



2015 Air Quality Update and  
Screening Assessment for  
*Tewkesbury Borough Council*

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

July 2015

**Tewkesbury Borough Council**

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## Executive Summary

The Borough Council currently has no areas of concern in respect of the proscribed pollutants as defined in the Air Quality Regulations; except within the Air Quality Management Area (AQMA) declared for Tewkesbury town centre in December 2008. This location has a classic street canyon effect giving rise to an exceedance of the annual average target objective for the traffic generated pollutant Nitrogen Dioxide (NO<sub>2</sub>).

Following in-depth and extended consultation with all interested parties, an Air Quality Action Plan (AQAP), designed to address the emissions was submitted to Department for Environment, Food and Rural Affairs (DEFRA) for consultation in December 2010.

The AQAP was approved for submission by Council in June 2011 and re-submitted to DEFRA in September 2011 with comments incorporated into the plan.

The AQAP made final recommendations as follows:

- 5% reduction in overall traffic
- Remove all heavy goods vehicles (HGV's) exceeding 7.5 tonne

These have been incorporated into traffic plans, introduced by the Gloucestershire County Council and forms part of the Tewkesbury Town Master Plan.

Highway improvement and safety works to High Street in Tewkesbury started in April 2012 and have been completed. Close monitoring of the AQMA has continued to monitor the effectiveness of the scheme. The data from the 2014 monitoring period indicate a downward trend in Nitrogen Dioxide (NO<sub>2</sub>).

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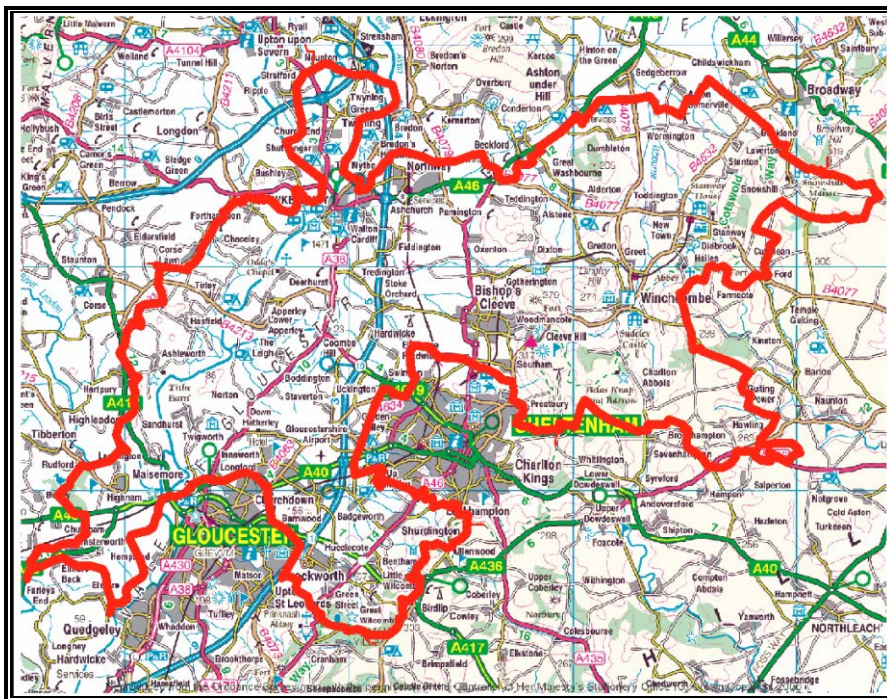
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# 1 Introduction

## 1.1 Description of Local Authority Area

Tewkesbury Borough Council is predominantly rural in its extent interspersed with areas of light industrial complexes and housing. It shares borders with several other Gloucestershire and Worcestershire authorities. The area is crossed by numerous traffic routes but the predominant route is the M5 going from north to south. The M50 crosses the Borough from southwest to northeast through the edge of the area, in the north. This is paralleled by a main rail route.

**Figure 1 Tewkesbury Borough Council Area of responsibility**



Tewkesbury continues to have a strong emerging economy based on light engineering, although the very wide range of large and small manufacturers have been joined by financial and other service companies such as Zurich Insurance at Bishop's Cleeve and Endsleigh Insurance at Shurdington. Today the principal areas of commercial and industrial activity continue at:

- Tewkesbury/Ashchurch to the east and west of Junction 9 of the M5, where land is still being developed;
- To the north and east of Gloucestershire Airport which has largely been developed, and;

- At Brockworth / Hucclecote, Gloucester Business Park.

There are no other significant industrial areas either within or close to the Borough that make a significant impact on air quality. The industries within the Borough that emit any of the proscribed pollutants are not located close to relevant public exposure. The scale on which they operate does not produce emissions that contribute significantly to the air quality and all hold relevant permits under the Air Quality Regulations.

Several large areas of housing development are identified and currently under construction. Many of these sites are now progressing due to the economic upturn. The main source of pollution from them will likely be traffic related and in particular NO<sub>2</sub>.

## **1.2 Purpose of Report**

This report fulfils the requirements of the Local Air Quality Management (LAQM) 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 all 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 AQMA and prepare an AQAP setting out the measures it intends to put in place in pursuit of the objectives.

The objective of this Updating and Screening Assessment (USA) 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. This table shows the objectives in units of micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ) and milligrams per cubic metre ( $\text{mg}/\text{m}^3$ ) for carbon monoxide, with the number of exceedences in each year that are permitted (where applicable).

