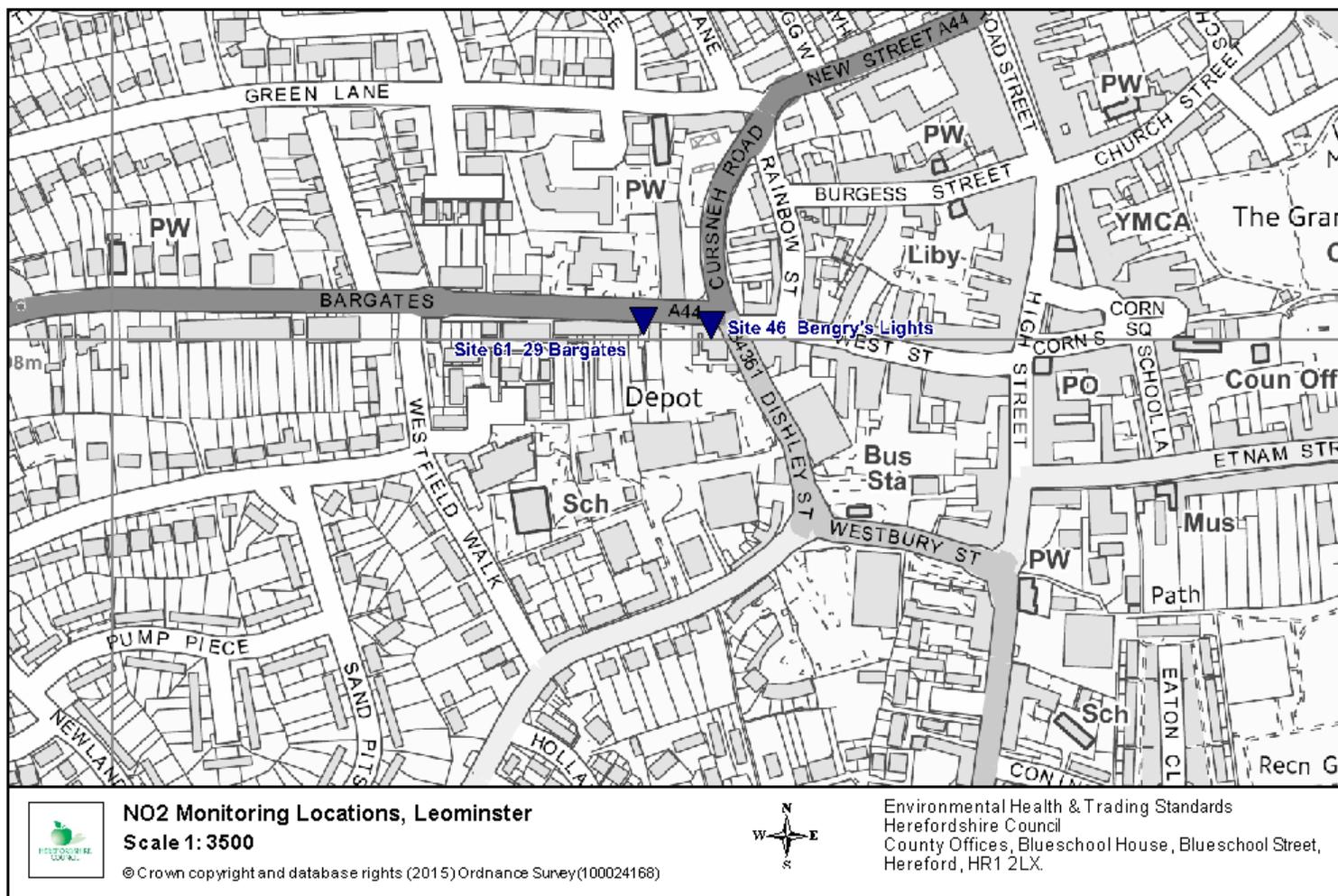
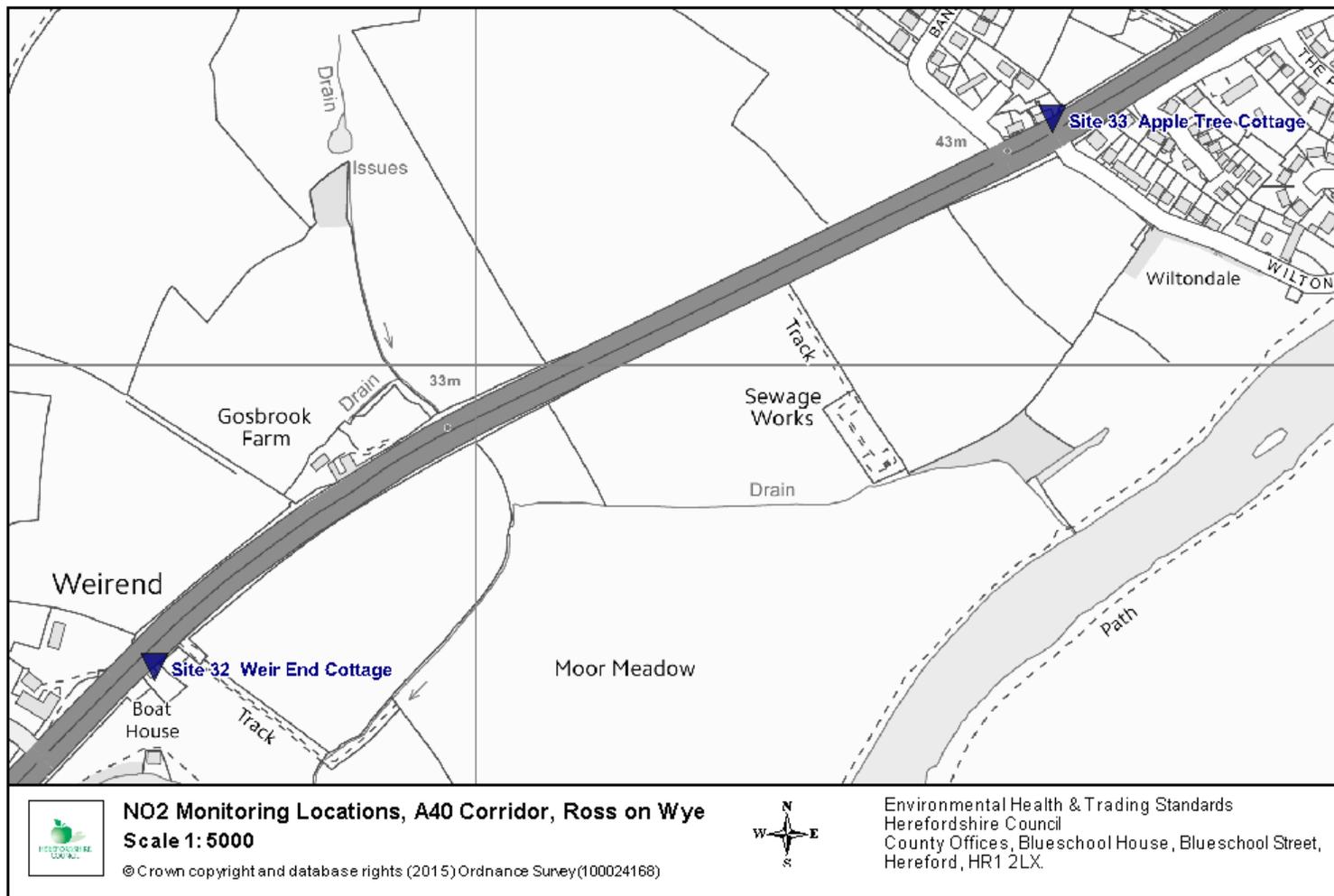


