



WEST OXFORDSHIRE
DISTRICT COUNCIL



WEST OXFORDSHIRE DISTRICT COUNCIL



2012 Air Quality Updating and Screening Assessment for WEST OXFORDSHIRE DISTRICT COUNCIL

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

April 2012

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|--------------------------------|---|
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|--------------------------------|--------------|
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Executive Summary

The monitoring reported within the 2012 Air Quality Updating 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 advanced feasibility work for the implementation of the lorry management measures including consultation with neighbouring Counties and costing of proposals. This was expected to be complete by end of FY 2009 / 10. Confirmation of this and a schedule for implementation is still awaited.

Currently, additional consultation with neighbouring Counties and financial constraints within OCC budgets have further delayed plans to implement this Action Plan.

However, the WODC Climate Change Action Plan (Apr 2011), incorporating the Green Travel Plan (Feb 2011), 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 remain further procedural stages to be concluded after which the Draft Action Plan and the results of the public consultation will be reviewed to produce an Action Plan (which should include the latest dispersion modelling) for consideration and approval by WODC Cabinet and OCC and in due course submitted to Defra.

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Appendices

Appendix A: QA/QC Data

Appendix B: Diffusion Tube Monitoring Data (% data capture)

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

Appendix D: Diffusion Tube Location Data

Note: As per Report PR4 – 463 dated 9 Jun 2011

1. The Council uses the Report template but, for ease of reading does include some repetition of presented data and some information, which could not be isolated from a PDF report on data ratification and validation, is presented as a screen capture within the appendices.

2. Table 2.3 has been modified to include only those diffusion tube monitoring sites within an AQMA . The location of these and all other non-AQMA diffusion tubes, with all associated data, is clearly referenced within the Appendices with enlarged maps clearly showing the location of all sites.

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 km² 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.]

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 can 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 unemployment is (in normal times) less than 1%. 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 microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

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

| Pollutant | Air Quality Objective | | Date to be achieved by |
|---|---|---------------------|------------------------|
| | Concentration | Measured as | |
| Benzene | 16.25 $\mu\text{g}/\text{m}^3$ | Running annual mean | 31.12.2003 |
| | 5.00 $\mu\text{g}/\text{m}^3$ | Running annual mean | 31.12.2010 |
| 1,3-Butadiene | 2.25 $\mu\text{g}/\text{m}^3$ | Running annual mean | 31.12.2003 |
| Carbon monoxide | 10.0 mg/m^3 | Running 8-hour mean | 31.12.2003 |
| Lead | 0.5 $\mu\text{g}/\text{m}^3$ | Annual mean | 31.12.2004 |
| | 0.25 $\mu\text{g}/\text{m}^3$ | Annual mean | 31.12.2008 |
| Nitrogen dioxide | 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 |
| Particles (PM ₁₀) (gravimetric) | 50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year | 24-hour mean | 31.12.2004 |
| | 40 $\mu\text{g}/\text{m}^3$ | Annual mean | 31.12.2004 |
| Sulphur dioxide | 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

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 1.1 and 1.3 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. 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.

Figure 1.2 is the remodelled Witney AQMA as completed in 2011. This did not indicate any significant variation but did address a previous anomaly regarding the boundary of the AQMA.

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.

In Witney, the approved traffic management option is the subject of some remaining procedural stages. A draft of the proposed Action Plan has been approved by Cabinet and a period of public consultation completed, results of which will be reviewed when the final Action Plan is compiled.

Note: Data is presented throughout in units of $\mu\text{g}/\text{m}^3$. This addresses the comment in Appraisal Report PR3-546.

Figure 1.1 Map of AQMA Boundaries – Witney

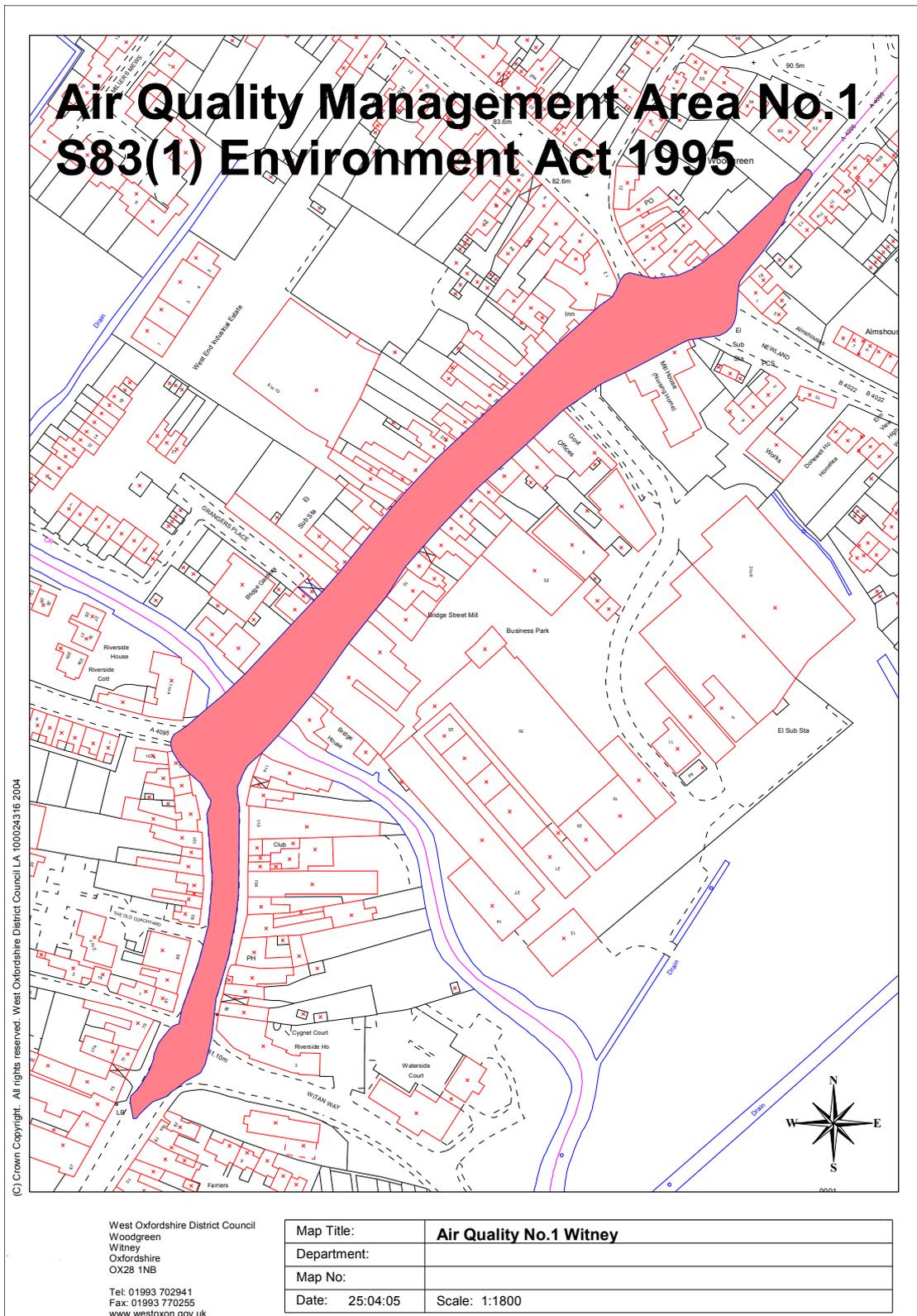
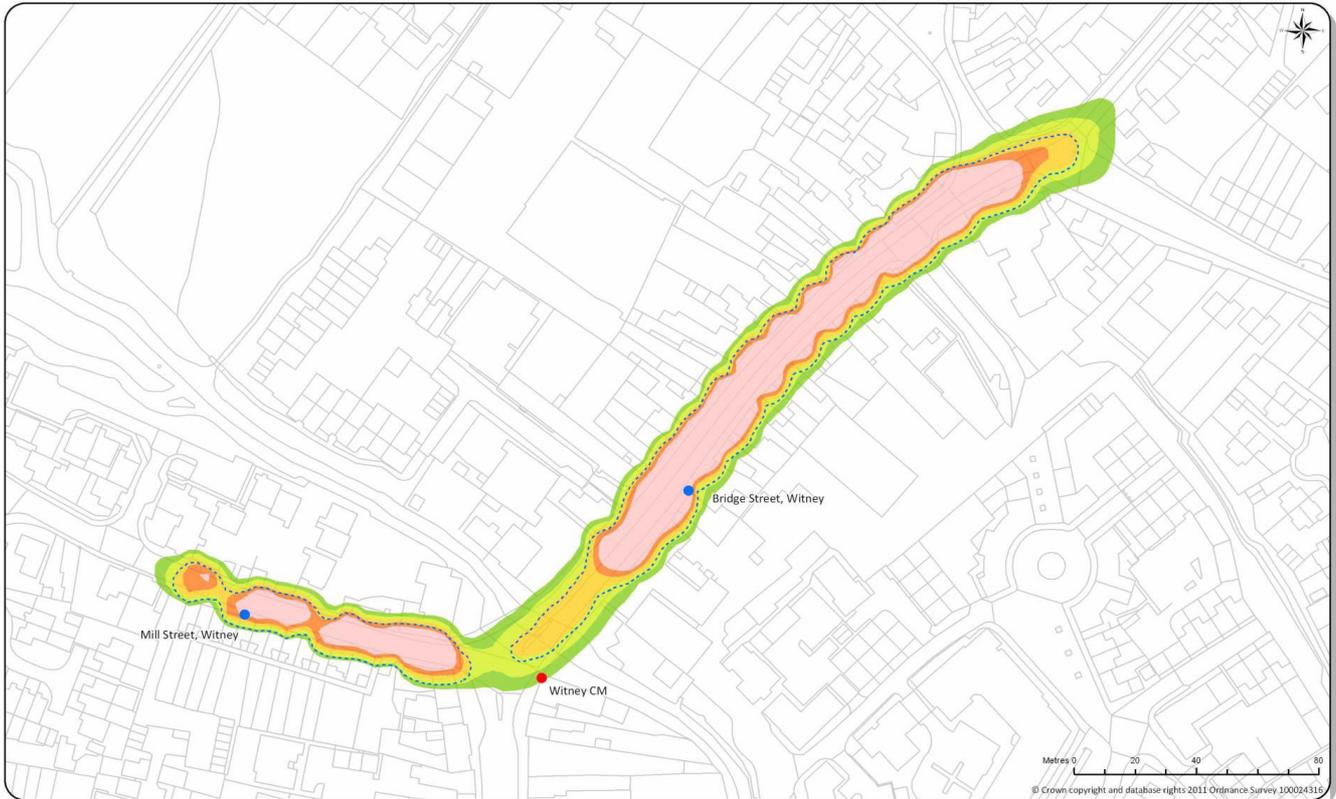