<b>Table 1- Air Quality Objectives included in Regulations for the purpose of LAQM in England</b>			
<b>Pollutant</b>	<b>Air Quality Objective</b>		<b>Date to be achieved by</b>
	<b>Concentration</b>	<b>Measured as</b>	
<b>Benzene</b>	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
<b>1,3-Butadiene</b>	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
<b>Carbon monoxide</b>	10.0 $\text{mg}/\text{m}^3$	Running 8-hour mean	31.12.2003
<b>Lead</b>	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
<b>Nitrogen dioxide</b>	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
<b>Particles (PM<sub>10</sub>) (gravimetric)</b>	50 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004

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	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
<b>Sulphur dioxide</b>	350 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

## 1.4 Summary of Previous Review and Assessments

### Round 2 – 2003 to 2005

#### **2003: Updating and Screening Assessment**

Tewkesbury Borough Council's USA published in 2003 concluded that a Detailed Assessment was required for:

- NO<sub>2</sub> - as the annual mean objective at Comus & Withybridge Gardens, close to Junction 10 on the M5 was showing an upward trend; and
- Sulphur Dioxide (SO<sub>2</sub>) – as the 15-min objective at the Gloucestershire and Warwickshire Railway (GWR) site at Toddington was suspected of an exceedance.

#### **2004 & 2005: Detailed Assessments**

In the case of Withybridge the conclusions of the Detailed Assessment (DA) identified the need for an AQMA as the annual mean NO<sub>2</sub> objective was breached. Tewkesbury Borough Council declared an AQMA for NO<sub>2</sub> (annual mean) at Withybridge, Junction 10 of the M5 on the 20<sup>th</sup> of September 2005. In the case of the latter, the modelling associated with the Detailed Assessment for 2005 was able to determine the lateral

extent of the AQMA. However a decision to declare an AQMA was deferred until further monitoring and modelling verification could be carried out with the AQMA finally declared in September 2005.

The GWR Detailed Assessment conducted in respect of SO<sub>2</sub> indicated that the likelihood of exceeding both the 1-hour and 24-hour objectives at a location of relevant exposure was unlikely with the centre of fallout being in a field to the East /North-East of the site.

### **2005: Progress Report**

This Progress Report highlighted the increasing concern with the air quality in Tewkesbury Town High Street. Air quality concentrations for NO<sub>2</sub> were found to marginally exceed the 2005 air quality objective at one location. The subsequent Detailed Assessment was completed in November 2008 and an AQMA recommended. However in accordance with advice from DEFRA the tube survey in Tewkesbury High Street was extended. This revealed a substantial gradient in concentrations running from north to south along the High Street.

Concerns were raised relating to two sites adjacent to the M5; "Comus" near Bamfurlong, and Withybridge. Continued monitoring was recommended.

### **Round 3 – 2006 to 2008**

#### **2006 - Updating and Screening Assessment**

NO<sub>2</sub> annual mean objective was likely to be exceeded at two locations in the Borough; Withybridge AQMA and Tewkesbury town centre. The Council did not propose to proceed to a Detailed Assessment with either but would continue monitoring at both locations. The assessment indicated that the NO<sub>2</sub> hourly objective was unlikely to be exceeded and therefore a Detailed Assessment would not be required with respect to the hourly mean.

Particulate matter less than 10µm (PM<sub>10</sub>) objectives could possibly be breached at Brookside, Staverton; therefore, Tewkesbury Borough Council would proceed to a Detailed Assessment for this location.

SO<sub>2</sub> objectives were unlikely to be exceeded in at any location in the Borough, and therefore a Detailed Assessment was not required.

**2007 – Progress Report**

In summary:

PM<sub>10</sub> The Authority undertook a detailed assessment over the 6 month period from September 2006 to April 2007. The final report concluded that whilst there was no problem evident at present that there will be an exceedance of the proposed 2010 annual limit value, should it be adopted.

Tewkesbury High Street In accordance with advice from DEFRA the tube survey in Tewkesbury High Street was extended and revealed a significant gradient in concentrations running from north to south along the High Street. Due to the upward trend evident since 2002 a Detailed Assessment was recommended for 6 months commencing September 2007.

Comus & Withybridge adjacent to the M5 In accordance with advice from DEFRA the diffusion tube survey had been maintained at the 2 sites with the following results;

<b>Table 2: Trends at Comus &amp; Withybridge</b>		
<b>Location</b>	<b>March 31 2006</b>	<b>March 31 2007</b>
Comus	38.2 µg/m <sup>3</sup>	39.4 µg/m <sup>3</sup>
Withybridge	33.9 µg/m <sup>3</sup>	37.4 µg/m <sup>3</sup>

The trend was continuing upwards which was contrary to the expected fall nationally forecast by DEFRA.

**Assessment for Junction 10 of M5 & Comus adjacent M5 (2008)**

An AQMA for Withybridge was originally declared on 20<sup>th</sup> September 2005. A Further Assessment was carried out in 2008. This indicated that an exceedance of the annual mean NO<sub>2</sub> objective (40µg/m<sup>3</sup>) no longer existed at locations of relevant

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exposure at Junction 10, M5. It was recommended that the AQMA at Withybridge Gardens, Junction 10, M5 should be revoked which was subsequently undertaken.