Figure C.9 – A40 Corridor, Ross-on-Wye Monitoring Locations



Appendix D: Nitrogen Dioxide Data 2010 – 2013

Table D.1 Bias adjusted NO₂ diffusion tube data 2014

ID	Easting	Northing	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean $\mu\text{g}/\text{m}^3$
6	350890	240000	Broad St, Hereford	35.60	37.33	32.91	32.90	31.20		22.28	24.10	28.32	32.59	39.36	33.13	28.93
9	350688	239864	Victoria St (duplicate 2), Hereford	49.29	45.98	57.17	53.80	38.27	40.69	33.53	32.87	45.78	42.10	47.01		40.25
10	350677	240015	Victoria St (house façade), Hereford	46.79	47.91	51.58	51.67	48.03	42.07	47.52	41.61	60.66	43.20	48.98	46.37	43.71
22	350860	240615	Façade Edgar/Moor St, Hereford (Duplicate 2)	43.32	35.18		36.92	30.82	28.47	21.10	21.10	36.48	36.02	47.27	33.12	30.59
32	357717	223736	House facade, Weir End	35.51	37.59	44.54	43.80	35.30	35.69	44.45	37.55	48.75	35.89	36.02	40.61	36.07
33	358506	224214	House façade, Wilton	41.24	39.52	44.74	42.98	42.84	41.67	39.16	31.36	36.77	38.19	41.07	38.71	36.27
46	349409	259010	Bengry's Lights, Leominster	45.15	41.88	45.82	41.88	43.37	41.85	42.54	37.04	41.80	39.51	41.83	44.07	38.43
53	350723	239163	House façade, Cross St, Belmont, Hereford	38.33	31.57	38.18	40.08	36.23	38.26	40.42	24.34	43.40		39.03	37.84	33.73
54	350602	241097	House façade, Holmer Rd, Hereford	28.18	23.33	30.17	29.61	28.03	26.91	26.00	24.34	30.39	25.06	37.20	28.17	25.58
57	350499	240108	Shop flat façade, Eign Street, Hereford	36.89	33.21	39.47	26.75	39.24	36.90	37.37	29.74	44.95	34.31	47.86	42.31	34.05
59	350987	240139	Elgars Restaurant (façade), Widemarsh St, Hereford	27.98	24.33	31.23	28.21	23.02	24.44	21.68	21.53	31.12	25.74	32.70	32.48	24.61
61	349363	259013	29 Bargates, Leominster	47.01	50.37	49.57	56.34	57.71	46.67	49.00	50.40	55.52	46.95	62.87	55.74	47.63
65	350086	240296	96 Whitecross Road (façade), Hereford	43.38	29.59	43.46	40.92	41.12	44.32	51.09	37.76	58.67	38.25	48.20	53.02	40.18
74	349985	240334	140 Whitecross	25.48	20.02	23.01	21.04	18.01	16.03	16.42	17.53	19.87	24.76	27.57	26.64	19.44
75	350511	239740	22 Barton Road, Hereford	43.09	39.94	43.21	45.94	40.07	39.79	37.10	31.39	47.51	36.43	46.86	32.57	36.70
79	350472	238999	76 Belmont Road	40.14	38.56	44.79	38.47	42.62	36.42	36.55	31.49	44.23	33.06	37.87	41.72	35.33

