
# WEST OXFORDSHIRE DISTRICT COUNCIL

WEST OXFORDSHIRE
DISTRICT COUNCIL

# 2015 Updating and Screening Assessment for WEST OXFORDSHIRE DISTRICT COUNCIL

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

## April 2015

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|---|---|
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**Note: In order to answer requests for data in the various sections some sets of data appear again in an alternative location however this does not detract from the presentation nor readability of the report.**
**Comments of a similar nature from previous reviews have been addressed.**

# Executive Summary

The monitoring reported within the 2015 Update and Screening Assessment for West Oxfordshire District Council does not indicate any additional areas of general concern with regard to air quality.
Within the District there are no industrial developments with air pollution implications and any development proposals have been considered with regard to their potential to increase traffic pollution in the AQMAs and other areas.

**Chipping Norton AQMA**
The Chipping Norton Air Quality Action Plan, as accepted by Defra, proposed the introduction of a Weight Limit for HGVs and re-routing of HGV traffic (primarily targeting the Vale of Evesham / SE England two way flow).

The proposal has the objective of reducing HGV traffic density on the A44 through Chipping Norton by routing traffic further to the West on the A40 to access the Vale of Evesham from the South. This measure would involve 'de-priming' the A44 (currently a Primary Route for HGVs) and associated modification to signage.

Oxfordshire County Council (OCC) commissioned a feasibility study for the implementation of the lorry management measures. Currently, further consultation with neighbouring Counties is necessary and financial constraints within OCC budgets have delayed plans to implement this Action Plan.

The above intent remains, re-stated, within the OCC Draft LTP4 (2011 – 2030) (Vol 1, Para 178). A schedule for implementation is still awaited.

However, the WODC Low Carbon and Environment Plan (2013), addresses some of the additional air quality mitigation measures within the Air Quality Action Plan.

**Witney AQMA**
The Draft Action Plan for the Witney AQMA, having been deferred for a significant period pending the outcome of the Cogges Link Road (CLR) Planning Application by OCC, was approved by WODC Cabinet in December 2010. A period of public consultation was conducted throughout February 2011.

The Draft Action Plan for the Witney AQMA was written with the assumption that the CLR would proceed as per the Planning Consent. There were further procedural stages to be concluded after which the Draft Action Plan and the results of the public consultation would be reviewed to produce an Action Plan (and which would include the latest dispersion modelling) for consideration and approval by WODC Cabinet and OCC and in due course submitted to Defra.

This latter expectation failed to materialise as, in June 2012, the Department for Transport refused a compulsory purchase order for the land Oxfordshire County Council needed to build the Cogges Link Road

Accordingly, there is currently no Draft Action Plan for the Witney AQMA pending the revision of options which might address traffic flow within and around Witney.OCC Draft LTP4, (Vol 2, Sect ii, Pages 42 – 50) details the proposals.




**Figure 1.1 West Oxfordshire District**

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# 1 Introduction

## 1.1 Description of Local Authority Area

West Oxfordshire is one of the most attractive parts of Britain, lying to the north of the River Thames, to the west of the city of Oxford and including the eastern edge of the Cotswolds, part of the District is designated an Area of Outstanding Natural Beauty.

It is a rural district covering 714 $km^2$ (71,494 Hectares) with a population of 110,300* spread across a large number of relatively small settlements, totalling 83 parishes.

[ * Updated projection for West Oxfordshire – Greater London Authority, Data Management and Analysis Group, published May 2011. The 2011 Census figure was 104,800]

Situated in a prime central location, there are excellent communications to most parts of the country via the A40/M40 and the A34 roads. There are railway stations at Charlbury, Hanborough and Kingham with regular services to London and Birmingham.

It has a rich architectural and historic heritage ranging from Cotswold stone cottages to the splendour of Blenheim Palace, a World Heritage site.

As might be expected from the above, tourism is buoyant and is a main contributor to the District's vibrant economy. The business sector is made up of a healthy mixture of high technology, small and medium enterprises and continues to have one of the lowest unemployment rates in Britain. The area faces no major social problems and crime figures are amongst the lowest in the country.

## 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.

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 micrograms per cubic metre μg/m$^3$ (milligrammes per cubic metre, mg/m$^3$ for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

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

| Pollutant | Air Quality Objective | | Date to be achieved by |
|---|---|---|---|
| | Concentration | Measured as | |
| **Benzene** | 16.25 μg/m$^3$ | Running annual mean | 31.12.2003 |
| | **5.00 μg/m$^3$** | **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

Two AQMA declarations have been made in the District because the annual nitrogen dioxide objective in the Air Quality (England) Regulations 2000 was unlikely to be met by December 2005 and the cause of this was believed to be traffic related.

The areas are detailed in Figures 1.2 , 1.3 and 1.4 below and were declared on 7th February 2005 (date of order). The development of the action plans began for both areas and a continuous monitoring site established in **Chipping Norton**. This site has been in operation since March 2006.

Oxfordshire County Council outlined a number of traffic management options which needed looking at in more detail to investigate their feasibility and impact on air quality so that a cost benefit analysis could be applied to each option. The County employed consultants to appraise the traffic management options and the results were used by the District Council's air quality consultants to model and predict their impact on air quality.

With regard to Chipping Norton, the Air Quality Action Plan was accepted by Defra in early 2009.

The original continuous monitoring site in **Witney** had to be decommissioned because the site was sold. However, another site in that area was established and continuous monitoring resumed in April 2009.

The Draft Action Plan for the Witney AQMA, having been deferred for a significant period pending the outcome of the Cogges Link Road (CLR) Planning Application by OCC, was approved by WODC Cabinet in December 2010. A period of public consultation was conducted throughout February 2011. In June 2012, the Department for Transport refused a compulsory purchase order for the land Oxfordshire County Council needed to build the Cogges Link Road.

Accordingly, there is currently no Draft Action Plan for the Witney AQMA pending the revision of options which might address traffic flow within and around Witney.

**Figure 1.2 Map of AQMA Boundaries – Witney**

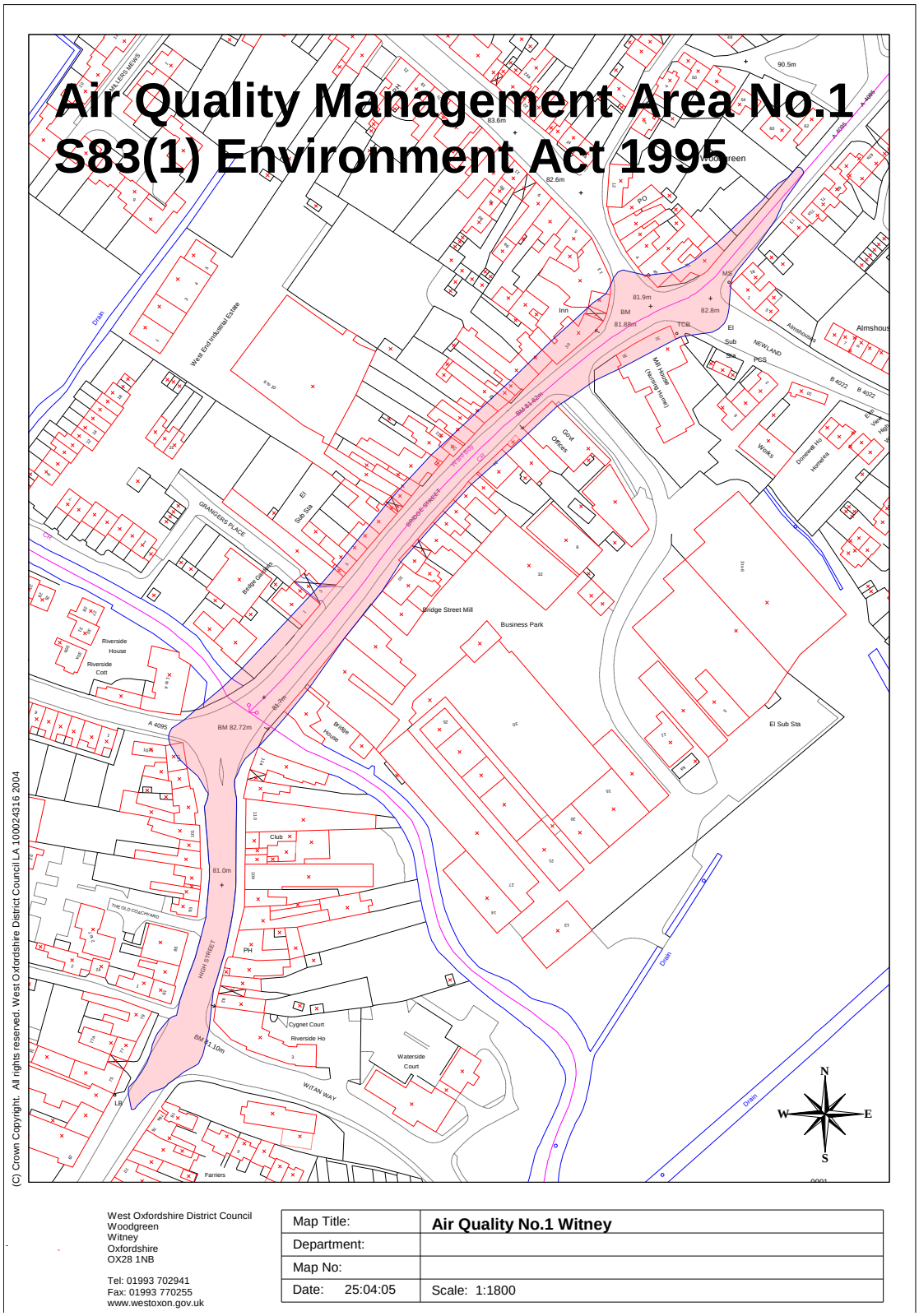
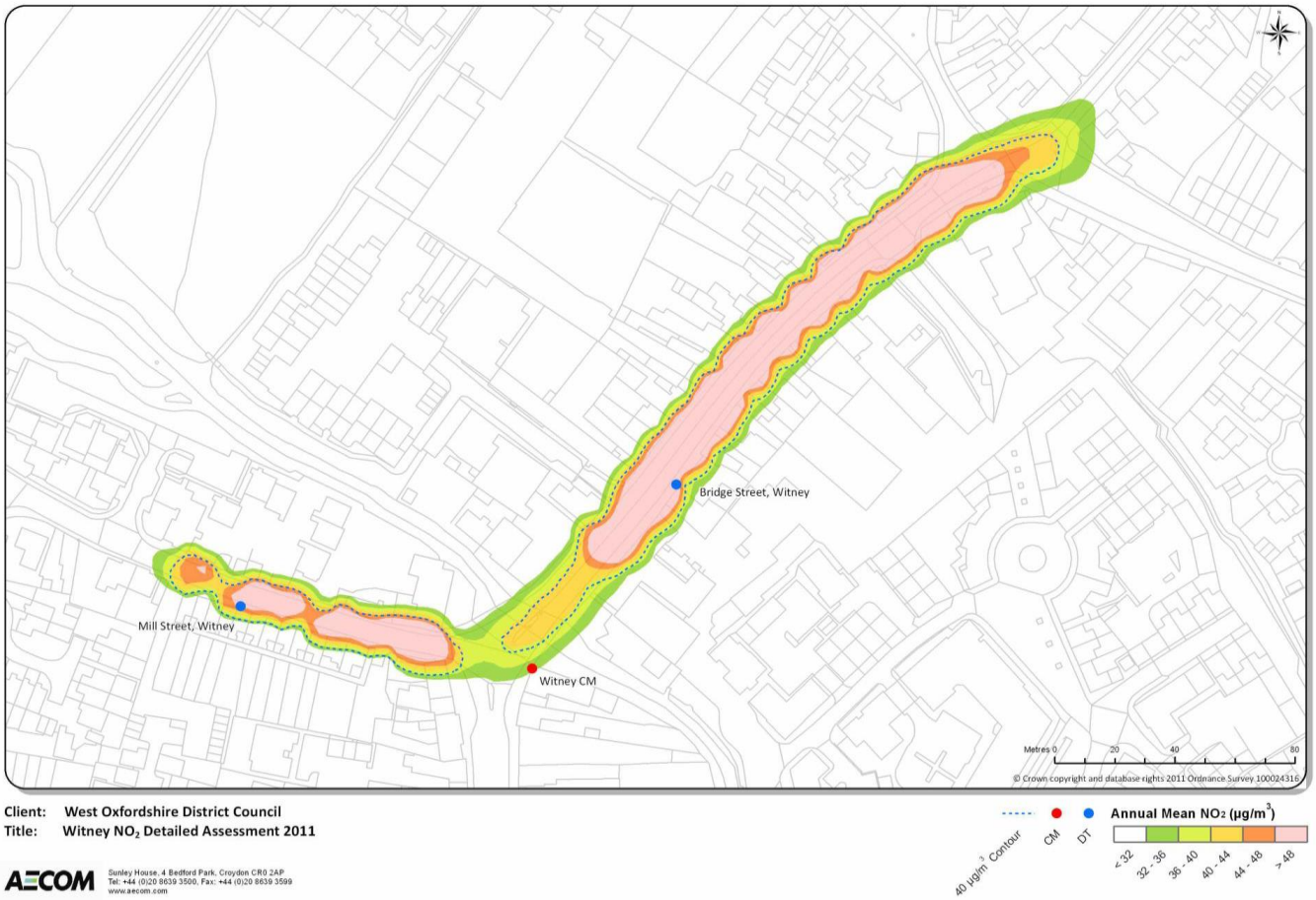
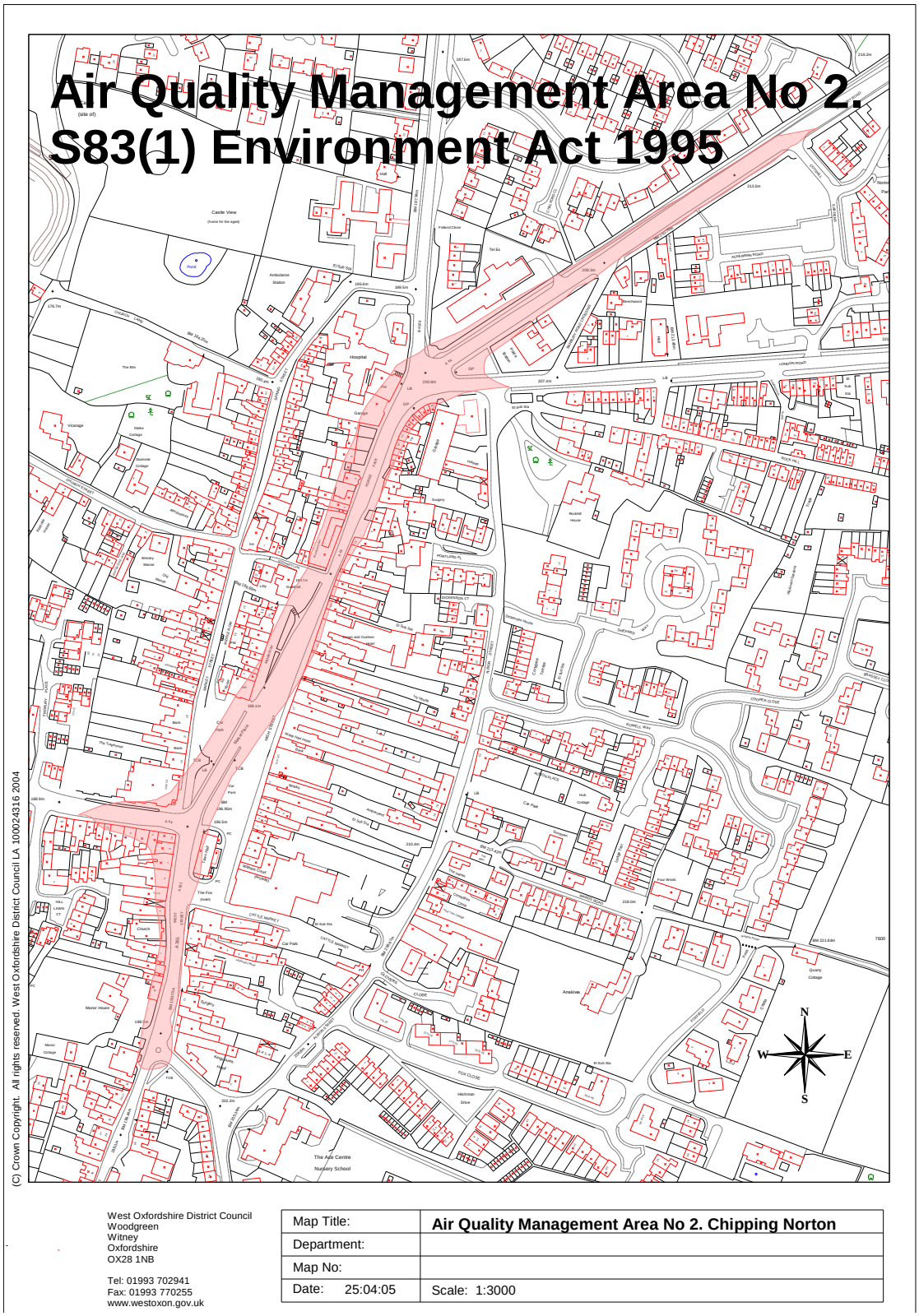