Figure 1.2 Map of AQMA Boundaries – Witney (2011 Update)

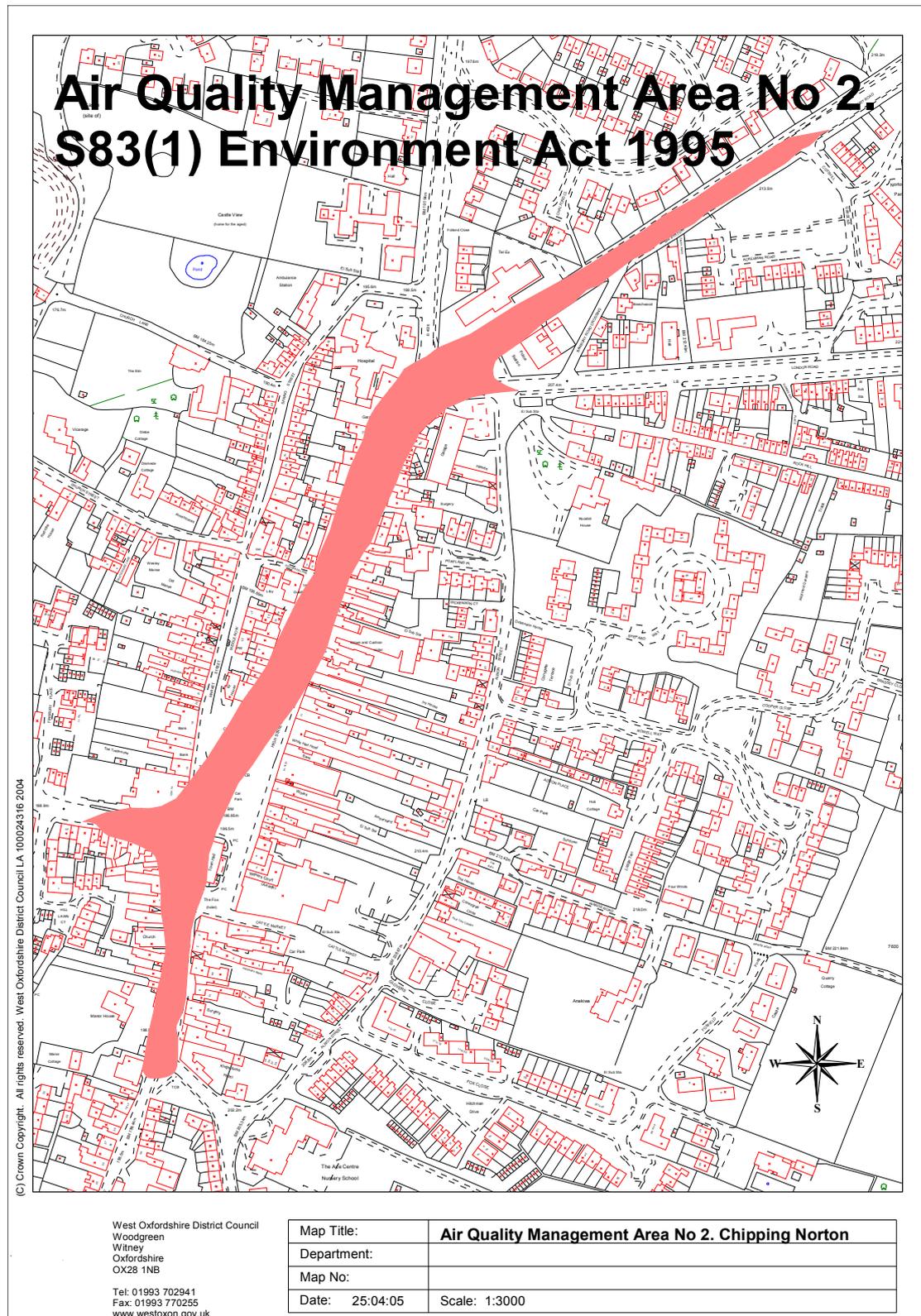


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 Title: Witney NO₂ Detailed Assessment 2011

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Figure 1.3 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 NO_x 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 Enviro Technology plc.

Service reports for 2011 have been routine but there was a computer hard drive failure at the data collection point (resulting in the loss of over three months of recorded data). All the data is ratified and validated by AECOM Limited. Data was collected during the period January 2011 to December 2011.

In 2010, WODC was awarded a Defra AQ Grant to update the modelling of the AQMA – this was commenced in May 2011. Any change to the AQMA boundary, as previously declared, will be used to further develop the Action Plan to improve air quality in Witney.

Annual Mean NO₂ Concentrations

| Period | Annual Mean NO ₂ Concentration / $\mu\text{g}/\text{m}^3$ | Hourly Exceedences |
|------------------|--|--------------------|
| 2011 Annual Mean | 27.9 * (30.2 Measured) | 0 |

* Period-adjusted Annual Mean (it is important to keep in mind the low data capture and the uncertainty associated with estimating the annual mean concentration)

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 further 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 is carried out by Enviro Technology plc. Service reports have been far from routine due to various unrelated failures and, following the 2010 data capture rate for this analyser which was much improved, 2011 data capture has been disappointing. A new servicing contractor, SupportingU Ltd, was appointed in November 2011. All the data is ratified and validated by AECOM Limited

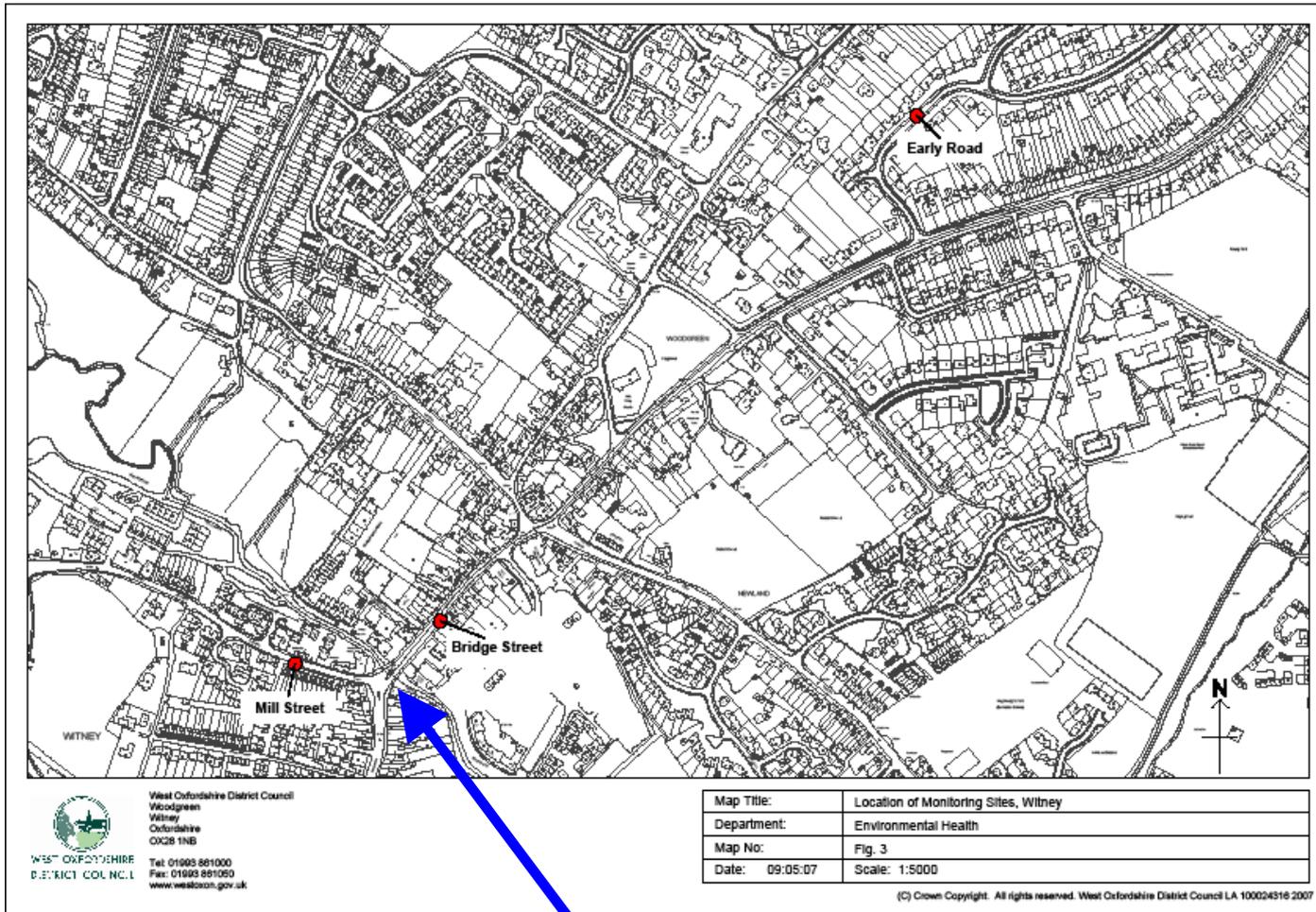
The data collected in the period January 2011 to December 2011 inclusive has been ratified and validated and is summarised in the table below.