Table D.2 Bias adjusted NO₂ diffusion tube data 2013

ID	Easting	Northing	Location	Jan - Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean µg/m ³	*Annualised mean µg/m ³
6	350890	240000	Broad St, Hereford	n/a	24.8	21.1	29.3	25.2	27.3	27.8	39.9	35.2	28.8	37.17
9	350688	239864	Victoria St (duplicate 2), Hereford	n/a	38.7	42.4	21.5	36.1	44.6	48.0	49.1	57.0	42.2	54.38
10	350677	240015	Victoria St (house façade), Hereford	n/a	32.0	36.2	31.6	42.5	34.9	34.8	49.1	51.7	39.1	50.40
22	350860	240615	Façade Edgar/Moor St, Hereford (Duplicate 2)	n/a	31.0	29.7	34.8	29.6	26.8	32.8	40.6	38.9	33.0	42.58
32	357717	223736	House facade, Weir End	n/a	31.6	34.9	30.7	39.6		36.6	46.2	42.0	37.4	49.24
33	358506	224214	House façade, Wilton	n/a	29.0	33.9	39.9	37.7	41.3	34.9	49.7	41.8	38.9	50.11
46	349409	259010	Bengry's Lights, Leominster	n/a	30.3	31.0	34.4	40.5	45.9		42.9	41.0	38.0	49.33
53	350723	239163	House façade, Cross St, Belmont, Hereford	n/a	29.2	33.9	21.6	33.2	34.8	32.5	41.1	32.5	32.3	41.71
54	350602	241097	House façade, Holmer Rd, Hereford	n/a	21.6	24.3	22.6	23.0	25.2	25.5	28.6	25.2	24.5	31.59
57	350499	240108	Shop flat façade, Eign Street, Hereford	n/a	28.5	32.4	35.5	32.7	35.2	31.6	42.7	34.2	34.1	43.94
59	350987	240139	Elgars Restaurant (façade), Widemarsh St, Hereford	n/a	25.0	22.4	38.7	23.2	25.9	26.2	36.9	32.0	28.8	37.11
61	349363	259013	29 Bargates, Leominster	n/a	39.3	42.5	43.1	50.0	46.2		46.3	56.3	46.2	60.02
65	350086	240296	96 Whitecross Road (façade), Hereford	n/a	35.5	35.5	38.7	36.5	43.4	40.7	49.8	41.7	40.2	51.87
74	349985	240334	140 Whitecross	n/a	16.4	15.0	14.9	16.1	20.4	21.7	30.7	24.0	19.9	25.65
75	350511	239740	22 Barton Road, Hereford	n/a	28.4	34.1	51.1	30.5	32.4	35.8	40.1		36.1	48.38
79	350472	238999	76 Belmont Road	n/a	33.1	33.3	29.5	34.1	38.4	37.2	44.4	44.7	36.8	47.50

*All locations results have been annualised in accordance with procedure outlined in Appendix A as less than 9 months capture

Table D.3 Bias Adjusted NO₂ diffusion tube data for 2012

ID	Easting	Northing	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean $\mu\text{g}/\text{m}^3$
1	351007	240248	Garrick House, Hereford	33.4	50.1	50.1		60.4	43.0	43.0	41.3	59.8	73.8	70.4	85.1	53.8
6	350890	240000	Broad St, Hereford	29.9	42.5	38.2	28.9	25.0	25.7	26.0	23.9	30.1	31.8	36.5	37.2	30.4
9	350688	239864	Victoria St , Hereford	28.7	56.0	57.7	44.0	40.7	42.0	35.1	39.8	34.2	59.1	56.0	59.7	44.7
10	350677	240015	Victoria St (house façade), Hereford	46.5	58.1	45.7	55.5	46.0	38.8	38.3	43.3	43.8	51.5	54.6	58.6	46.9
15	350948	240905	Newtown Rd/Edgar St, Hereford	31.4	47.4	38.0	32.8	32.1	25.2	25.1	27.4	29.6	36.1	48.1	45.8	33.9
17	350700	238685	Holme Lacy Rd/Ross Rd traf.lights, Hfd	49.1	67.6	59.4	44.6	43.4	39.7	43.4	37.5	49.3	46.8	57.0	61.3	48.4
19	351681	240412	Commercial St/Railway Bridge, Hfd	38.2	49.0	41.8	32.7	27.5	32.7	46.6	38.1	35.1	40.7	39.6	37.7	37.1
22	350860	240615	Façade Edgar/Moor St,Hfd	28.7	44.7	43.6	26.8	28.8	35.3	30.0	33.7	32.9	41.8	56.2	39.3	35.7
32	357717	223736	House facade, Weir End	45.6	56.9	47.1	35.5	38.1	33.7	32.6	28.1	35.4	42.1	42.9	23.4	37.3
33	358506	224214	House façade, Wilton	37.8	49.6	45.5	32.1	31.6	38.4	29.5	48.2	43.4	33.2	45.6	44.3	38.7
46	349409	259010	Bengry's Lights, Leominster	41.0	49.9	43.1	38.6	35.7	35.8	38.9	38.3	40.5	44.3	53.4	39.2	40.3
51	359950	224104	Market Place, Ross	31.4	37.5	38.1	32.3	29.0	23.1	17.1	23.6	30.1	37.0	36.4	33.7	29.8
53	350723	239163	House façade, Cross St, Belmont, Hfd	32.4	42.7	43.9	30.5	29.0	28.2	29.9	35.1	32.2	37.8	42.0	37.7	34.1
54	350602	241097	House façade, Holmer Rd, Hereford	29.7	36.3	36.9	28.8	25.5	24.1	21.0	22.9	25.0	33.1	33.2	28.2	27.9
57	350499	240108	Shop flat façade, Eign Street, Hereford	34.3	54.7	45.3	38.3	36.1	35.2	32.1	36.2	36.7	45.4	41.0	39.1	38.3
58	351258	240136	Shop flat façade, Union St/ Bath St, Hfd	33.9	42.4	42.7	38.5	37.4	25.9	25.3	27.1	29.4	29.6	35.3	40.4	33.0
59	350987	240139	Shepherds Restaurant (façade), Widemarsh St, Hfd	30.4	34.7	33.4	29.4	25.6	21.8	20.9	20.8	28.4	32.6	31.0	38.5	28.1
61	349363	259013	29 Bargates, Leominster	58.0	65.9	62.9	52.5	38.8	49.2	61.3	59.7	64.8	54.5	63.2	42.4	54.4
64	350362	238909	106 Belmont Road (façade), Hereford	26.5	36.4	31.3	28.6	25.7	18.7	23.5	23.2	25.9	31.8	32.9	26.8	26.8
65	350086	240296	96 Whitecross Road (façade), Hereford	47.3	56.2	45.8	40.2	35.8	31.9	32.4	31.4	38.9	47.6	46.2	34.7	39.5
71	350107	240297	Goodridge Gatehouse	33.8	45.6	40.2	40.4	32.6	21.1	34.0				44.1	28.6	34.5
74	356641	220477	140 Whitecross	23.5	32.5	27.8	19.8	15.7	16.4	16.8	17.7	18.0	25.7	28.3	29.0	21.9

