

2014 Air Quality Progress Report for Watford Borough Council

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

June 2014

Local Authority Officer	Richard Brown
Department	Community and Customer Services
Address	Town Hall, Watford, WD17 3EX
Telephone	01923 278440
e-mail	richard.brown@watford.gov.uk
Report Reference number	PR2014_V1
Date	6 th June 2014

Executive Summary

This is the fifth Progress Report prepared by Watford Borough Council. It sets out updated air quality monitoring data and assesses whether any new or proposed developments are likely to have a significant effect on air quality concentrations, and in particular whether there is sufficient concern to move immediately to an Updating and Screening Assessment.

Air Quality Monitoring Data

This continues to be provided by real-time analysers monitoring oxides of nitrogen and PM10 particles close to the Town Hall, As well as a network of diffusion tubes monitoring long term nitrogen dioxide concentrations. This network has been increased from 15 to 16 tubes so that the effects of the proposed Health Campus and associated link road.

It should be noted that concentrations across all of the sites appear to be declining and that the number of sites where results suggest that the objective level could be exceeded has dropped from 6 to 4.

If the trend of decreasing nitrogen dioxide concentrations continues when the 2015 Updating and Screening Assessment is completed then the council should carry out a detailed assessment of air quality within the existing Air Quality Management Areas, which a view to amending their boundaries.

New Developments

There have been no new developments within in the Borough that are likely to have a significant effect on air quality. **However the effect of the Health Campus and the associated access road will be assessed through nitrogen dioxide diffusion tube monitoring at Willow Lane (WF47) and Lower High Street (WF48)**

Revisions to existing Air Quality Management Areas

Since the last Progress report the Council has been finalising its plans to revise the boundaries of the six Air Quality Management Areas that it declared in 2006. This is

being done because the Further Assessment of air quality within the AQMAs identified that changes were needed. The following changes were consulted on in 2012:

- Extending the boundary of AQMA 2 (Vicarage Road)
- Amalgamate AQMA 3 (Aldenham Road) and AQMA 4 (Chalk Hill) into a single larger AQMA (AQMA 3A, Aldenham Road and Chalk Hill)
- Reducing the boundary of AQMA 5 (Horseshoe Lane)
- Revoking AQMA 6 (M1 / Meriden).

This process is currently with the council's legal section and will be completed shortly.

In addition to the above key points, the council will also be:

1. Re-tendering in Air Quality monitoring service and maintenance contract
2. Undertaking a nitrogen dioxide diffusion tube co-location study.
3. The outstanding measures in the council's Air Quality Action Plan will be progressed.

Table of Contents

1	Introduction	6
1.1	Description of Local Authority Area	6
1.2	Purpose of Progress Report	6
1.3	Air Quality Objectives	7
1.4	Summary of Previous Review and Assessments	9
2	New Monitoring Data	13
2.1	Summary of Monitoring Undertaken	13
2.2	Comparison of Monitoring Results with Air Quality Objectives	19
3	New Local Developments	28
3.1	Road Traffic Sources	28
3.2	Other Transport Sources	28
3.3	Industrial Sources	28
3.4	Commercial and Domestic Sources	28
3.5	New Developments with Fugitive or Uncontrolled Sources	28
4	Local / Regional Air Quality Strategy	30
5	Planning Applications	31
6	Air Quality Planning Policies	32
7	Local Transport Plans and Strategies	34
8	Climate Change Strategies	35
9	Implementation of Action Plans	36
10	Conclusions and Proposed Actions	41
10.1	Conclusions from New Monitoring Data	41
10.2	Conclusions relating to New Local Developments	41
10.3	Other Conclusions	41
10.4	Proposed Actions	41
11	References	43

List of Tables

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

Table 11.2	Summary of Watford AQMAs designated in February 2006
Table 2.1	Details of Automatic Monitoring Sites
Table 2.2	Details of Non- Automatic Monitoring Sites
Table 11.3a	Results of Automatic Monitoring for NO₂: Comparison with Annual Mean Objective
Table 2.3b	Results of Automatic Monitoring for NO₂: Comparison with 1-hour Mean Objective
Table 2.4	Results of NO₂ Diffusion Tubes monitoring 2014
Table 2.5	Results of NO₂ Diffusion Tubes (2009 to 2013)
Table 2.6a	Results of Automatic Monitoring for PM₁₀: Annual Mean Concentrations
Table 2.6b	Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour Mean Objective
Table 9.1	Action Plan Progress

List of Figures

Figure 2.1	Map(s) of Automatic Monitoring Sites
Figure 2.2	Map(s) of Non-Automatic Monitoring Sites (if applicable)
Figure 2.3	Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

Appendices

Appendix A: Original and Revised Air Quality Management Areas

Appendix B: Diffusion Tube Bias Adjustment Factors

Appendix C: Watford Borough Council Air Quality Planning Policies

1 Introduction

1.1 Description of Local Authority Area

Watford is a concentrated urban area situated to the North West of London, with a population of around 90,300 (2011 Census). It is a well established regional shopping centre with major rail and road communication links. It has both mainline and underground train stations. The M1 lies along the northern boundary of the borough and the M25 is situated to the west. The borough is also served by several major trunk roads, including the A41, A411, A412 and A405.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

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

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

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in **England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of 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 $\mu\text{g}/\text{m}^3$	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 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 $\mu\text{g}/\text{m}^3$	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
Particulate Matter (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

1.4.1 First Round of Review & Assessment (December 2000)

The combined effect of the Stage 1 and 2 reports of the first round Review and Assessment suggested that a Stage 3 Review and Assessment was only needed for two pollutants: nitrogen dioxide (NO₂) and particulate matter (PM₁₀). Exceedences of the Air Quality Regulation objectives were predicted close to some major roads. A public exposure assessment was carried out, which concluded that there were no domestic properties within the areas of exceedence. Accordingly no Air Quality Management Areas (AQMAs) were declared.

