2013 Air Quality Progress Report for Stratford-on-Avon District Council

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

May 2013

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Executive Summary

This report presents the findings of Stratford-on-Avon District Council's 2013 air quality Progress Report (PR). The PR evaluates new sources since the 2012 Updating and Screening Assessment to identify those that may give rise to a risk of an exceedence of an air quality objective. Results from monitoring within the District are also presented and evaluated in relation to the objectives. Where a risk of an exceedence is identified at a relevant location, the Council will proceed to a Detailed Assessment.

Previous Review and Assessments have concluded that concentrations of carbon monoxide, benzene, 1,3-butadiene, lead, sulphur dioxide and PM_{10} are compliant with the relevant objectives. Air Quality Management Areas (AQMAs) have however been declared for exceedences of the annual mean nitrogen dioxide objective.

Long-term monitoring data shows that there have been significant improvements in air quality across the District over the last five years. Monitoring data for 2011 and 2012 indicate that there are no longer any measured exceedences within the Stratford-upon-Avon AQMA; only one monitoring site, within the Studley AQMA, exceeded the annual mean objective in 2012.

The PR has not identified any significant increases in measured concentrations, or any significant new emissions sources within the Stratford-on-Avon District Council area. It will therefore not be necessary to proceed to a Detailed Assessment.

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1 Introduction

1.1 Description of Local Authority Area

Stratford-on-Avon is a mostly rural district and covers most of the southern half of Warwickshire. As well as Stratford-upon-Avon, the district also includes the towns of Alcester, Southam, and Shipston-on-Stour, and the large villages of Studley and Wellesbourne.

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 exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

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

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

1.3 Air Quality Objectives

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

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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25μg/m^3	Running annual mean	31.12.2003
	5.0μg/m^3	Annual mean	31.12.2010
1,3-Butadiene	2.25μg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10.0mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5μg/m^3	Annual mean	31.12.2004
	0.25μg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200μg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40μg/m^3	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50μg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40μg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350μg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125μg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266μg/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

During the first Round of Review and Assessment, Stratford-on-Avon District Council concluded that air quality across the District was good, and that there was no requirement to declare an Air Quality Management Area for any pollutant.

The 2003 Updating and Screening Assessment, prepared at the start of the second round of Review and Assessment identified one location, in Alcester Road, Studley, where the nitrogen dioxide objective may not be met. A Detailed Assessment was subsequently carried out in 2004, however, this concluded that the nitrogen dioxide objectives would not be exceeded in 2005 at any location within central Studley. An Air Quality Management Area was not therefore declared. Further monitoring in the area however confirmed that there were in fact exceedences of the annual mean objective during 2005, and an AQMA was declared in 2006 (Figure 1.1).

The 2006 Updating and Screening Assessment, prepared at the start of the third round of Review and Assessment, confirmed the findings of the second round. High nitrogen dioxide concentrations were measured in Wood Street, Stratford-upon-Avon and additional monitoring was established to investigate this.

The 2008 Progress Report considered monitoring data available since the 2006 Updating and Screening Assessment. The report concluded that there were exceedences of the annual mean nitrogen dioxide objective at relevant locations outside of the Studley AQMA. These locations were identified as Henley-in-Arden and Wood Street, Grove Road, Greenhill Street and Tiddington Road in Stratford-upon-Avon. The Council therefore proceeded to undertake a Detailed Assessment at these locations.

The 2008 Detailed Assessment concluded that AQMAs were required in both Henley-in-Arden and Stratford-upon-Avon. An AQMA was subsequently declared for Stratford-upon-Avon, and following the Further Assessment carried out in 2010, the area was expanded (Figure 1.2). An AQMA was not declared in Henley-in-Arden, and subsequent monitoring confirms that an AQMA is no longer required.

The 2010 Progress Report concluded that there were no significant changes to air quality within the District, and that a Detailed Assessment was not necessary. The 2012 Updating and Screening Assessment considered new monitoring data for 2010 and 2011, and changes to sources since the 2009 Updating and Screening Assessment. Significant reductions in measured concentrations over the last five years were demonstrated, no significant changes to sources of emissions were identified, and it was not considered necessary to proceed to a Detailed Assessment.

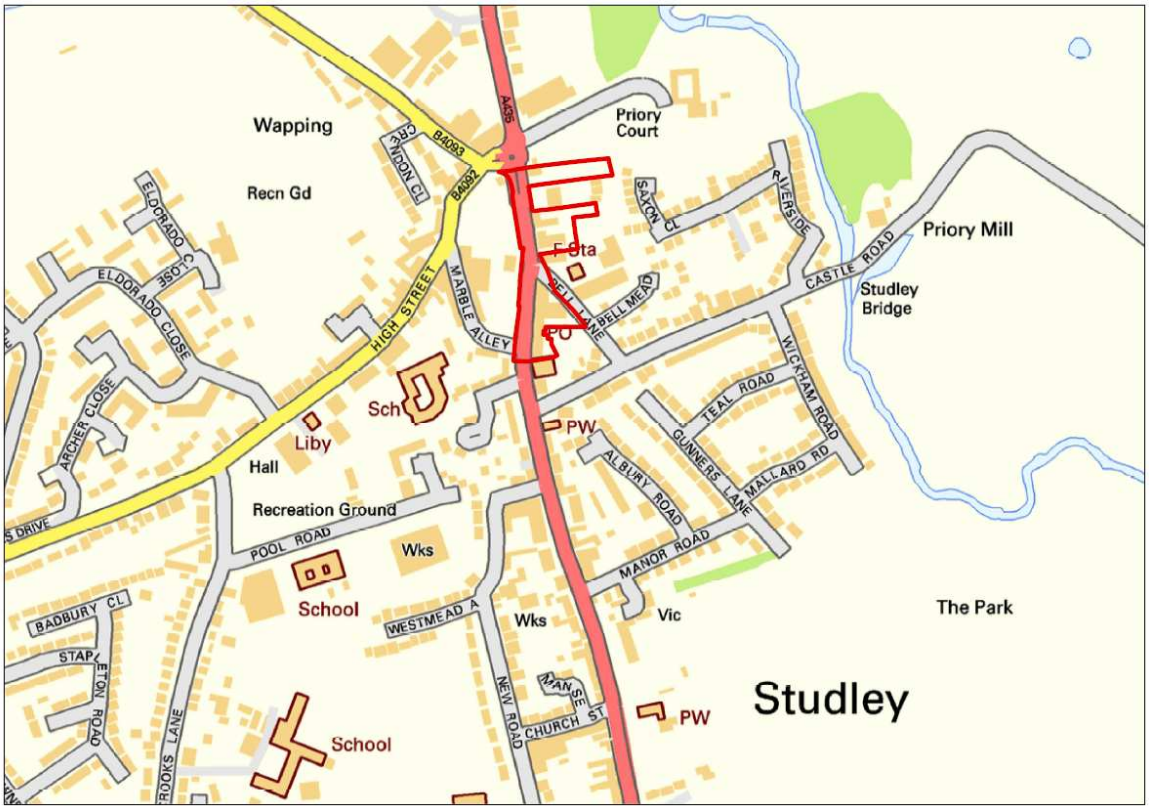


Figure 1.1 Studley AQMA Boundary Contains Ordnance Survey data © Crown copyright and database right [2013]