Annual Mean NO₂ Concentrations

| Period | Annual Mean NO ₂ Concentration / µg/m ³ | Hourly Exceedences |
|------------------|---|--------------------|
| 2011 Annual Mean | 38.3 * (41.9 Measured) | 5 |

* Period-adjusted Annual Mean (it is important to keep in mind the low data capture and the uncertainty associated with estimating the annual mean concentration)

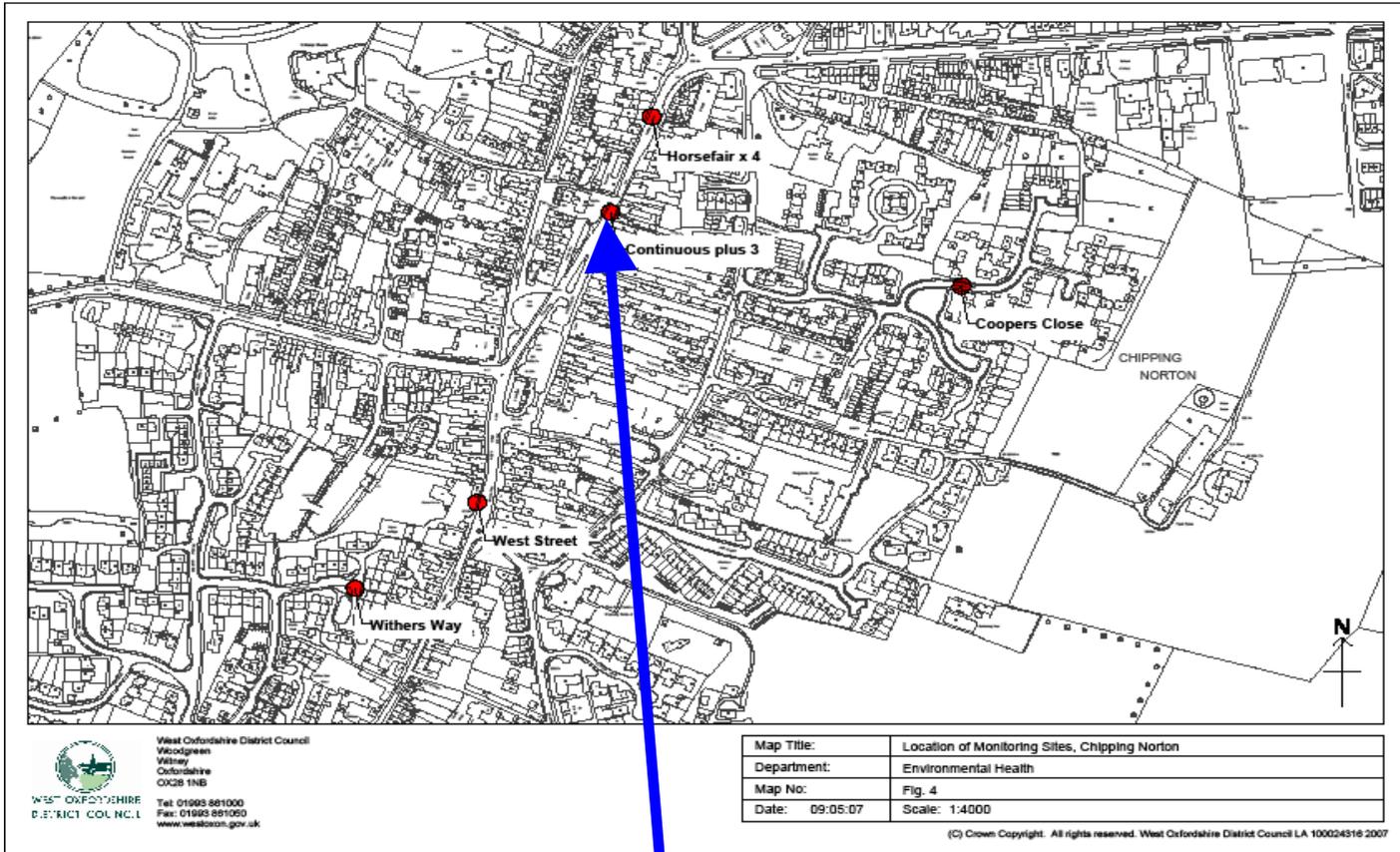
Figure 2.1 Map of Automatic Monitoring Site - Witney
WITNEY



A Q Continuous Monitor

Figure 2.2 Map of Automatic Monitoring Site – Chipping Norton

CHIPPING NORTON



A Q Continuous Monitor

Table 2.1 Details of Automatic Monitoring Sites

| Site Name | Site Type | OS Grid Ref | Pollutants Monitored | In AQMA ? | Relevant Exposure? | Distance to kerb of nearest road | Worst-case Location? |
|-----------------|----------------|------------------|----------------------|-----------|--------------------|----------------------------------|----------------------|
| Chipping Norton | Urban Roadside | 431404 227206 | NO ₂ | Y | Y (2.0m to facade) | 0.5m | N |
| Witney | Urban Roadside | 435768 210177 | NO ₂ | Y | Y (0.5m to facade) | 2.0m | N |

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 Harwell Scientifics at Didcot. The Overall Bias Adjustment factor available from the AEA spreadsheet v03.12, where a bias adjustment figure is provided for the participating laboratories for the period 2011, was 0.84. Additionally, 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.

Table 2.1.2 and Appendices B and C detail the results of the monitoring across the district adjusted for laboratory bias. It shows that 'Bridge Street' and 'Mill Street' in Witney and 'Horsefair', '31, High Street' and the mean of the three co-located diffusion tubes in Chipping Norton currently exceed the objective concentration and these sites lie within the Air Quality Management Areas that were declared in March 2005. All other sites and areas were within the objective limits.

[Note that the diffusion tube at 31, High Street was moved at the half year point, due to permanent building construction changes, and relocated for the remaining period at 17, Horsefair]

Furthermore, with the exception of two roadside diffusion tube sites in Burford, and the now relocated site at 17 Horsefair in Chipping Norton, all other remaining sites (30) were more than one standard deviation (SD = 4 i.e. 36 µg/m³ or less) below the objective limit.

Sites reported as exceptions last year, two in Woodstock and another in Bladon, are now also more than one standard deviation below the objective limit.

Table 2.2 Details of Non-Automatic Monitoring Sites - Within AQMAs

Annual Mean NO₂ / µg/m³ (2011) in **Witney** (Bias Adjusted – Local v National)

| Location | Annual Mean NO ₂ / µg/m ³ | |
|---------------|---|-----------------|
| | Local (0.76) | National (0.84) |
| Bridge Street | 48.8 | 54.0 |
| Mill Street | 41.1 | 45.4 |

Annual Mean NO₂ / µg/m³ (2011) in **Chipping Norton** (Bias Adjusted – Local v National)

| Location | Annual Mean NO ₂ / µg/m ³ | |
|------------------|---|-----------------|
| | Local (0.76) | National (0.84) |
| Horsefair | 54.3 | 60.0 |
| 31 High Street * | 37.4 | 41.3 |
| Co-Location | 37.5 | 41.5 |
| Triplicate Mean | | |
| 5 Horsefair | 24.2 | 26.8 |
| 7 Horsefair | 24.2 | 26.7 |
| West Street | 28.5 | 31.5 |
| 17 Horsefair * | 34.0 | 37.5 |

[* The diffusion tube at 31 Horsefair was moved at the half year point, due to permanent building construction changes, and relocated for the remaining period at 17 Horsefair]

Note: Data in this table addresses the comment in Appraisal Report PR3-546. All are representative of relevant exposure – those in bold exceed 40 µg/m³

Table 2.3 Details of Non- Automatic Monitoring Sites

| Site Name | Site Type | OS Grid Ref | In AQMA ? | Relevant Exposure? | Distance to kerb of nearest road | Worst-case Location? |
|-------------|-------------------------------------|----------------------|---------------------|-------------------------------|---|----------------------|
| As detailed | Roadside or Background as specified | Listed at Appendix D | As per tables above | Appropriate to area within 3m | Generally within 3m or on building facade | Appropriate to area |

For more detail see Appendices B, C and D

The diffusion tubes are supplied by Harwell Scientifics and analysed in accordance with Harwell Scientifics SOP HS/WI/1015, issue 14. 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.

The Overall Bias Adjustment factor available from the AEA spreadsheet v3.12, where a bias adjustment figure is provided for the participating laboratories for the period 2011 was 0.84. 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.

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

Ratification of the WODC data was completed by AECOM Limited in April 2012.

2.2 Comparison of Monitoring Results with AQ Objectives

Automatic AQ Monitoring Station – Chipping Norton

The data collected in the period January 2011 to December 2011 inclusive has been ratified and validated and is summarised in the table below.

Annual Mean NO₂ Concentrations

| Period | Annual Mean NO ₂ Concentration / $\mu\text{g}/\text{m}^3$ | Hourly Exceedences >200 $\mu\text{g}/\text{m}^3$ |
|------------------|--|--|
| 2011 Annual Mean | 38.3 * (41.9 Measured) | 5 (182.9 $\mu\text{g}/\text{m}^3$)** |

Note: Based on 53.1 % data capture

* Period-adjusted Annual Mean (it is important to keep in mind the low data capture and the uncertainty associated with estimating the annual mean concentration)

** 99.8th %ile

Automatic AQ Monitoring Station – Witney

The data collected in the period January 2010 to December 2010 inclusive has been ratified and validated and is summarised in the table below.

Annual Mean NO₂ Concentrations

| Period | Annual Mean NO ₂ Concentration / $\mu\text{g}/\text{m}^3$ | Hourly Exceedences >200 $\mu\text{g}/\text{m}^3$ |
|------------------|--|--|
| 2011 Annual Mean | 27.9 * (30.2 Measured) | Nil (100.2 $\mu\text{g}/\text{m}^3$)** |

Note: Based on 68.5% data capture

* Period-adjusted Annual Mean (it is important to keep in mind the low data capture and the uncertainty associated with estimating the annual mean concentration)

** 99.8th %ile

Diffusion Tube Site Monitoring

At Appendices B and C are details of the results of the monitoring across the district adjusted for laboratory bias. It shows that 'Bridge Street' and 'Mill Street' in Witney and 'Horsefair' and '31, High Street' in Chipping Norton and the mean of the three co-located diffusion tubes 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.