1.4.2 Updating and Screening Assessment (June 2003)

The assessment concluded that there was no need to progress to a Detailed Assessment for carbon monoxide, lead, benzene, 1,3-butadiene, or sulphur dioxide. It was, however, considered necessary to proceed to a Detailed Assessment for NO₂ and PM₁₀ as 23 locations required additional assessment before a decision could be made as to whether to declare one or more AQMAs.

1.4.3 Detailed Assessment (April 2004)

The study concluded that for NO₂, there were likely to be six areas where the annual mean objective for nitrogen dioxide was unlikely to be met:

- Parts of St.Albans Road between Beechen Grove and North Western Avenue;
- Parts of Rickmansworth Road between the High Street and Cassio Road;
- Parts of Farraline Road close to its junction with Vicarage Road;
- Parts of Pinner Road close to its junction with Chalk Hill;
- Close to the junction of Horseshoe Lane, the A405 and St.Albans Road; and
- Parts of the Gossamers, Ravenscroft, Eastlea Avenue and Westlea Avenue.

In February 2006, six AQMAs were declared, encompassing the residential properties identified in Table 1.2. Maps showing the extents of the AQMAs are shown in Appendix A.

Table 1.2 Summary of Watford AQMAs designated in February 2006

Watford AQMA no 1 St Albans Road	1B & 1C Wellington Road 155 – 157 St. Albans Road 211-215 St. Albans Road 164 – 454 St. Albans Road
Watford AQMA no 2 Vicarage Road	28A – 30A Vicarage Road (Flats above shops) 85A-87A Vicarage Road (Flats above shops)
Watford AQMA no 3 Aldenham Road	Residential Accommodation above The Railway Arms, Aldenham Road
Watford AQMA no 4 Chalk Hill	12 Chalk Hill
Watford AQMA no 5 A405 / Horseshoe Lane	3A – 5A Horseshoe Lane 887 St Albans Road 1026 St Albans Road
Watford AQMA no 6 M1 / Meriden	16, 17 & 18 Ravenscroft 1 – 5 The Gossamers 31 The Gossamers 63 – 65 The Gossamers 95 – 97 The Gossamers 62, 64, 69 Eastlea Avenue

1.4.4 Updating and Screening Assessment (July 2007)

The USA concluded that there was no need to progress to a Detailed Assessment for carbon monoxide, lead, benzene, 1,3-butadiene, sulphur dioxide or PM10. Monitoring data indicated the continuing need for the existing AQMAs, designated for NO2.

1.4.5 Progress Report (December 2008)

The 2008 Progress Report concluded that there was not a requirement to continue to a Detailed Assessment for any pollutant.

1.4.6 Further Assessment of AQMAs 1- 6 (April 2009)

The Further Assessment of the six AQMAs recommended that AQMA 1 (St Albans Road) should remain unchanged and AQMA 5 (A405/Horseshoe Lane) should be decreased. It also recommended that that AQMA 2 (Vicarage Road), AQMA 3 (Aldenham Road) and AQMA 4 (Chalk Hill) should be extended, and AQMA 6 (M1 / Meriden) should be revoked. The recommendations of the Further Assessment were accepted by DEFRA in April 2009.

Accordingly in 2012 we formally consulted on our intentions to:

- Leave AQMA 1 (St.Albans Road) unchanged.

- Extend the boundary of AQMA 2 (Vicarage Road)
- Amalgamate AQMA 3 (Aldenham Road) and AQMA 4 (Chalk Hill) into a single AQMA (AQMA 3A, Aldenham Road and Chalk Hill) due to their proximity and similarity in air quality issues affecting them.
- Reduce the boundary of AQMA 5 (Horseshoe Lane)
- Revoke AQMA 6 (M1 / Meriden).

Maps showing the revised AQMAs are shown in Appendix A. No objections were received to the proposals, and the legal mechanism to formally amend and revoke the AQMAs will be completed in 2013.

1.4.7 Combining Updating and Screening Assessment and Progress Report (June 2010)

This report showed that there were some annual mean NO₂ concentrations recorded during 2009 using passive diffusion tubes where the annual mean objective of 40 µg/m³ and that 3 of these locations were outside the Air Quality Management Areas. These locations are not representative of relevant public exposure, and hence a Detailed Assessment was not required:

- WF03 Hospital, Vicarage Road;
- WF37 St Albans Road 2; and
- WF42 Queens Road.

Once more detailed distance from roads calculations were submitted, the report was accepted by DEFRA and progression to a Detailed Assessment was not required.

Monitoring of PM₁₀ showed no exceedences of the Air Quality Strategy objective, and further assessment is subsequently not required. The assessment does not identify any other pollutant source of concern.

1.4.8 Updated Air Quality Action Plan (April 2011)

This report confirmed that the most likely source of nitrogen dioxide as transport, in particular congestion. It set out 16 measures aimed at improving air quality, and the council consulted on these on 2012. No objections to the measures laid out in the

Action Plan were received, indeed a number of useful suggestions aimed at improving air quality were received and these will be taken forward.

1.4.9 Updating and Screening Assessment (June 2012)

This Updating and Screening Assessment concluded that concentrations of nitrogen dioxide and PM10 particles have remained fairly stable over recent years, and that there have been no exceedences of the objectives.

There continued to be some locations where results suggested that nitrogen dioxide concentrations would be above the annual mean objectives, but all of these were in existing Air Quality Management Areas. Overall it was concluded that there was no need to progress to a Detailed Assessment.

1.4.10 Progress Report (July 2013)

This progress report concluded that concentrations across all of the sites have remained fairly constant in recent years. At the following sites, results suggested that concentrations were above an objective level.