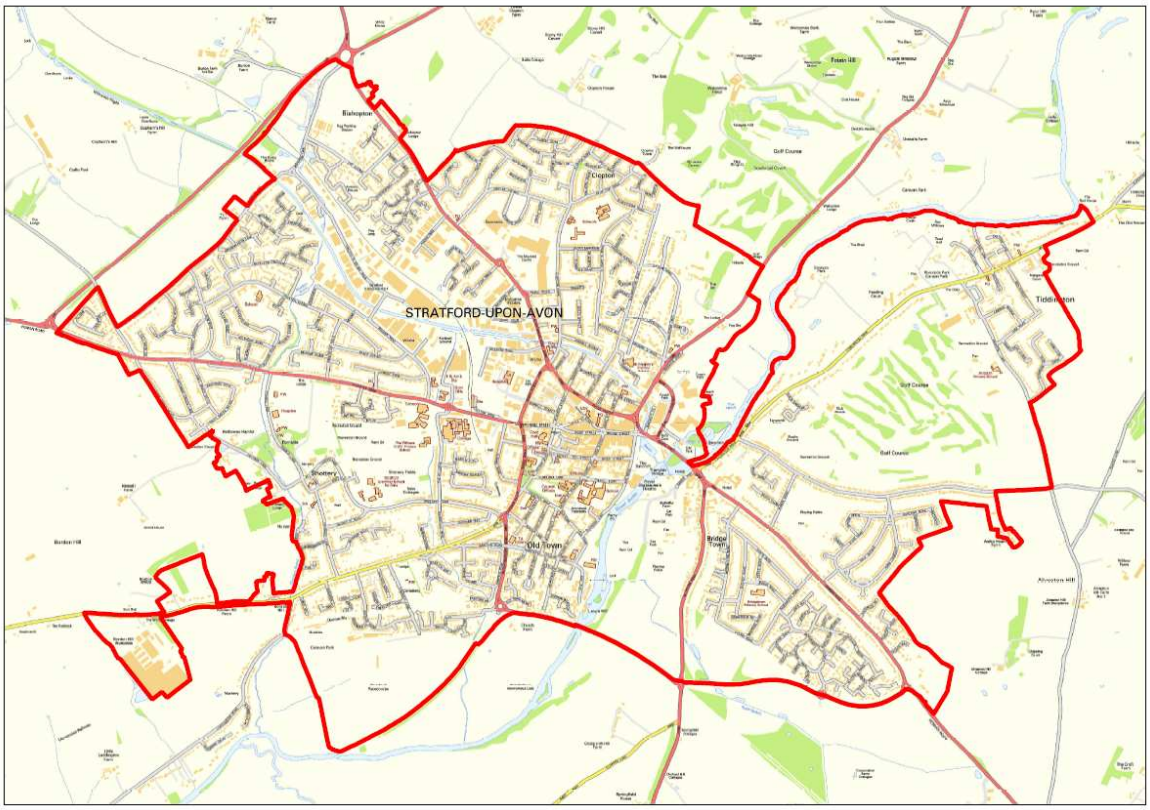


Figure 1.2 Stratford-upon-Avon AQMA Boundary Contains Ordnance Survey data © Crown copyright and database right [2013]

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Stratford-on-Avon District Council does not carry out any automatic monitoring.

2.1.2 Non-Automatic Monitoring Sites

This report presents monitoring data collected since 2007 for twenty-nine monitoring locations. During 2012, Stratford-on-Avon District Council monitored annual mean nitrogen dioxide concentrations using passive diffusion tubes at twenty-one locations across its area (Figures 2.1 – 2.4). Table 2.1 provides details of each of the monitoring sites. Maps of decommissioned monitoring sites are provided in Appendix B.

The diffusion tubes are prepared and analysed by Kent Scientific Services using the 20% TEA in water method. Tubes are changed on a monthly basis. Further details of the diffusion tube QA/QC is presented in Appendix A.

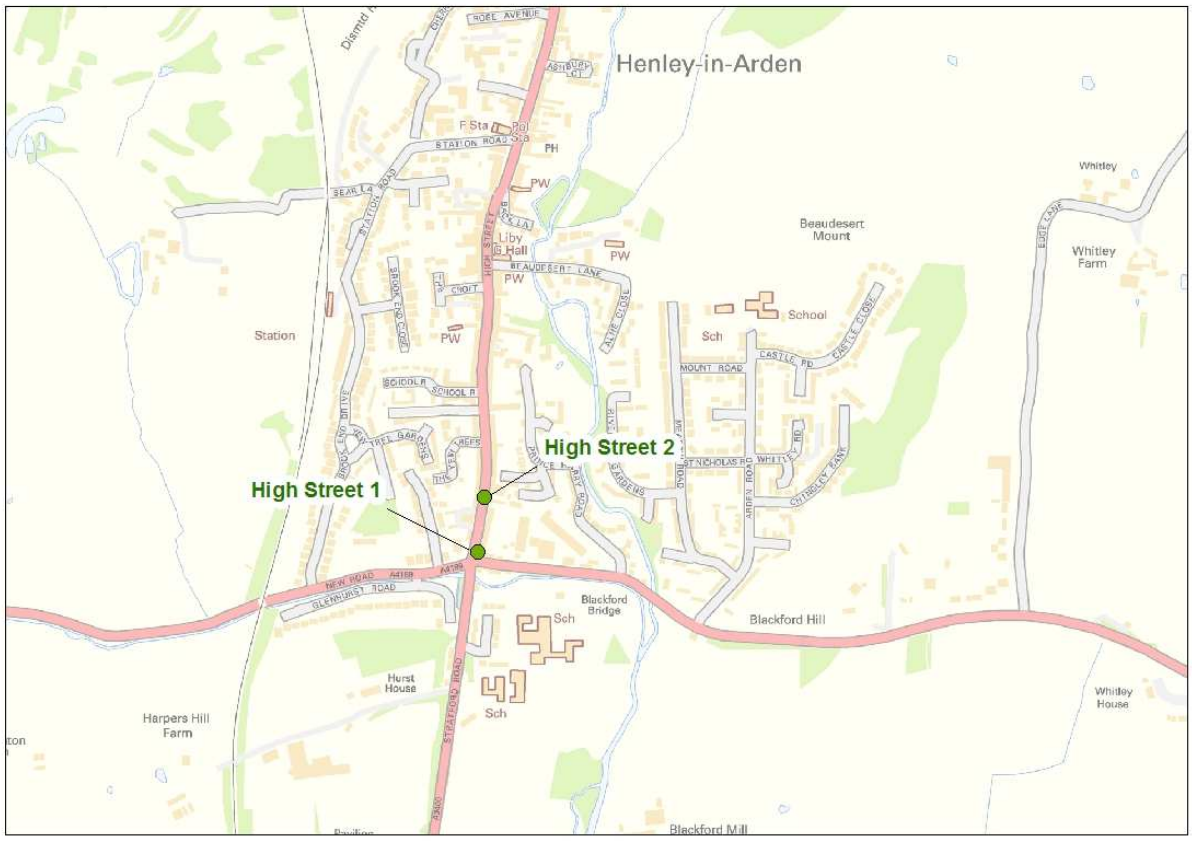


Figure 2.1 Diffusion Tube Monitoring Sites in Henley-in-Arden Contains Ordnance Survey data © Crown copyright and database right [2013]