**Figure 1.3 Map of AQMA Boundaries – Witney (2011 Update)**




The Witney AQMA has been reassessed and the inclusion of the Mill Street diffusion tube site within its boundary has been confirmed following an update of the dispersion modelling in May 2011. Different modelling makes it difficult to reconcile the two similar but different presentations and overlaying one upon the other doesn't truly reflect the current boundary as per the later assessment. It is proposed to maintain the AQMA boundary, as originally declared, whilst noting the inclusion of the minor extension along Mill Street. [This site had always previously been considered part of the AQMA, previous mapping had placed it marginally outside the boundary.]

## Figure 1.4 Map of AQMA Boundaries – Chipping Norton



# 2 New Monitoring Data

## 2.1 Summary of Monitoring Undertaken

### 2.1.1 Automatic Monitoring Sites

**AQMA No 1 - Witney**

Continuous monitoring of nitrogen dioxide began in Newland, Witney in August 2001 and continued there until April 2005. When this site was sold, the original API, a chemiluminescent NOx continuous analyser, was relocated to Chipping Norton. A similar but newer model was established (May 2009) at a new location on Bridge Street within the Witney AQMA (the location is shown on the plan at Figure 2.1).

Calibration checks of the instrumentation are made every two weeks by the LA and six monthly service and calibration work was carried out by SupportingU Ltd.

All the data is ratified and validated annually by AECOM Ltd.

Annual Mean $NO_2$ Concentrations - Witney

| Period | Annual Mean $NO_2$ Concentration / $\mu g/m^3$ | Hourly Exceedences |
|---|---|---|
| 2014 Annual Mean | **26.2** | **0** |

**AQMA No 2 - Chipping Norton**.

A monitoring station was established in Chipping Norton to monitor nitrogen dioxide using the chemiluminescent analyser relocated from Witney. This was done to carry out further assessment work in response to the declaration of AQMA No 2 (the location is shown on the plan at Figure 2.2). The analysis of previous results helped formulate the Chipping Norton AQMA Action Plan which was accepted by Defra

Continuing monitoring is an integral part of the plan as submitted. Financial constraints have delayed the necessary consultation and technical investigation required prior to installation and implementation of recommended mitigation measures.

Calibration checks of the instrumentation are made every two weeks by the LA and six monthly service and calibration work was carried out by SupportingU Ltd.

Service reports have been routine and the 2014 data capture rate for this analyser was much improved.

All the data is ratified and validated annually by AECOM Ltd.

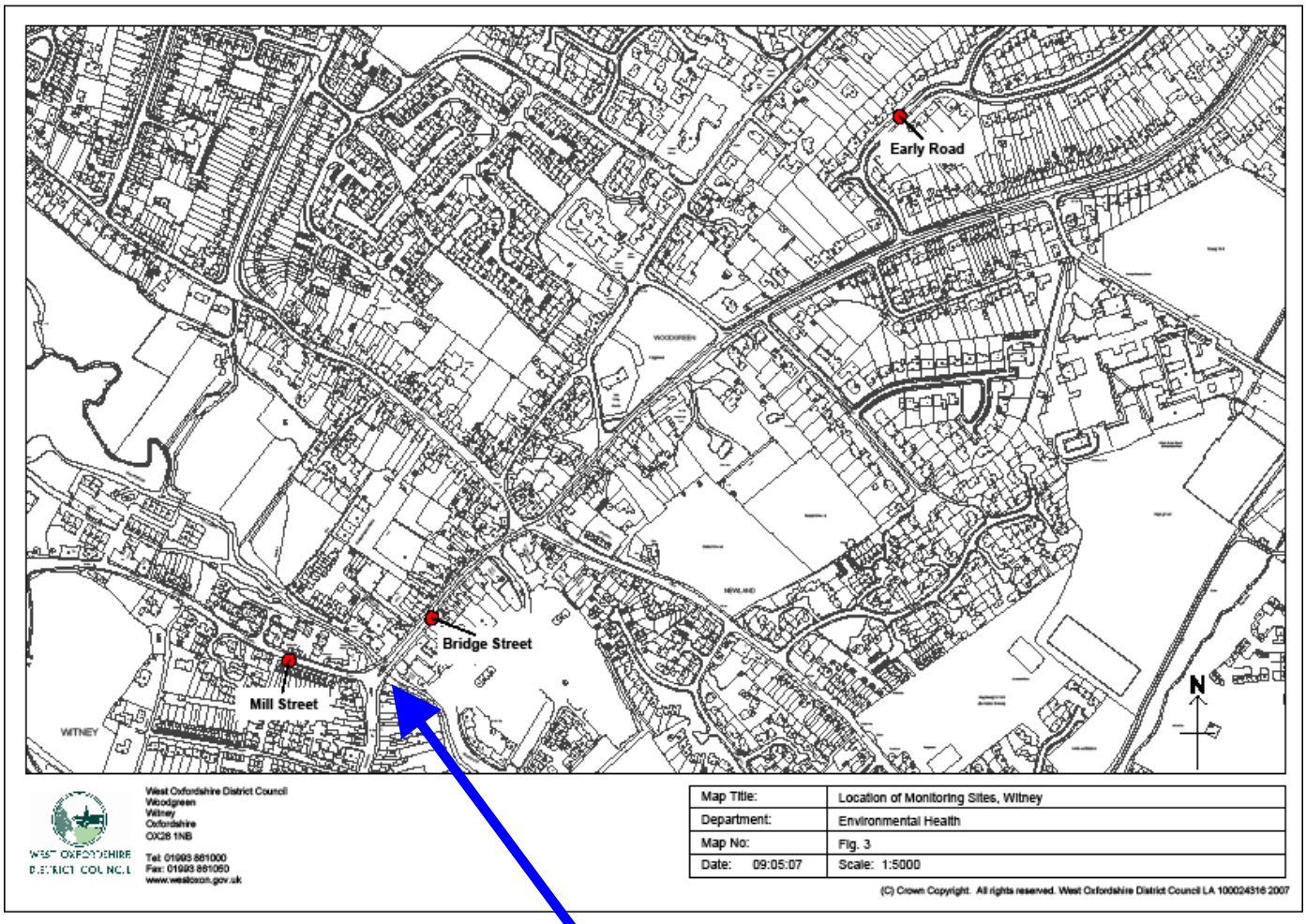
The data collected in the period January 2014 to December 2014 inclusive has been ratified and validated and is summarised in the table below.

Annual Mean $NO_2$ Concentrations - Chipping Norton

| Period | Annual Mean $NO_2$ Concentration / $\mu g/m^3$ | Hourly Exceedences |
|---|---|---|
| 2014 Annual Mean | **36.4** | **0** |