[Note that the diffusion tube at 31, High Street was moved at the half year point, due to permanent building construction changes, and relocated for the remaining period at 17, Horsefair]

Furthermore, with the exception of two roadside diffusion tube sites in Burford, and the now relocated site at 17 Horsefair in Chipping Norton, all other remaining sites (30) were more than one standard deviation (SD = 4 i.e. $36 \mu\text{g}/\text{m}^3$ or less) below the objective limit.

Sites reported as exceptions last year, two in Woodstock and another in Bladon, are now also more than one standard deviation below the objective limit.

Annual Mean NO_2 / $\mu\text{g}/\text{m}^3$ (2010) in Witney (Bias Adjusted – Local v National)

| Location | Annual Mean NO_2 / $\mu\text{g}/\text{m}^3$ | |
|---------------|--|-----------------|
| | Local (0.76) | National (0.84) |
| Bridge Street | 48.8 | 54.0 |
| Mill Street | 41.1 | 45.4 |

Annual Mean NO_2 / $\mu\text{g}/\text{m}^3$ (2011) in Chipping Norton (Bias Adjusted – Local v National)

| Location | Annual Mean NO_2 / $\mu\text{g}/\text{m}^3$ | |
|-----------------|--|-----------------|
| | Local (0.76) | National (0.84) |
| Horsefair | 54.3 | 60.0 |
| 31 High Street | 37.4 | 41.3 |
| Co-Location | 37.5 | 41.5 |
| Triplicate Mean | | |

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

2.2.1 Nitrogen Dioxide

The measured annual mean concentration is greater than $40 \mu\text{g}/\text{m}^3$ within parts of the Chipping Norton AQMA (Horsefair) and within or at the boundary of the Witney AQMA.

The Chipping Norton data includes both automatic monitoring and diffusion tube monitoring. The automatic monitoring returned a Mean Pollution Concentration of $38.3 \mu\text{g}/\text{m}^3$ this was based on a 53.1% data capture.

The Chipping Norton AQMA (Horsefair) site has not recorded more than 18 1-hour means above $200 \mu\text{g}/\text{m}^3$ (actual number is 5), and the 99.8th percentile of 1-hour mean concentrations is $182.9 \mu\text{g}/\text{m}^3$.

Data from the continuous monitoring station within the Witney AQMA achieved 68.5% capture rate. The 1-hour mean was not exceeded and the 99.8th percentile of 1-hour mean concentrations is $100.2 \mu\text{g}/\text{m}^3$.

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.

[The Witney AQMA Review was submitted to Defra upon completion - see Figures 1.1 & 1.2 and References at Section 9]

The monitoring site locations are representative of relevant public exposure.

Automatic Monitoring Data

Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

| Site ID | Location | Within AQMA? | Data Capture for full calendar year 2011 % | Annual mean concentrations ($\mu\text{g}/\text{m}^3$) | | | |
|---------|-----------------|--------------|--|---|-------|------|-------|
| | | | | 2008 | 2009 | 2010 | 2011 |
| AQMA 1 | Witney | Y | 68.5 | N/A | 32.7* | 33.0 | 27.9* |
| AQMA 2 | Chipping Norton | Y | 53.1 | 39.8 | 39.6 | 45.3 | 38.3* |

*Mean was "annualised" as monitoring was not carried out for the full year.

Table 2.5 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

| Site ID | Location | Within AQMA? | Data Capture for full calendar year 2011 % | Number of Exceedences of hourly mean ($200 \mu\text{g}/\text{m}^3$) | | | |
|---------|-------------------|--------------|--|---|---------------|--------------|--------------|
| | | | | 2008 | 2009 | 2010 | 2011 |
| AQMA 1 | Witney | Y | 68.5 | N/A | 0* (105.0) | 0 (105.9) | 0 (100.2) |
| AQMA 2 | Chipping Norton** | Y | 53.1 | 5 (178.6) | 4 (174.5) | 6 (172.8) | 5 (182.9) |

*Mean was “annualised” as monitoring was not carried out for the full year - the 99.8th percentile of hourly means in brackets are included for comparison only.

**Exceptionally, it is possible for a vehicle to be parked close to the automatic monitor and, in the worst case, with the exhaust closest to it and the engine running this is the likely cause of exceedences. This remains however ‘Relevant Exposure’ as this would be within 2m of the façade of a hotel or residential premises.

Diffusion Tube Monitoring Data

The full data set (monthly mean values) is at Appendix C.

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes - Witney

Annual Mean NO_2 / $\mu\text{g}/\text{m}^3$ (2011) in Witney (Bias Adjusted – Local v National)

| Location | Annual Mean NO_2 / $\mu\text{g}/\text{m}^3$ | |
|---------------|--|-----------------|
| | Local (0.76) | National (0.84) |
| Bridge Street | 48.8 | 54.0 |
| Mill Street | 41.1 | 45.4 |

Table 2.7 Results of Nitrogen Dioxide Diffusion Tubes - Chipping Norton

Annual Mean NO₂ / µg/m³ (2011) in Chipping Norton (Bias Adjusted – Local v National)

| Location | Annual Mean NO ₂ / µg/m ³ | |
|---|---|--------------------|
| | Local (0.76) | National (0.84) |
| Horsefair | 54.3 | 60.0 |
| 31, High Street then 17 Horsefair ** | 37.4 / 34.0 | 41.3 / 37.5 |
| Co-Location Triplicate Mean | 37.5 | 41.5 |

** July 2011 on: Relocated due to building works at site

The national bias adjustment factor applied in USA 2012 to the annual means is 0.84

All of the above are located within AQMAs.

All other areas were within the objective limits. Furthermore, with the exception of two roadside diffusion tube sites in Burford, all other sites (30) were more than one standard deviation (SD = 4 i.e. 36 µg/m³ or less) below the objective limit.

See Appendix B for % data capture of other Diffusion Tubes

2.2.2 Summary of Compliance with AQS Objectives

Andrew Ward 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.

Table 2.8 Results of Nitrogen Dioxide Diffusion Tubes in 2011

[Presented here are the sites within AQMAs. For other locations see Appendices B, C and D]

| Site ID | Location | Site Type | Within AQMA? | Triplicate or Co-located Tube | Data Capture 2011 (Number of Months or %) | Data with less than 9 months has been annualised (Y/N) | Confirm if data has been distance corrected (Y/N) | Annual mean concentration (Bias Adjustment factor = 0.84) |
|---------|------------------------------------|-----------|--------------|-------------------------------|---|--|---|---|
| | | | | | | | | 2011 ($\mu\text{g}/\text{m}^3$) |
| 1 | Bridge Street | Roadside | Y | N | 100% | N/A | N | 54.0 |
| 2 | Mill Street | R | Y | N | 100% | N/A | N | 45.4 |
| 17 | Horsefair | R | Y | N | 100% | N/A | N | 60.0 |
| 33 | 31 High Street then **17 Horsefair | R | Y | N | 5 months / 6 months | N/A | N | 41.3 / 37.5 |
| 36 | Co-Location 1 | R | Y | Y | 100% | N/A | N | 42.6 |
| 37 | Co-Location 2 | R | Y | Y | 100% | N/A | N | 42.5 |
| 38 | Co-Location 3 | R | Y | Y | 100% | N/A | N | 39.4 |

** July 2011 on: Relocated due to building works at site

Table 2.9 Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2011)

| Site ID | Site Type | Within AQMA ? | Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$ | | | | |
|---------|-------------------------------------|---------------|--|---|---|---|---|
| | | | 2007 (Bias Adjustment Factor = 0.81) | 2008 (Bias Adjustment Factor = 0.74) * | 2009 (Bias Adjustment Factor = 0.81) | 2010 (Bias Adjustment Factor = 0.85) | 2011 (Bias Adjustment Factor = 0.84) |
| 1 | Bridge Street | Y | 50 | 43 | 52.4 | 56.3 | 54.0 |
| 2 | Mill Street | Y | 43 | 42 | 45.0 | 44.5 | 45.4 |
| 17 | Horsefair | Y | 70 | 59 | 63.8 | 66.4 | 60.0 |
| 33 | 31 High Street then 17 Horsefair | Y | 43 | 43 | 46.1 | 45.6 | 41.3 / 37.5 |
| 36 | Co-Location 1 | Y | 44 | 40 | | | 42.6 |
| 37 | Co-Location 2 | Y | 40 | 41 | 44.6 *** | 45.4 *** | 42.5 |
| 38 | Co-Location 3 | Y | 45 | 38 | | | 39.4 |

* Locally derived bias factor.

** July 2011 on: Relocated due to building works at site

*** Triplicate mean

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Andrew Ward 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

Andrew Ward 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.

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

3.4 Junctions

Andrew Ward 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

Andrew Ward confirms that there are no new / proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

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

3.7 Bus and Coach Stations

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

4 Other Transport Sources

4.1 Airports

RAF Brize Norton is a military base involved in the transportation of freight and personnel. It is located within 1000m of residential properties and therefore the significance with regard to local air pollution was investigated previously

Above 10 million passengers per year is considered significant which is equivalent to 1,000,000 tonnes of freight.

Operations at RAF Brize Norton are low (compared with commercial civilian airports) and substantially below the 10mppa threshold that requires a more detailed assessment.

Previously, Defra advised that as operations at the base were well below the threshold they did not warrant further investigation. As suggested, some monitoring in the vicinity of the military base was conducted. This was reported in subsequent annual reviews and the results were consistent with other background levels in the vicinity.

Andrew Ward confirms that there are no airports in the Local Authority area other than RAF Brize Norton (information provided above).