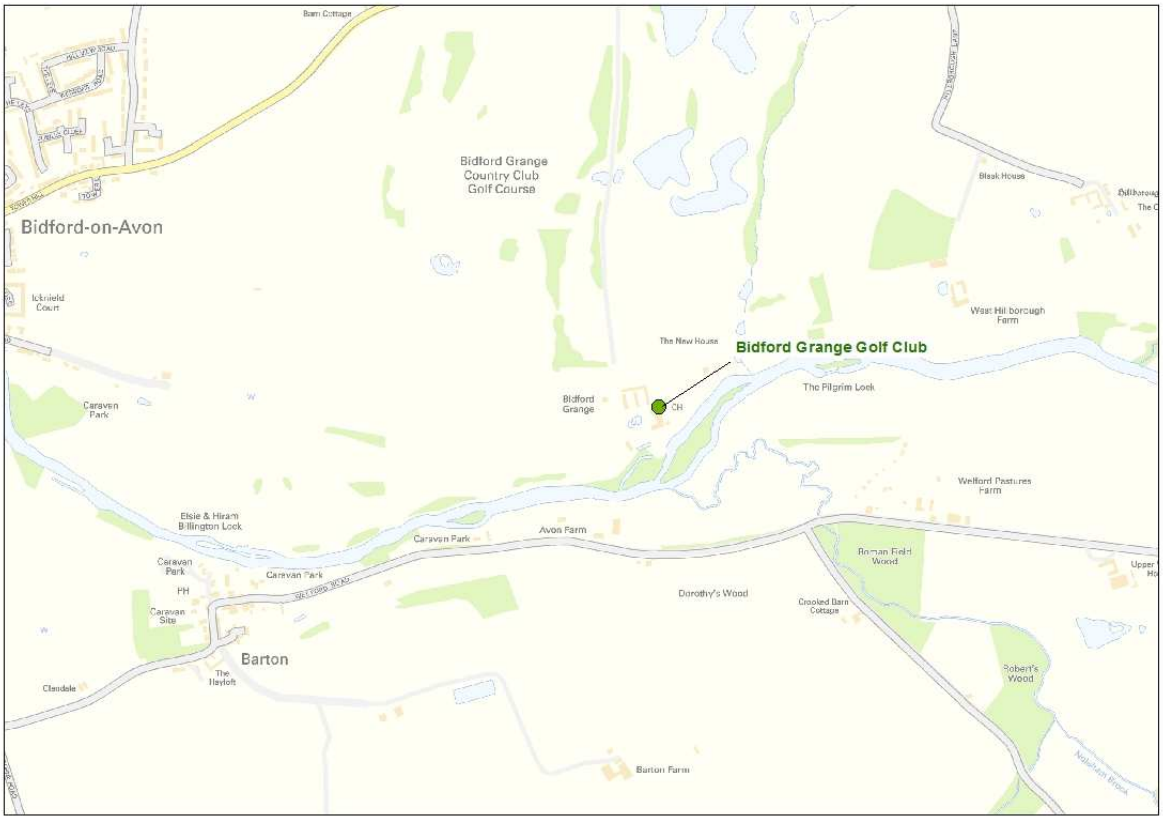


Figure 2.2 Diffusion Tube Monitoring Sites in Bidford-on-Avon Contains Ordnance Survey data © Crown copyright and database right [2013]

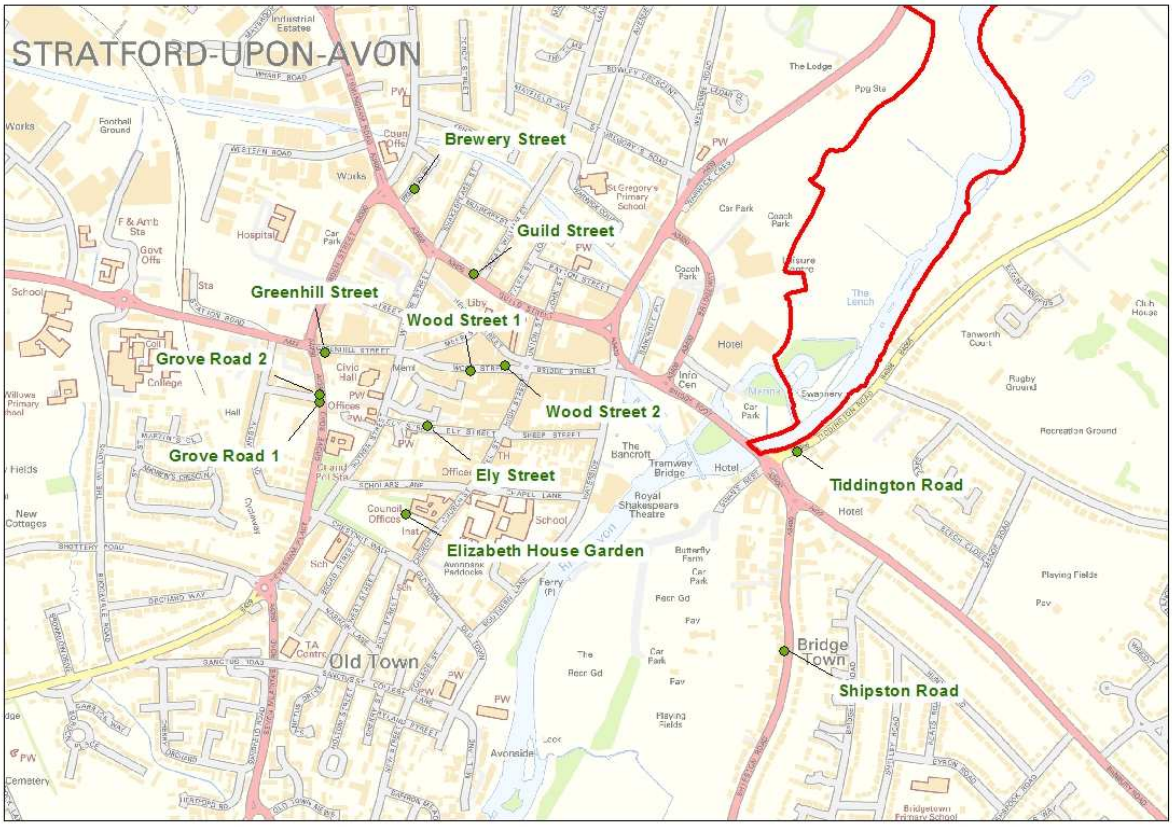


Figure 2.3 Diffusion Tube Monitoring Sites in Stratford-upon-Avon Contains Ordnance Survey data © Crown copyright and database right [2013]

Figure 2.4 Diffusion Tube Monitoring Sites in Studley Contains Ordnance Survey data © Crown copyright and database right [2013]

Table 2.1 Details of Nitrogen Dioxide Diffusion Tube Monitoring Sites

Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	In AQMA?	Relevant Exposure?	Distance to kerb of nearest road	Does this location represent worst-case exposure?
Henley-in-Arden							
High Street 1	Roadside (façade)	415078	265542	N	Y	4.0	Y
High Street 2	Kerbside (façade)	415089	265631	N	Y	1.5	N
Bidford-on-Avon							
Bidford Grange Golf Club	Background	411719	251629	N	N	n/a	n/a
Stratford-upon-Avon							
Elizabeth House Garden	Urban Background	419931	254693	Y	N	59.7	n/a
Shipston Road	Roadside	420683	254421	Y	Y	6.0	N
Brewery Street	Urban Background	419948	255342	Y	Y	43.5	n/a
Guild Street	Roadside	420066	255172	Y	Y	1.6	Y
Tiddington Road	Kerbside	420710	254818	Y	Y	1.0	Y
Wood Street 1	Roadside	420059	254978	Y	Y	2.3	N
Ely Street	Roadside	419972	254869	Y	Y	1.8	N
Grove Road 1	Roadside	419759	254917	Y	Y	1.4	Y
Greenhill Street	Roadside	419768	255016	Y	Y	2.7	Y
Grove Road 2	Roadside	419758	254931	Y	Y	1.4	Y
Wood Street 2	Roadside	420127	254990	Y	Y	3.1	Y
Studley							
Alcester Road	Roadside	407300	263873	Y	Y	2.7	Y
Studley office	Roadside	407309	263991	Y	Y	14.4	N
Studley 1	Roadside	407300	263986	Y	Y	3.5	Y
Studley 2	Roadside	407302	263913	Y	Y	2.5	Y
Studley 3	Roadside	407301	263901	Y	Y	2.3	Y
Studley 4	Roadside	407297	263850	Y	Y	1.5	Y
Studley 5	Roadside	407322	263716	N	Y	3.0	Y
Decommissioned							
High Street	Roadside	407210	263988	N	Y	2.6	Y
Redditch Road	Roadside	407193	264088	N	Y	2.0	Y
Alcester High Street	Roadside	408957	257364	N	Y	1.5	N
Shipston on Stour	Roadside	425896	240530	N	Y	1.5	Y
Wellesbourne	Roadside	427988	255437	N	Y	8.1	N
Bidford on Avon	Rural	409915	251807	N	Y	n/a	n/a
Southam	Roadside	441839	261770	N	Y	9.5	N
Bridgefoot Multistorey Car Park	Other	420435	255054	N	N	58.3	n/a

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Stratford-on-Avon District Council does not carry out any automatic monitoring.

Diffusion Tube Monitoring Data

Measured concentrations at the 21 diffusion tube monitoring sites which were operational in 2012 are presented in Tables 2.2. Concentrations since 2007, at all sites where monitoring data are available, are presented in Table 2.3.