- Pinner Road,
- St. Albans Road 2
- Balmoral Road
- Salisbury Road
- Farraline Road
- Chalk Hill
- Wellington Road

All of these locations are existing Air Quality Management Areas so it was concluded that there was no need to progress to a Detailed Assessment.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Since January 2008, the following analysers have been in operation at Watford Town Hall:

1. API M200E chemiluminescent NO_x analyser from Envirotechnology; and
2. Rupprecht & Patashnick TEOM analyser, gathering PM₁₀ data.

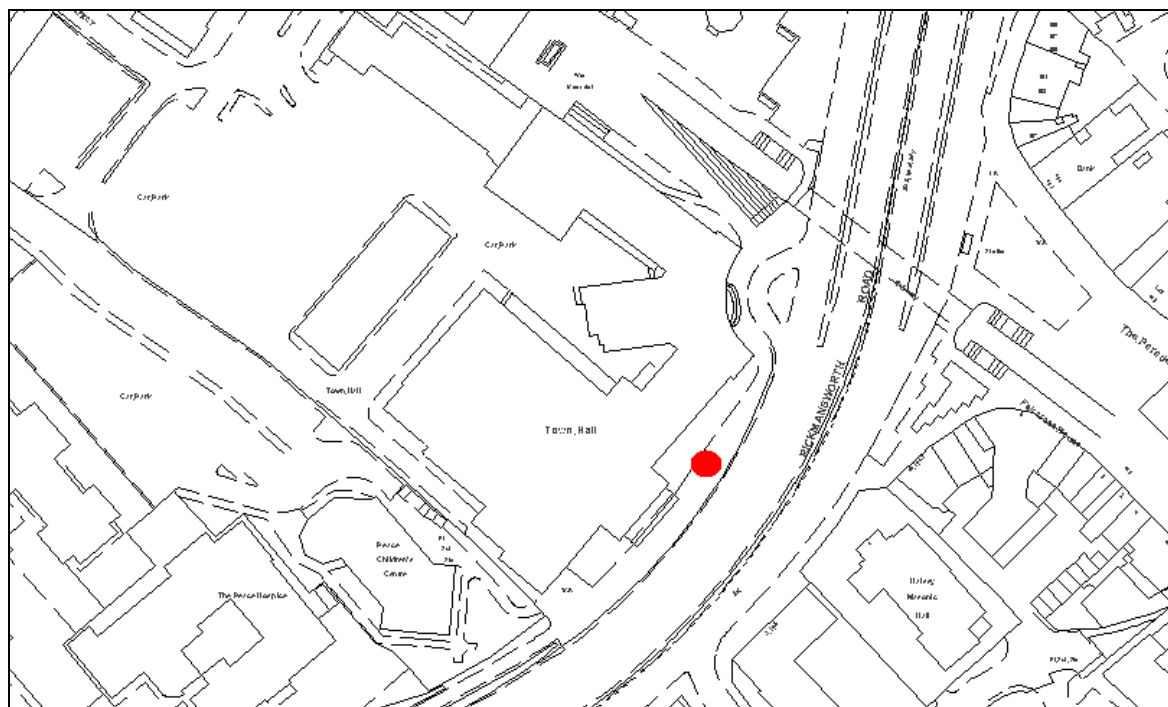
The monitoring station is classified as a Roadside monitoring site, and is situated approximately 10 metres from the kerb of Rickmansworth Road. Figure 2.1 shows the location of the monitoring station and table 2.1 shows the technical details of the site.

Until 2011 data was collected via modem by the King's College London Environmental Research Group (ERG), who validated and reported on the data. Since 2011 data has been collected, via modem by Air Quality Data Management (AQDM), part of Envitech Europe. AQDM also now carry out the validation and reporting of the data. Real time data, as well as weekly month and annual reports are available from Herts & Beds Air Pollution Monitoring Network website; www.hertsbedsair.net

All servicing and maintenance (including periodic calibration of equipment) is still carried out by Kings ERG, and we have a service and monitoring contract with SupportingU. The service contract expires in October 2014 at which point the council will be re-tendered.

PM10 data collected using the TEOM instrument is converted by ERG to reference equivalence using the volatile correction method (VCM).

Figure 2.1 Map(s) of Automatic Monitoring Sites



This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. 100018689 (2010).

Table 2.1 Details of Automatic Monitoring Sites

Site ID	WF1
Site Name	Watford Town Hall
Site Type	Roadside
X OS Grid Reference	510540
Y OS Grid Reference	196780
Inlet Height (m)	2m
Pollutants Monitored	NO2, PM0
In AQMA?	N
Monitoring Technique	NOx: Chemiluminescence PM10: TEOM
Relevant Exposure?	N
Distance to Kerb of Nearest Road (m)	10m
Does this Location Represent Worst-Case Exposure?	Y

2.1.2 Non-Automatic Monitoring Sites

As of 1st January 2014, passive monitoring of NO₂ is undertaken using diffusion tubes at 17 locations within the Borough.

This is up from 16 sites in 2013 following commencement of monitoring at a new site on Lower High Street, Watford (WF48). This site has been commissioned to monitor possible effects of the link road that is planned for the Health Campus (this is discussed more in Chapter 3). In the 2013 previous Progress Report it was suggested that two new sites would be commissioned, and that the Willow Lane site (WF47) would be decommissioned. However since that time it has become apparent that traffic on this road may increase as a result of the Health Campus development so it was decided to keep the site as one of the two sites used to monitor the effects of the development.