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Andrew Ward 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

Andrew Ward 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)

Andrew Ward 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

Dust Monitoring for Neighbourhood Nuisance

Burford Quarry, previously operated by Enstone Breedon is now operated by Smith and Sons of Bletchington. Within the quarry is a Cement and Lime process permitted under Part 1 of the Environmental Protection Act 1990. As part of the planning consent, a range of dust monitoring and control measures were required. There was a period (between July 2005 and March 2006) of PM10 emission monitoring using an OSIRIS portable infra red light scattering device located near residential property. The results of this monitoring showed that the objective limit was exceeded over 4 days of the 99 days of monitoring. As a proportion, this translated to a rate of 15 days exceedence of the 24-hour objective limit per year. The objective states that 35 days are permissible and therefore it was predicted that the objective would be complied with at this location.

The site operators conduct dust monitoring around the site using a Frisbee Dust Gauge and monitoring using the OSIRIS has discontinued. The general dust monitoring carried out around the site on behalf of the company shows concentrations that fall within the recommended limit of 200mg/m²/day.

The site currently does not generate complaints of dust nuisance during the continuing operations and dust monitoring levels arising from the quarry site are within acceptable limits.

At one further site, Whitehill Quarry, Burford, operated by the same company as Burford Quarry, recent assessment of monitored dust levels were within acceptable limits. This action was prior to applying for a Permit to operate which is still pending favourable economic factors.

Smith and Sons also operating at Gill Mill, Ducklington, instructed DustScan Ltd to conduct a baseline dust assessment for an EIA for a proposed extension to the quarry. PM₁₀, directional and deposited dust, and weather were monitored at Gill Mill quarry. PM₁₀ concentrations were well below the NAQS limit for the entire study period and average directional dust flux was generally low and was unlikely to have been at levels associated with adverse public reaction due to its visibility or soiling effects.

Neil Shellard 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 other those potential site developments referred to above.

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

Andrew Ward 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

Andrew Ward 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

Andrew Ward confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

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

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Andrew Ward confirms that there is no biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

Andrew Ward confirms that there is no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

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

7 Fugitive or Uncontrolled Sources

Andrew Ward 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

The proposed Witney Cogges Link Road will not adversely affect Air Quality along its route and a beneficial improvement within the Witney AQMA is expected.

Located within Witney town centre there is a major combined residential and commercial development completed in 2009. 'Marriotts Walk' includes major retail and recreational outlets and some 140 residences.

This development is assessed as having no material impact on traffic flow and density within or through the AQMA.

8.3 Proposed Actions

The Updating and Screening Assessment has not identified the need to proceed to a Detailed Assessment for any pollutant.

The next course of action is to submit the 2013 Progress Report

9 References

Witney AQMA Review – *West Oxfordshire District Council Air Quality Detailed Assessment for Nitrogen Dioxide 2011* – AECOM Ltd – November 2011

WODC Data Ratification - *Continuous and Diffusion Tube Monitoring Report*
April 2012 – AECOM Ltd

Oxfordshire Traffic Flows 2010 - *Table A – Annual Average Daily Traffic*
Oxfordshire County Council,

Oxfordshire Traffic Flows 2009 - *Table B – Summary of Manual Classified Counts*
Oxfordshire County Council,

Appendices

Appendix A: QA/QC Data

Appendix B: Diffusion Tube Monitoring Data (% data capture)

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

Appendix D: Diffusion Tube Location Data

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, Harwell Scientifics at Didcot. The Overall Bias Adjustment factor available from the AEA spreadsheet v3/12, where the bias adjustment figure provided for the participating laboratories for the period 2011 is 0.84. 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.

QA/QC of diffusion tube monitoring - 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 'below ideal' data capture rate (53%) of the automatic analyser within the Chipping Norton AQMA.

This is below the UK NAQS recommended capture rate of 90% and the EU Directive for NO₂ which specifies a 75% data capture threshold for assessing compliance with limit and guidance values. Reliability had improved during 2010 and the data captured was assessed to be reliable and representative however for 2011 the reduced capture rate was due to equipment outages.

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 hitherto been carried out by Enviro Technology plc. From November 2011 and April 2012 respectively, the Chipping Norton and Witney sited analysers will be serviced by SupportingU Ltd. All the data is ratified and validated by AECOM Limited.

Appendix B: Diffusion Tube Monitoring Data (% data capture)

Diffusion Tube Results Summary, 2011

| Area | Site Name | Site Type | Annual Mean NO ₂ Concentration (µg/m ³) | | | Data Capture (%) |
|-----------------------|--------------------------|-----------|--|-----------------------|--------------------------|------------------|
| | | | Unadjusted | Bias Adjusted (Local) | Bias Adjusted (National) | |
| Witney | Bridge Street | R | 64.2 | 48.8 | 54.0 | 100 |
| Mill Street | R | | 54.1 | 41.1 | 45.4 | 100 |
| Early Road | B | | 18.3 | 13.9 | 15.4 | 100 |
| Abbey Road | B | | 19.6 | 14.9 | 16.5 | 100 |
| Burford | High Street | R | 44.8 | 34.1 | 37.7 | 100 |
| 93 High Street | R | | 43.9 | 34.0 | 37.5 | 75 |
| Frethern Close | B | | 14.3 | 10.9 | 12.0 | 92 |
| Orchard Rise | B | | 12.5 | 9.5 | 10.5 | 100 |
| Carterton | Brize Norton Road | R | 31.9 | 19.0 | 20.9 | 50 |
| Upavon Way | R | E | 26.2 | 19.7 | 21.8 | 75 |
| Garner Close | B | | 13.8 | 10.5 | 11.6 | 100 |
| Oakfield Road | B | | 16.2 | 12.3 | 13.6 | 100 |

| | | | | | | |
|----------------------------|------------------------|----------|-------------|-------------|-------------|------------|
| Charlbury | Dyers Hill | R | 22.0 | 16.7 | 18.5 | 100 |
| Nineacres Lane | R | | 20.1 | 15.3 | 16.9 | 100 |
| Tanners Close | B | | 13.4 | 10.2 | 11.2 | 100 |
| The Green | B | | 12.8 | 9.7 | 10.8 | 92 |
| Chipping Norton | Horsefair | R | 71.4 | 54.3 | 60.0 | 100 |
| 31 High Street | R | | 57.6 | 37.4 | 41.3 | 83 |
| 17 Horsefair | R | | 40.0 | 34.0 | 37.5 | 100 |
| Co-location Average | R | | 49.4 | 37.5 | 41.5 | 100 |
| 5 Horsefair | R | | 31.9 | 24.2 | 26.8 | 100 |
| 7 Horsefair | R | | 31.8 | 24.2 | 26.7 | 100 |
| West Street | R | | 37.6 | 28.5 | 31.5 | 100 |
| Coopers Close | B | | 15.0 | 11.4 | 12.6 | 83 |
| Withers Way | B | | 13.4 | 10.2 | 11.2 | 83 |
| Eynsham | Acre End Street | R | 19.6 | 14.9 | 16.4 | 100 |
| Mill Street | R | | 20.1 | 15.3 | 16.9 | 92 |
| Orchard Close | B | | 14.8 | 11.2 | 12.4 | 100 |
| Shakespeare Road | B | | 17.4 | 13.2 | 14.6 | 100 |

| | | | | | | |
|-------------------------|----------------------|----------|-------------|-------------|-------------|------------|
| Woodstock | Oxford Street | R | 40.3 | 30.7 | 33.9 | 92 |
| Oxford Street(2) | R | | 42.2 | 32.0 | 35.4 | 100 |
| The Ley | B | | 14.0 | 10.6 | 11.7 | 92 |
| Westland Way | B | | 13.4 | 10.2 | 11.3 | 100 |
| Bladon | Grove Road | R | 25.2 | 19.1 | 21.1 | 100 |
| Grove Road(2) | R | | 33.1 | 25.2 | 27.8 | 83 |
| Heath Lane | B | | 15.0 | 11.4 | 12.6 | 100 |
| Park Close | B | | 13.9 | 10.5 | 11.7 | 100 |
| Park Street | R | | 40.8 | 31.0 | 34.3 | 100 |

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Table 3: Emission Table Results Summary, 2011

| Area | Site Name | Site Type ^A | Annual Mean NO ₂ Concentration (µg/m ³) | | | Data Capture |
|-----------------|--------------------------------|------------------------|--|------------------------------------|---------------------------------------|--------------|
| | | | Unadjusted | Bias Adjusted (Local) ^B | Bias Adjusted (National) ^C | (%) |
| Witney | Bridge Street | R | 64.2 | 48.8 | 54.0 | 100 |
| | Mill Street | R | 54.1 | 41.1 | 45.4 | 100 |
| | Early Road | B | 18.3 | 13.9 | 15.4 | 100 |
| | Abbey Road | B | 19.6 | 14.9 | 16.5 | 100 |
| Burford | High Street | R | 44.8 | 34.1 | 37.7 | 100 |
| | 93 High Street | R | 43.9 | 34.0 | 37.5 | 75 |
| | Frethem Close | B | 14.3 | 10.9 | 12.0 | 92 |
| | Orchard Rise | B | 12.5 | 9.5 | 10.5 | 100 |
| Carterton | Brize Norton Road ^E | R | 31.9 | 19.0 | 20.9 | 50 |
| | Upavon Way | R | 26.2 | 19.7 | 21.8 | 75 |
| | Gamer Close | B | 13.8 | 10.5 | 11.6 | 100 |
| | Oakfield Road | B | 16.2 | 12.3 | 13.6 | 100 |
| Charlbury | Dyers Hill | R | 22.0 | 16.7 | 18.5 | 100 |
| | Nineacres Lane | R | 20.1 | 15.3 | 16.9 | 100 |
| | Tanners Close | B | 13.4 | 10.2 | 11.2 | 100 |
| | The Green | B | 12.8 | 9.7 | 10.8 | 92 |
| Chipping Norton | Horsefair | R | 71.4 | 54.3 | 60.0 | 100 |
| | 31 High Street ^{D,E} | R | 57.6 | 37.4 | 41.3 | 83 |
| | 17 Horsefair ^{D,E} | R | 40.0 | 34.0 | 37.5 | 100 |
| | Co-location Average | R | 49.4 | 37.5 | 41.5 | 100 |
| | 5 Horsefair | R | 31.9 | 24.2 | 26.8 | 100 |
| | 7 Horsefair | R | 31.8 | 24.2 | 26.7 | 100 |
| | West Street | R | 37.6 | 28.5 | 31.5 | 100 |
| | Coopers Close | B | 15.0 | 11.4 | 12.6 | 83 |
| Eynsham | Withers Way | B | 13.4 | 10.2 | 11.2 | 83 |
| | Acre End Street | R | 19.6 | 14.9 | 16.4 | 100 |
| | Mill Street | R | 20.1 | 15.3 | 16.9 | 92 |
| | Orchard Close | B | 14.8 | 11.2 | 12.4 | 100 |
| Woodstock | Shakespeare Road | B | 17.4 | 13.2 | 14.6 | 100 |
| | Oxford Street | R | 40.3 | 30.7 | 33.9 | 92 |
| | Oxford Street(2) | R | 42.2 | 32.0 | 35.4 | 100 |
| | The Ley | B | 14.0 | 10.6 | 11.7 | 92 |
| Bladon | Westland Way | B | 13.4 | 10.2 | 11.3 | 100 |
| | Grove Road | R | 25.2 | 19.1 | 21.1 | 100 |
| | Grove Road(2) | R | 33.1 | 25.2 | 27.8 | 83 |
| | Heath Lane | B | 15.0 | 11.4 | 12.6 | 100 |
| | Park Close | B | 13.9 | 10.5 | 11.7 | 100 |
| | Park Street | R | 40.8 | 31.0 | 34.3 | 100 |