Data capture for a number of the diffusion tube sites was below 75%, and these data have been annualised following guidance in LAQM.TG(09). Further details are presented in Appendix A. The national bias adjustment factor has been applied to the diffusion tube data. Further details are provided in Appendix A.

Exceedences of the annual mean objective were measured at one site during 2012. This measured exceedence is within the existing Studley AQMA. Alongside Alcester Road within the AQMA, relevant exposure exists at first floor only, and therefore concentrations will be slightly lower than those measured. In 2012, there were no measured exceedences of the annual mean nitrogen dioxide objective within the Stratford-upon-Avon AQMA for the second year running.

Between 2011 and 2012, concentrations continued to reduce at the majority of the sites. Figures 2.5 - 2.6 present data for those sites where at least five years of data are available. Between 2007 and 2012, concentrations have decreased by, on average, 26% (ranging from 4%-43%). Within the Studley AQMA, concentrations have reduced by an average of 17% (ranging from 9%-25%) between 2010 and 2012.

Table 2.2 Results of Nitrogen Dioxide Diffusion Tubes in 2012 (Bias Adjusted)

Site	Site Type	In AQMA?	Triplicate or Co-located?	Data Capture (Months)	2012 Annual Mean Concentration ($\mu g/m^3$)
Henley-in-Arden					
High Street 1	Roadside	N	N	12	34.5
High Street 2	Kerbside	N	N	12	28.5
Bidford-on-Avon					
Bidford Grange Golf Club	Background	N	N	6	10.2*
Stratford-upon-Avon					
Elizabeth House Garden	Urban Background	Y	N	8	14.4*
Shipston Road	Roadside	Y	N	12	20.9
Brewery Street	Urban Background	Y	N	12	18.3
Guild Street	Roadside	Y	N	9	26.5
Tiddington Road	Kerbside	Y	N	12	36.5
Wood Street 1	Roadside	Y	N	8	27.2*
Ely Street	Roadside	Y	N	11	23.1
Grove Road 1	Roadside	Y	N	10	37.1
Greenhill Street	Roadside	Y	N	7	32.7*
Grove Road 2	Roadside	Y	N	11	35.7
Wood Street 2	Roadside	Y	N	8	31.9*
Studley					
Alcester Road	Roadside	Y	N	12	39.7
Studley office	Roadside	Y	N	12	20.5
Studley 1	Roadside	Y	N	11	32.6
Studley 2	Roadside	Y	N	11	34.0
Studley 3	Roadside	Y	N	12	38.8
Studley 4	Roadside	Y	N	9	**43.2**
Studley 5	Roadside	N	N	10	25.5
Objective					**40**

* Annualised (see Appendix A for further details)

Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes, 2007 to 2012 (Bias Adjusted)

Site	Site Type	In AQMA ?	Annual Mean Concentration (µg/m^3)					
			2007 [1.01]	2008 [0.91]	2009 [0.83]	2010 [0.78]	2011 [0.77]	2012 [0.82]
Henley-in-Arden								
High Street 1	Roadside	N	**43.7**	**40.0**	37.6	39.4	33.9	34.5
High Street 2	Kerbside	N	**50.0**	**45.5**	33.7	35.7	30.4	28.5
Bidford-on-Avon								
Bidford Grange Golf Club	Background	N	14.4	12.7	12.1	12.2	8.6	10.2
Stratford-upon-Avon								
Elizabeth House Garden	Urban Background	Y	14.7	15.6	13.7	17.4	12.4	14.4
Shipston Road	Roadside	Y	26.7	25.5	23.2	24.1	21.8	20.9
Brewery Street	Urban Background	Y	23.9	22.4	23.6	23.4	18.1	18.3
Guild Street	Roadside	Y	38.2	34.4	34.2	31.4	27.1	26.5
Tiddington Road	Kerbside	Y	**50.2**	**49.6**	**44.5**	**42.5**	37.7	36.5
Wood Street 1	Roadside	Y	**44.6**	**45.2**	**43.3**	39.4	37.7	27.2
Ely Street	Roadside	Y	24.1	25.6	23.9	24.1	18.0	23.1
Grove Road 1	Roadside	Y	**47.8**	**47.0**	**44.9**	**43.7**	36.9	37.1
Greenhill Street	Roadside	Y	**47.2**	**40.9**	**43.2**	**41.0**	34.3	32.7
Grove Road 2	Roadside	Y	**42.8**	**44.6**	**43.4**	**42.1**	36.4	35.7
Wood Street 2	Roadside	Y	**45.1**	**44.6**	**41.5**	**43.5**	36.8	31.9
Studley								
Alcester Road	Roadside	Y	**51.8**	**48.6**	**46.4**	**45.1**	**42.8**	39.7
Studley office	Roadside	Y	27.9	25.0	24.0	26.1	20.7	20.5
Studley 1	Roadside	Y	-	-	-	38.6	25.0	32.6
Studley 2	Roadside	Y	-	-	-	37.7	35.4	34.0
Studley 3	Roadside	Y	-	-	-	**42.6**	38.2	38.8
Studley 4	Roadside	Y	-	-	-	**57.1**	**49.2**	**43.2**
Studley 5	Roadside	N	-	-	-	33.9	26.9	25.5
Decommissioned								
High Street	Roadside	N	-	-	-	33.9	28.6	-
Redditch Road	Roadside	N	-	-	-	26.1	23.8	-
Alcester High Street	Roadside	N	29.5	27.8	26.7	-	-	-
Shipston on Stour	Roadside	N	28.1	27.2	27.7	-	-	-
Wellesbourne	Roadside	N	20.4	18.9	30.1	-	-	-
Bidford on Avon	Rural	N	36.8	29.8	28.5	-	-	-
Southam	Roadside	N	25.9	25.0	23.3	-	-	-
Bridgefoot Multistorey Car Park	Other	N	26.4	25.4	-	-	-	-
Objective			**40**	**40**	**40**	**40**	**40**	**40**

Figure 2.5 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites in Henley-in-Arden, Bidford-on-Avon and Studley