### 2008 Progress Report

In summary it was concluded that there were several areas of concern requiring a 2 year work plan (summarised in Table 3 below):

- Potential exceedences of the NO<sub>2</sub> annual mean objective along Tewkesbury High Street
- Potential exceedences of the NO<sub>2</sub> annual mean objective at Comus, Bamfurlong Lane, M5

<b>Year</b>	<b>Activity</b>	<b>Status</b>
<b>2009</b>	Updating and Screening Assessment 2009	Submitted
	Comus, Bamfurlong Detailed Assessment (NO <sub>2</sub> )	Submitted
	Withybridge AQAP Progress Report (if required)	AQMA revoked – AQAP no longer required
<b>2010</b>	Progress Report	Submitted
<b>2010</b>	Draft Tewkesbury High Street AQAP sent to DEFRA for appraisal	Accepted with minor amendments
<b>2011</b>	AQAP submitted for Council approval	Accepted
<b>2011</b>	Progress Report 2011	Submitted

### Detailed Assessment for Tewkesbury High Street (2008)

Following on from the decision to undertake a Detailed Assessment both continuous and diffusion tube monitoring was carried out along Tewkesbury High Street. Dispersion modelling conducted in conjunction with this study indicated that the 40µg/m<sup>3</sup> NO<sub>2</sub> annual mean objective was being exceeded at the façade of buildings with relevant exposure (this was after utilising a precautionary area verification and

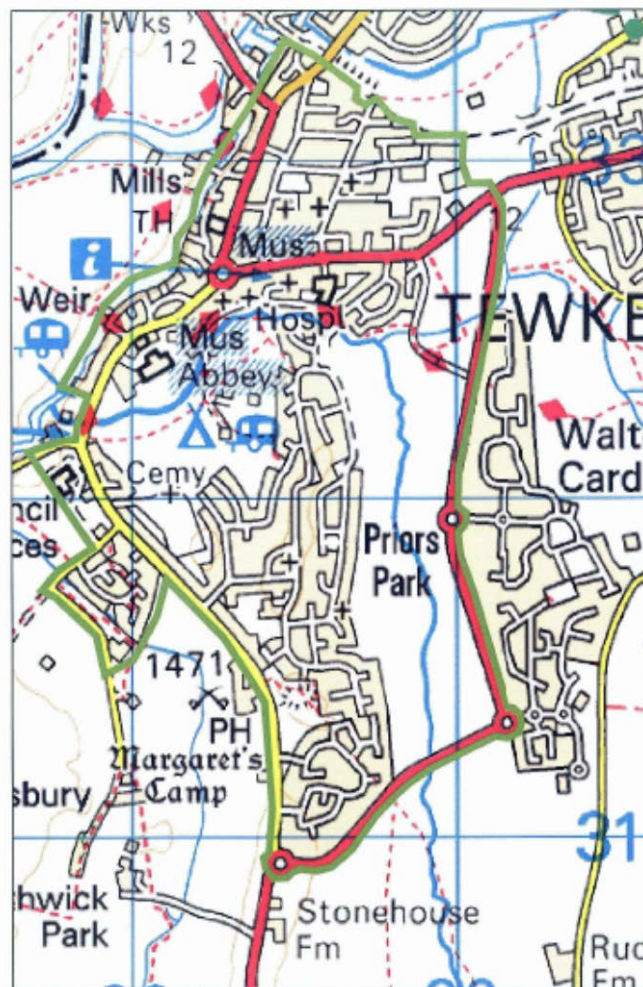
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adjustment factor for the dispersion modelling). The street canyon effect of the High Street appeared to have a substantial influence on concentrations along it warranting further investigations. In accordance with the recommendations following that report an AQMA was declared on 21<sup>st</sup> December 2008.

There was several meetings of the Steering and Consultative AQAP group and a Further Assessment completed and submitted.

The AQMA was subsequently defined and is shown below (bordered in green):

**Figure 2: Tewkesbury Town Centre AQMA**



## **2010 Progress Report**

### Conclusions from Monitoring Data

The Further Assessment monitoring programme undertaken in 2009 indicated continued exceedances of the annual mean objective for NO<sub>2</sub> within the Tewkesbury Town Centre. The AQMA continued to be justified.

Source apportionment undertaken on four main road links within the Tewkesbury Town Centre AQMA indicated that the proportion of NO<sub>2</sub> on High Street is divided approximately equally between light goods vehicles (LGV) and HGV's on Oldbury Road, Church Street and Barton Street with the largest proportion of NO<sub>2</sub> attributed to LGVs.

To achieve the annual mean objective (based on measured 2009 concentrations) a reduction of greater than 3.7µg/m<sup>3</sup> would be required in the High Street and for Barton Road, 5.4µg/m<sup>3</sup>. This equates to an 11.9% and 16.4% reduction in the road traffic component of the NO<sub>2</sub> concentration in High Street and Barton Street respectively.

Trends in concentrations along High Street indicated NO<sub>2</sub> concentrations close to, or exceeding, the annual mean objective for a number of years. Utilising the future year projection factors it was estimated, based on 2009 measured concentrations at worst-case locations that the annual mean objective would be achieved at 10 High Street, Tewkesbury (trading at that time as Marks & Spencer) by 2010 and below 36 µg/m<sup>3</sup> by 2012, while the annual mean objective would be achieved at 31 Barton Street by 2011 and below 36 µg/m<sup>3</sup> by 2013.

Tewkesbury Borough Council undertook scenario testing utilising dispersion modelling to inform the action plan which was finalised in March 2011.

## **2011 Progress Report**

The AQAP in respect of the Tewkesbury AQMA was submitted for appraisal to DEFRA and a favourable response received with some changes recommended.

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These were incorporated into the plan and ratified by the Council's Executive Committee on 8<sup>th</sup> June 2011 prior to final submission to DEFRA in September 2011.

Works have since been completed on Tewkesbury High Street to implement part of the AQAP.