Notes: ^A Site Types: R = Roadside; B = Background. ^B Local bias adjustment factor = 0.76. ^C National bias adjustment factor = 0.84, further details on bias adjustment can be found in Appendix C. ^D Monitoring at 31 High Street, Chipping Norton discontinued in June 2011. Monitoring at 17 Horsefair, Chipping Norton commenced in July 2011. ^E "Annualised" due to short-term monitoring and/or low capture for 2011 - see section 3.6 and Appendix B for details. Figures in **BOLD** indicate exceedances of the annual mean NO₂ objective.

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

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Table 8: Raw Monthly Diffusion Tube Monitoring Data, 2011

| Area | Location | Type | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Data Capture (%) | Unadjusted Annual Mean |
|-----------------|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------------------|------------------------|
| Witney | Bridge Street | R | 85.1 | 77.9 | 85.3 | 65.2 | 46.2 | 62.2 | 54.2 | 44.2 | 55.1 | 66.1 | 82.3 | 47.1 | 100 | 64.2 |
| | Mill Street | R | 60.8 | 64.8 | 51.7 | 54.1 | 40.1 | 46.4 | 42.8 | 43.2 | 52.4 | 61.4 | 80.2 | 51 | 100 | 54.1 |
| | Early Road | B | 28.3 | 28.5 | 24.9 | 16.4 | 10.3 | 11.6 | 7.8 | 10.7 | 15.9 | 20.1 | 26 | 19 | 100 | 18.3 |
| | Abbey Road | B | 34.2 | 26.7 | 25.5 | 16.2 | 10.6 | 11.3 | 10 | 11.7 | 13.9 | 21.8 | 34 | 19.5 | 100 | 19.6 |
| Burford | High Street | R | 48.4 | 45.2 | 39 | 44.9 | 42 | 52.2 | 41.3 | 43.5 | 45.7 | 48.3 | 40.1 | 47.3 | 100 | 44.8 |
| | 93 High Street | R | 52.1 | ND | 55.5 | 42 | 34.1 | 38.3 | ND | 34 | 33.2 | 49.2 | 56.4 | ND | 75 | 43.9 |
| | Frethern Close | B | 24.9 | ND | 18 | 11.1 | 9.4 | 10.4 | 7.7 | 9.3 | 11.6 | 15.9 | 24.9 | 14.4 | 92 | 14.3 |
| | Orchard Rise | B | 21.6 | 17.9 | 17.1 | 11.1 | 7.1 | 8.4 | 7.2 | 8 | 9.5 | 12.7 | 19.7 | 9.9 | 100 | 12.5 |
| Carterton | Brize Norton Road | R | 38.4 | 34 | 37.6 | 27.2 | ND | ND | ND | 17.2 | ND | ND | 36.9 | ND | 50 | 31.9 |
| | Upavon Way | R | ND | 34.5 | 32.5 | 24.2 | 16.1 | ND | 18.7 | ND | 20.7 | 34.2 | 30.5 | 24.5 | 75 | 26.2 |
| | Garner Close | B | 22.3 | 21.7 | 19.8 | 11.6 | 7.8 | 7.5 | 7.1 | 7.4 | 10.2 | 15.5 | 24.2 | 10.7 | 100 | 13.8 |
| | Oakfield Road | B | 28 | 22.1 | 26.8 | 15.6 | 8.5 | 9.5 | 8.6 | 9.1 | 9.6 | 18.2 | 27.2 | 11.6 | 100 | 16.2 |
| Charlbury | Dyers Hill | R | 29.7 | 27 | 27.9 | 20.2 | 16.7 | 19.7 | 16.3 | 18.5 | 18.8 | 24.2 | 25.7 | 19 | 100 | 22.0 |
| | Nineacres Lane | R | 32.8 | 28.6 | 25.6 | 19 | 12.6 | 14.9 | 12.1 | 13.1 | 13.9 | 20.8 | 32.5 | 15.2 | 100 | 20.1 |
| | Tanners Close | B | 16.5 | 19.8 | 35.9 | 9.9 | 6.3 | 7.2 | 6.8 | 6.1 | 7.1 | 12.5 | 22.4 | 10.1 | 100 | 13.4 |
| | The Green | B | 23.4 | 13.1 | 17.1 | 10.2 | 7.8 | 9.5 | 7.3 | ND | 8.9 | 13.7 | 19 | 11 | 92 | 12.8 |
| Chipping Norton | Horsefair | R | 92.8 | 75.6 | 73.8 | 93.9 | 65.2 | 93.9 | 75.2 | 70.1 | 80.9 | 17.2 | 46.8 | 71.6 | 100 | 71.4 |
| | 31 High Street | R | 63.6 | 64.5 | 59.7 | 57.2 | 43.1 | | | | | | | | 83 | 57.6 |
| | 17 Horsefair | | | | | | | | 31.6 | 29.1 | 34.5 | 45.9 | 66.5 | 32.1 | 100 | 40.0 |
| | CN Co-Location | R | 58.3 | 56.1 | 70.9 | 53.9 | 41.3 | 55.4 | 47.1 | 36.4 | 32.6 | 58.6 | 68.4 | 29.4 | 100 | 50.7 |
| | CN Co-Location | R | 61.3 | 50.7 | 65.1 | 55 | 41.9 | 50.4 | 46 | 39.6 | 42.1 | 57 | 67.3 | 30.4 | 100 | 50.6 |
| | CN Co-Location | R | 58.2 | 55.9 | 61.5 | 51.7 | 35.4 | 46.6 | 45.4 | 36.5 | 31.8 | 54 | 60.1 | 26.2 | 100 | 46.9 |
| | Co-Location Average | | 59.3 | 54.2 | 65.8 | 53.5 | 39.5 | 50.8 | 46.2 | 37.5 | 35.5 | 56.5 | 65.3 | 28.7 | 100 | 49.4 |
| | 5 Horsefair | R | 42.5 | 40.3 | 40.5 | 34 | 22.7 | 30.5 | 23.9 | 25.6 | 27.3 | 32.9 | 40.5 | 21.5 | 100 | 31.9 |
| | 7 Horsefair | R | 40.9 | 37.8 | 45 | 38.3 | 25.7 | 29.6 | 26.3 | 25.9 | 27.3 | 25.1 | 34.3 | 25.8 | 100 | 31.8 |
| | West Street | R | 48.5 | 35.6 | 46.7 | 39.8 | 30.2 | 44.1 | 30.9 | 33.7 | 30.1 | 35.2 | 41.8 | 34.1 | 100 | 37.6 |
| Coopers Close | | B | 26.4 | ND | 20 | 13.5 | 8.6 | 10 | 8.7 | 9.9 | ND | 15.4 | 22.4 | 15.4 | 83 | 15.0 |
| | Withers Way | B | 25.7 | ND | 19.1 | 12 | 7.6 | 8.8 | 7 | 7.7 | 8.4 | 13.8 | 23.7 | ND | 83 | 13.4 |

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Capabilities on project: Environment