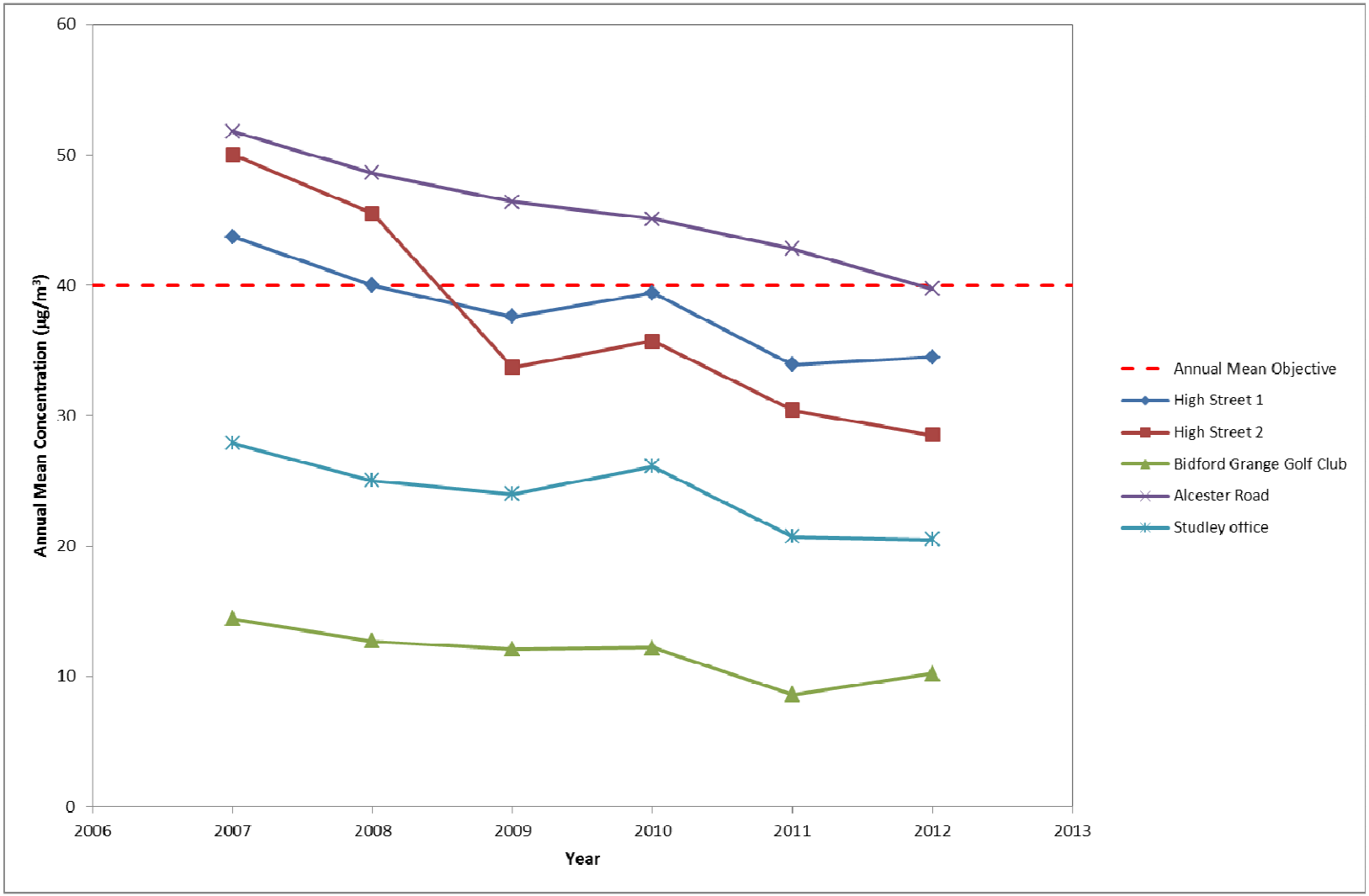
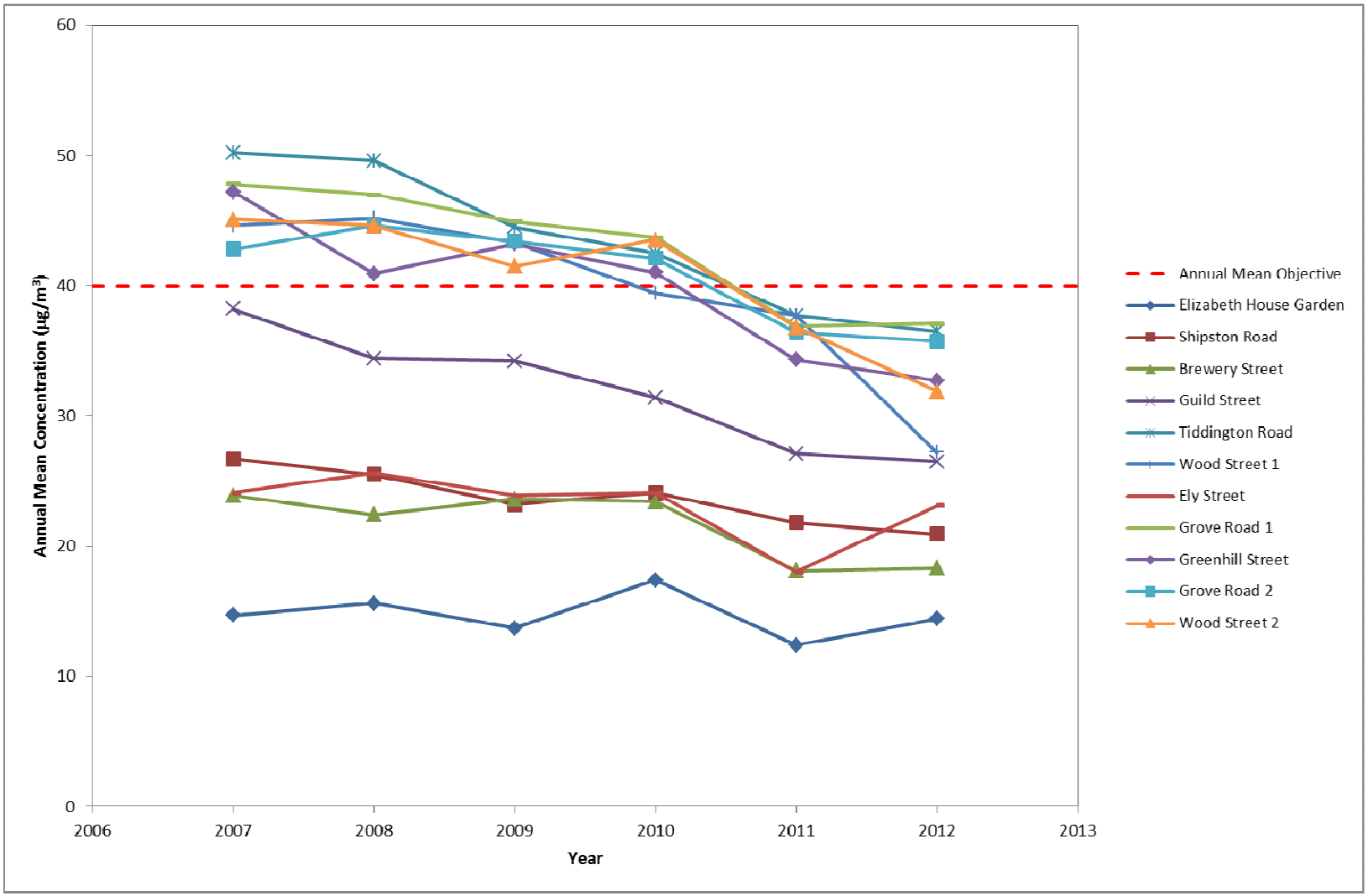


Figure 2.6 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites in Stratford-upon-Avon



2.2.1 PM_{10}

PM_{10} is not monitored within the Stratford-on-Avon District Council area.

2.2.2 Sulphur Dioxide

Sulphur Dioxide is not monitored within the Stratford-on-Avon District Council area.

2.2.3 Benzene

Benzene is not monitored within the Stratford-on-Avon District Council area.

2.2.4 Other pollutants monitored

No other pollutants are monitored within the Stratford-on-Avon District Council area.

2.2.5 Summary of Compliance with AQS Objectives

Stratford-on-Avon District Council has examined the results from monitoring in the District. Concentrations are below the objectives at all but one location, which lies within the existing Studley AQMA. There is therefore no need to proceed to a Detailed Assessment.

3 New Local Developments

Stratford-on-Avon District Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area since the 2012 Updating and Screening Assessment.

Stratford-on-Avon District Council confirms that all the following have been considered:

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

4 Local / Regional Air Quality Strategy

Stratford-on-Avon District Council does not have a Local Air Quality Strategy; however, Warwickshire County Council included a county-wide Air Quality Strategy within the Local Transport Plan 2011-2026. The strategy recognises that road transport emissions are the main contributor to poor air quality within Warwickshire, and that many schemes and initiatives identified in Air Quality Action Plans have common approaches to those identified within the LTP.

The objectives of the Air Quality Strategy are:

- To address air quality issues that have, or will arise, due to transport-related issues;
- To inform and complement the County Council's wider policies on transport contained in the LTP;
- To take a proactive, rather than a reactive approach, to dealing with future air quality issues and taking measures to minimise them before they occur;
- To create a realistic, deliverable Action Plan with schemes and initiatives for improving air quality related to transport issues within the County; and
- To integrate the Strategy fully within the Local Transport Plan, complementing the schemes and objectives contained in other parts of the document.

5 Planning Applications

No planning applications for major developments with the potential to significantly impact air quality have been identified since the 2012 Updating and Screening assessment was prepared.

6 Air Quality Planning Policies

There have been no significant changes to air quality planning policies within Stratford-on-Avon. The Development Plan for Stratford-on-Avon District continues to comprise the West Midlands Regional Spatial Strategy, saved policies from Warwickshire Structure Plan (relevant policies relate to transport) and the Local Plan (saved policies).

In 2012, the draft Core Strategy, which will set out the strategic context for new developments in the District until 2028, was consulted upon. The draft Core Strategy identifies the Air Quality Management Areas declared within the District. It recognises the contribution traffic has within these areas, and the need for developers to demonstrate that air quality will not deteriorate as a consequence of development proposals, or that appropriate mitigation can be applied to reduce the impact.