### **2012 Progress Report**

The primary pollutant of concern for the Borough was traffic derived and in particular NO<sub>2</sub>. Where traffic is constricted and in particular where street canyons are evident, objectives were not being met. The monitoring data showed that Tewkesbury High Street AQMA was still required.

No concerns are raised in the other areas monitored.

### **2013 Progress Report**

The monitoring data showed that Tewkesbury High Street AQMA was still required. No concerns are raised in the other areas monitored.

A close eye would be kept on the new developments and the effect on Air Quality and the Planning stage

### **2014 Progress Report**

The primary pollutant of concern for the Borough was traffic derived and in particular NO<sub>2</sub>. Where traffic is constricted and in particular where street canyons are evident, objectives are not being met. The monitoring data showed that Tewkesbury High Street AQMA is still required.

No concerns are raised in the other areas monitored.

A close eye would again be kept on the new developments and the effect on Air Quality and the Planning stage

### **Proposed Actions**

The proposed future actions for the Borough were to:



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- Progress the AQAP for the Tewkesbury AQMA;
- Make formal contact with Gloucestershire County Council regarding the continued exceedences.
- Continue to closely monitor levels of NO<sub>2</sub> within the Tewkesbury AQMA.
- Continue to monitor levels of NO<sub>2</sub> at Withybridge & Comus.
- Completion of 2015 Air Quality Update and Screening Assessment

## 2 New Monitoring Data

### 2.1 Summary of Monitoring Undertaken

#### 2.1.1 Automatic Monitoring Sites

There are currently no automatic monitoring sites within Tewkesbury Borough.

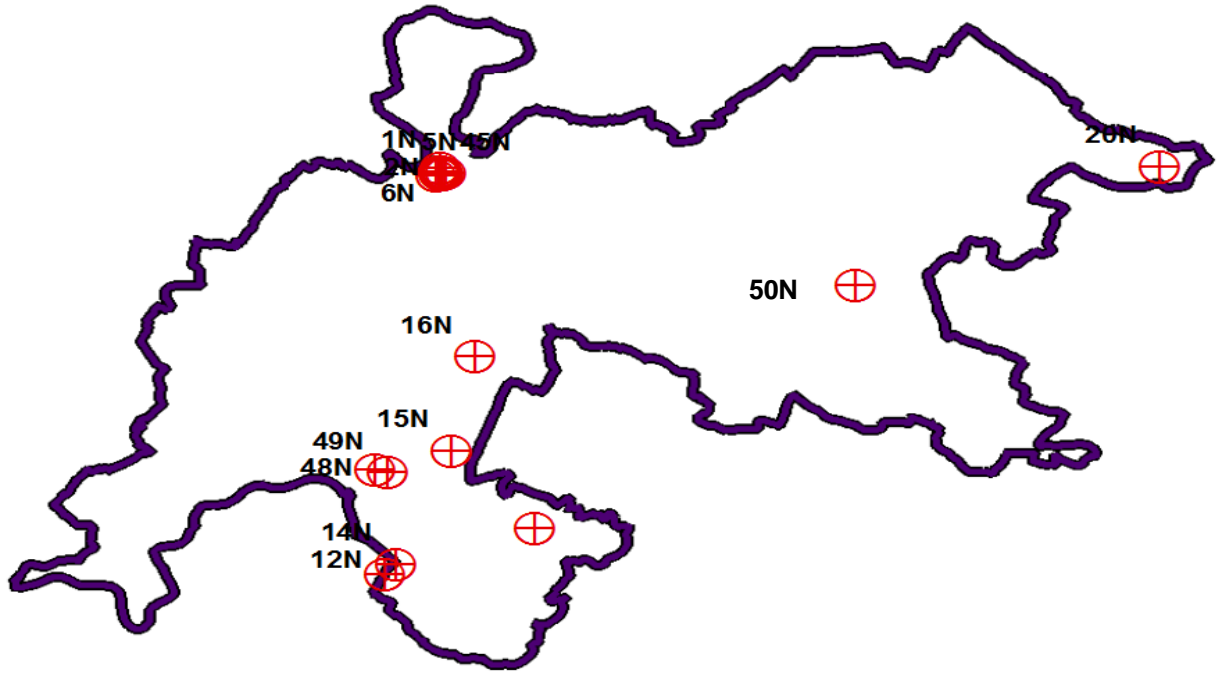
#### 2.1.2 Non-Automatic Monitoring Sites

Tewkesbury Borough Council undertook diffusion tube monitoring at 17 locations in 2014. The diffusion tubes (50% Triethanolamine in Acetone) are supplied and analysed by Gradko International Ltd. The tubes at all locations have a monthly exposure period. A bias adjustment factor of 1.089 has been generated from the Tewkesbury High Street co-location study and was applied to all diffusion tubes within the AQMA. Another bias adjustment factor of 0.98 (obtained for the National Bias Adjustment Spreadsheet) was applied to all diffusion tubes outside of the AQMA.