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|-----------|------------------|---|------|------|------|------|------|------|------|------|------|------|------|------|-----|------|
| Eynsham | Acre End Street | R | 33.8 | 23.6 | 28.5 | 17.3 | 11.5 | 15.2 | 11.4 | 12.3 | 15.3 | 22.6 | 30.6 | 12.6 | 100 | 19.6 |
| | Mill Street | R | 25.9 | 25.9 | 29.8 | 17.5 | ND | 13.4 | 12.1 | 11.4 | 13.2 | 22.3 | 34.5 | 15.4 | 92 | 20.1 |
| | Orchard Close | B | 23 | 19.5 | 24.3 | 13.5 | 8 | 7.2 | 9.4 | 9.2 | 8.8 | 15.8 | 26 | 12.5 | 100 | 14.8 |
| | Shakespeare Road | B | 28.9 | 23.9 | 24.5 | 17.1 | 9.5 | 11.2 | 9.7 | 9.4 | 13.2 | 19 | 28.3 | 13.6 | 100 | 17.4 |
| Woodstock | Oxford Street | R | 53.3 | 50.7 | 57.6 | 43.2 | 30.1 | 30.1 | ND | 27.1 | 22.5 | 42.2 | 61.9 | 25.1 | 92 | 40.3 |
| | Oxford Street(2) | R | 54.8 | 49.5 | 49.4 | 42.9 | 31.8 | 35.4 | 30.3 | 34 | 38.4 | 44.1 | 56.4 | 38.8 | 100 | 42.2 |
| | The Ley | B | 22.5 | 21 | 14.1 | 10.8 | 7 | 8.4 | 9 | 7.9 | 10.4 | 16.6 | 26 | ND | 92 | 14.0 |
| | Westland Way | B | 2 | 24 | 22.9 | 12.7 | 7.8 | 10 | 8.4 | 7.4 | 10.9 | 14.4 | 27.6 | 12.8 | 100 | 13.4 |
| Bladon | Grove Road | R | 33.2 | 32.8 | 35.3 | 24.7 | 19.2 | 20.4 | 21.3 | 17 | 20.4 | 27.2 | 29.6 | 20.9 | 100 | 25.2 |
| | Grove Road(2) | R | 40.4 | 40.1 | 41 | 36.1 | 21.7 | ND | ND | 22.6 | 21.5 | 36.1 | 45.4 | 26.1 | 83 | 33.1 |
| | Heath Lane | B | 25.7 | 24.2 | 22.2 | 13.1 | 8.1 | 9 | 8.9 | 8.5 | 10.4 | 13.3 | 25.9 | 11 | 100 | 15.0 |
| | Park Close | B | 21.1 | 20.9 | 18.3 | 10.3 | 7 | 9.3 | 12.1 | 6.9 | 9.6 | 14 | 25.8 | 11.2 | 100 | 13.9 |
| | Park Street | R | 56 | 56.1 | 49.5 | 43.1 | 31.5 | 35.7 | 30.2 | 26.3 | 34.1 | 42.8 | 46.9 | 37.5 | 100 | 40.8 |

NOTES: All concentrations are in units of µg/m³. ND signifies missing data. Monitoring at 31 High St Chipping Norton was discontinued in June 2011. Monitoring at 17 Horsefair, Chipping Norton commenced in July 2011.

Appendix D: Diffusion Tube Location Data

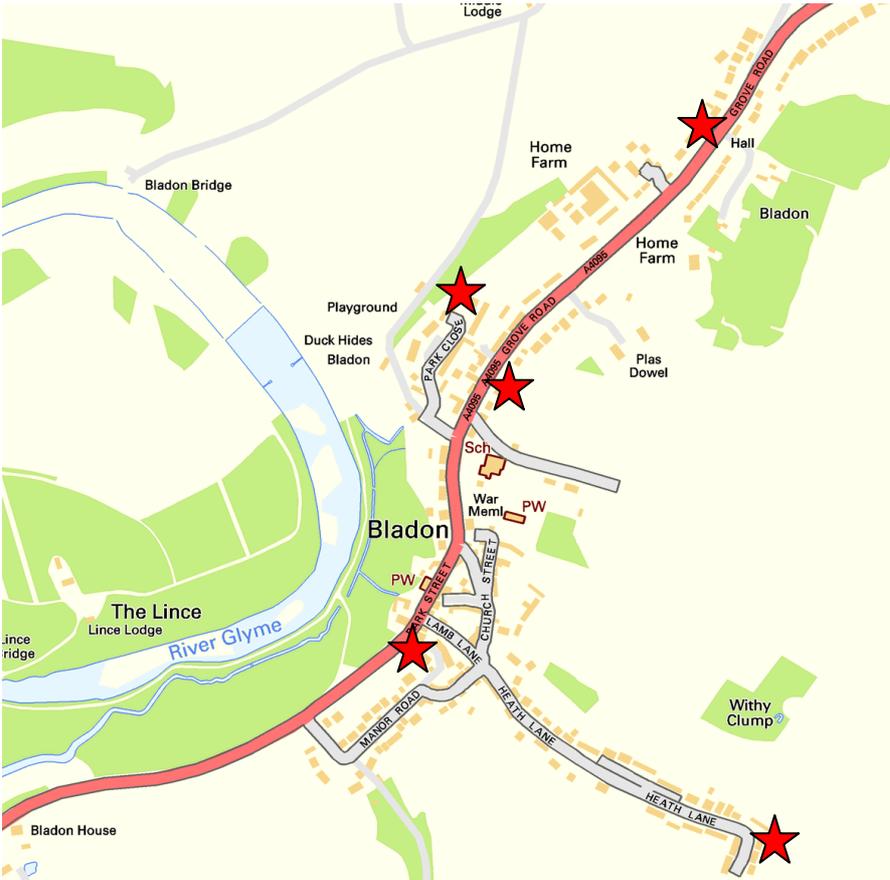
| Site Name | Grid Reference |
|------------------------------------|----------------|
| Bridge Street, Witney | 435816 210239 |
| Mill Street, Witney | 435671 210198 |
| Early Rd., Witney | 436339 210806 |
| Abbey Rd., Witney | 434596 209210 |
| High St, Burford (N) | 425187 212431 |
| 93 High Street, Burford (S) | 425156 212197 |
| Frethern Cl, Burford | 425406 211678 |
| Orchard Rise, Burford | 425447 211949 |
| Brize Norton Rd, Carterton | 428254 206902 |
| Upavon Way, Carterton | 428467 207442 |
| Garner Close, Carterton | 427415 208234 |
| Oakfield Road, Carterton | 427687 206254 |
| Dyers Hill, Charlbury | 435585 219620 |
| Nineacres Lane, Charlbury | 435654 219763 |
| Tanners Close, Charlbury | 435945 219324 |
| The Green, Charlbury | 436138 219973 |
| Horsefair, Chipping Norton | 431425 227275 |
| 31 High Street, Chipping Norton | 431428 227260 |
| 17 Horsefair, Chipping Norton | 431450 227314 |

| | | |
|--|--------|--------|
| Co-location, Chipping Norton (Triplicate Mean) | 431404 | 227206 |
| 5 Horsefair, Chipping Norton | 431439 | 227268 |
| 7 Horsefair, Chipping Norton | 431443 | 227282 |
| West Street, Chipping Norton | 431300 | 226959 |
| Coopers Close, Chipping Norton | 431694 | 227156 |
| Withers Way, Chipping Norton | 431207 | 226877 |
| Acre End Street, Eynsham | 442950 | 209301 |
| Mill Street, Eynsham | 443309 | 209573 |
| Orchard Close, Eynsham | 443632 | 209356 |
| Shakespeare Rd, Eynsham | 442856 | 209781 |
| Oxford Street, Woodstock (E) | 444592 | 216763 |
| Oxford Street(2), Woodstock (W) | 444526 | 216851 |
| The Ley, Woodstock | 445131 | 216615 |
| Westland Way, Woodstock | 444212 | 217270 |
| Grove Road, Bladon | 444871 | 214983 |
| Grove Road(2), Bladon | 445190 | 215353 |
| Heath Lane, Bladon | 445227 | 214402 |
| Park Close, Bladon | 444851 | 215094 |
| Park Street, Bladon | 444791 | 214681 |

OS Grid References are included to assist third parties who require the precise location of diffusion tubes for modelling purposes. Enlarged mapping of locations is included for illustrative purposes



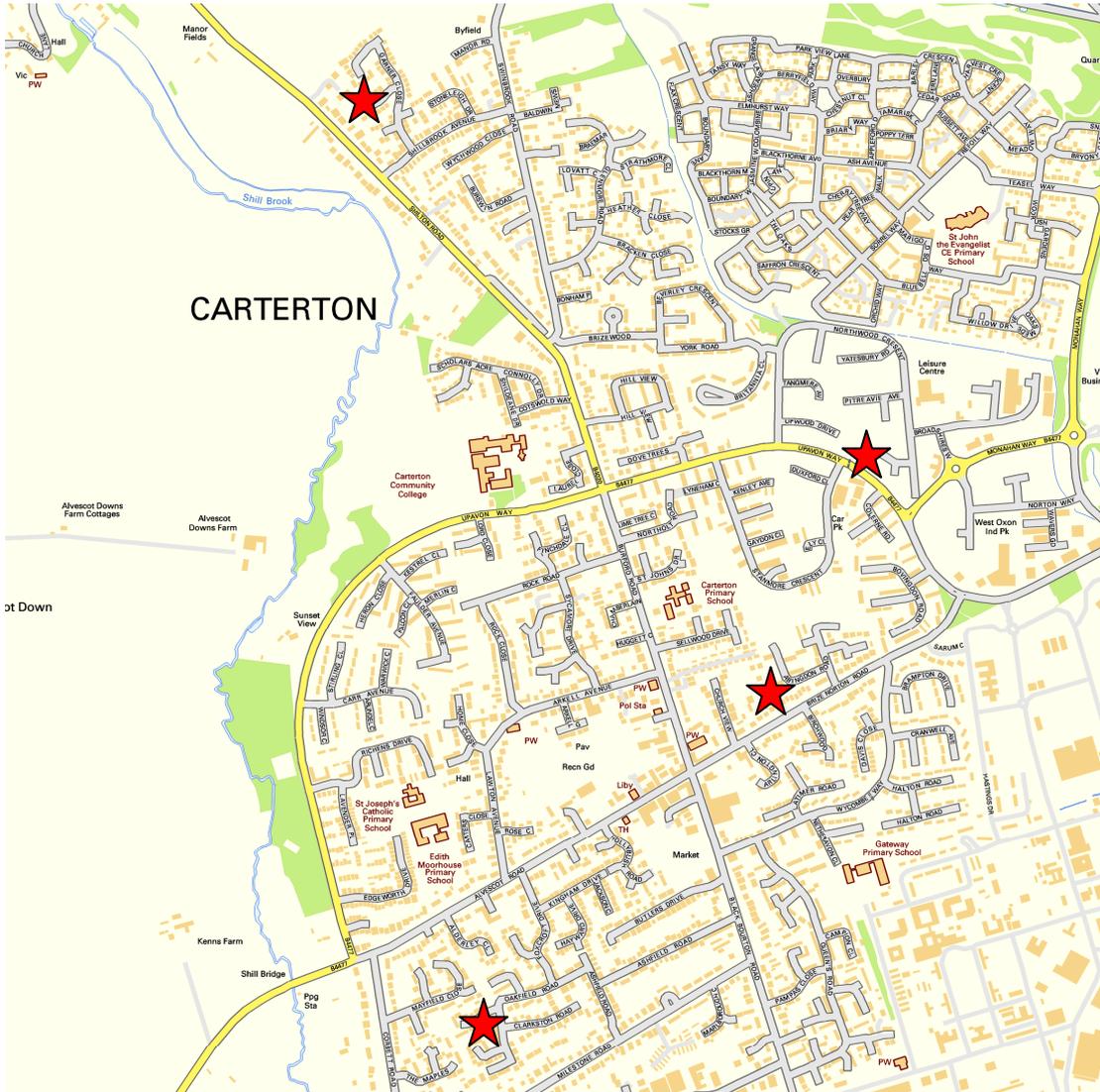
[This addresses commentary in previous reports PR4-038 & PR4-463]