Policy CS 28 Transport and Communication states:

"*The District council will support those transport schemes identified…., subject to the outcome of assessment where appropriate.*

Small-scale schemes and initiatives that address local problems of accessibility, road safety, parking, congestion and air quality will be supported."

7 Local Transport Plans and Strategies

The Warwickshire Local Transport Plan 2011 – 2026 (LTP3) was adopted April 2011. The LTP3 sets out the transport strategy and policies for the County, and was developed in collaboration with a range of stakeholders. One of the key objectives of the LTP3 is:

"*To reduce the impact of transport on people and the [built and natural] environment and improve the journey experience of transport users*."

In particular, within Stratford-on-Avon:

"*To deliver improvements that reduce the environmental impact of traffic within the District and improve local air quality in existing Air Quality Management Areas*."

The LTP3 aims to improve air quality by improving congestion / reducing traffic and encouraging people to use more sustainable modes of transport. The LTP3 recognises that transport emissions are a major contributor to the poor air quality within the county; and that a number of measures exist which can potentially alleviate the air quality problems, but that these measures must be far reaching in order to avoid simply displacing the problem.

8 Climate Change Strategies

There have been no changes to the Stratford-on-Avon DC climate change policy (adopted 2004), which states:

"*Through its work the Council will seek to:*

1. *Reduce greenhouse gas emissions including:*
    a. *Reducing greenhouse gas emissions through Home energy conservation*
    b. *Reducing energy use by SDC*
    c. *Reducing council transport-related emissions*
    d. *Reducing emissions from transport*
2. *Encourage the provision and use of energy from renewable sources*
3. *Raise public awareness of the issues of Climate Change*
4. *Adapt to meet the effects of Climate Change.*"

The Warwickshire Local Transport Plan (LTP3) works towards National Transport Goals, and includes Objective 6, which aims:

"To reduce transport's emissions of carbon dioxide and other greenhouse gases, and address the need to adapt to climate change."

The LTP3 aims to reduce transport related carbon emissions by:

- "*Promoting and enabling a shift to more sustainable forms of transport;*
- *Reducing vehicle miles by reducing the need to travel and influencing the pattern of journeys;*
- *Promoting more efficient fuel usage through changes in speed and driver behaviour;*
- *Adopting more sustainable options for street lighting and signs; and*
- *Use of recycled materials in maintenance activities*."

9 Implementation of Action Plans

There has been no further progress made with the Studley Air Quality Action Plan (AQAP), and the Stratford-upon-Avon AQAP process has not been started. The monitoring data presented in this report suggest that air quality has improved significantly within each AQMA without any intervention.

In 2011 and 2012, measured concentrations within the Stratford-upon-Avon AQMA were below the annual mean objective at all locations. Consequently, a meaningful Action Plan is not warranted. An Action Plan for this area will be considered should concentrations increase in future, however should concentrations remain below the objective in 2013, consideration will be given to the revocation of the Stratford-upon-Avon AQMA.

Many of the proposed Action Plan measures set out in the draft Studley Action Plan are the responsibility of the County Council and are outwith the control of the District Council. The LTP3 recognises that high traffic volumes, including large numbers of HGVs, on the A435 through Studley contribute to the poor air quality within the AQMA. Proposals for a Studley bypass were withdrawn, however the County Council propose to continue working with the District Council to investigate alternatives.

Further consultation will be made with the County Council to consider which measures remain appropriate and the Action Plan will be updated and finalised. Given the significant reduction in concentrations within Studley in recent years without the implementation of specific measures, and the limited extent of the exceedence in 2012 (one monitoring location), the benefits of updating the Action Plan are considered limited.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

Measured concentrations have decreased significantly over the last five years. In 2012, there was only one measured exceedence, at a monitoring site within the existing Studley AQMA. There is no need to proceed to a Detailed Assessment based on the results of monitoring within the Stratford-on-Avon DC area.

10.2 Conclusions relating to New Local Developments

The Progress Report has not identified any significant changes to emissions sources within the Stratford-on-Avon District Council area that will lead to a deterioration in air quality. There have been no new road traffic, other transport, industrial, commercial, domestic or fugitive sources of emissions for which a more Detailed Assessment is required.

10.3 Proposed Actions

A Progress Report will be submitted to Defra in April 2014.

The draft Studley Action Plan will be revisited and updated where necessary.

11 References

Defra (2009) Review & Assessment: Technical Guidance LAQM.TG(09), available at: http://archive.defra.gov.uk/environment/quality/air/airquality/local/guidance/documents/tech-guidance-laqm-tg-09.pdf

Defra (2013) Data Archive, available at: http://uk-air.defra.gov.uk/data/

Appendices

Appendix A: QA/QC of Diffusion Tube Data

Appendix B: Maps of Decommissioned Diffusion Tube Monitoring Sites

Appendix A: QA/QC of Diffusion Tube Data

Diffusion Tube Bias Adjustment Factor

The national bias adjustment factor for diffusion tubes supplied and analysed by Kent Scientific Services, 20% TEA in water for 2012 is 0.82. This factor is taken from spreadsheet version 03/13. This factor has been applied to all 2012 diffusion tube data presented in this report.

WASP

Kent Scientific Services take part in the Workplace Analysis Scheme for Proficiency (WASP), operated by the Health and Safety Laboratory (HSL). During 2012, on average, 87.5% of samples were determined to have been satisfactory (1st quarter: 75%; 2nd quarter: 100%; 3rd quarter: 75%, 4th quarter: 100%).

Short-term to Long-term Data Adjustment (Annualisation)

Where diffusion tubes were lost during the year, resulting in less than 9 months of data, the resulting period mean is not directly comparable to the objective. Therefore, in accordance with the guidance set out in Box 3.2 of LAQM.TG(09), the data have been adjusted to an annual mean, based on the ratio of concentrations during the short-term monitoring period to those over the 2012 calendar year. This has utilised data from three background sites operated as part of the Automatic Urban and Rural Network (AURN) where long-term data are available (with data capture >90%).

The annual mean nitrogen dioxide concentrations and the period means for each of the monitoring sites from which adjustment factors have been calculated are presented in the tables below, along with the Ratio applied.

July – December 2012

Site	Site Type	2012 Annual Mean	Period Mean	Ratio
Birmingham Tyburn	Urban Background	32.2	31.6	1.019
Leamington Spa	Urban Background	20.7	19.3	1.070
Leominster	Urban Background	8.9	8.9	0.995
			Average	1.028

January – February, July – December 2012

Site	Site Type	2012 Annual Mean	Period Mean	Ratio
Birmingham Tyburn	Urban Background	32.2	33.8	0.952
Leamington Spa	Urban Background	20.7	21.6	0.955
Leominster	Urban Background	8.9	9.0	0.990
			Average	0.966

January – July, November 2012

Site	Site Type	2012 Annual Mean	Period Mean	Ratio
Birmingham Tyburn	Urban Background	32.2	32.5	0.990
Leamington Spa	Urban Background	20.7	21.3	0.972
Leominster	Urban Background	8.9	8.9	0.993
			Average	0.985