**Figure 2.1 Map of Automatic Monitoring Site**

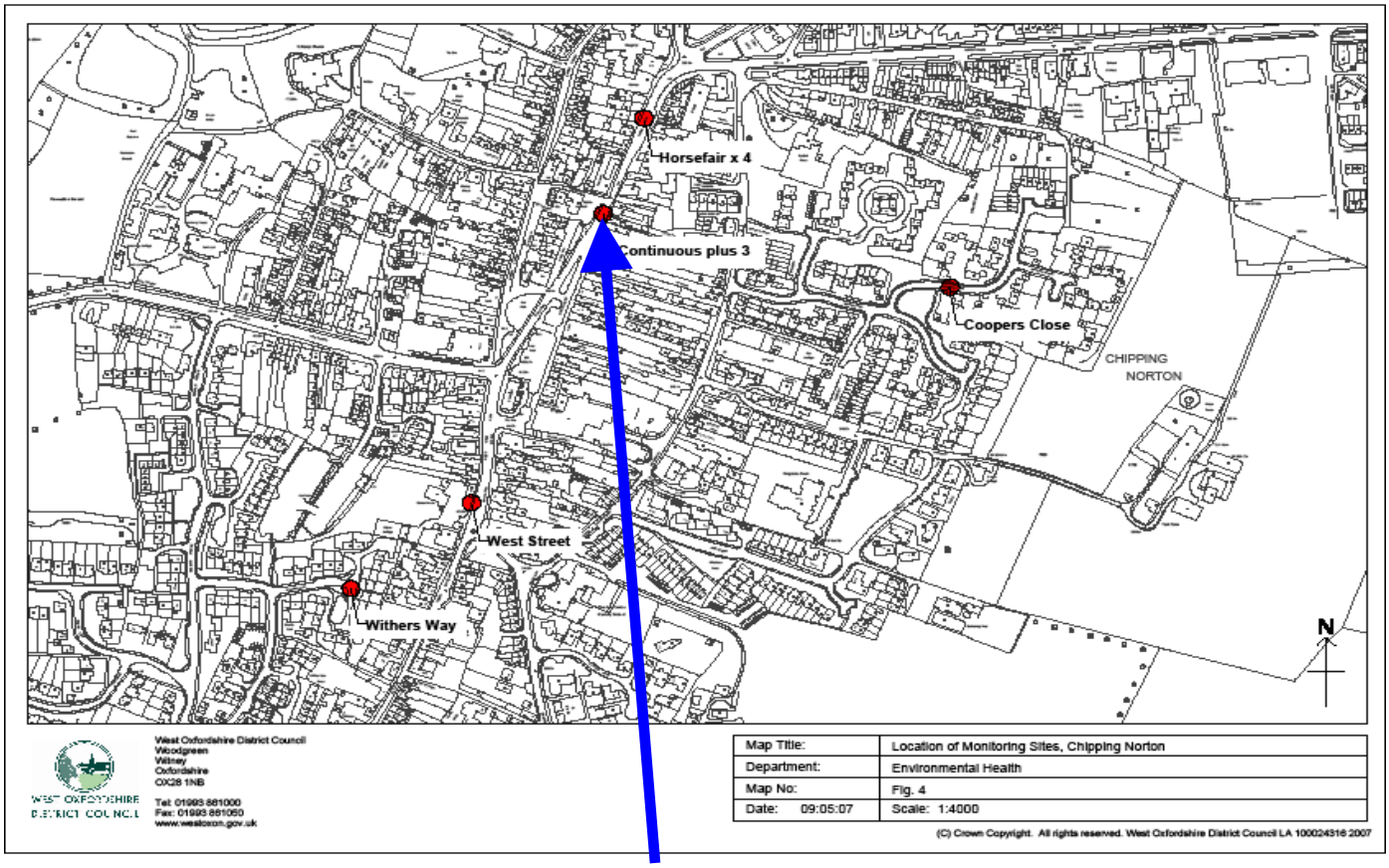
## CM1 WITNEY




**CM1 A Q Continuous Monitor**

**Figure 2.2 Map of Automatic Monitoring Site**

## CM2 CHIPPING NORTON




**CM2 A Q Continuous Monitor**

**Table 2.1a Details of Automatic Monitoring Sites**

| Site ID | Site Name | Site Type | OS Grid Ref | Inlet Height (m) | Pollutants Monitored | In AQMA? | Relevant Exposure? | Distance to kerb of nearest road | Worst-case Location |
|---|---|---|---|---|---|---|---|---|---|
| CM2 | Chipping Norton | Urban Roadside | 431404 227206 | 2.0 | $NO_2$ | Y | Y (2.0m to facade) | 0.5m | Y |
| CM1 | Witney | Urban Roadside | 435768 210177 | 2.0 | $NO_2$ | Y | Y (0.5m to facade) | 2.0m | Y |

### 2.1.2 Non-Automatic Monitoring Sites

**Nitrogen Dioxide monitoring by Diffusion Tube**.

Diffusion tubes are exposed for approximately 4 weeks before being sent for analysis to Environmental Scientifics Group (ESG) at Didcot. The Overall Bias Adjustment factor available from the AEA spreadsheet **v03.15 (22 studies)**, where a bias adjustment figure is provided for the participating laboratories for the period 2014, was **0.81**. Additionally, a Bias Adjustment Factor, **0.76**, was calculated using the AEA Spreadsheet for Calculation of Diffusion Tube Precision and Accuracy and the raw NO2 concentrations measured by the Chipping Norton Co-Location study diffusion tubes.

Table 2.4 details the results of the monitoring across the district adjusted for laboratory bias. It shows that 'Bridge Street' in Witney and 'Horsefair' in Chipping Norton currently exceed the objective concentration and these areas lie within the Air Quality Management Areas that were declared in March 2005. All other areas were within the objective limits. Furthermore, with the exception of the mean of the three co-located diffusion tubes in Chipping Norton and Mill Street in Witney, all other sites (33) were more than one standard deviation (SD = 4 i.e. 36 µg/$m^3$ or less) below the objective limit.

The diffusion tubes are supplied by ESG and analysed in accordance with ESG's ANU/SOP/1015, issue 1. This method meets the guidelines set out in Defra's 'Diffusion Tubes for Ambient $NO_2$ Monitoring: Practical Guidance.'

The tubes (from a specified batch) are prepared by spiking acetone : triethanolamine (50:50) on to the grids prior to the tubes being assembled.

In the WASP inter-comparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, ESG is currently ranked as a ‘Category Good’ laboratory

Ratification of the WODC data was completed by AECOM Ltd in April 2015.

### Table 2.1b Details of Non-Automatic Monitoring Sites - Within AQMAs

Annual Mean $NO_2$ / µg/$m^3$ (2014) in Witney (Bias Adjusted – Local v National)

| Location | Annual Mean $NO_2$ / µg/$m^3$ | |
|---|---|---|
| | Local (0.76) | National (0.81) |
| Bridge Street | **44.3** | **47.2** |
| Mill Street | 35.0 | 37.3 |

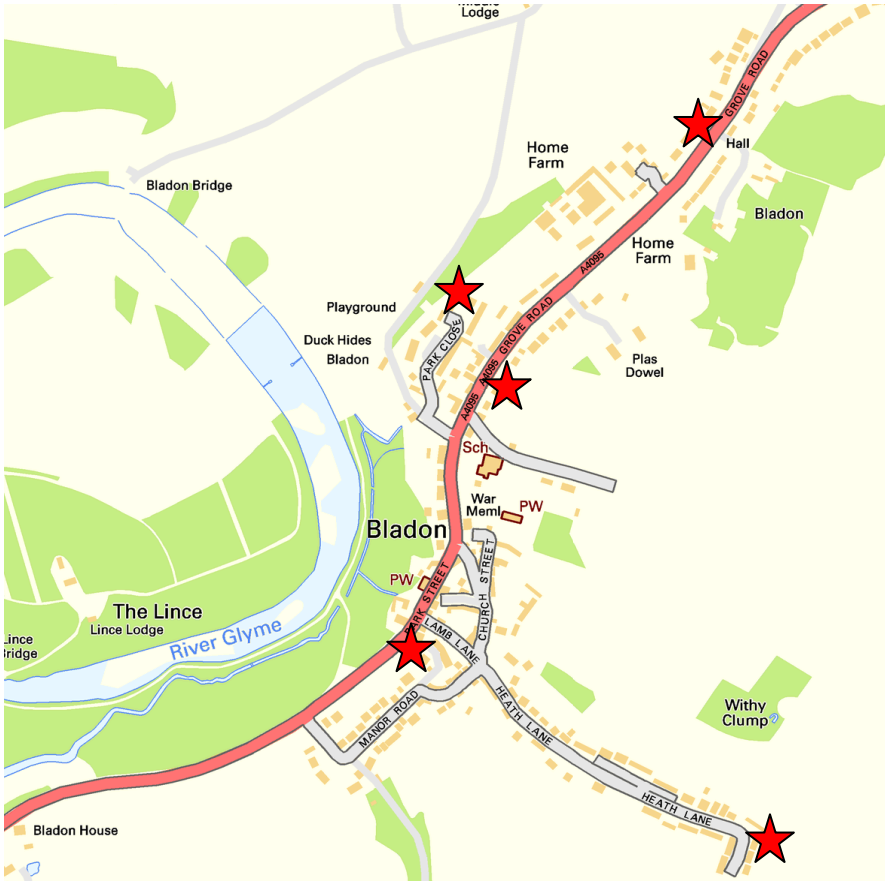
Annual Mean $NO_2$ / µg/$m^3$ (2013) in Chipping Norton (Bias Adjusted – Local v National)

| Location | Annual Mean $NO_2$ / µg/$m^3$ | |
|---|---|---|
| | Local (0.76) | National (0.81) |
| Horsefair | **54.1** | **57.7** |
| 17 Horsefair | 28.6 | 30.5 |
| Co-Location Triplicate Mean | 36.6 | 39.1 |
| 5 Horsefair | 22.2 | 23.7 |
| 7 Horsefair | 22.6 | 24.0 |
| West Street | 25.3 | 27.0 |

Note: All are representative of relevant exposure – those in bold exceed 40 µg/$m^3$