Details of the site locations are given in table 2.2 and their approximate location is shown in Figure 2.2. Unadjusted monthly diffusion tube data can be downloaded from: www.hertsbedsair.net

Figure 2.2 Map(s) of Non-Automatic Monitoring Sites (if applicable)

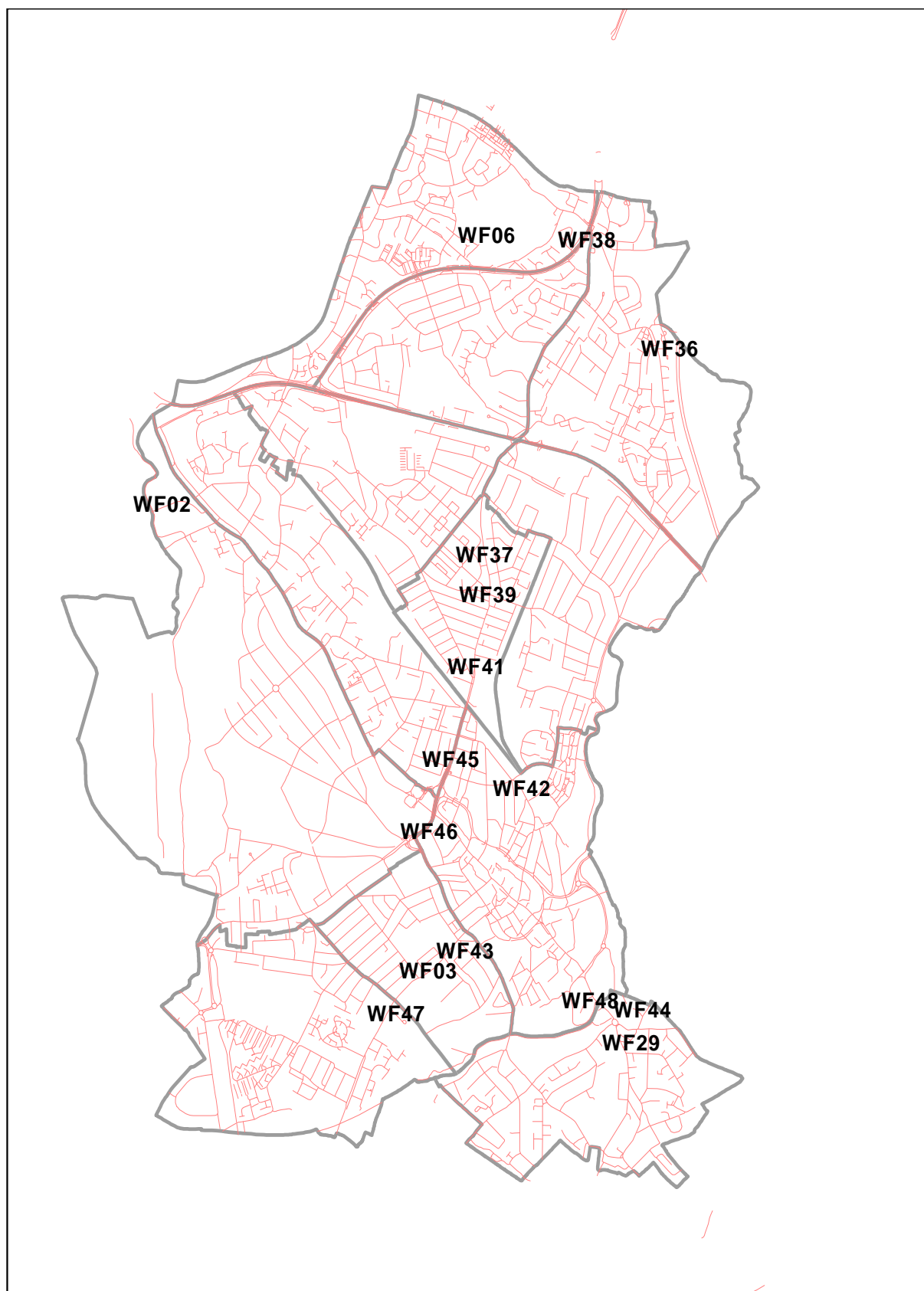


Table 2.2 Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Co-located with a Continuous Analyser (Y/N)	Relevant Exposure?	Distance to Kerb of Nearest Road (m)	Does this Location Represent Worst-Case Exposure?
WF02	Grove Pumping Station	B	508700	198950	2m	NO2	N	N	N	n/a	N
WF03	Hospital Vicarage Road	K	510570	195800	2.4m	NO2	N	N	N	4m	Y
WF06	Woodside Playing Fields	B	510985	200710	3m	NO2	N	N	N	n/a	N
WF29	Pinner Road	K	511940	195320	2.1m	NO2	Y	N	Y- 6m	2m	Y
WF36	Ravenscroft	I	512240	199910	2.2m	NO2	N	N	Y – 8m	n/a	Y
WF37	St Albans Road 2	K	510970	198535	2.4m	NO2	N	N	Y – 5m	1m	Y
WF38	A405 Horseshoe Lane	K	511680	200700	3m	NO2	Y	N	Y -2m	4m	Y
WF39	Balmoral Road	K	511000	198270	2.4m	NO2	Y	N	N	1m	Y
WF40	Salisbury Road	K	510930	198000	2.4m	NO2	Y	N	N	2m	Y
WF41	Leavesden Road	K	510850	197780	2.5m	NO2	Y	N	N	1m	Y
WF42	Farraline Road	K	511160	197000	2.4m	NO2	N	N	Y - 4m	1m	Y
WF43	Queens Road	K	510800	196020	2.4m	NO2	Y	N	Y- 4m	2m	Y
WF44	Chalk Hill	K	511920	195450	2.1m	NO2	Y	N	Y – 6m	2m	Y

Watford Borough Council

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Co-located with a Continuous Analyser (Y/N)	Relevant Exposure?	Distance to Kerb of Nearest Road (m)	Does this Location Represent Worst-Case Exposure?
WF45	Wellington Road	K	510750	197230	2.3m	NO2	Y	N	Y- 10m	4m	Y
WF46	Town Hall	R	510565	196800	2m	NO2	N	Y	N	6m	N
WF47	Willow Lane	K	510335	195610	2.4m	NO2	N	N	Y- 4m	1m	Y
WF48 NEW SITE	Lower High Street	K	511720	195630	2.2m	NO2	N	N	Y-4m	1m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO₂)

Automatic Monitoring Data

The annual mean ratified NO₂ concentrations recorded by the continuous analyser at Watford Town Hall on Rickmansworth for the period 2009-13 are presented in Table 2.3a. Comparison with 1-hour Mean Objective is shown in Table 2.3b.