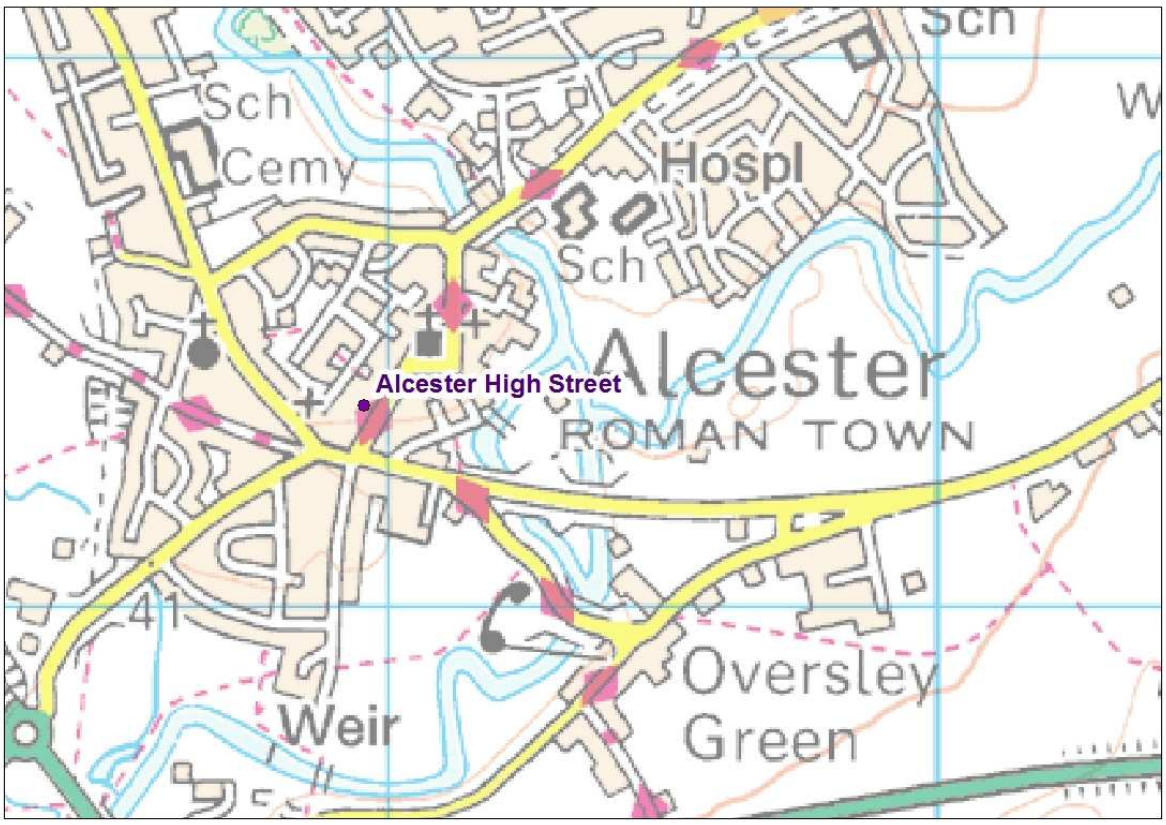
January – April, July, September – October 2012

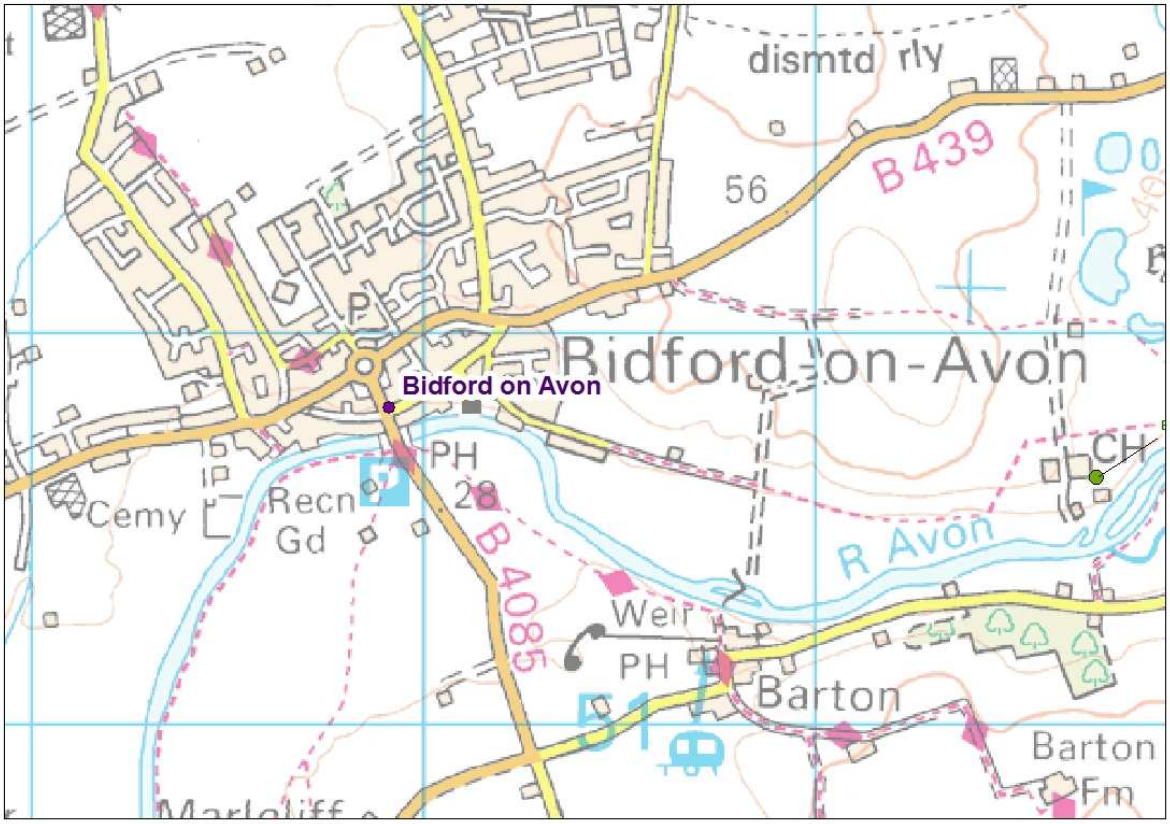
Site	Site Type	2012 Annual Mean	Period Mean	Ratio
Birmingham Tyburn	Urban Background	32.2	33.8	0.952
Leamington Spa	Urban Background	20.7	21.9	0.942
Leominster	Urban Background	8.9	8.9	1.000
			Average	0.964

February – May, September – December 2012

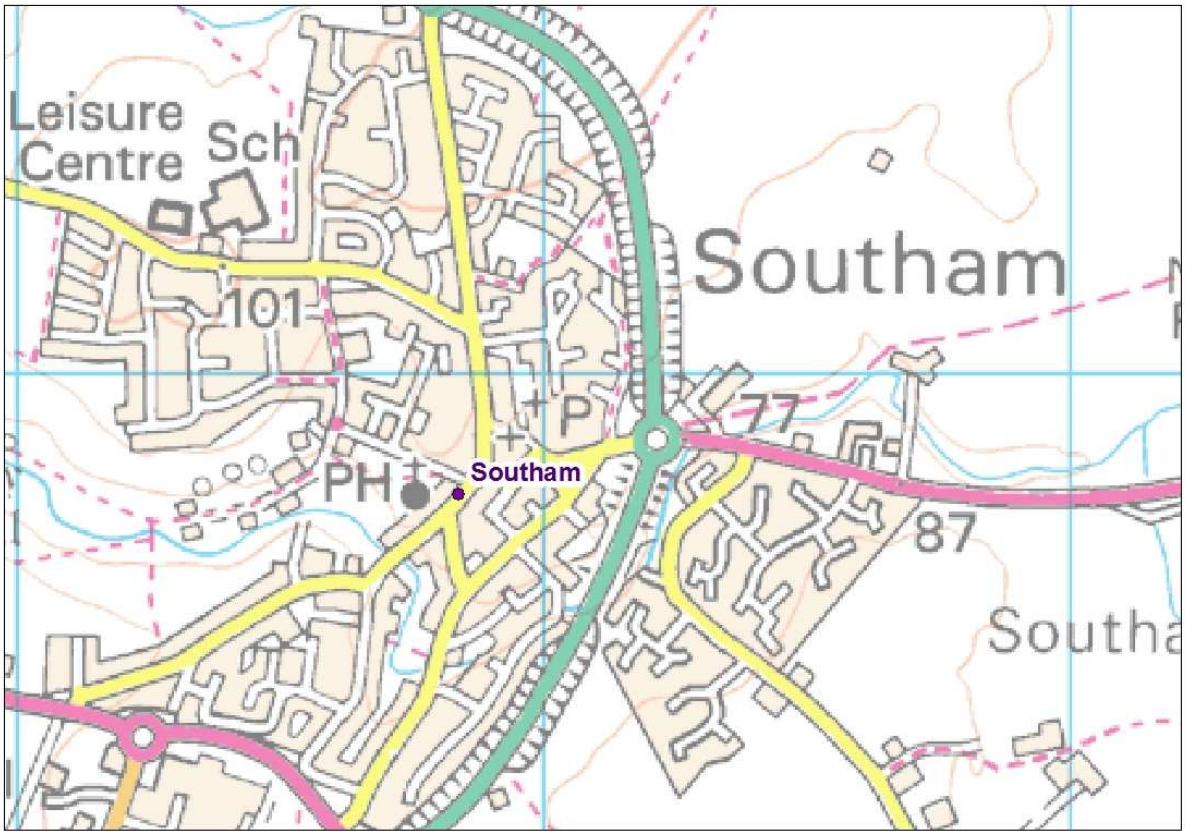
Site	Site Type	2012 Annual Mean	Period Mean	Ratio
Birmingham Tyburn	Urban Background	32.2	35.1	0.916
Leamington Spa	Urban Background	20.7	23.1	0.893
Leominster	Urban Background	8.9	10.4	0.854
			Average	0.888