## Maps of Non-Automatic Monitoring Sites

## Figure 2.3

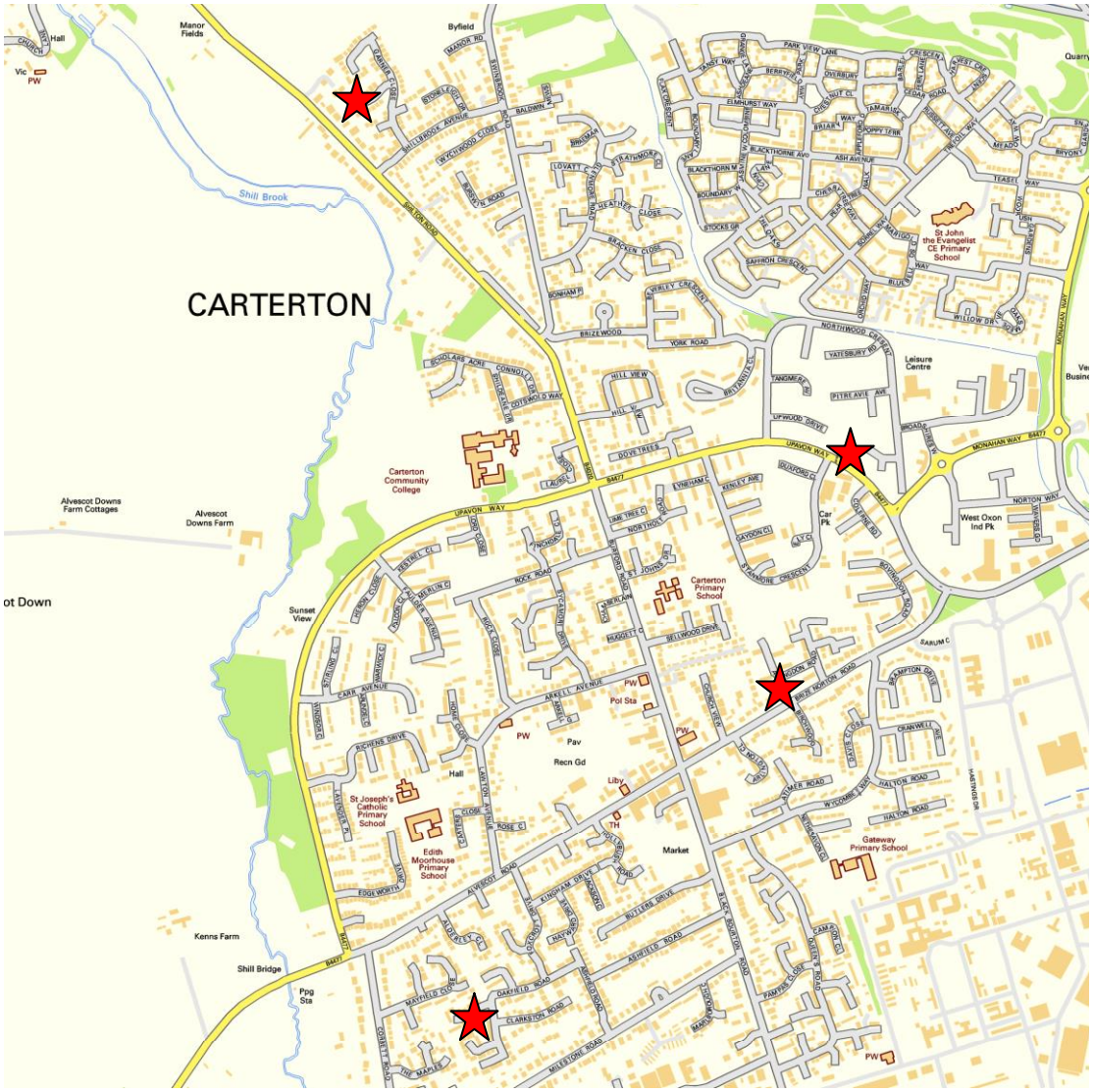



**BLADON**

**Figure 2.4**

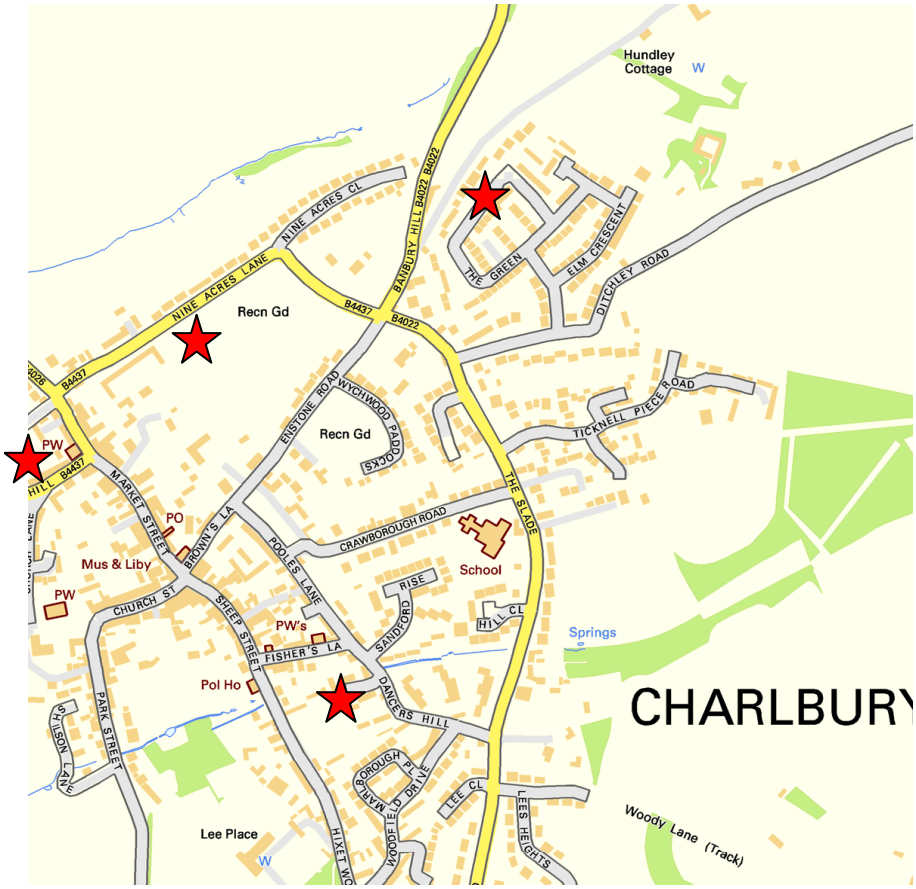

**BURFORD**

## Figure 2.5




**CARTERTON**

**Figure 2.6**




**CHARLBURY**

**Figure 2.7**

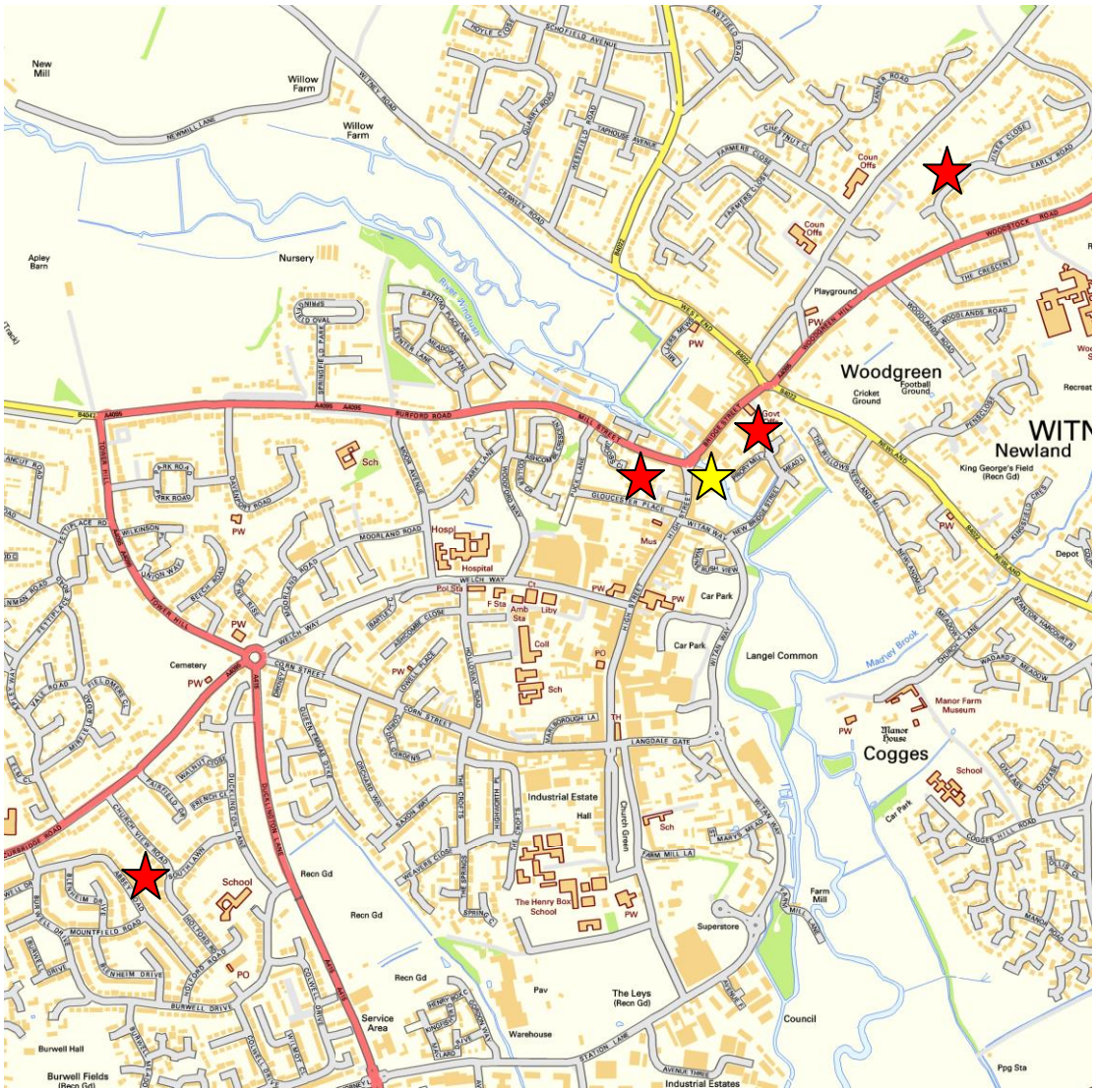

**CHIPPING NORTON**

**Diffusion tubes co-located with NOx Analyser**

## Figure 2.8


**EYNSHAM**

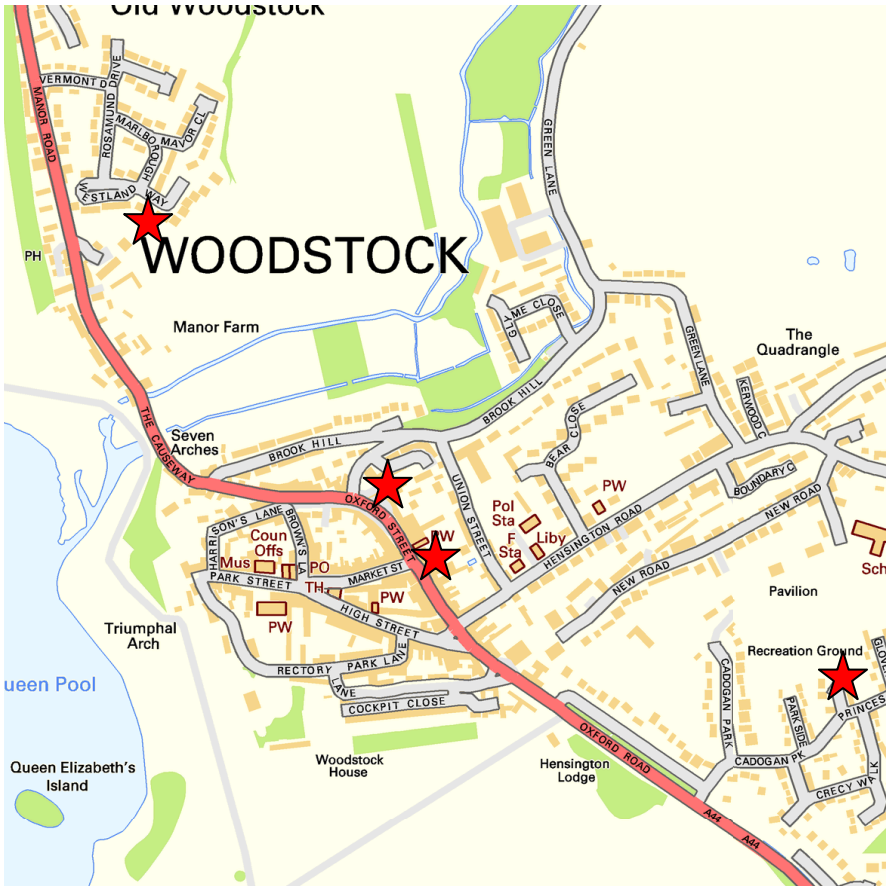
## Figure 2.9




**WITNEY**

**NOx Analyser**

**Figure 2.10**




**WOODSTOCK**

**Table 2.1c Details of Non- Automatic Monitoring Sites**

| Site ID<br><br>DT# | Site Name | Site Type | OS Grid Reference | Site Height (m)<br><br>2.5 to 3m | Pollutants Monitored<br><br>NO2 | In AQMA | Is Monitoring Co-located with a Continuous Analyser | Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Does this Location Represent Worst-Case Exposure? |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Bridge Street, Witney | R | 435816 210239 | | | Y | | Y 0.5 | 2 | Y |
| 2 | Mill Street, Witney | R | 435671 210198 | | | Y | | Y 0.5 | 1 | Y |
| 3 | Early Rd., Witney | B | 436339 210806 | | | | | | 2 | |
| 4 | Abbey Rd., Witney | B | 434596 209210 | | | | | | 2 | |
| 5 | High St, (N) Burford | R | 425187 212431 | | | | | Y 0.5 | 2 | Y |
| 6 | 93 High Street, (S) Burford | R | 425156 212197 | | | | | Y 2 | 0.5 | Y |
| 7 | Frethern Cl, Burford | B | 425406 211678 | | | | | | 1 | |

| Site ID<br><br>DT# | Site Name | Site Type | OS Grid Reference | Site Height (m)<br><br>2.5 to 3m | Pollutants Monitored<br><br>NO2 | In AQMA | Is Monitoring Co-located with a Continuous Analyser | Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Does this Location Represent Worst-Case Exposure? |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Orchard Rise, Burford | B | 425447 211949 | | | | | | 1 | |
| 9 | Brize Norton Rd, Carterton | R | 428329 206946 | | | | | Y | 2 | Y |
| 10 | Upavon Way, Carterton | R | 428467 207442 | | | | | Y | 2 | Y |
| 11 | Garner Close, Carterton | B | 427415 208234 | | | | | | 1 | |
| 12 | Oakfield Road, Carterton | B | 427687 206254 | | | | | | 1 | |
| 13 | Dyers Hill, Charlbury | R | 435585 219620 | | | | | Y | 1 | Y |
| 14 | Nineacres Lane, Charlbury | R | 435654 219763 | | | | | Y | 1 | Y |

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| Site ID<br><br>DT# | Site Name | Site Type | OS Grid Reference | Site Height (m)<br><br>2.5 to 3m | Pollutants Monitored<br><br>NO2 | In AQMA | Is Monitoring Co-located with a Continuous Analyser | Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Does this Location Represent Worst-Case Exposure? |
|---|---|---|---|---|---|---|---|---|---|---|
| 15 | Tanners Close, Charlbury | B | 435945 219324 | | | | | | **1** | |
| 16 | The Green, Charlbury | B | 436138 219973 | | | | | | **1** | |
| 17 | Horsefair, Chipping Norton | R | 431425 227275 | | | **Y** | | **Y 0.5** | **0.5** | **Y** |
| 33 | 17,Horsefair Chipping Norton | R | 431450 227314 | | | **Y** | | **Y 2** | **0.5** | **Y** |
| 36<br>37<br>38 | Co-location, Chipping Norton (Triplicate Mean) | R | 431404 227206 | | | **Y** | **Y** | **Y 2** | **0.5** | **Y** |
| 34 | 5 Horsefair, Chipping Norton | R | 431439 227268 | | | **Y** | | **Y 0.5** | **5** | **Y** |

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| Site ID<br><br>DT# | Site Name | Site Type | OS Grid Reference | Site Height (m)<br><br>2.5 to 3m | Pollutants Monitored<br><br>NO2 | In AQMA | Is Monitoring Co-located with a Continuous Analyser | Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Does this Location Represent Worst-Case Exposure? |
|---|---|---|---|---|---|---|---|---|---|---|
| 35 | 7 Horsefair, Chipping Norton | R | 431443 227282 | | | Y | | Y 0.5 | 4 | Y |
| 18 | West Street, Chipping Norton | R | 431300 226959 | | | Y | | Y 0.5 | 2 | Y |
| 19 | Coopers Close, Chipping Norton | B | 431694 227156 | | | | | | 1 | |
| 20 | Withers Way, Chipping Norton | B | 431207 226877 | | | | | | 1 | |
| 21 | Acre End Street, Eynsham | R | 442950 209301 | | | | | Y 2 | 1 | Y |
| 22 | Mill Street, Eynsham | R | 443309 209573 | | | | | Y 1 | 1 | Y |

| Site ID<br><br>DT# | Site Name | Site Type | OS Grid Reference | Site Height (m)<br><br>2.5 to 3m | Pollutants Monitored<br><br>NO2 | In AQMA | Is Monitoring Co-located with a Continuous Analyser | Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Does this Location Represent Worst-Case Exposure? |
|---|---|---|---|---|---|---|---|---|---|---|
| 23 | Orchard Close, Eynsham | B | 443632 209356 | | | | | | **0.5** | |
| 24 | Shakespeare Rd, Eynsham | B | 442856 209781 | | | | | | **1** | |
| 25 | Oxford Street, (E) Woodstock | R | 444592 216763 | | | | | **Y 2** | **1** | **Y** |
| 26 | Oxford Street, (W) Woodstock | R | 444526 216851 | | | | | **Y 1** | **0.5** | **Y** |
| 27 | The Ley, Woodstock | B | 445131 216615 | | | | | | **1** | |
| 28 | Westland Way, Woodstock | B | 444212 217270 | | | | | | **1** | |
| 29 | Grove Road, (S) Bladon | R | 444871 214983 | | | | | **Y 5** | **1** | **Y** |

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| Site ID<br><br>DT# | Site Name | Site Type | OS Grid Reference | Site Height (m)<br><br>2.5 to 3m | Pollutants Monitored<br><br>NO2 | In AQMA | Is Monitoring Co-located with a Continuous Analyser | Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Does this Location Represent Worst-Case Exposure? |
|---|---|---|---|---|---|---|---|---|---|---|
| 30 | Grove Road, (N) Bladon | R | 445190 215353 | | | | | **Y 5** | **1** | **Y** |
| 31 | Heath Lane, Bladon | B | 445227 214402 | | | | | | **1** | |
| 32 | Park Close, Bladon | B | 444851 215094 | | | | | | **1** | |
| 39 | Park Street, Bladon | R | 444791 214681 | | | | | **Y 0.5** | **1** | **Y** |

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

### Automatic AQ Monitoring Station – CM2 Chipping Norton

The data collected in the period January 2014 to December 2014 inclusive has been ratified and validated and is summarised in the table below.