Table 2.3a Results of Automatic Monitoring for NO₂: Comparison with Annual Mean Objective

Year	2009	2010	2011	2012	2013
Annual mean concentration (µg/m ³)	39	39	39	38	39
Data Capture (%)	98	98	98.3	99.6	99.8

Data can be downloaded from www.hertsbedsair.net

It can be seen that concentrations have remained fairly constant over the last few years, and that the annual mean objective of 40 µg/m³ has not been exceeded during this time.

Table 2.3b Results of Automatic Monitoring for NO₂: Comparison with 1-hour Mean Objective

Year	2009	2010	2011	2012	2013
Number of Exceedences of hourly mean (200 µg/m ³)	0	1	0	1	0
Data Capture (%)	98	98	98.3	99.6	99.8

Data can be downloaded from www.hertsbedsair.net

There were no hours during 2012 where the hourly average was above 200 µg/m³, so the NO₂ hourly mean objective of 200 µg/m³ was not exceeded at the Watford Town Hall site.

Recent results are consistent with those from previous years so we can be confident that the hourly mean objective is not being exceeded at this location.

Diffusion Tube Monitoring Data

Table 2.4 shows the annual mean bias adjusted NO₂ concentrations recorded at the 17 diffusion tube sites in 2013. Figures for the last 5 years are shown in Table 2.5

Table 2.4 Results of NO₂ Diffusion Tubes monitoring 2014

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months)	2013 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) - Bias Adjustment factor = 0.80
WF02	Grove Pumping Station, Hempstead Road	B	N	N	12	18
WF03	Hospital, Vicarage Road	K	N	N	10	36
WF06	Leisure Centre, Horseshoe Lane	B	N	N	12	21
WF29	Pinner Road	K	Y	N	12	51
WF36	Ravenscroft	I	N	N	12	29
WF37	St Albans Road 2	K	N	N	9	35
WF38	A405 Horseshoe Lane	K	Y	N	12	37
WF39	Balmoral Road	K	Y	N	10	43
WF40	Salisbury Road	K	Y	N	12	39
WF41	Leavesden Road	K	Y	N	12	36
WF42	Queens Road	K	N	N	12	34
WF43	Farraline Road	K	Y	N	12	49
WF44	Chalk Hill	K	Y	N	12	84
WF45	Wellington Road	K	Y	N	12	35
WF46	Town Hall collocation	R	N	Y	12	34
WF47	Willow Lane	R	N	N	11	35

1. Exceedences of the NO₂ annual mean AQS objective of 40 $\mu\text{g}/\text{m}^3$ are shown in bold
2. Annual means > 60 $\mu\text{g}/\text{m}^3$ are underlined, indicating a potential exceedence of the NO₂ hourly mean AQS objective
3. There were no sites for which data capture was below 75%, so no annulisation has been needed.

Table 2.5 Results of NO₂ Diffusion Tubes (2009 to 2013)