Herefordshire Council

ID	Easting	Northing	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean $\mu\text{g}/\text{m}^3$
75	349985	240334	22 Barton Road, Hereford	32.4	41.6	40.7	28.6	28.9	21.4	17.1	19.3	25.8	32.3	33.6	33.9	28.7
76	350511	239740	St.Thomas Cantilope	25.3	30.6	28.3	17.0	12.8	15.2	13.8	15.2	19.0	26.6	31.0	22.9	20.8
77	351130	240370	Widemarsh Street	32.2	41.1	34.9	23.7	22.3	18.0	21.3	19.0	23.8	33.2	33.8	26.6	26.7
78	351110	240620	46 Broad Street Leominster	32.6	44.1	35.5	30.0	31.5	28.5	26.5	31.1	31.1	38.6	43.9	40.5	33.4
79	349590	259250	76 Belmont Road	39.3	57.1	51.2		35.0	31.6	31.7	29.6	38.0	42.7	45.2	34.9	38.5
80	350472	238999	90 Whitecross	32.5	40.9	36.8	34.9	34.7	26.4	25.3	28.5	28.0	37.8	37.6	39.8	32.6
81	350721	239791	Victoria Street Box									43.8	49.8		36.0	41.9

Table D.4 Adjusted NO₂ diffusion tube data for 2011

ID	Easting	Northing	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean $\mu\text{g}/\text{m}^3$
1	351007	240248	Garrick House,Hereford	52.1	31.4	52.2	44.2	33.6	30.0	35.3	35.2	30.3	29.8		53.7	38.9
6	350890	240000	Broad St, Hereford	35.8	38.5	38.2	27.1	26.8	24.1	26.8	25.8	28.9	29.9	31.0	33.7	30.5
9	350688	239864	Victoria St , Hereford	59.7	43.4	52.3	42.8	28.4	35.1	44.0	31.7	38.4	38.6	59.0	34.6	42.3
10	350677	240015	Victoria St (house façade), Hereford	55.5	47.6	66.4	48.8	40.1	29.9	39.0	42.3	35.8	38.5	54.6	52.5	45.9
12	350776	240224	Edgar St Roundabout (Triplicate 1), Hfd	57.2	39.9	60.3	74.4	40.7	41.4	44.4	41.6	40.8	45.2	58.0		49.5
13	350776	240224	Edgar St Roundabout (Triplicate 2), Hfd	54.6	49.2	57.4	50.1	41.5		50.2	43.1	41.1	40.0	48.8		47.6
14	350776	240224	Edgar St Roundabout (Triplicate 3), Hfd	54.0	38.2	60.0	28.6	41.2	44.6	67.5	42.1	44.2	43.3	54.9		47.1
15	350948	240905	Newtown Rd/Edgar St, Hereford	41.8	35.6	50.9	35.4	23.1	27.1	27.9	24.6	24.0	30.2	41.6	30.0	32.7
17	350700	238685	Holme Lacy Rd/Ross Rd traf.lights, Hfd	64.6	60.4	76.0	49.9	51.0	44.2	46.8	44.8	47.4	47.6	38.1	39.4	50.9
19	351681	240412	Commercial St/Railway Bridge, Hfd	43.8		45.1	37.8	29.2	30.8	29.3	29.4	35.5	36.5	39.1	32.6	35.4
22	350860	240615	Façade Edgar/Moor St,Hfd	44.4	40.2	51.7	40.3	24.6	27.0	32.1	27.1	31.0	33.4	33.8	34.8	35.0
32	357717	223736	House facade, Weir End	57.1	46.7	54.9	42.3	37.2	34.0	35.6	35.2	38.4	33.6	40.3	44.8	41.7
33	358506	224214	House façade, Wilton			52.4	42.2	33.8	38.6	34.1	34.0	42.1	37.2	40.6	32.8	38.8
46	349409	259010	Bengry's Lights, Leominster	48.4	34.9	47.8	37.1	31.6	37.3	38.2	37.0	39.9	43.9	35.2	37.3	39.1
51	359950	224104	Market Place, Ross	37.4	32.8	45.4	30.6	21.9	21.6	24.1	24.1	22.9	26.7	29.8	26.5	28.7
53	350723	239163	House façade, Cross St, Belmont, Hfd	43.4	37.0	46.7		51.1	26.2	27.9	27.5	29.5	32.1	38.2	26.8	35.1
54	350602	241097	House façade, Holmer Rd, Hereford	37.1	31.2		28.5	24.2	24.1	24.1	28.7	21.1	23.4	31.7	20.1	26.7
57	350499	240108	Shop flat façade, Eign Street, Hereford	48.7	40.5	51.8	38.3	31.8	32.3	33.7	30.1	33.9	37.1	39.4	37.1	37.9
58	351258	240136	Shop flat façade, Union St/ Bath St, Hfd	47.2	32.2	48.4	33.9	24.0	24.9	26.7	26.9	23.8	27.6	34.7	25.7	31.3
59	350987	240139	Shepherds Restaurant (façade), Widemarsh St, Hfd	37.4	24.5				21.0	23.0	23.2	23.3	27.0	30.5	32.8	27.0

Herefordshire Council

ID	Easting	Northing	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean $\mu\text{g}/\text{m}^3$
61	349363	259013	29 Bargates, Leominster	37.2	54.0	63.5	42.5	53.2	44.6	52.9	52.7	51.8		45.4	53.9	50.2
64	350362	238909	106 Belmont Road (façade), Hereford	37.7	28.1	37.0	27.3	20.2	22.9	22.5	22.7	21.4	26.0	27.7	30.1	27.0
65	350086	240296	96 Whitecross Road (façade), Hereford	55.4	43.7	67.7	46.2	36.8	34.8	39.5	33.5	29.5	34.7	46.5	35.2	42.0
71	350107	240297	Goodridge Gatehouse					37.8	34.4	47.1	38.5	35.5	34.3	36.3	29.1	36.6
74	356641	220477	140 Whitecross	32.0	13.4	26.2	20.6	17.2	16.8	16.9	17.7	15.4	18.4	22.7	22.3	20.0
75	349985	240334	22 Barton Road, Hereford	40.8	27.5	42.9	24.7	21.3	23.3	0.0	22.7	19.4	23.8	28.3	23.6	27.1
76	350511	239740	St.Thomas Cantilope	33.0	26.7	27.8	18.9	14.3	14.8	14.6	16.2	18.4	19.0	29.1	15.3	20.7
77	351130	240370	Widemarsh Street	43.1	29.1	36.9	23.9	21.1	21.8	19.7	23.4	21.7	22.3	29.6	26.1	26.6
78	351110	240620	46 Broad Street Leominster	32.3	34.3	40.4	29.6	26.7	28.7	29.9	27.3	28.6	32.6	37.4	21.0	30.7
79	349590	259250	76 Belmont Road	47.8	37.0	0.0	37.6	35.1	0.0	42.2	33.3	36.3	39.0	40.2	37.6	38.6
80	350472	238999	90 Whitecross	41.3	31.6	45.0	32.0	26.3	24.0	30.3	25.2	23.9	28.4	35.3	24.8	30.7