Annual Mean $NO_2$ Concentrations

| Period | Annual Mean $NO_2$ Concentration / µg/m$^3$ | Hourly Exceedences >200 µg/m$^3$ |
|---|---|---|
| 2014 Annual Mean | **36.4** | **0** |

Note: Based on **97.8%** data capture

### Automatic AQ Monitoring Station – CM1 Witney

The data collected in the period January 2014 to December 2014 inclusive has been ratified and validated and is summarised in the table below.

Annual Mean $NO_2$ Concentrations

| Period | Annual Mean $NO_2$ Concentration / µg/m$^3$ | Hourly Exceedences >200 µg/m$^3$ |
|---|---|---|
| 2014 Annual Mean | **26.2** | **0** |

Note: Based on **95.7%** data capture

### Diffusion Tube Site Monitoring

At Table 2.4 are details of the results of the monitoring across the district adjusted for laboratory bias. It shows that 'Bridge Street' in Witney and 'Horsefair' in Chipping Norton currently exceed the objective concentration and these areas lie within the Air Quality Management Areas that were declared in March 2005. All other areas were

within the objective limits. Furthermore, with the exception of the mean of the three co-located diffusion tubes in Chipping Norton and Mill Street in Witney, all other sites (33) were more than one standard deviation (SD = 4 i.e. 36 µg/m$^3$ or less) below the objective limit.

Annual Mean $NO_2$ / µg/m$^3$ (2014) in Witney (Bias Adjusted – Local v National)

| Location | Annual Mean $NO_2$ / µg/m$^3$ | |
|---|---|---|
| | Local (0.76) | National (0.81) |
| Bridge Street | **44.3** | **47.2** |
| Mill Street | 35.0 | 37.3 |

Annual Mean $NO_2$ / µg/m$^3$ (2014) in Chipping Norton (Bias Adjusted – Local v National)

| Location | Annual Mean $NO_2$ / µg/m$^3$ | |
|---|---|---|
| | Local (0.76) | National (0.81) |
| Horsefair | **54.1** | **57.7** |
| Co-Location Triplicate Mean | 36.6 | 39.1 |

The results, overall, do not indicate any additional areas of concern requiring a detailed assessment.

### 2.2.1 Nitrogen Dioxide ($NO_2$)

Data includes both automatic monitoring and diffusion tube monitoring.

In Chipping Norton, the automatic monitoring returned a Mean Pollution Concentration of **36.4** µg/m$^3$ based on a **97.8**% data capture. The measured annual mean concentration (by Diffusion Tube) is greater than 40 µg/m$^3$ within part of the Chipping Norton AQMA (Horsefair).

The Chipping Norton automatic site has not recorded any 1-hour means above 200 µg/m$^3$ ( the 99.8$^{th}$ percentile of 1-hour mean concentrations is **139.3**µg/m$^3$).

Data from the continuous monitoring station within the Witney AQMA returned a Mean Pollution Concentration of **26.2** µg/m$^3$ based on a **95.7**% capture rate. The measured annual mean concentration (by Diffusion tube) is greater than 40 µg/m$^3$ within part of the Witney AQMA (Bridge Street).

The Witney AQMA site has not recorded any 1-hour means above 200 µg/m$^3$ (the 99.8$^{th}$ percentile of 1-hour mean concentrations is **86.4**µg/m$^3$ ).

The monitoring site locations are representative of relevant public exposure.

## Automatic Monitoring Data

Graphs showing the full year dataset (hourly mean values) of both Automatic monitoring stations are at Appendix C.

**Table 2.2 Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective**

| Site ID | Site Type | Within AQMA? | Valid Data Capture for period of monitoring %[a] | Valid Data Capture 2014 % [b] | Annual Mean Concentration μg/m$^3$ | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2010 | 2011 | 2012 | 2013 | 2014 |
| CM1 [Witney] | Roadside | Y | - | **95.7** | **33.0** | **27.9** | **28.2** | **29.6** | **26.2** |
| CM2 [Chip N'tn] | Roadside | Y | - | **97.8** | **45.3** | **38.3** | **36.6** | **38.0** | **36.4** |

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).

**Table 2.3 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective**

| Site ID | Site Type | Within AQMA? | Valid Data Capture for period of monitoring %[a] | Valid Data Capture 2014 % [b] | Number of Exceedences of Hourly Mean (200 μg/m$^3$) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2010 [c] | 2011 [c] | 2012 [c] | 2013 [c] | 2014 [c] |
| CM1 | Roadside | Y | - | 95.7 | 0 (105.9) | 0 (100.2) | 0 (87.5) | 0 (90.9) | 0 (86.4) |
| CM2 | Roadside | Y | - | 97.8 | 6 (172.8) | 5 (182.9) | 1 (157.9) | 3 (155.9) | 0 (139.3) |

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).
[c] If the period of valid data is less than 90%, include the 99.8$^{th}$ percentile of hourly means in brackets (NB Included, even if >90%)

## Diffusion Tube Monitoring Data

A full dataset (monthly mean values) is included at Appendix B.

This is raw data (not bias adjusted) - the more relevant (corrected) data is presented below in the various tables.

## Results of Nitrogen Dioxide Diffusion Tubes - Witney

Annual Mean $NO_2$ / µg/$m^3$ (2014) in Witney (Bias Adjusted – Local v National)

| Location | Annual Mean $NO_2$ / µg/$m^3$ | |
|---|---|---|
| | **Local (0.76)** | **National (0.81)** |
| Bridge Street | **44.3** | **47.2** |
| Mill Street | 35.0 | **37.3** |

## Results of Nitrogen Dioxide Diffusion Tubes - Chipping Norton

Annual Mean $NO_2$ / µg/$m^3$ (2014) in Chipping Norton (Bias Adjusted – Local v National)

| Location | Annual Mean $NO_2$ / µg/$m^3$ | |
|---|---|---|
| | **Local (0.76)** | **National (0.81)** |
| Horsefair | **54.1** | **57.7** |
| Co-Location Triplicate Mean | 36.6 | 39.1 |
| 17 Horsefair | 28.6 | 30.5 |
| 5 Horsefair | 22.2 | 23.7 |
| 7 Horsefair | 22.6 | 24.0 |
| West Street | 25.3 | 27.0 |

The national bias adjustment factor applied in USA 2015 to the annual means is 0.**81**

All of the above are located within AQMAs.

All other areas were within the objective limits. Furthermore, with the exception of the mean of the three co-located diffusion tubes in Chipping Norton and Mill Street in Witney, all other sites (**33**) were more than one standard deviation (SD = 4 i.e. 36 µg/$m^3$ or less) below the objective limit.

See Table 2.4 for % data capture of other / all Diffusion Tubes

**Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes in 2014**

| Site ID<br><br>DT# | Location | Site Type | Within AQMA? | Triplicate or Co-located Tube | Full Calendar Year Data Capture 2014 (Number of Months or %) [a] | Data with less than 9 months has been annualised (Y/N)<br><br>N/A | Confirm if data has been distance corrected (Y/N)<br><br>N/A | 2014 Annual Mean Concentration (µg/m$^3$) - Bias Adjustment factor = (National) 0.81 |
|---|---|---|---|---|---|---|---|---|
| 2 | Mill Street, Witney | R | Y | | 100 | | | 37.3 |
| 3 | Early Rd., Witney | B | | | 100 | | | 12.6 |
| 4 | Abbey Rd., Witney | B | | | 92 | | | 12.4 |
| 1 | Bridge Street, Witney | R | Y | | 100 | | | 47.2 |
| 5 | High St, (N) Burford | R | | | 100 | | | 33.0 |
| 6 | 93 High Street, (S) Burford | R | | | 92 | | | 35.0 |
| 7 | Frethern Cl, Burford | B | | | 100 | | | 11.1 |

**West Oxfordshire – England** **April 2015**

| Site ID<br><br>DT# | Location | Site Type | Within AQMA? | Triplicate or Co-located Tube | Full Calendar Year Data Capture 2014 (Number of Months or %) [a] | Data with less than 9 months has been annualised (Y/N)<br><br>N/A | Confirm if data has been distance corrected (Y/N)<br><br>N/A | 2014 Annual Mean Concentration (µg/m$^3$) - Bias Adjustment factor = (National) 0.81 |
|---|---|---|---|---|---|---|---|---|
| 8 | Orchard Rise, Burford | B | | | 100 | | | 9.3 |
| 9 | Brize Norton Rd, Carterton | R | | | 83 | | | 26.0 |
| 10 | Upavon Way, Carterton | R | | | 100 | | | 17.5 |
| 11 | Garner Close, Carterton | B | | | 100 | | | 10.1 |
| 12 | Oakfield Road, Carterton | B | | | 100 | | | 11.9 |
| 13 | Dyers Hill, Charlbury | R | | | 100 | | | 15.4 |
| 14 | Nineacres Lane, Charlbury | R | | | 100 | | | 14.3 |

**West Oxfordshire – England** **April 2015**

| Site ID<br><br>DT# | Location | Site Type | Within AQMA? | Triplicate or Co-located Tube | Full Calendar Year Data Capture 2014 (Number of Months or %) [a] | Data with less than 9 months has been annualised (Y/N)<br><br>N/A | Confirm if data has been distance corrected (Y/N)<br><br>N/A | 2014 Annual Mean Concentration (µg/m$^3$) - Bias Adjustment factor = (National) 0.81 |
|---|---|---|---|---|---|---|---|---|
| 15 | Tanners Close, Charlbury | B | | | 100 | | | 8.9 |
| 16 | The Green, Charlbury | B | | | 92 | | | 9.4 |
| 17 | Horsefair, Chipping Norton | R | Y | | 100 | | | 57.7 |
| 33 | 17,Horsefair Chipping Norton | R | Y | | 100 | | | 30.5 |
| 36 37<br>38 | Co-location, Chipping Norton (Triplicate Mean) | R | Y | Y | 100 | | | 39.1 |
| 34 | 5 Horsefair, Chipping Norton | R | Y | | 100 | | | 23.7 |

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| Site ID<br><br>DT# | Location | Site Type | Within AQMA? | Triplicate or Co-located Tube | Full Calendar Year Data Capture 2014 (Number of Months or %) [a] | Data with less than 9 months has been annualised (Y/N)<br><br>N/A | Confirm if data has been distance corrected (Y/N)<br><br>N/A | 2014 Annual Mean Concentration (µg/m$^3$) - Bias Adjustment factor = (National) 0.81 |
|---|---|---|---|---|---|---|---|---|
| 35 | 7 Horsefair, Chipping Norton | R | Y | | 100 | | | 24.0 |
| 18 | West Street, Chipping Norton | R | Y | | 92 | | | 27.0 |
| 19 | Coopers Close, Chipping Norton | B | | | 100 | | | 10.4 |
| 20 | Withers Way, Chipping Norton | B | | | 100 | | | 10.2 |
| 21 | Acre End Street, Eynsham | R | | | 100 | | | 13.3 |
| 22 | Mill Street, Eynsham | R | | | 100 | | | 14.3 |