**Figure 3: Map of Non-Automatic Monitoring Sites within Tewkesbury AQMA**



Figure 4 Map of Non-Automatic Monitoring Sites within Tewkesbury Borough



**Table 4 Details of Diffusion Tube Data Capture 2014**

Site No	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	In AQMA?	Relevant Exposure?	Distance to Kerb of Nearest Road (m)	Does this Location Represent Worst-Case Exposure?
1N	Scrivens, 131 High Street	Roadside	389314	232807	4.0	Yes	Yes	1.5m	Yes
2N	43 Oldbury Road	Roadside	389399	232788	3.0	Yes	Yes	1.5m	Yes
3N	Tewkesbury Hospital	Urban Background	389611	232660	1.5	Yes	No	N/A	No
5N	Kellands, 13-14 Barton St	Roadside	389356	232705	4.0	Yes	Yes	1.5m	Yes
6N	Age Concern, 14 High St	Roadside	389294	232806	4.0	Yes	Yes	1.5m	Yes
12N	Windrush, Belmont Avenue	Urban	387591	216975	2.0	No	Yes	N/A	Yes
14N	69 Sussex Gardens	Urban	387915	217389	1.5	No	Yes	N/A	Yes
15N	Comus Bamfurlong	Urban	389714	221845	2.0	No	Yes	N/A	Yes
16N	15 Withybridge Gardens	Urban	390461	225544	1.5	No	Yes	N/A	Yes
20N	Snowhill Hill Farm	Rural	412224	233012	1.5	No	Yes	N/A	No
33N	Travis Perkins, Mitton Rd	Urban	389565	233275	1.5	Yes	Yes	N/A	no
35N	Store 21, High Street	Roadside	389283	232769	3.0	Yes	Yes	1.5m	Yes
37N	Out of the Hat, The Cross	Roadside	389254	232670	3.0	Yes	Yes	2.0m	No
38N	Sanford, 38 High Street	Roadside	389331	232950	3.0	Yes	Yes	1.5m	Yes
41N	Tackle Shop, 31 Barton Street	Roadside	389462	232721	2.5	Yes	Yes	2.0m	Yes

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Site No	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	In AQMA?	Relevant Exposure?	Distance to Kerb of Nearest Road (m)	Does this Location Represent Worst-Case Exposure?
45N	54 Barton Street	Roadside	389500	232700	2.0	Yes	Yes	2.0m	Yes
47N	65 Barton Street	Roadside	389400	232600	2.0	Yes	Yes	2.0m	Yes
48N	399 Innsworth Road	Urban	387271	221133	2.0	No	Yes	N/A	Yes
49N	51 Parton Road	Urban	387658	220989	2.0	No	Yes	N/A	Yes
50N	3 North Street	Roadside	402476	228456	2.0	No	Yes	1.5m	Yes
51N	Shurdington	Roadside	392336	218718	2.0	No	Yes	2.0m	Yes

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

### 2.2.1 Nitrogen Dioxide

A summary of the corrected results are given in Table 5, with results of concern in orange and red. The raw data is at Appendix 1. Site 3N represents urban background, all other sites are representative of public exposure, mostly being on façades of properties. One diffusion tube exceeded the annual mean objective in 2014 at 31 Barton Street (The Tackle Shop) ( $40.4 \mu\text{g}/\text{m}^3$ ) which is within the Tewkesbury Town AQMA. There were also one other diffusion tube site which came close to the annual mean objective which was Age Concern, High Street ( $33.2 \mu\text{g}/\text{m}^3$ ), also within the Tewkesbury Town AQMA.

The results suggest an improvement in Air Quality for the AQMA in Tewkesbury High Street although the data confirms that AQMA is still required.

Site Ref	Location	In AQMA?	Data Capt. 2014	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ ) Adjusted for Bias		
				2012	2013	2014
				1N	Scrivens, 131 High St	Yes
2N	43 Oldbury Rd	Yes	100%	24.3	21.9	23.6
3N	Tewkesbury Hospital	Yes	N/A	13.6	N/A	N/A
5N	Kellands	Yes	100%	29.0	31.2	28.5
6N	Age Concern, 14 High St	Yes	92%	35.2	32.6	33.2
12N	Windrush Belmont Ave	No	50%	28.1	27.1	22.1
14N	69 Sussex Gardens	No	100%	26.2	26.8	26.3
15N	Comus bamfurlong	No	100%	32.8	30.2	27.9
16N	15 Witheridge Gardens	No	100%	33.0	36.8	27.8
20N	Snowhill Hill Farm	No	100%	7.1	7.0	6.4
35N	Store 21, High Street	Yes	N/A	40.8	37.5	44.0
37N	Out of the Hat, The Cross	Yes	100%	30.4	28.3	28.0
38N	Sanford, 38 High St	Yes	100%	30.9	28.9	28.7
41N	Tackle Shop, 31 Barton St	Yes	100%	41.0	41.8	40.4
45N	54 Barton St	Yes	92%	29.8	28.4	28.2
47N	65 Barton Road	Yes	100%	32.2	30.1	30.7
48N	399 Innsworth	No	N/A	19.7	17.3	N/A
49N	51 Parton Street	No	N/A	21.3	15.8	N/A
50N	3 North Street	No	100%	N/A	28.3	24.3
51N	Shurdington	No	66%	N/A	23.3	16.8

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52N	43 Stocken Close	No	50%	N/A	N/A	25.5
53N	Ashchurch Road	No	25%	N/A	N/A	24.4
<p><b>A: Local bias adjusted results inside the AQMA and national bias adjusted results outside the AQMA have been utilised to format conclusions, and for use in further analysis.</b></p> <p><b>Red indicates an exceedance of the annual mean objective. Orange indicates the concentrations are within 10% of the annual mean objective (i.e. greater than 36 µg/m<sup>3</sup>)</b></p>						

### 2.2.2 PM<sub>10</sub>

Tewkesbury Borough Council undertook a detailed assessment for PM<sub>10</sub> over a six month period from September 2006 to April 2007 in line with DEFRA guidelines which was detailed in the 2009 USA. The daily average particle (PM<sub>10</sub>) concentration was ~25 µg m<sup>-3</sup> which is about half the daily average Objective Value of 50 µg m<sup>-3</sup>. An annual average particle (PM<sub>10</sub> concentration of 24.7 µg m<sup>-3</sup> was determined using procedures recommended by DEFRA in guidance note LAQM TG (03). This value is well within the annual Objective Value of 40 µg m<sup>-3</sup>. Therefore further monitoring has not been undertaken and there have been no changes since the previous USA.