Table D.5 Adjusted NO₂ diffusion tube data for 2010

ID	Easting	Northing	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean µg/m ³
1	351007	240248	Garrick House, Hereford	49.00	52.54	39.70	37.07	48.46	40.02	28.22	28.08	40.33	36.54	42.99	45.56	40.71
3	351548	240924	Geoffrey Ave, Hereford	24.41	24.39	22.64	16.45	12.93		6.93	11.79	18.18	22.84	25.11	29.71	19.58
5	353106	240559	Heywood Ave, Hereford	22.94	17.74	14.49	10.07	7.46	7.01	3.71	6.58	11.73		18.42	36.30	14.22
6	350890	240000	Broad St, Hereford	39.62	35.07	32.25	30.49	24.37	24.13	21.65		29.19	28.57	36.49		30.18
7	351093	240114	Gommond St, Hereford	30.28	26.56	20.80	17.92	15.75	12.26	11.32	13.30	17.35	21.35	25.34		19.29
8	350688	239864	Victoria St (duplicate 1), Hereford	59.92	61.68	65.86	49.60	47.59	50.03	31.54	36.54	43.75	52.52	56.46	60.07	51.30
9	350688	239864	Victoria St (duplicate 2), Hereford	53.32	64.33	72.86	41.70	34.11	42.87	24.38	31.04	52.62	43.30	56.19	46.53	46.94
10	350677	240015	Victoria St (house façade), Hereford	50.00	66.98	56.55	51.50	46.35	50.42	34.48	39.28	48.08	41.09	49.66	55.37	49.15
12	350776	240224	Edgar St Roundabout (Triplicate 1), Hfd	54.92	61.61	49.01	62.04	46.38	51.18	38.80	39.99	52.62	37.98	56.26	55.85	50.55
13	350776	240224	Edgar St Roundabout (Triplicate 2), Hfd	56.27	49.76	49.34	49.17	57.23	56.04	37.15			57.37	43.83	55.35	51.15
14	350776	240224	Edgar St Roundabout (Triplicate 3), Hfd	45.70	62.23	53.85	49.06	44.17	49.04	38.51	42.35	49.49	44.84	39.81	51.05	47.51
15	350948	240905	Newtown Rd/Edgar St, Hereford	43.81	51.25	45.73	38.92	30.89		22.72	27.84	37.72	50.85	40.32		39.01
17	350700	238685	Holme Lacy Rd/Ross Rd traf.lights, Hfd	74.85	64.72	62.57	64.84	49.32	46.88	51.25	46.83	56.15	58.03	63.50	52.02	57.58
19	351681	240412	Commercial St/Railway Bridge, Hfd	39.58	43.61	36.74	34.70	28.99	35.56	18.81	25.18	36.72	34.77	44.88	41.18	35.06
20	350611	241086	Holmer Rd/Newtown Rd island, Hfd	47.66	53.64	49.19	45.37	38.96	49.27	37.45	23.66	30.69	26.37	28.58		39.17
21	350860	240615	Façade Edgar/Moor St(Duplicate 1), Hfd	44.68	54.33	44.18	42.94	33.00	31.83	27.28	30.47	44.55	38.42	41.90	40.72	39.53
22	350860	240615	Façade Edgar/Moor St(Duplicate 2), Hfd	43.49	48.41	40.30	39.40	36.23	35.03	26.03	26.44	36.40	37.72	42.76	42.62	37.90
23	355209	217814	Whitchurch	35.51	48.98	51.31			47.17	36.45	37.61	39.65	43.77	34.65	37.58	41.27
25	360115	225247	Greytree/M50 (vergeside), Ross	39.12	58.06	42.24	29.38	30.11	17.58	25.34	29.68	37.75	38.34	31.75	35.67	34.59