**West Oxfordshire – England** **April 2015**

| Site ID<br><br>DT# | Location | Site Type | Within AQMA? | Triplicate or Co-located Tube | Full Calendar Year Data Capture 2014 (Number of Months or %) [a] | Data with less than 9 months has been annualised (Y/N)<br><br>N/A | Confirm if data has been distance corrected (Y/N)<br><br>N/A | 2014 Annual Mean Concentration (µg/m$^3$) - Bias Adjustment factor = (National) 0.81 |
|---|---|---|---|---|---|---|---|---|
| 23 | Orchard Close, Eynsham | B | | | 100 | | | 10.2 |
| 24 | Shakespeare Rd, Eynsham | B | | | 100 | | | 12.6 |
| 25 | Oxford Street, (E) Woodstock | R | | | 100 | | | 30.2 |
| 26 | Oxford Street, (W) Woodstock | R | | | 100 | | | 29.6 |
| 27 | The Ley, Woodstock | B | | | 100 | | | 10.1 |
| 28 | Westland Way, Woodstock | B | | | 100 | | | 11.2 |
| 29 | Grove Road, (S) Bladon | R | | | 100 | | | 20.7 |

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| Site ID DT# | Location | Site Type | Within AQMA? | Triplicate or Co-located Tube | Full Calendar Year Data Capture 2014 (Number of Months or %) [a] | Data with less than 9 months has been annualised (Y/N) N/A | Confirm if data has been distance corrected (Y/N) N/A | 2014 Annual Mean Concentration (µg/m$^3$) - Bias Adjustment factor = (National) 0.81 |
|---|---|---|---|---|---|---|---|---|
| 30 | Grove Road, (N) Bladon | R | | | 100 | | | 21.9 |
| 31 | Heath Lane, Bladon | B | | | 92 | | | 10.4 |
| 32 | Park Close, Bladon | B | | | 100 | | | 9.8 |
| 39 | Park Street, Bladon | R | | | 100 | | | 31.8 |

**Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes (2010 to 2014)**

| Site ID DT# | Name Location | Site Type | Within AQMA? | Annual mean concentration (adjusted for bias) μg/m$^3$ | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2010 (Bias Adjustment Factor = 0.85) | 2011 (Bias Adjustment Factor = 0.84) | 2012 (Bias Adjustment Factor = 0.79) | 2013 (Bias Adjustment Factor = 0.80) | 2014 (Bias Adjustment Factor = 0.81) |
| 1 | Bridge Street, Witney | R | Y | **56.3** | **54.0** | **49.3** | **51.3** | **47.2** |
| 2 | Mill Street, Witney | R | Y | **44.5** | **45.4** | **41.5** | 37.9 | **37.3** |
| 3 | Early Rd., Witney | B | | 16.9 | 15.4 | 14.0 | 14.4 | **12.6** |
| 4 | Abbey Rd., Witney | B | | 20.0 | 16.5 | 16.2 | 15.5 | **12.4** |
| 5 | High St, (N) Burford | R | | 38.6 | 37.7 | 33.6 | 34.1 | **33.0** |
| 6 | 93 High Street, (S) Burford | R | | 38.6 | 37.5 | 30.9 | 36.5 | **35.0** |
| 7 | Frethern Cl, Burford | B | | 15.5 | 12.0 | 12.6 | 10.9 | **11.1** |
| 8 | Orchard Rise, Burford | B | | 12.5 | 10.5 | 10.3 | 10.3 | **9.3** |

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| Site ID DT# | Name Location | Site Type | Within AQMA? | Annual mean concentration (adjusted for bias) μg/m$^3$ | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2010 (Bias Adjustment Factor = 0.85) | 2011 (Bias Adjustment Factor = 0.84) | 2012 (Bias Adjustment Factor = 0.79) | 2013 (Bias Adjustment Factor = 0.80) | 2014 (Bias Adjustment Factor = 0.81) |
| 9 | Brize Norton Rd, Carterton | R | | 23.7 | 20.9 | 21.8[a] | 26.1 | **26.0** |
| 10 | Upavon Way, Carterton | R | | 24.6 | 21.8 | 20.0 | 19.9 | **17.5** |
| 11 | Garner Close, Carterton | B | | 14.3 | 11.6 | 11.5 | 12.1 | **10.1** |
| 12 | Oakfield Road, Carterton | B | | 15.7 | 13.6 | 13.2 | 14.1 | **11.9** |
| 13 | Dyers Hill, Charlbury | R | | 19.8 | 18.5 | 17.9 | 17.0 | **15.4** |
| 14 | Nineacres Lane, Charlbury | R | | 17.6 | 16.9 | 15.7 | 15.5 | **14.3** |
| 15 | Tanners Close, Charlbury | B | | 13.1 | 11.2 | 10.2 | 10.3 | **8.9** |
| 16 | The Green, Charlbury | B | | 12.6 | 10.8 | 10.6 | 11.1 | **9.4** |

**West Oxfordshire – England** **April 2015**

| Site ID DT# | Name Location | Site Type | Within AQMA? | Annual mean concentration (adjusted for bias) μg/m$^3$ | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2010 (Bias Adjustment Factor = 0.85) | 2011 (Bias Adjustment Factor = 0.84) | 2012 (Bias Adjustment Factor = 0.79) | 2013 (Bias Adjustment Factor = 0.80) | 2014 (Bias Adjustment Factor = 0.81) |
| 17 | Horsefair, Chipping Norton | R | **Y** | **66.4** | **60.0** | **61.6** | **56.1** | **57.7** |
| 33 | 17 Horsefair Chipping Norton | R | **Y** | 0 | 37.5 | 31.9 | 31.4 | **30.5** |
| 36<br>37<br>38 | Co-location, Chipping Norton (Triplicate Mean) | R | **Y** | **45.4** | **41.5** | 38.4 | 39.6 | **39.1** |
| 34 | 5 Horsefair, Chipping Norton | R | **Y** | 29.9 | 26.8 | 24.2 | 23.3 | **23.7** |
| 35 | 7 Horsefair, Chipping Norton | R | **Y** | 29.3 | 26.7 | 24.7 | 24.8 | **24.0** |
| 18 | West Street, Chipping Norton | R | **Y** | 35.5 | 31.5 | 29.6 | 27.3 | **27.0** |

| Site ID DT# | Name Location | Site Type | Within AQMA? | Annual mean concentration (adjusted for bias) μg/m$^3$ | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2010 (Bias Adjustment Factor = 0.85) | 2011 (Bias Adjustment Factor = 0.84) | 2012 (Bias Adjustment Factor = 0.79) | 2013 (Bias Adjustment Factor = 0.80) | 2014 (Bias Adjustment Factor = 0.81) |
| 19 | Coopers Close, Chipping Norton | B | | 14.8 | 12.6 | 11.5 | 12.6 | **10.4** |
| 20 | Withers Way, Chipping Norton | B | | 14.8 | 11.2 | 11.5 | 12.1 | **10.2** |
| 21 | Acre End Street, Eynsham | R | | 18.6 | 16.4 | 16.2 | 16.6 | **13.3** |
| 22 | Mill Street, Eynsham | R | | 19.1 | 16.9 | 15.3 | 15.9 | **14.3** |
| 23 | Orchard Close, Eynsham | B | | 14.7 | 12.4 | 12.3 | 12.4 | **10.2** |
| 24 | Shakespeare Rd, Eynsham | B | | 18.4 | 14.6 | 14.0 | 14.9 | **12.6** |
| 25 | Oxford Street, (E) Woodstock | R | | 39.0 | 33.9 | 32.5 | 33.9 | **30.2** |

**West Oxfordshire – England** **April 2015**

| Site ID DT# | Name Location | Site Type | Within AQMA? | Annual mean concentration (adjusted for bias) μg/m$^3$ | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2010 (Bias Adjustment Factor = 0.85) | 2011 (Bias Adjustment Factor = 0.84) | 2012 (Bias Adjustment Factor = 0.79) | 2013 (Bias Adjustment Factor = 0.80) | 2014 (Bias Adjustment Factor = 0.81) |
| 26 | Oxford Street, (W) Woodstock | R | | 38.6 | 35.4 | 33.9 | 33.6 | **29.6** |
| 27 | The Ley, Woodstock | B | | 13.6 | 11.7 | 11.5 | 12.5 | **10.1** |
| 28 | Westland Way, Woodstock | B | | 16.5 | 11.3 | 12.2 | 12.6 | **11.2** |
| 29 | Grove Road, (S) Bladon | R | | 23.5 | 21.1 | 20.8 | 21.3 | **20.7** |
| 30 | Grove Road, (N) Bladon | R | | 31.3 | 27.8 | 26.1 | 25.8 | **21.9** |
| 31 | Heath Lane, Bladon | B | | 14.0 | 12.6 | 12.6 | 12.0 | **10.4** |
| 32 | Park Close, Bladon | B | | 12.8 | 11.7 | 10.8 | 10.9 | **9.8** |
| 39 | Park Street, Bladon | R | | 36.9 | 34.3 | 33.5 | 31.1 | **31.8** |

### 2.2.2 Summary of Compliance with AQS Objectives

WODC has examined the results from monitoring in the district. 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

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

WODC 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

WODC 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.

WODC confirms that there are no new/newly identified roads with high flows of buses/HDVs.

## 3.4 Junctions

WODC 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

WODC confirms that there are no new/proposed roads.

## 3.6 Roads with Significantly Changed Traffic Flows

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

## 3.7 Bus and Coach Stations

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

# 4 Other Transport Sources

## 4.1 Airports

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

RAF Brize Norton does not fall within measureable criteria.

## 4.2 Railways (Diesel and Steam Trains)

### 4.2.1 Stationary Trains

WODC 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

WODC 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)

WODC 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

WODC 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

WODC 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

WODC 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

WODC confirms that there are no petrol stations meeting the specified criteria**.**

## 5.4 Poultry Farms

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

# 6 Commercial and Domestic Sources

## 6.1 Biomass Combustion – Individual Installations

WODC confirms that there are no biomass combustion plant in the Local Authority area.

## 6.2 Biomass Combustion – Combined Impacts

WODC confirms that there are no biomass combustion plant in the Local Authority area.

## 6.3 Domestic Solid-Fuel Burning

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

# 7 Fugitive or Uncontrolled Sources

WODC 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

No additional exceedences have been identified.
There are no significant trends to report.

## 8.2 Conclusions from Assessment of Sources

Any proposal for a Witney traffic alleviation scheme will be expected to beneficially affect Air Quality along its route within the Witney AQMA. Future details will form the basis of a revised Action Plan.

## 8.3 Proposed Actions

The Progress Report has not identified the need to proceed to a Detailed Assessment for any pollutant.

The new monitoring data has not identified any need for additional monitoring, or changes to the existing monitoring programme.

The next course of action is to submit the 2016 Air Quality Progress Report

Local / Regional Air Quality Strategy

With two AQMAs declared, an Action Plan running for one and, pending a re-appraisal of options, a second one to be re-presented in draft form after review of matters raised during a Public Consultation and Judicial Review, the District has addressed the significant sources of pollution and monitors progress within these declared areas.

Planning Applications

The previously proposed ‘Cogges Link Road’ in Witney, intended to provide a by-pass / relief road around the Witney AQMA, has ceased to be an option. When an alternative scheme is developed, pre and post construction air quality data will be

available from the continuous monitoring station sited within the AQMA. The design and positioning of any new road to be considered should not adversely affect air quality along the route of the new road.

Chipping Norton

Land at Rockhill Farm, London Road, Chipping Norton
WODC Planning App 14/0522/P/OP
80 unit x Extra Care Housing plus 16 x Dwellings
Environmental Statement has been reviewed and the ES does not predict any significant difference to the Air Quality in the locality.

Local Transport Plans and Strategies

Monitoring data is available from the automatic analyser in Witney, a review of which will give a 'before' scenario of the AQMA - prior to the implementation of any proposed Action Plan. Comparisons will be able to be made with post construction data.

Despite WODC objections, Oxfordshire County Council (OCC) has approved the installation of a Zebra Crossing across Bridge Street (between #23 and #24) which lies within the Witney AQMA.

At the request of local residents, a Diffusion Tube has been positioned roadside at this location (re-deployed from background at Abbey Road). As, at the date of this report, construction work has not yet commenced, at least 5 months of data prior to such an event will be available to help assess any significant change to local air quality.

# 9 References

**WODC Data Ratification**

'Air Quality Monitoring: Annual Report 2014'

April 2015 – AECOM Ltd

WODC Low Carbon and Environment Plan 2013 (December)

http://www.westoxon.gov.uk/media/731615/WODC-Low-Carbon-and-Environmental-Plan.pdf

Oxfordshire Local Transport Plan 2011 -2030 (April 2011)

https://www.oxfordshire.gov.uk/cms/sites/default/files/folders/documents/roadsandtransport/transportpoliciesandplans/localtransportplan/finalfinalltp3summarydocument.pdf

Oxfordshire Draft Local Transport Plan LTP 4

https://consultations.oxfordshire.gov.uk/gf2.ti/f/545058/14121221.1/PDF/-/Oxfordshire_LTP4_SEA_ER_Jan_15_Public_Consultation_Draft.pd

# Appendices

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Appendix B: Diffusion Tube Monitoring Data (monthly mean values)

Appendix C: Hourly Mean NO2 Concentration: Chipping Norton and Witney

Appendix D: Local Bias Adjustment Factor for Diffusion Tube Correction. Chipping Norton Co-Location 2014

# Appendix A: QA/QC Data

## Diffusion Tube Bias Adjustment Factors and Factor from Local Co-location Studies

Diffusion tubes are exposed for approximately 4 weeks before being sent for analysis to the supplier, ESG(Didcot). The Overall Bias Adjustment factor available from the AEA spreadsheet v3/15, where the bias adjustment figure provided for the participating laboratories for the period 2014 is **0.81**.