### 2.2.3 Sulphur Dioxide

The Borough has a preserved steam railway operating in the lee of the Cotswold Edge. A detailed assessment was carried out as part of the 2009 USA. Modelling conducted in 2004 showed that the any likely breach of SO<sub>2</sub> would occur some 60 metres to the north-west of the terminal station at Toddington, well away from any target population. Subsequent diffusion tube monitoring confirmed the gradient and those levels were not in excess of the target objectives. The Borough has no further issues with SO<sub>2</sub> and no longer carries out monitoring of the pollutant.

### 2.2.4 Benzene

Tewkesbury Borough Council has never had any issues with benzene, and has never had a need to carry out any benzene monitoring. Nothing has changed since last assessment.

### 2.2.5 Other pollutants monitored

Carbon Monoxide- Tewkesbury Borough Council has never had any issues with carbon monoxide, and has never had a need to carry out any carbon monoxide monitoring. Nothing has changed since last assessment.

Lead- Tewkesbury Borough Council has never had any issues with lead, and has never had a need to carry out any lead monitoring. Nothing has changed since last assessment.

1,3-Butadiene- Tewkesbury Borough Council has never had any issues with 1,3-butadiene, and has never had a need to carry out any 1,3-butadiene monitoring. Nothing has changed since the last assessment.

### **2.2.6 Summary of Compliance with Air Quality Strategy Objectives**

**Tewkesbury Borough Council** has examined the results from monitoring in the borough. Concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.



### 3 Road Traffic Sources

Tewkesbury Borough Council is currently developing the Joint Core Strategy (JCS) with Cheltenham and Gloucester to produce a coordinated strategic development plan for their areas up to 2031. The JCS has been submitted to the Secretary of State and is currently undergoing its Examination in Public by the Planning Inspectorate.

The Strategic Allocation Sites have changed since the last version of the USA and now comprise the following:

<b>Strategic Allocations</b>	<b>Indicative Housing to be delivered up to 2031</b>	<b>Hectares of employment land to be delivered up to 2031</b>
A1 Innsworth	1,250	9.1
A2 North Brockworth	532	-
A3 South Churchdown	868	17.4
A4 North Brockworth	1,500	-
A5 North West Cheltenham	4,785 (2,560 within TBC)	23.4
A6 South Cheltenham	1,124 (360 within TBC)	-

These proposals would have an impact on air quality within the Borough, however the JCS has not yet been adopted, therefore the proposals have not been considered in this year's USA.

#### 3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Tewkesbury Borough 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**

Tewkesbury Borough Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

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

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

### **3.4 Junctions**

Tewkesbury Borough Council had previously identified the junction of the A46 with the main access road (Shannon Way, Tewkesbury) to a major industrial estate (now completed) as a possible hot spot. Diffusion tube monitoring was undertaken from June 2009 to March 2010. The results from June to December 2009 were 27.4  $\mu\text{g}/\text{m}^3$  and January to March 2010 were 26.2  $\mu\text{g}/\text{m}^3$ . Therefore no further monitoring was required.

Tewkesbury Borough 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**

Tewkesbury Borough Council confirms that there are no new/proposed roads.

### **3.6 Roads with Significantly Changed Traffic Flows**

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

### **3.7 Bus and Coach Stations**

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

## **4 Other Transport Sources**

### **4.1 Airports**

Tewkesbury Borough Council confirms that there is an airport in the borough but traffic is below the threshold criteria.

### **4.2 Railways (Diesel and Steam Trains)**

#### **4.2.1 Stationary Trains**

Tewkesbury Borough 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**

Tewkesbury Borough 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)**

Tewkesbury Borough 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

The area has a predominantly light industrial base with the largest sites being associated with the aerospace industry. These are all permitted sites under the Environmental Permitting (England & Wales) Regulations 2010.

Currently there are no plans for any major development of that base other than an occasional infill. The JCS for Gloucester, Cheltenham and Tewkesbury indicates that 46 Hectares of employment across the JCS area is required.

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

Tewkesbury Borough 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

Tewkesbury Borough 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

Tewkesbury Borough 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 Tewkesbury Borough area.

## 5.3 Petrol Stations

Tewkesbury Borough Council confirms that there are no petrol stations meeting the specified criteria. **For details of petrol stations see Appendix 2 or 3.**

## 5.4 Poultry Farms

There are currently 2 poultry farms identified within Tewkesbury Borough, detailed in the Table below:

Farm	No of Chickens	Ventilation	Buildings within 100m
Tredington House, Stoke Orchard	100,000	Gable and roof fans	No
Pamington	215,000	Roof fans with side wall inlet	No

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

## **6 Commercial and Domestic Sources**

### **6.1 Biomass Combustion – Individual Installations**

Tewkesbury Borough Council confirms that there is no biomass combustion plant in the Local Authority area.

### **6.2 Biomass Combustion – Combined Impacts**

Tewkesbury Borough Council confirms that there is no biomass combustion plant in the Local Authority area.

### **6.3 Domestic Solid Fuel Burning**

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

## 7 Fugitive or Uncontrolled Sources

Tewkesbury Borough 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 primary pollutant of concern for the Borough is traffic derived and in particular NO<sub>2</sub>. Where traffic is constricted and in particular where street canyons are evident, objectives are not being met. The monitoring data shows that Tewkesbury High Street AQMA is still required.