Herefordshire Council

ID	Easting	Northing	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean $\mu\text{g}/\text{m}^3$
30	356328	220999	Post Office, Pencraig	39.02	49.58	42.02	38.36	39.32	39.92	32.07	29.68	48.08	36.76	39.31	41.05	39.60
32	357717	223736	House facade, Weir End	42.61	47.53	43.49	38.00	41.93	41.75	18.36	40.72	43.75	48.63	47.85	50.18	42.07
33	358506	224214	House façade, Wilton	54.40		46.16	39.84	34.70		30.46	27.22	39.62	37.96	38.48	42.07	39.09
36	359963	224096	Gloucester Rd, Ross	41.56	54.52	34.30	34.30	35.23	28.78	20.47	26.32	31.80	31.99		45.15	34.95
37	359936	224446	Swimming Pool, Ross	22.53	23.33	15.92	13.39	11.73	12.70	8.94	10.43	13.40	17.35	19.89	24.14	16.15
38	359819	224016	Church St, Ross	28.74	21.19	20.07	16.57	12.57	14.40	9.73	10.19	15.03	18.15	21.53	30.04	18.18
41	348771	258960	Bargates, Leominster	27.63	26.18	22.12	21.45	19.10	16.08	14.54	14.65	22.17	21.55	20.27	29.22	21.25
44	348040	258770	Ebnal Close, Leominster	19.29	15.32	11.71	9.98	7.70	6.35		6.02	9.28	11.53	15.06	22.01	12.21
45	340421	251766	Bearcroft, Weobley	16.42	12.87	9.32	7.64	5.25	4.90	4.07	4.42	6.35	9.92	12.92	19.34	9.45
46	349409	259010	Bengry's Lights, Leominster	48.93	43.49	43.96	44.17	38.15	40.97	37.27	38.61	42.64	43.06	40.83	51.30	42.78
47	338983	258132	Pembridge	28.91	30.20	22.40	19.99	20.45	20.86	14.70	14.66	20.03	21.39	27.15	28.28	22.42
48	329610	258520	Kington	24.25	22.85			19.01		7.68	9.79	15.55	16.18	21.00	24.58	17.88
49	365440	254620	Bromyard	41.14	44.13	35.12	34.37	28.38	30.77	19.70		29.71	31.72	38.70	41.45	34.11
50	371080	237670	Ledbury Town Centre	30.52	27.65	27.75	24.31	20.62	21.29	21.51	19.49	24.60	26.81	24.39	28.47	24.78
51	359950	224104	Market Place, Ross	45.17	46.20	38.21	36.20	27.96	35.44	21.91	20.39	32.33	31.76	37.75	44.37	34.81
53	350723	239163	House façade, Cross St, Belmont, Hfd	45.82	48.03	42.98	39.95	34.08	33.47	29.33	27.80	32.95	32.97	38.24	35.31	36.74
54	350602	241097	House façade, Holmer Rd, Hereford	40.19	42.83	31.68	29.50	30.04	34.97			45.48	46.62		46.08	38.60
56	350801	240142	Bus Station (adj to Tesco), Hereford	52.87	49.20	42.68	44.37	31.97	32.74	25.39						39.89
57	350499	240108	Shop flat façade, Eign Street, Hereford	60.43	49.73	44.14	42.29	39.29	41.33	28.90	33.43	33.62	38.34	44.49	62.56	43.21
58	351258	240136	Shop flat façade, Union St/ Bath St, Hfd			39.01	36.40	33.50	32.51	22.84	23.34	32.36	33.57	42.21	60.14	35.59
59	350987	240139	Elgars Restaurant (façade), Widemarsh St, Hfd				32.52			18.51		25.01	28.27	27.53	38.28	28.35
60	349430	259015	Connolly's PH, Cursneh Rd, Leominster	38.86	31.79	30.53	26.16	24.74	22.43	22.76		36.72		32.68	43.55	31.02
61	349363	259013	29 Bargates, Leominster	54.66	53.45	60.24	52.79	41.62	45.16	39.05	35.25	47.33	31.14	51.18	46.46	46.53
62	349284	259033	46 Bargates, Leominster	36.34	31.01	29.07	23.90	27.21	24.41	18.06	21.93	28.50	36.65	31.15	34.87	28.59
63	349221	259018	85 Bargates (Radnorshire Arms), Leominster	39.17	34.62	34.68		28.46	32.23	25.33	25.44	33.66	22.11	31.25	38.15	31.37
64	350362	238909	106 Belmont Road (façade),	39.31	37.21	31.46	30.87	26.35	26.01	20.38	21.91	27.35	46.46	32.60	36.00	31.33

Herefordshire Council

ID	Easting	Northing	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean $\mu\text{g}/\text{m}^3$
			Hereford													
65	350086	240296	96 Whitecross Road (façade), Hereford	63.31	65.05	54.11	55.01	51.12	43.86	33.45	37.57	48.90	27.39	54.80	58.69	49.44
67	349158	242261	Roman Road / Three Elms, Hereford	37.42	36.03	27.00	26.20	19.20	21.35	16.38	21.97	25.94	33.62	30.25	38.10	27.79
68	358459	224197	Wilton Road sign	35.59	35.17	19.19	30.57	29.03	29.14	26.01	21.70	34.52	21.42	27.09	36.09	28.79
69	357761	223751	Weir End Road Sign	26.71	37.37	29.32	32.77	25.87	26.94	27.05	21.00	27.96	19.96	35.07	37.73	28.98
70	356288	221076	Pencraig sign	45.92	53.61	43.58	38.90	37.64	37.32	35.85	31.19	42.89	35.91	43.47	44.90	40.93
71	356641	220477	Goodrich	40.15	47.35	45.60	45.71	44.91	40.65	36.62	37.17	47.20	37.15	44.01	46.55	42.76
72	354585	217162	Daf-Y-Nant	42.11	39.52	40.11	37.97	27.14	26.79	0.00	31.46	42.95	45.63	34.11	45.30	34.42
73	348071	242364	(New) Roman Road, Hereford	25.12	24.87	15.64	14.21	10.78	11.45	7.26	9.34	11.61	13.15	21.28	24.28	15.75
74	349985	240334	Whitecross	34.79	32.09	26.75	23.51	19.45	19.43	15.21	18.41	23.27	23.81	28.04	36.17	25.08
75	350511	239740	22 Barton Road, Hereford	41.52	44.58	34.43	31.33	28.80	26.63	18.96	24.75	26.22	34.00	37.40	46.17	32.90
76	351130	240370	St.Thomas Cantilupe	36.35	29.13	26.70	20.78	16.06	15.76	14.74	16.00	22.81	27.77	32.84	37.23	24.68
77	351110	240620	Widemarsh Street	42.90	35.99	37.33	31.33	31.22	31.87	44.56	20.99	32.10	28.69	35.60	46.82	34.95
78	349590	259250	46 Broad Street Leominster	37.74	44.81	39.24	41.81	33.35	33.08	26.18	26.90		33.86	37.23		35.42
79	350472	238999	76 Belmont Road	60.70	52.07	44.88	42.32	41.53	39.43	31.74	34.00	34.74	37.75	44.67	58.05	43.49
80	350107	240297	90 Whitecross								30.60		31.00	44.21	46.22	38.01