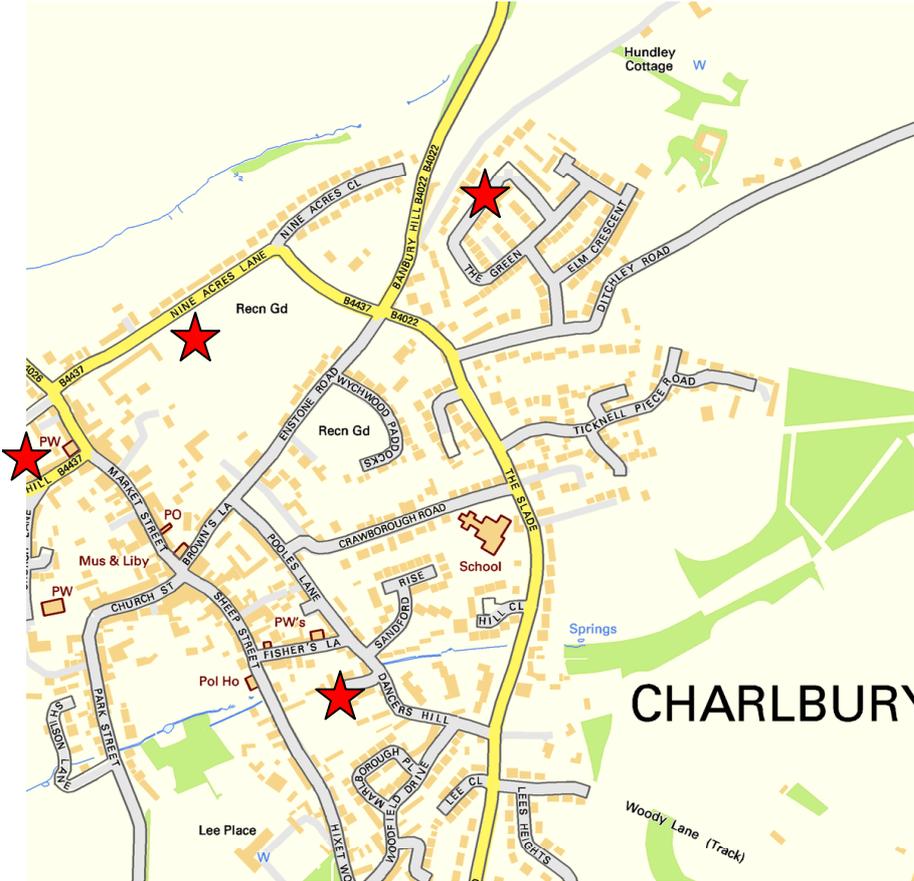
BLADON



BURFORD



CARTERTON



CHARLBURY



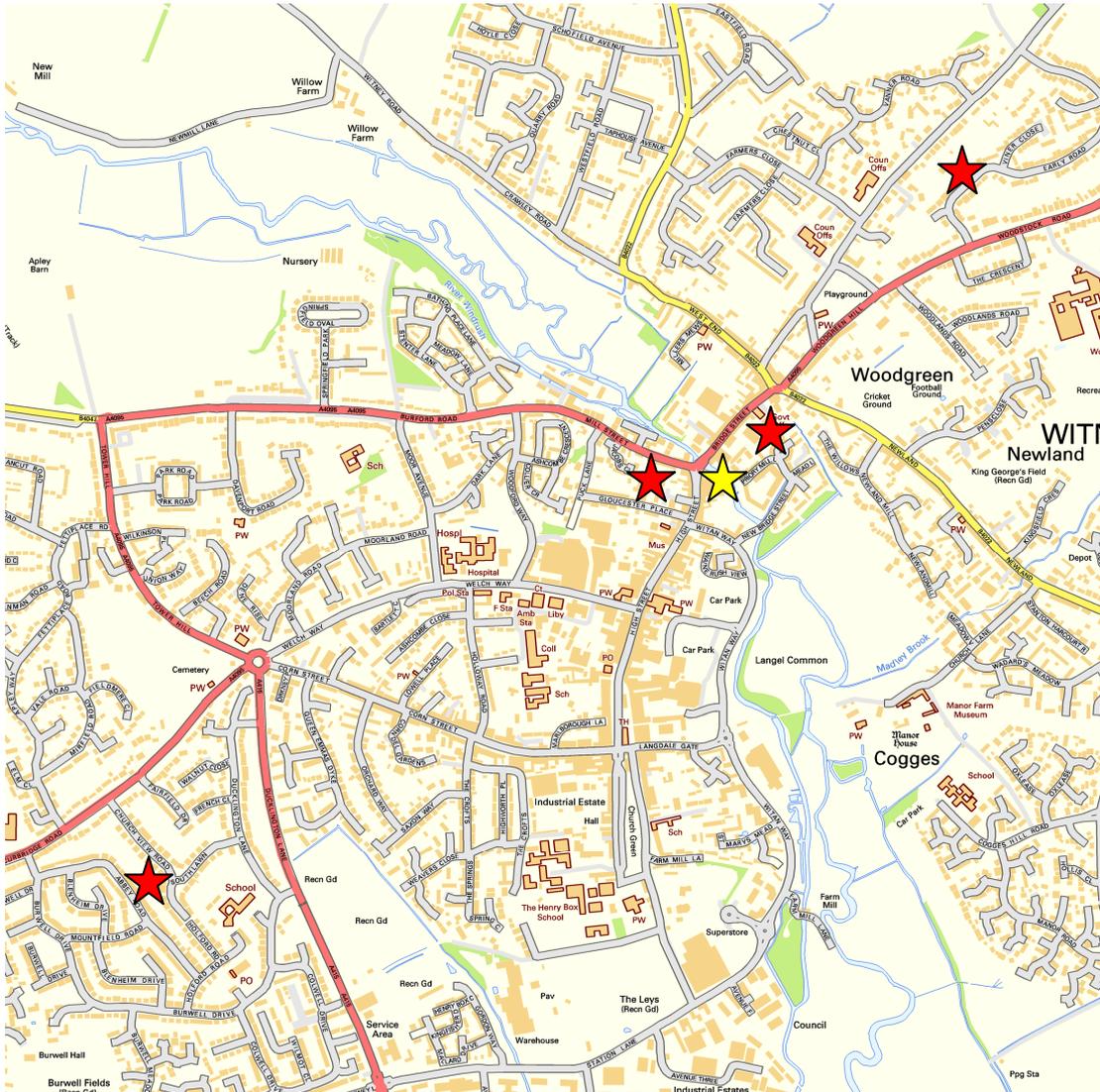
CHIPPING NORTON



Diffusion tubes co-located with NOx Analyser



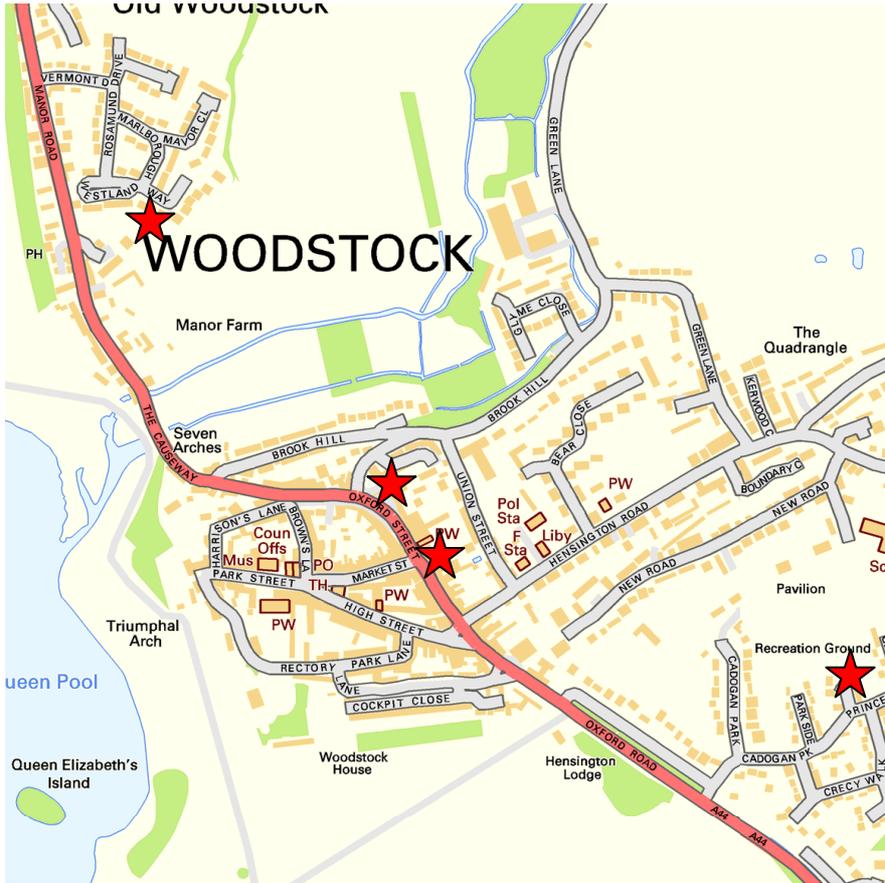
EYNESHAM



WITNEY



NOx Analyser



WOODSTOCK