Appendix B: Maps of Decommissioned Diffusion Tube Monitoring Sites





(Includes existing sites in green)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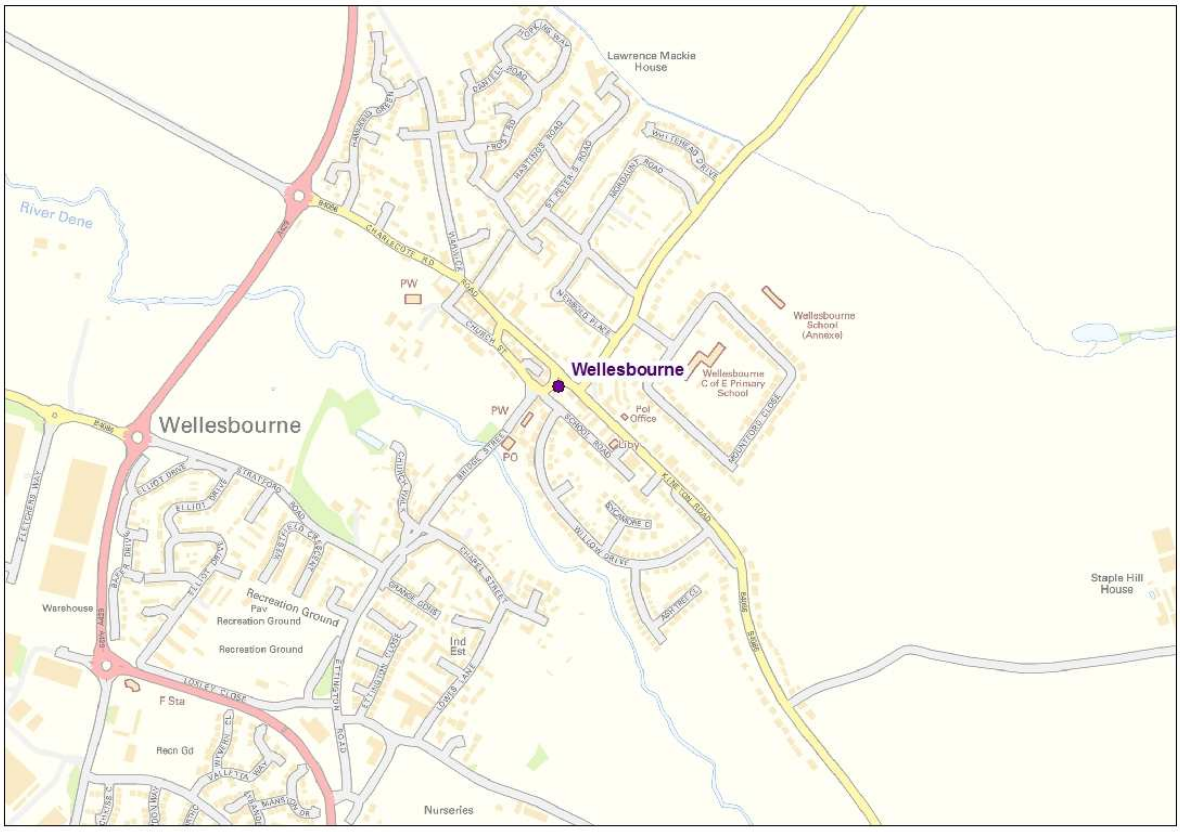
Centre
Sch
Southam
101
77
87
PH
Southam
Southa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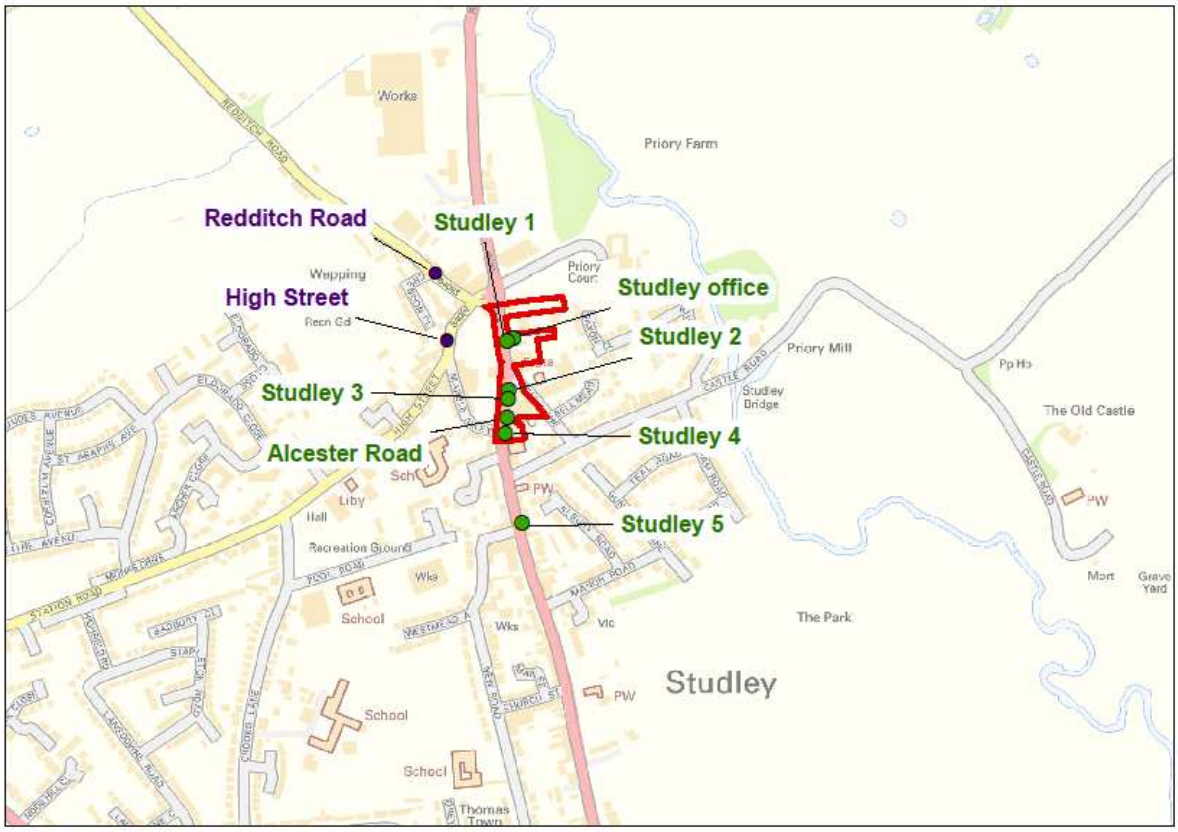
House
River Dene
Wellesbourne
Wellesbourne
Wellesbourne
School
(Annexe)
Wellesbourne
C of E Primary
School
Pol
Office
Library
PO
PW
Staple Hill
House
Warehouse
Recreation Ground
Recreation Ground
Recreation Ground
Ind
Est
F Sta
Recn Gd
Nurseries



(Includes existing sites in green)