CALCULATION OF MONTHLY MULTIPLYER FOR DIFF TUBE DATA BASED ON SPAN GAS CALIBRATIONS														
Multipler derived from UWE	0.95													
Double tube average for Victoria Street	56.62	63.01	69.36	45.65	40.85	46.45	27.96	33.79	48.18	47.91	56.33	53.30	49.12	
Triplicate tube average at Edgar Street	52.29	57.86	50.73	53.42	49.26	52.09	38.15	41.17	51.05	46.73	46.64	54.08	49.46	
Double tube average for façade Edgar/Moor Street	44.08	51.37	42.24	41.17	34.62	33.43	26.66	28.45	40.47	38.07	42.33	41.67	38.71	
Raw data: Edgar Street NO ₂ analyser	30.59	34.52	31.13	29.92	30.30	29.05	18.95	19.09	26.36	29.21	29.96	35.33	28.70	

Appendix E – Estimation of concentrations at nearest receptor calculations

Results from monitoring locations demonstrating exceedances of NO₂ objective or borderline sites have been estimated to nearest receptor location, where appropriate, using the NO₂ distance from road calculator tool available from Defra. A copy of each calculation is provided below and summarised in Table E1

Table E.1 – Summary of Estimations of concentrations at nearest Receptor

Site ID	Location	In AQMA	Tube distance from kerb (m)	Receptor distance from kerb (m)	Local annual mean background NO ₂ (µg/m ³)	Measured annual mean concentration at tube location	Estimation of concentration at nearest receptor
9	Victoria St, Hereford	Y	2.3	3.3	19.44	40.25	38.4
10	Victoria St, Hereford	Y	2.6	3.6	19.44	43.71	41.7
46	Bengry's Lights, Leominster	Y	3.3	4.3	19.44	38.43	37.1
61	29 Bargates, Leominster	Y	2.0	3.0	19.44	47.63	45.0
65	96 Whitecross Road, Hereford	N	1.7	3.0	19.44	40.18	37.5

Figure E.1 – Location 9 NO₂ Distance from road calculation

This calculator allows you to predict the annual mean NO₂ concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph. 

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)? (Note 1)	2.3 metres
Step 2	How far from the KERB is your receptor (in metres)? (Note 1)	3.3 metres
Step 3	What is the local annual mean background NO₂ concentration (in µg/m³)? (Note 2)	19.44 µg/m ³
Step 4	What is your measured annual mean NO₂ concentration (in µg/m³)? (Note 2)	40.25 µg/m ³
Result	The predicted annual mean NO₂ concentration (in µg/m³) at your receptor (Note 3)	38.4 µg/m ³

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at <http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm> for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Issue 4: 25/01/11. Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

Figure E.2 – Location 10 NO₂ Distance from road calculation

This calculator allows you to predict the annual mean NO₂ concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph. 

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)? (Note 1)	2.6 metres
Step 2	How far from the KERB is your receptor (in metres)? (Note 1)	3.6 metres
Step 3	What is the local annual mean background NO₂ concentration (in µg/m³)? (Note 2)	19.44 µg/m ³
Step 4	What is your measured annual mean NO₂ concentration (in µg/m³)? (Note 2)	43.71 µg/m ³
Result	The predicted annual mean NO₂ concentration (in µg/m³) at your receptor (Note 3)	41.7 µg/m ³

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at <http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm> for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Issue 4: 25/01/11. Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

Figure E.3 - Location 46 NO₂ Distance from road calculation

This calculator allows you to predict the annual mean NO₂ concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph. 

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	3.3	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	4.3	metres
Step 3	What is the local annual mean background NO₂ concentration (in µg/m³)?	(Note 2)	19.44	µg/m ³
Step 4	What is your measured annual mean NO₂ concentration (in µg/m³)?	(Note 2)	38.43	µg/m ³
Result	The predicted annual mean NO₂ concentration (in µg/m³) at your receptor	(Note 3)	37.1	µg/m ³

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at <http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm> for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Issue 4: 25/01/11 Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

Figure E.4 - Location 61 NO₂ Distance from road calculation

This calculator allows you to predict the annual mean NO₂ concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph. 

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	3	metres
Step 3	What is the local annual mean background NO₂ concentration (in µg/m³)?	(Note 2)	19.44	µg/m ³
Step 4	What is your measured annual mean NO₂ concentration (in µg/m³)?	(Note 2)	47.63	µg/m ³
Result	The predicted annual mean NO₂ concentration (in µg/m³) at your receptor	(Note 3)	45.0	µg/m ³

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at <http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm> for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Issue 4: 25/01/11 Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

Figure E.5 - Location 65 NO₂ Distance from road calculation

This calculator allows you to predict the annual mean NO₂ concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph. 

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1.7	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	3	metres
Step 3	What is the local annual mean background NO₂ concentration (in µg/m³)?	(Note 2)	19.44	µg/m ³
Step 4	What is your measured annual mean NO₂ concentration (in µg/m³)?	(Note 2)	40.18	µg/m ³
Result	The predicted annual mean NO₂ concentration (in µg/m³) at your receptor	(Note 3)	37.5	µg/m ³

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at <http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm> for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Issue 4: 25/01/11 Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

Appendix F – Air Quality Action Plan Update

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
1	Edgar Street Grid Re-development	To re-locate the livestock market (and therefore its traffic) to an out of town location. To downgrade the inner ring road (Newmarket Street and Blue School Street). Construct new A49/Commercial road link road. Enhanced network for pedestrians and cyclists	Herefordshire Council & Advantage West Midlands formed ESG Herefordshire Ltd		2010 - 2025	Trends in diffusion tube results	<1%	Works have been completed flood alleviation work and land acquisition has commenced on the new link road. Work has been completed on new livestock market site April 2014	Land acquisition has commenced on the new link road.	2025	NO ₂ levels at the city centre sites have been gradually reducing since 2007, although this cannot be attributed to the actual re-development, as works have not yet been completed. NO ₂ data to be reviewed in once action is complete.