A Bias Adjustment Factor of 0.**76** was calculated using the AEA Spreadsheet for Calculation of Diffusion Tube Precision and Accuracy and the raw NO2 concentrations measured by the Chipping Norton Co-Location study diffusion tubes.

The annual means and bias calculations for the site are at Appendices B and D

## Discussion of Choice of Factor to Use

Both local and national Bias Adjustment Factors were available. The national factor has been used because of the variable data capture rate of the automatic analyser within the Chipping Norton AQMA and to be consistent with previous years' reporting.

The UK NAQS recommended capture rate is 90% and the EU Directive for NO2 specifies a 75% data capture threshold for assessing compliance with limit and guidance values.

- In 2010 the data captured was assessed to be reliable and representative.
- In 2011 the capture rate was reduced due to equipment outages.
- The year 2012 showed a marked improvement in reliability and data capture rate.
- Data capture in 2013 was affected by air conditioning reliability requiring the analyser to be isolated during the warmer period for 8 weeks from July through to September.
- 2014 has been a very good year with 97.9% data collection

## QA/QC of automatic monitoring

Calibration checks of the instrumentation are made every two weeks by the LA and six monthly service and calibration work has been carried out at the Chipping Norton and Witney sites respectively by SupportingU Ltd.

All the data is ratified and validated annually by AECOM Ltd.

## QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied by ESG (Didcot) and analysed in accordance with ESG's ANU/SOP/1015, Issue 1. This method meets the guidelines set out in Defra's 'Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance.'

The tubes (from a specified batch) are prepared by spiking acetone : triethanolamine (50:50) on to the grids prior to the tubes being assembled.

In the WASP inter-comparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, ESG is currently ranked as a 'Category Good' laboratory

Ratification of the WODC data was completed by AECOM Ltd in April 2015.

# Appendix B: Diffusion Tube Data – Monthly raw and Annual mean - plus Bias

| Location | | Jan-14 | Feb-14 | Mar-14 | Apr-14 | May-14 | Jun-14 | Jul-14 | Aug-14 | Sep-14 | Oct-14 | Nov-14 | Dec-14 | Unadj Annual Mean | Data Capture | BIAS ADJ FACTORS Local Bias **0.76** | National Bias **0.81** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bridge Street | R | 71.6 | 63.1 | 69.5 | 58.6 | 51.2 | 41.9 | 47.5 | 37.9 | 68.0 | 60.3 | 74.8 | 55.3 | 58.3 | 100% | **44.3** | **47.2** |
| Mill Street | R | 44.3 | 56.6 | 52.7 | 46.8 | 40.9 | 30.3 | 32.0 | 39.1 | 48.0 | 47.1 | 63.0 | 52.4 | 46.1 | 100% | 35.0 | 37.3 |
| Early Rd. | B | 22.4 | 18.1 | 19.8 | 13.7 | 10.6 | 4.5 | 6.9 | 9.2 | 13.3 | 18.4 | 28.3 | 22.0 | 15.6 | 100% | 11.9 | 12.6 |
| Abbey Rd. | B | 21.9 | 18.3 | 19.1 | 15.8 | 11.9 | 6.1 | 5.1 | 9.3 | 15.3 | 18.1 | 27.2 | | 15.3 | 92% | 11.6 | 12.4 |
| High St | R | 45.5 | 46.9 | 26.2 | 45.6 | 39.4 | 37.0 | 39.3 | 41.4 | 39.8 | 47.0 | 36.7 | 44.8 | 40.8 | 100% | 31.0 | 33.0 |
| 93 High Street | R | 48.1 | 45.5 | 49.6 | 53.0 | 44.4 | 31.1 | 39.0 | 29.7 | | 40.0 | 59.7 | 34.8 | 43.2 | 92% | 32.8 | 35.0 |
| Frethern Cl | B | 16.6 | 14.4 | 16.0 | 15.4 | 11.7 | 18.9 | 7.7 | 6.9 | 11.2 | 12.7 | 20.9 | 12.0 | 13.7 | 100% | 10.4 | 11.1 |
| Orchard Rise | B | 14.6 | 12.5 | 15.3 | 11.6 | 9.0 | 6.8 | 6.4 | 8.1 | 10.4 | 10.9 | 19.5 | 13.4 | 11.5 | 100% | 8.8 | 9.3 |
| Brize Norton Rd | R | | 62.7 | 33.4 | 28.1 | 34.4 | 15.4 | | 17.9 | 29.2 | 28.0 | 39.6 | 32.5 | 32.1 | 83% | 24.4 | 26.0 |
| Upavon Way | R | 25.9 | 25.5 | 25.6 | 23.9 | 17.8 | 8.3 | 9.7 | 13.6 | 21.9 | 25.7 | 34.6 | 26.6 | 21.6 | 100% | 16.4 | 17.5 |
| Garner Close | B | 17.7 | 13.2 | 16.0 | 14.7 | 10.7 | 4.3 | 3.6 | 8.6 | 11.5 | 9.1 | 24.5 | 15.0 | 12.4 | 100% | 9.4 | 10.1 |
| Oakfield Road | B | 17.8 | 12.9 | 19.7 | 27.6 | 11.9 | 7.2 | 5.4 | 7.6 | 13.9 | 12.4 | 22.9 | 17.2 | 14.7 | 100% | 11.2 | 11.9 |
| Dyers Hill | R | 20.0 | 19.2 | 17.8 | 22.8 | 15.7 | 15.8 | 16.0 | 16.5 | 21.3 | 18.0 | 25.3 | 19.6 | 19.0 | 100% | 14.4 | 15.4 |
| Nineacres Lane | R | 21.8 | 18.6 | 18.9 | 18.6 | 13.7 | 12.6 | 13.0 | 12.6 | 17.8 | 16.7 | 29.9 | 17.4 | 17.6 | 100% | 13.4 | 14.3 |
| Tanners Close | B | 15.6 | 10.6 | 15.6 | 10.9 | 8.4 | 6.5 | 4.0 | 5.9 | 10.3 | 10.4 | 19.9 | 13.9 | 11.0 | 100% | 8.4 | 8.9 |
| The Green | B | 16.7 | 11.8 | 15.3 | | 9.4 | 6.6 | 5.4 | 6.2 | 10.4 | 12.2 | 20.6 | 12.5 | 11.6 | 92% | 8.8 | 9.4 |
| Horsefair | R | 74.7 | 73.3 | 72.8 | 74.8 | 72.3 | 59.1 | 61.0 | 70.2 | 72.4 | 75.6 | 74.1 | 74.4 | 71.2 | 100% | **54.1** | **57.7** |
| 17 Horsefair | R | 45.3 | 47.1 | 41.3 | 43.4 | 35.6 | 27.5 | 27.2 | 23.8 | 40.4 | 37.9 | 47.1 | 35.2 | 37.7 | 100% | 28.6 | 30.5 |
| CN Co location | R | 48.5 | 42.8 | 53.6 | 60.3 | 54.6 | 48.7 | 43.3 | 32.5 | 57.0 | 43.3 | 71.5 | 41.1 | 49.8 | 100% | | |
| CN Co location | R | 53.2 | 45.5 | 56.6 | 56.7 | 53.4 | 43.9 | 38.3 | 35.0 | 53.8 | 41.5 | 66.2 | 38.5 | 48.6 | 100% | | |
| CN Co location | R | 48.6 | 46.6 | 55.5 | 53.6 | 51.6 | 37.7 | 41.5 | 33.0 | 56.0 | 43.1 | 56.9 | 32.1 | 46.4 | 100% | | |
| TRIP.MEAN | | 50.1 | 45.0 | 55.2 | 56.9 | 53.2 | 43.4 | 41.0 | 33.5 | 55.6 | 42.6 | 64.9 | 37.2 | 48.2 | 100% | 36.6 | 39.1 |
| 5 Horsefair | R | 32.5 | 35.2 | 29.4 | 32.2 | 27.2 | 21.3 | 23.4 | 21.6 | 31.5 | 30.1 | 38.1 | 28.0 | 29.2 | 100% | 22.2 | 23.7 |
| 7 Horsefair | R | 28.2 | 30.4 | 34.3 | 36.8 | 25.7 | 24.9 | 21.9 | 21.7 | 35.4 | 31.2 | 37.7 | 28.0 | 29.7 | 100% | 22.6 | 24.0 |
| West Street | R | | 32.1 | 42.2 | 36.4 | 32.8 | 28.5 | 24.7 | 30.3 | 34.8 | 38.6 | 37.7 | 28.8 | 33.4 | 92% | 25.3 | 27.0 |

**West Oxfordshire – England** **April 2015**

| Location | | Jan-14 | Feb-14 | Mar-14 | Apr-14 | May-14 | Jun-14 | Jul-14 | Aug-14 | Sep-14 | Oct-14 | Nov-14 | Dec-14 | Unadj Annual Mean | Data Capture | Local Bias **0.76** | National Bias **0.81** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coopers Close | B | 16.8 | 12.9 | 16.7 | 12.3 | 11.7 | 7.8 | 7.1 | 7.3 | 13.5 | 11.5 | 19.2 | 17.2 | 12.8 | 100% | 9.8 | 10.4 |
| Withers Way | B | 16.1 | 14.5 | 17.6 | 12.9 | 9.8 | 5.6 | 6.1 | 6.5 | 11.8 | 11.3 | 24.4 | 14.5 | 12.6 | 100% | 9.6 | 10.2 |
| Acre End Street | R | 18.9 | 18.7 | 21.0 | 17.2 | 12.3 | 10.1 | 12.2 | 9.9 | 16.7 | 16.6 | 25.8 | 17.1 | 16.4 | 100% | 12.4 | 13.3 |
| Mill Street | R | 21.7 | 17.4 | 21.2 | 19.0 | 16.3 | 13.9 | 11.7 | 9.4 | 18.5 | 16.2 | 27.8 | 19.0 | 17.7 | 100% | 13.4 | 14.3 |
| Orchard Close | B | 16.4 | 13.2 | 17.1 | 13.4 | 9.6 | 6.8 | 6.0 | 6.6 | 15.3 | 11.4 | 22.2 | 13.8 | 12.7 | 100% | 9.6 | 10.2 |
| Shakespeare Rd | B | 22.1 | 12.4 | 19.4 | 18.2 | 12.2 | 8.5 | 8.4 | 8.6 | 16.5 | 14.5 | 27.2 | 18.2 | 15.5 | 100% | 11.8 | 12.6 |
| Oxford Street | R | 38.1 | 36.5 | 43.7 | 45.7 | 36.4 | 30.5 | 32.3 | 24.2 | 45.1 | 30.4 | 51.9 | 32.6 | 37.3 | 100% | 28.3 | 30.2 |
| Oxford Street(2) | R | 41.6 | 33.4 | 38.6 | 39.1 | 36.9 | 31.2 | 30.6 | 32.7 | 40.7 | 37.0 | 43.0 | 33.6 | 36.5 | 100% | 27.8 | 29.6 |
| The Ley | B | 15.8 | 16.9 | 15.9 | 13.6 | 8.6 | 5.6 | 6.1 | 8.3 | 10.2 | 11.6 | 20.8 | 15.7 | 12.4 | 100% | 9.4 | 10.1 |
| Westland Way | B | 19.8 | 15.4 | 15.2 | 16.4 | 10.3 | 4.7 | 7.5 | 7.9 | 12.9 | 12.9 | 22.0 | 21.1 | 13.8 | 100% | 10.5 | 11.2 |
| Grove Road | R | 32.5 | 26.7 | 30.0 | 24.9 | 23.1 | 20.2 | 19.1 | 17.7 | 26.8 | 26.1 | 33.0 | 26.4 | 25.5 | 100% | 19.4 | 20.7 |
| Grove Road(2) | R | 37.2 | 25.3 | 32.2 | 31.9 | 24.0 | 12.2 | 21.0 | 22.8 | 16.2 | 28.9 | 38.2 | 35.0 | 27.1 | 100% | 20.6 | 21.9 |
| Heath Lane | B | 17.4 | 14.7 | 18.0 | | 8.8 | 7.6 | 4.1 | 6.8 | 13.6 | 11.7 | 21.4 | 16.6 | 12.8 | 92% | 9.7 | 10.4 |
| Park Close | B | 17.1 | 13.5 | 16.2 | 13.5 | 9.6 | 6.1 | 6.8 | 7.4 | 12.1 | 11.6 | 19.8 | 11.1 | 12.1 | 100% | 9.2 | 9.8 |
| Park Street | R | 47.3 | 48.1 | 44.9 | 41.8 | 34.1 | 26.3 | 28.3 | 30.3 | 42.4 | 43.2 | 44.6 | 39.8 | 39.3 | 100% | 29.8 | 31.8 |