No concerns are raised in the other areas monitored.

### **8.2 Conclusions from Assessment of Sources**

No new potential pollution sources have been assessed this year.

### **8.3 Proposed Actions**

The proposed future actions for the Borough are to:

- Progress the Air Quality Action Plan for the Tewkesbury AQMA;
- Continue to closely monitor levels of NO<sub>2</sub> within the Tewkesbury AQMA.
- Continue to monitor levels of NO<sub>2</sub> at Withybridge & Comus

## 9 References

- All documents produced by Tewkesbury Borough Council are referenced in section 1.4 [bvgf](#)
  - Local Air Quality Management Review and Assessment Progress Report; University of the West of England (UWE), July 2008.
  - SO<sub>2</sub> Emissions from Gloucestershire & Warwickshire Railway at Toddington; MSE Environmental, July 2004.
  - Detailed Assessment for PM<sub>10</sub> at “Brookside”, Staverton; MSE Environmental, March 2007.
  - Updating & Screening Assessment 2006; UWE, June 2006.
  - Review and Rewriting of Withybridge AQMA Air Quality Action Plan; UWE, March 2008.
  - Detailed assessment for Nitrogen Dioxide Tewkesbury High Street; UWE, November 2008.
  - Air Quality Assessment of the High Street Tewkesbury; Air Quality Consultants, August 2008.
- DEFRA Guidance can be found at [www.defra.uk/environment/airquality/local/index.htm](http://www.defra.uk/environment/airquality/local/index.htm)

# APPENDICES

## Appendix 1

### Adjustments, Bias and Quality Analysis / Quality Control

#### Diffusion Tube Bias Adjustment Factors

The diffusion tubes (50% TEA in Acetone) are supplied and analysed by Gradko International Ltd (<http://www.gradko.com>). The tubes at all locations throughout the area have a monthly exposure period. A bias adjustment factor of 1.089 has been generated from the Tewkesbury High Street co-location study and was applied to all diffusion tubes within the AQMA. Another bias adjustment factor of 0.98 (obtained for the National Bias Adjustment Spreadsheet) was applied to all diffusion tubes outside of the AQMA.

#### Adjustment of Short-Term Data to Annual Mean

No adjustments have been made as there were some gaps in the record. These were due to loss of tube to vandalism, spiders in the tube or collapse of the holder.

#### Quality Analysis / Quality Control of diffusion tube monitoring

- Lab supplying and analysing the tubes; Gradko International Ltd, St. Martins House, 77 Wales Street, Winchester, Hampshire SO23 0RH
- Preparation method used 50% TEA in acetone
- It can be confirmed that the lab follows the procedures set out in the Harmonisation Practical Guidance Procedures under the DEFRA practical guidance are followed.
- The Local Authority has not recently compared the diffusion tubes with the reference method in a co-location study other than at a local level.
- The bias adjustment factor applied to the annual means from the diffusion tubes was based on the National site. Those within the Tewkesbury AQMA which have benefited from a local co-location study using chemiluminescent monitor had a local correction factor applied. National figure was 0.92 whilst that applied to Tewkesbury town centre tubes was 1.089.

- The local correction factor was derived during the detailed assessment for Tewkesbury High Street i.e. local co-location, Review and Assessment website, etc.
- Gradko participates in the Workplace Analysis Scheme for Proficiency scheme, the latest results for January – February 2015 show Gradko submitted 100% satisfactory results.

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## Diffusion Tube Raw data 2014

Nitrogen dioxide (ug/m3)																				
Date	(3)1N	(3)2N	5N	6N	12N	14N	15N	16N	20N	35N	37N	38N	41N	45N	47N	50N	51N	52N	53N	51N
	Scrivens	43 Oldbury	kellands	ge Concer	Windrush	69 Sussex	Comus	15 Withyb	Snowhill	store 21	ut of the H	Sanford	Tackle Sho	ie Barber Sh	Retro Attire	North Stres	Shurdington	Stocken Cl	hchurch Road	Shurdington
	131 High St	Road	4 Barton S	14 High St	Belmont Av	Gardens	bamfurlong	Gardens	Hill farm	High Street	The Cross	High Stre	1 Barton S	54 Barton St	5 Barton St					
Jan-14	47.24	25.29	22.96	34.85	23.91	39.49	37.65	29.25	8.74	36.82	26.06	27.49	34.91	31.52	33.47	24.16	ube missing			20.5
Feb-14	26.15	17.06	16.76	26.54	23.35	23.52	34.45	23.77	4.26	30.85	19.98	23.59	25.39	26.24	28.74	20.81	13.04			28.2
Mar-14	31.34	24.65	26.26	29.33	25.38	26.4	30.25	29.81	8.36	35.66	25.68	25.73	36.59	28.41	30.15	26.37	19.48			20.5
<b>Apr-14</b>	32	22.18	28.38	26.72	23.81	26.05	26.3	30.49	6.64	35.13	27.63	24.44	37.88	27.42	27.71	28.02	17.11			tube missing
May-14	20.3	16.0	17.8	22.6	16.2	16.2	18.5	20.5	3.5	25.7	19.8	17.3	28.2	18.3	20.4	20.0	11.1			13.0
Jun-14	29.1	20.1	29.1	no data	22.8	22.6	23.1	29.0	4.6	36.2	29.2	24.8	39.1	23.3	24.5	23.3	17.7			19.5
Jul-14	28.7	21.9	32.0	34.3	site closed	32.9	29.0	34.0	8.6	42.6	32.9	30.9	42.7	25.3	28.4	24.4	20.0	26.5		17.1
Aug-14	20.9	14.8	23.0	25.9		29.3	25.0	33.4	3.4	31.6	14.9	23.2	31.0	23.0	25.7	22.5	15.2	27.4		11.1
Sep-14	32.1	24.2	34.2	31.9		27.9	22.7	33.0	6.2	38.1	30.8	27.9	42.0	25.2	29.0	27.5	23.3	26.3		17.7
Oct-14	30.7	21.9	22.0	32.3		21.6	31.0	15.2	5.6	37.5	24.5	27.6	30.1	27.1	30.1	20.4	site closed	23.2	20.1	20.0
Nov-14	40.5	30.0	34.6	35.8		27.1	29.7	29.5	12.7	90.1	30.9	33.2	41.7	tube missing	31.4	35.8		26.0	31.3	15.2
Dec-14	25.2	22.5	27.2	35.5		28.7	33.9	29.1	6.1	44.6	26.6	30.4	37.3	29.7	28.7	24.2		26.7	23.4	23.3
Average	30.4	21.7	26.2	30.5	22.6	26.8	28.5	28.1	6.6	40.4	25.7	26.4	35.6	25.9	28.2	24.8	17.1	26.0	24.9	18.7
Bias Corre	1.089	1.089	1.089	1.089	0.98	0.98	0.98	0.98	0.98	1.089	1.089	1.089	1.089	1.089	1.089	0.98	0.98	0.98	0.98	1
Annual Ave	33.1	23.6	28.5	33.2	22.1	26.3	27.9	27.5	6.4	44.0	28.0	28.7	38.7	28.2	30.7	24.3	16.8	25.5	24.4	18.7
	Bias correction updated July 2015																			
	Due to be updated September 2015																			