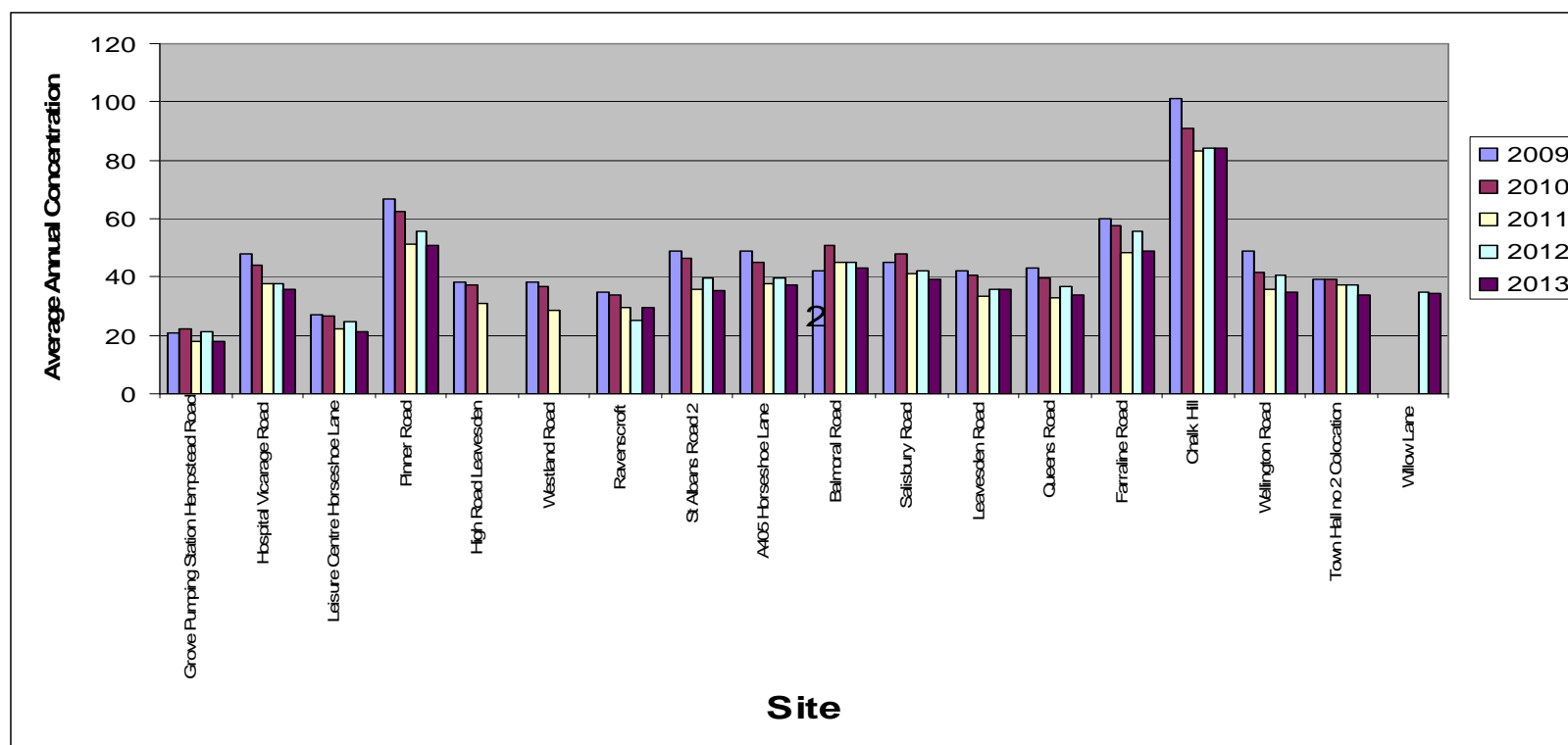
Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m ³) - Adjusted for Bias ^a				
			2009 (Bias Adjustment Factor = 0.91)	2010 (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.79)	2013 (Bias Adjustment Factor = 0.80)
WF02	Grove Pumping Station, Hempstead Road	N	21	22	18	21	18
WF03	Hospital, Vicarage Road	N	48	44	38	38	36
WF06	Leisure Centre, Horseshoe Lane	N	27	27	22	25	21
WF29	Pinner Road	Y	<u>67</u>	<u>62</u>	52	56	51
WF36	Ravenscroft	N	35	34	30	25	29
WF37	St Albans Road 2	Y	49	46	36	40	35
WF38	A405 Horseshoe Lane	Y	49	45	38	40	37
WF39	Balmoral Road	Y	42	51	45	(45)	43
WF40	Salisbury Road	Y	45	48	41	42	39
WF41	Leavesden Road	Y	42	40	33	36	36
WF42	Queens Road	N	43	39	33	(37)	34
WF43	Farraline Road	Y	<u>60</u>	58	48	55	49
WF44	Chalk Hill	Y	<u>101</u>	<u>91</u>	<u>83</u>	<u>(84)</u>	<u>84</u>
WF45	Wellington Road	Y	49	42	36	40	35
WF46	Town Hall collocation	N	39	39	37	37	34
WF47	Willow Lane	N	n/a	n/a	n/a	35	35

Notes

4. Exceedences of the NO₂ annual mean AQS objective of 40µg/m³ are shown in bold
5. Annual means > 60µg/m³ are underlined, indicating a potential exceedence of the NO₂ hourly mean AQS objective
6. Figures in brackets are those for which data capture was below 75%
7. Local adjustment factors, calculated from the collocation of diffusion tubes at the Watford Town Hall continuous monitoring site, have been applied to diffusion tube data collected during 2009 (0.91). In 2010, 2011, 2012 and 2013 DEFRA's national bias adjustment spreadsheet was used to obtain values of 0.85, 0.83, 0.79 and 0.80 respectively

Figure 2.3 shows how results have changed in the last 5 years.

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



It should be noted that concentrations across all of the sites appear to be declining and that the number of sites where results suggest that concentrations are above an objective contraction has decreased from 6 to 4. Results at the St.Albans Road and Wellington Road are no longer above the objective concentration, leaving the following 4 sites:

- Pinner Road,
- Balmoral Road

- Farraline Road
- Chalk Hill

All of these sites are within existing Air Quality Management Areas, so it is not proposed to proceed to a Detailed Assessment.

If concentrations continue to decrease then a Further Assessment of air quality within the St.Albans Road Air Quality Management Area should be considered. This should be considered in more detail at the time of the 2015 Updating and Screen Assessment

2.2.2 Particulate Matter (PM₁₀)

The annual mean PM10 concentrations recorded by the TEOM instrument at Watford Town Hall for the period 2009-13 are presented in Table 2.6a, and the number of exceedences of the 24-hour mean objective are shown in Table 2.6b.

Table 2.6a Results of Automatic Monitoring for PM10: Annual Mean Concentrations

	2009	2010	2011	2012	2013
Annual Mean Concentration (µg/m ³)	22	24	25	22	24
Data Capture	98	98	98.8	97.8	97.9

Table 2.6b Results of Automatic Monitoring for PM10: Comparison with 24-hour Mean Objective

	2008	2009	2010	2011	2012	2013
Number of Exceedences of 24-hour mean (50 µg/m³) *	9	0	7	20	13	7
Data Capture	98	98	98	98.8	97.8	97.9

Full datasets can be downloaded from www.hertsbedsair.net

In both cases, data was collected using a TEOM PM10 instrument. Results have been converted to reference equivalence using the volatile correction method (VCM).

The annual mean PM10 concentration recorded at Watford Town Hall has been well below the objective of 40 µg/m³ for the period 2009-13.

The number of exceedences of the 24-hour mean objective of 50 µg/m³ is well within the permitted 35 exceedences per year for the period 2009-13.

Watford Borough Council has examined the results from monitoring in the borough.