# Appendix C: Hourly Mean NO2 Concentration: Chipping Norton and Witney

Figure 4 Hourly Mean $NO_2$ Concentration: Chipping Norton, 2014

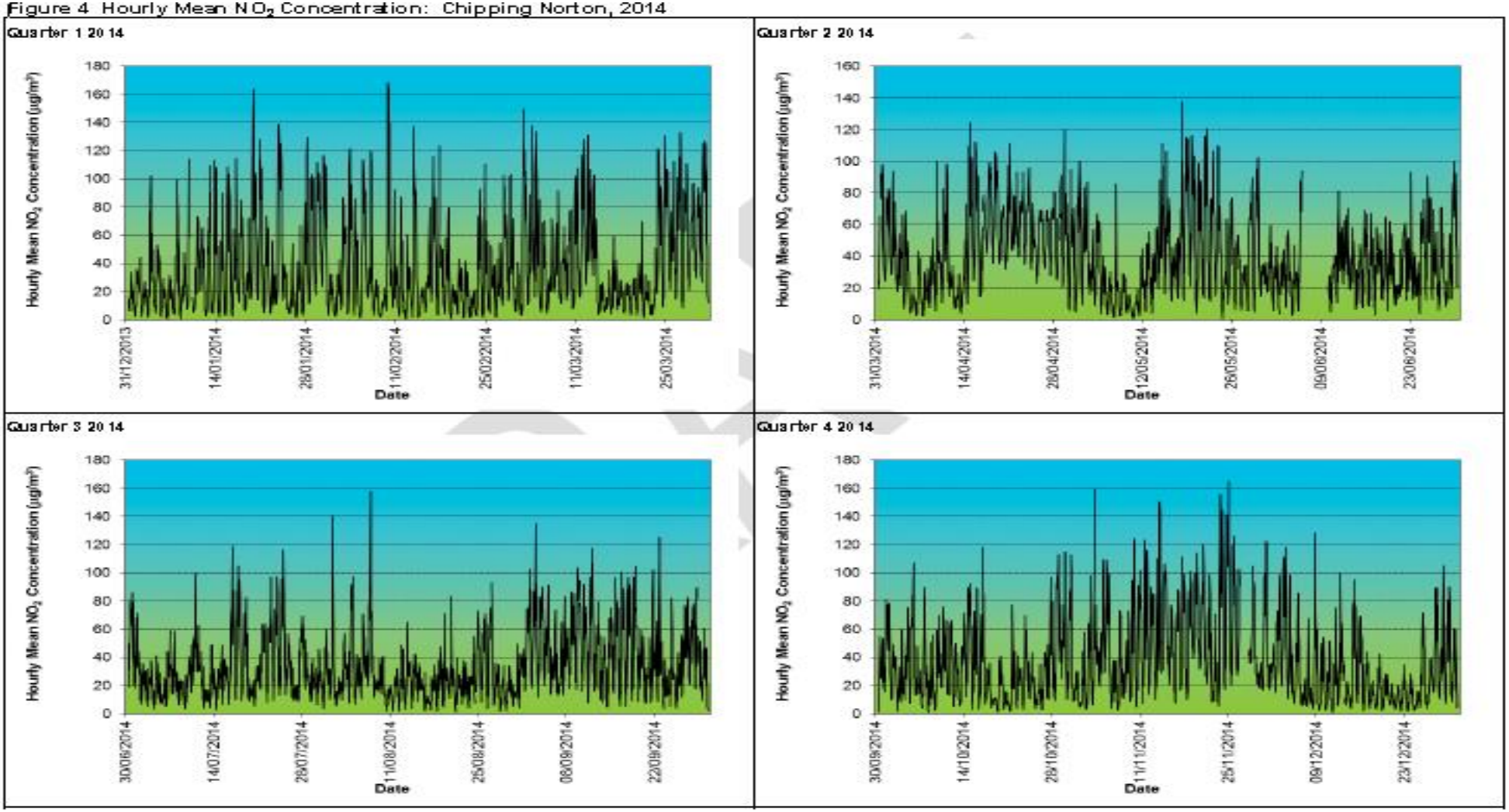
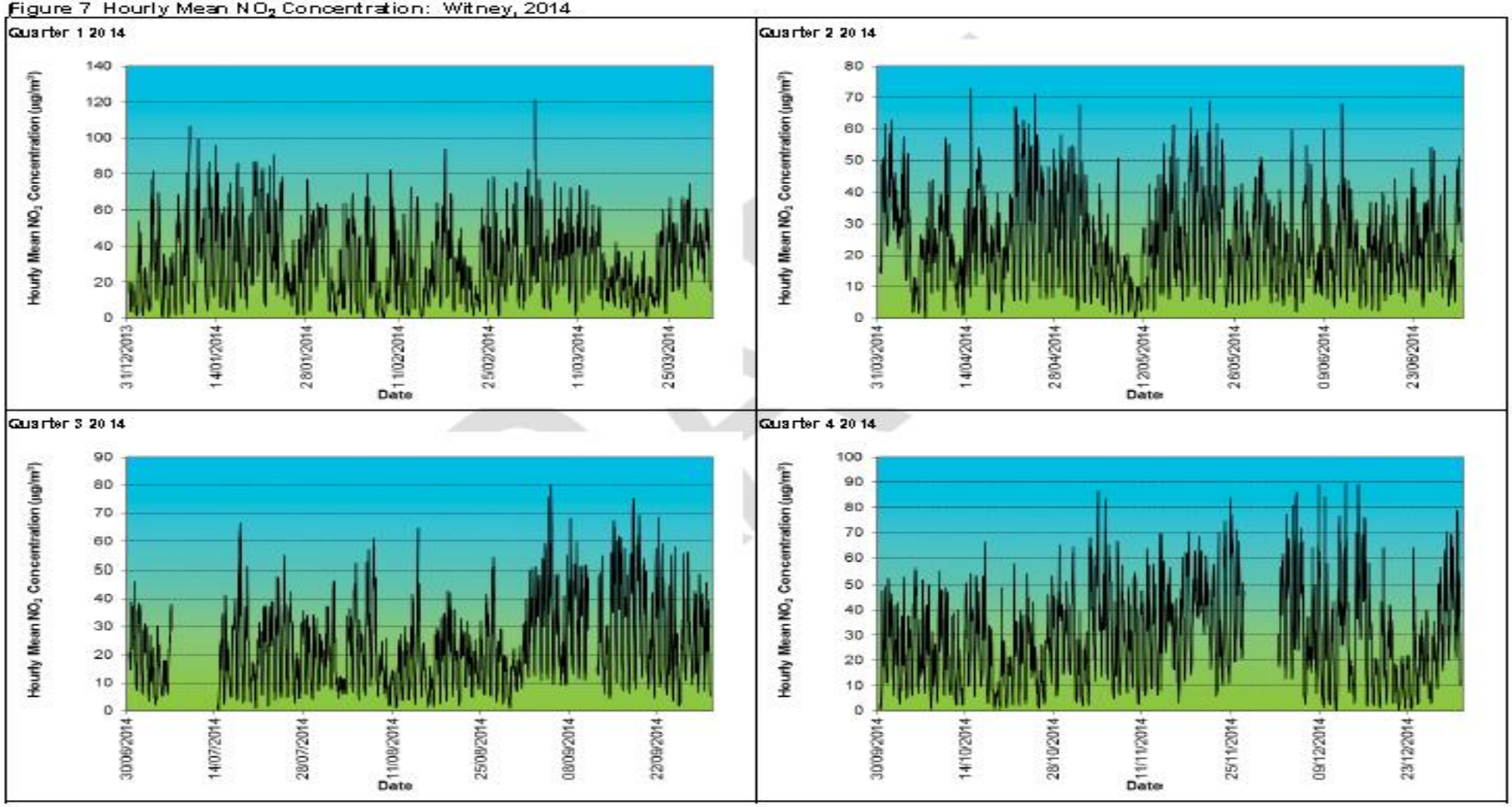


Figure 7 Hourly Mean $NO_2$ Concentration: Witney, 2014



# Appendix D: Local Bias Adjustment Factor for Diffusion Tube Correction. Chipping Norton Co-Location 2014

# Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

| Diffusion Tubes Measurements | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Period | Start Date dd/mm/yyyy | End Date dd/mm/yyyy | Tube 1 $\mu gm^{-3}$ | Tube 2 $\mu gm^{-3}$ | Tube 3 $\mu gm^{-3}$ | Triplicate Mean | Standard Deviation | Coefficient of Variation (CV) | 95% CI of mean |
| 1 | 07/01/2014 | 06/02/2014 | 48.5 | 53.2 | 48.6 | 50 | 2.7 | 5 | 6.7 |
| 2 | 06/02/2014 | 04/03/2014 | 42.8 | 45.5 | 46.6 | 45 | 2.0 | 4 | 4.9 |
| 3 | 04/03/2014 | 01/04/2014 | 53.6 | 56.6 | 55.5 | 55 | 1.5 | 3 | 3.8 |
| 4 | 01/04/2014 | 29/04/2014 | 60.3 | 56.7 | 53.6 | 57 | 3.4 | 6 | 8.3 |
| 5 | 29/04/2014 | 29/05/2014 | 54.6 | 53.4 | 51.6 | 53 | 1.5 | 3 | 3.8 |
| 6 | 29/05/2014 | 01/07/2014 | 48.7 | 43.9 | 37.7 | 43 | 5.5 | 13 | 13.7 |
| 7 | 01/07/2014 | 29/07/2014 | 43.3 | 38.3 | 41.5 | 41 | 2.5 | 6 | 6.3 |
| 8 | 29/07/2014 | 27/08/2014 | 32.5 | 35.0 | 33.0 | 34 | 1.3 | 4 | 3.3 |
| 9 | 27/08/2014 | 29/09/2014 | 57.0 | 53.8 | 56.0 | 56 | 1.6 | 3 | 4.1 |
| 10 | 29/09/2014 | 29/10/2014 | 43.3 | 41.5 | 43.1 | 43 | 1.0 | 2 | 2.5 |
| 11 | 29/10/2014 | 03/12/2014 | 71.5 | 66.2 | 56.9 | 65 | 7.4 | 11 | 18.4 |
| 12 | 03/12/2014 | 05/01/2015 | 41.1 | 38.5 | 32.1 | 37 | 4.6 | 12 | 11.5 |
| 13 | | | | | | | | | |

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

| Automatic Method | |
|---|---|
| Period Mean | Data Capture (% DC) |
| 39.46 | 98.2 |
| 31.64 | 99.5 |
| 42.60 | 99.3 |
| 45.95 | 99.7 |
| 37.88 | 99.6 |
| 34.99 | 86.8 |
| 30.69 | 99.3 |
| 26.17 | 99.0 |
| 40.80 | 99.6 |
| 29.77 | 99.4 |
| 50.32 | 95.7 |
| 26.83 | 95.9 |
| | |

| Data Quality Check | |
|---|---|
| Tubes Precision Check | Automatic Monitor Data |
| Good | Good |
| Good | Good |
| Good | Good |
| Good | Good |
| Good | Good |
| Good | Good |
| Good | Good |
| Good | Good |
| Good | Good |
| Good | Good |
| Good | Good |
| Good | Good |
| | |

Overall survey --> Good precision | Good Overall DC

(Check average CV & DC from Accuracy calculations)

| Site Name/ ID: | Chipping Norton 2014 |
|---|---|

Precision: 12 out of 12 periods have a CV smaller than 20%

**Accuracy (with 95% confidence interval) without periods with CV larger than 20%**

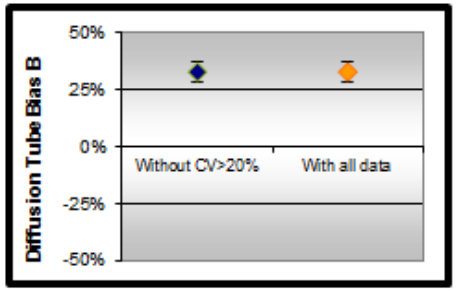
Bias calculated using 12 periods of data

| | |
|---|---|
| Bias factor A | 0.76 (0.73 - 0.78) |
| Bias B | 32% (28% - 37%) |
| Diffusion Tubes Mean: | 48 $\mu gm^{-3}$ |
| Mean CV (Precision): | 6 |
| Automatic Mean: | 36 $\mu gm^{-3}$ |
| Data Capture for periods used: | 98% |
| Adjusted Tubes Mean: | 37 (35 - 38) $\mu gm^{-3}$ |

**Accuracy (with 95% confidence interval) WITH ALL DATA**

Bias calculated using 12 periods of data

| | |
|---|---|
| Bias factor A | 0.76 (0.73 - 0.78) |
| Bias B | 32% (28% - 37%) |
| Diffusion Tubes Mean: | 48 $\mu gm^{-3}$ |
| Mean CV (Precision): | 6 |
| Automatic Mean: | 36 $\mu gm^{-3}$ |
| Data Capture for periods used: | 98% |
| Adjusted Tubes Mean: | 37 (35 - 38) $\mu gm^{-3}$ |

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Version 04 - February 2011