## Appendix 2

### LAPPC Controlled Service Stations – Benzene potential

IPC ID	Location	Post Code	Process Guidance
26	Alderton Garage	GL20 8NH	Petroleum PG1/14
27	Morrisons Petrol Station	GL20 8AB	Petroleum PG1/14
28	BP Ashchurch	GL20 8JN	Petroleum PG1/14
32	Coombe Hill Service Station	GL19 4FD	Petroleum PG1/14
33	Cross Hands Garage (Shell)	GL3 4PL	Petroleum PG1/14
37	Gotherington Cross Garage	GL52 4SA	Petroleum PG1/14
39	Kingswood Service Station	GL52 4LZ	Petroleum PG1/14
41	Mitton Manor Garage	GL20 5DA	Petroleum PG1/14
42	P J Nicholls	GL20 8DS	Petroleum PG1/14
45	Pirton Corner Filling Station	GL3 1AE	Petroleum PG1/14
48	Teddington Hands Services	GL20 8NF	Petroleum PG1/14
50	Robert Bamford (Glos) Ltd	GL2 9PG	Petroleum PG1/14

## Appendix 3

### Environmental Permitting Regulations 2007

#### List of registered processes

Name of Company	Post code	Process and PG Note
Alderton Garage	GL20 8NH	Petroleum PG1/14
B Elliott & Sons	GL52 4DQ	Other PG3/16
BP Ashchurch	GL20 8JN	Petroleum PG1/14
Bull Rubber Ltd	GL20 7BJ	Rubber Process PG6/28
Clive Woolford Motor Engs	GL20 8JG	Waste Oil Burner PG1/1
Colin Moore Motor Engineers	GL20 8HQ	Waste Oil Burner PG1/1
Coombe Hill Service Station	GL19 4FD	Petroleum PG1/14
Cross Hands Garage (Shell)	GL3 4PL	Petroleum PG1/14
Defence Storage & Distribution Centre	GL20 8LZ	Vehicle Respray PG6/34
Dowty Aerospace Propellers	GL2 9QN	Coating PG6/40
Gotherington Cross Garage	GL52 4SA	Petroleum PG1/14
Hanson Quarry	GL54 6AY	Minerals PG3/8
JP Construction	GL20 8SJ	Other PG3/16
Kingswood Service Station	GL52 4LZ	Petroleum PG1/14
Marleton Cross Inspirations	GL20 8JF	Organic PG4/2
Messier Services Ltd	GL2 9QL	Surface Cleaning of Metals PG4/01
Messier-Dowty Landing Gear	GL2 9QH	Coating PG6/40
Mitton Manor Garage	GL20 5DA	Petroleum PG1/14
Morrisons Petrol Station	GL20 8AB	Petroleum PG1/14
Oberthur Card Systems Ltd	GL20 8GA	Coating PG6/16
P J Nicholls	GL20 8DS	Petroleum PG1/14
Pirton Corner Filling Station	GL3 1AE	Petroleum PG1/14
Robert Bamford (Glos) Ltd	GL2 9PG	Petroleum PG1/14
Teddington Hands Services	GL20 8NF	Petroleum PG1/14
TESCO Stores Ltd	GL3 4AA	Petroleum PG1/14
The Dry Cleaners	GL52 8LP	Dry Cleaning PG6/46
The Dry Cleaners	GL3 4EL	Dry Cleaning PG6/46
The Dry Cleaners	GL54 5 HT	Dry Cleaning PG6/47
The Dry Cleaners	GL20 8AN	Dry Cleaning PG6/48
The Dry Cleaners (Hard Pressed for Time)	GL20 5AT	Dry Cleaning PG6/49
TTI Group Ltd	GL51 6SX	Surface Cleaning of Metals
Wales & West Utilities	N/A	Gasification