Herefordshire Council

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
2	Improvement of A4103 road west of Herefordshire	Improvement of A4103 road west of Herefordshire between Three Elms and Stretton Sugwas. Widening of Road to 2 lanes with roundabout access at west to A438 Brecon Road (inc. Cycle Lane). Improve current signage to direct through traffic along route and by pass city centre	Herefordshire Council - Highways and Transportation		Jun-08		<1%	Road completed 2005 however signage still to be installed to indicate northern east-west bypass		Road completed 2005	Since 2007 NO ₂ levels along the Roman Road have been below the objective. Annual Average Daily Flow trends (AADT) along the Roman Road indicate a continuing increase of traffic since the completion of the improved road and an increase in HGVs until 2008 with a slight reduction in 2009. Traffic data to be reviewed in future report.

Herefordshire Council

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
3	Rotherwas Access Road Link (1st Link)	Re-diect HGV's and some other traffic from the A49 and B4339 Holme Lacy	Herefordshire Council - Highways and Transportation		Jun-08	Annual Average Daily Flow trends (AADT) and diffusion tubes	<1%	Completed June 2008	Completed	Completed	Annual Average Daily Flow trends (AADT) show a reduction in the number of HGVs from 1045 in 2008 to 964 in 2009 however total motor vehicles has increased. Updated traffic data to be reviewed in future reports
4	New Outer Distributer road (2nd Link)	Construction of new road	Herefordshire Council – Highways and Transportation Service		2012 - 2015	Annual Average Daily Flow trends (AADT) and diffusion tubes	<1%	This is being considered as part of the Major Scheme Bid for the Outer Relief Road and will be progressed as part of the emerging Local	A planning application is currently being prepared.	Construct by 2026	Not applicable until road constructed

Herefordshire Council

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
								Development Framework			
5	New Outer Distributer road (3rd Link)	Construction of new road	Herefordshire Council – Highways and Transportation Service		2016-2026	Annual Average Daily Flow trends (AADT) and diffusion tubes	<3%	The potential corridor for the road has been proposed in the Councils Draft Core Strategy	Scope route was undertaken in 2010	Construct by 2026	Not applicable until road constructed

Herefordshire Council

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
6	Alteration of traffic management at the Belmont Round-about	Alteration of traffic management at the roundabout to improve access to new Asda superstore	Highway Agency		2005 - 2006	Diffusion tube at roundabout	<1%	Completed in 2006. New signals are now fully integrated into the Council's SCOOT system and the infrastructure improvements have greatly improved traffic movements	Completed	Completed	The diffusion tube measuring at this roundabout was showing exceedances of the NO ₂ objective in 2006 and 2007 although levels were falling. However, a noticeable reduction in 2008 and 2009, to a level well below the objective level.

Herefordshire Council

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
7	“North & South” Park and ride Scheme in Hereford	Plans for park and ride are currently being developed in an innovative dispersed manor around the radial routes in and our of Hereford city.	Herefordshire Council – Highways and Transportation Service		Timescales are currently undecided	Annual Average Daily Flow trends (AADT) and diffusion tubes		No longer being taken forward			
8	Parking Strategy in Hereford to reduce commuter parking	Zonal charging system to deter long stay parking in the central area	Herefordshire Council – Highways and Transportation Service and Planning Services			Annual Average Daily Flow trends (AADT) and diffusion tubes		No longer being taken forward. Alternative parking strategy in place			
9	Improve and increase number of cycle routes and facilities in Hereford	To encourage motorists to transfer to cycling as their commuter/ shopper/ leisure trip travel mode	Herefordshire Council – Highways and Transportation Service		Ongoing	Diffusion tubes		1.5km of the Great Western Way was completed in 2008 along with a cycle lane along Aylestone Hill. Connect 2 Rotherwas Cycle Link currently in progress	Riverside signing project between Belmont and Rotherwas was completed.	Rotherwas Cycle Link currently in progress – Completed Dec 2013	NO ₂ levels at the city centre sites have been gradually reducing since 2007

Herefordshire Council

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
10	City Centre Pedestrian Enhancement in Hereford	Experimental 10.30 – 4.30pm pedestrianisation of Widemarsh Street and High Street	Herefordshire Council – Highways and Transportation Service		2005	Diffusion tubes at Widemarsh Street, Broad Street and Edgar Street sites		Completed in 2006	Completed in 2006	Completed in 2006	NO ₂ levels at Site 6 (Broad Street) and Site 59 (Elgars, Widemarsh St) have remained at or below 75% of the objective for the last 5 year trend, following the introduction of the scheme. Sites 12, 13 and 14 (Edgar Street) are no longer monitored.

Herefordshire Council

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
11	Behavioural Change Programme	Ongoing programme of promotions and initiatives in place and practical easures to support behaviour change	Herefordshire Council – Highways and Transportation Service			Diffusion tubes		Ongoing programme of promotions and initiatives in place and practical measure to support behaviour change. Examples include free cycle training to adults and school children and the promotion of TwoShare, the council's car-sharing scheme	Ongoing	Ongoing	NO ₂ levels throughout the county have fallen in 2009 and the majority of AADT flows are less in 2009 than in 2008. Recent air quality & traffic data to be reviewed in future reports.
12	Designation of a Traffic manager for network management Duties along the A49 in Hereford	To improve road working liaison and notification procedure between Highway Agency and contractors on A49	Highway Agency and Hereford-shire Council			Diffusion tubes along A49 corridor		Completed 2008	Completed 2008	Completed 2008	NO ₂ levels at the sites along the A49 have been gradually reducing since 2007. Recent air quality data

Herefordshire Council

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
											to be reviewed.
13	Continue to implement Vehicle Emission Testing in Hereford	Random vehicle emission testing in the Hereford HQMA with Vehicle & Operators Services Agency (VOSA)	District Council – Environmental Health and Trading Standards		Annually from 2000	Review of necessity dependant upon number of vehicles failing.		Commenced in 2000 and was carried out every year until 2007. A dramatic continual improvement in exhaust emissions with the Hereford AQMA noted each year. No failures in 2006 and 2007.	None carried out – conclusion that no testing needed as 100% in last two years of monitored, likely due to newer vehicles/improving vehicle technology	Completed	100% compliance in 2006 and 2007
14	Information and awareness training	Improved website information on air quality	Herefordshire Environmental Health and Trading Standards		Ongoing improvement of website material on air quality	Number of hits on the website					Currently unable to quantify