Concentrations within the AQMA still exceed the annual objective from nitrogen dioxide at a number of locations in the Borough and the AQMA should remain.

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 New Local Developments

3.1 Road Traffic Sources

The new road scheduled for construction as part of the Health Campus will start construction in late 2014. This is discussed in more detail in Chapter 5. Baseline monitoring has commenced so that the effect of this road on air quality can be determined in due course.

3.2 Other Transport Sources

There are no new other transport sources that may have an impact on air quality in the Borough.

3.3 Industrial Sources

There are no new industrial sources that may have an impact on air quality in the Borough.

3.4 Commercial and Domestic Sources

There are no new commercial or domestic sources that may have an impact on air quality in the Borough.

3.5 New Developments with Fugitive or Uncontrolled Sources

At the time of writing there are no new developments with fugitive or uncontrolled sources that may have an impact on air quality in the Borough. In 2013 the council received a number of complaints about dust emissions from a concrete crusher

Watford Borough Council

operating in the Borough. The operation had been issued with a permit by the council under the Pollution Prevention and Control Act 1999 and following the complaints a number of compliance inspections were carried out. The crusher was found to be complying with the terms of the permit but emissions were noticed from the access road which the company shared with other businesses.

The site was managed by the council's Property Section and after conversations with them it was decided to terminate the lease for company. The crusher stopped operating in April 2014 and resulted in reduced traffic onto the site.

Watford Borough Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Watford Borough Council confirms that all the following have been considered:

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

4 Local / Regional Air Quality Strategy

Currently the Council is not proposing to develop an Air Quality Strategy. Instead we are developing the measures outlining the Air Quality Action plan that was produced following the declaration of the six Air Quality Management Areas in 2006. This is discussed in more detail in chapter 9.

5 Planning Applications

Discussions with the Council's Development Control Section have not revealed only one development which could impact upon air quality, the Watford Health Campus.

This is a large development will seeing the rebuilding of Watford General Hospital, along with the construction of new commercial and residential properties, and a new road that will improve access from the M1 and Lower High Street Areas. The project has been at the planning stage for a number of years but has now been given planning consent and is due for completion in 2018.

As part of the pre-application work, an air quality assessment was carried out in 2007, which concluded that overall the likely impact of the development on air quality was 'minor adverse', based on conditions at that time. It suggested that nitrogen dioxide concentrations could rise by up to 2µg/m³ at some locations.

It suggested that concentrations at other locations could be reduced, as a result of the access road relieving congestion. Overall, the benefit of the project was deemed to outweigh any air quality considerations and it was given planning consent in 2011.

It is also worth noting that since the air quality assessment was carried out, the size of the Air Quality Management Areas at Bushey Arches and Vicarage Road have increased. As these are the two areas most likely to be affected by the Health Campus Development, it is possible that any areas affected by it will be in the new areas.

Baseline monitoring in Willow Lane (WF47) and Lower High Street (WF48) has been established so that the effect of the health campus and the associated link road can be assessed.

Supermarket Development

The major supermarket project mentioned in the 2013 Progress Report has not been progressed.

6 Air Quality Planning Policies

As described in the last Progress Report, in Watford the Local Development Plan remains the principal planning policy document relating to air quality. It was adopted in December 2003. The plan has two policies that relate to air quality as follows:

SE20 Air Quality

SE21 Air Quality Management Areas

The full text of the current policies is contained in Appendix C

The Council's Planning Policy Team and the Environmental Health Section drafted a new policy in June 2013 and this was consulted on later the same year. It was hoped that conclusion will be more robust air quality policies that will restrict development where it may have an adverse effect on air quality, as well as allow for more mitigation measures where they are needed.

Further consultation is expected in late 2015, followed by submission to DEFRA in 2015 and adoption in 2016.

The current wording as is follows:

"Applications for all major development and other development which, due to its nature or operational characteristics, may give rise to emissions, will be required to consider the impact of the development in terms of the effects on air quality caused by both the operational characteristics of the development (industrial processes and emissions, biomass boilers, etc.) and the traffic generated by it. The Council will have regard to the potential effects of a development on local air quality when determining planning applications.

Developments should not cause significant harm to air quality, cumulatively or individually. Any development within or adjacent to locations with poor air quality, areas designated as Air Quality Management Areas (AQMAs), will need to be assessed with regard to the council's Air Quality Action Plan. Applicants should

ensure that development in these areas improves the air quality. Where adequate mitigation is not provided and/or is not practicable, planning permission may be refused.”

7 Local Transport Plans and Strategies

As part of the development on the updated Air Quality Action plan, Watford Borough Council continues to working closely with Hertfordshire County Council to make sure that the measures included with the plan tie in with the development of their LTP3. In addition we have been fully involved in County Council's consultation on their transport policy.

8 Climate Change Strategies

The Council has adopted a Climate Change Policy which formalises the commitments that the Council has made to tackle climate change.

In addition the Council has adopted a Carbon Management Strategy and associated Action Plan that sets out how reductions in community and Council carbon emissions will be delivered.

9 Implementation of Action Plans

Table 9.1 shows progress to date with the Council's Air Quality Action Plan

Table 9.1 Action Plan Progress

No.	Measure	Focus	Lead authority	Policy linkages	Timescale	Indicator	Target	Air Quality impact	Progress	Update notes 2013
1	Intelligent Transport Systems	To manage traffic movement more efficiently throughout the County	HCC	LTP3	2011 onwards	NI167 congestion	2.87 mins/mile in 2008/09 to 2.80 mins/mile in 2015/16	Likely to be high in the AQMA congested junctions	Complete	Herts County Council highway engineer advises this work now complete in SW Herts. Real time passenger information / vehicle locations available at interchange and bus stops New Herts control centre
2	Road Infrastructure Improvements	Ease congestion in St Albans Road AQMA. Further improvements are recommended in the Congestion study	HCC/ WBC	LTP3	2011 onwards	Schemes completed	2 link roads completed	Likely to be high	Partially complete	Local Sustainable Transport Fund 20 Zone west of St. Albans Road planned New cycle route along St.Albans Road The congestion study was completed 'some time ago' and signals at two junctions have been adjusted. Some permanent loops are in place so there will be some journey time information. St.Albans Road link road on hold
3	Enforcement of parking policy	Minimise emissions due to reduced traffic flow caused by obstructions	WBC	Council Enforcement Officers	2011 onwards	Number of warnings, fines and prosecutions for such offences	n/a	low	Outstanding	Contact with Council transportation section needed

Watford Borough Council

4	Installation of EV charging points	Encourage the uptake of electric vehicles	HCC	LTP3, Relies on success of bid to Plugged In Places government grant	2011 – medium term	Number of charging points installed	N/A depends on success of grant	low	Complete	4 EV charging points in place.
5	Implement bus strategy	Encourage the increase of bus patronage	HCC/ WBC	LTP3, Bus Strategy	2011 onwards	Bus patronage	Not set as yet	medium	Complete / ongoing	Local Sustainable Transport Fund Ongoing partnerships and promotion with local bus companies through council commuting officer
6	Implement the intalink project	Increase the integration of public and sustainable transport movements	HCC/ WBC	LTP3	2011 onwards	Bus and rail patronage, number of cyclists and pedestrians	Not set as yet	medium	Complete / ongoing	Ongoing promotion
7	Watford Junction interchange improvement	Increase the accessibility of the rail station	HCC/ WBC	LTP3	2011	Completed scheme	Completed scheme	High in the vicinity of the junction	Partially complete	Forecourt and other work done as part of national station improvement scheme. No start date as yet for major work such as link road Improvements to Abbey train Line planned
8	Promotion of car sharing scheme	Increase car sharing to ease congestion	WBC	LTP3, WBC green travel plan	2011 onwards	Registered members on liftshare Number of private schemes	2011 level is 480,000 8 schemes in 2011	low	Complete / ongoing	Ongoing promotion through council's commuting officer
9	Promotion of Travel Plans	Increase in sustainable transport	WBC	LTP3, WBC green travel plan	2011 onwards	Number of travel plans in schools and businesses	Increase from 2011	low	Complete / ongoing	Ongoing promotion through council's commuting officer

Watford Borough Council

10	Promotion of TravelSmart	Personalised travel planning to reduce car use	WBC	LTP3, WBC green travel plan	2011 onwards	Progress on the Croxley programme	N/A	low	Complete / ongoing	Travelsmart continues to be promoted Croxley Rail link commencement order agreed
11	Promotion of cycling and walking	Increase sustainable transport	WBC/HCC	LTP3, WBC green travel plan	2011 onwards	Number of cyclists and pedestrians	N/A	low	Complete / ongoing	New cycle route along St.Albans Road Ebury Road route planned Grand union canal route planned New road signs with pedestrian info being implemented SW Herts cycling strategy Permanent loop monitoring planned
12	Develop Supplementary Planning Document for Air Quality	Develop SPD on AQ for inclusion in the 2011 Development Plan Document	WBC	LDF	2011	Publication of SPD; Number of planning applications made using the guidance;	n/a	low	Complete – awaiting adoption	Revised policy written July 2013
13	Annual Council vehicle fleet review	Maintain clean Council vehicle fleet	WBC	Green Travel Plan	2011	Age and Euro standard of Council vehicle fleet	n/a	low	Outstanding	
14	Promote air quality within the Borough	Increase awareness of AQ as a health issue and the	WBC	Air Quality SPD; Green Travel Plans	2011 onwards	“Hits” on Herts&Beds Air Quality website	Increase on 2011	low	completed	Website Improved
15	Continue to monitor air quality	Maintenance of air quality monitors and data management	WBC	LTP3, Green travel	2011	Number of operational monitors	Same as in 2010	low	Completed	Ongoing

Watford Borough Council

				plan, Communi ty strategy						
16	Undertake feasibility studies	To investigate the air quality impact of any potential future schemes	WBC	LDF, LTP3	2011	N/A	N/A	N/A	Completed	Site allocation traffic light system put in place with planning policy Constraint information for developers included in planning information

There are a number of outstanding items and these will be progressed.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

There is no new monitoring data to suggest that there are any potential breaches of Air Quality objectives outside the existing AQMAs.

10.2 Conclusions relating to New Local Developments

The Council has identified no new local developments that that will require more detailed consideration in the next Updating and Screening Assessment, or that give rise to the need for a Detailed Assessment.

However the progress of the Health Campus and the associated access road will be monitored.

10.3 Other Conclusions

The outstanding actions in the Air Quality Action Plan will be progressed.

10.4 Proposed Actions

1. The formal process to amend and revoke some of the existing Air Quality Management Area will be completed.
2. If the trend of decreasing nitrogen dioxide concentrations continues when the 2015 Updating and Screening Assessment is completed then the council should carry out a detailed assessment of air quality within the existing Air Quality Management Areas, which a view to amending their boundaries.
3. The effect of the Health Campus and the associated access road will be assessed through nitrogen dioxide diffusion tube monitoring at Willow Lane (WF47) and Lower High Street (WF48)
4. The final measures outlined in the Air Quality Action plan will be progressed.

5. A nitrogen dioxide diffusion tube co-location study will be undertaken.

11 References

First Round Review & Assessment, Watford Borough Council, December 2000

Updating and Screening Assessment Watford Borough Council, June 2003

Detailed Assessment, Watford Borough Council, April 2004

Updating and Screening Assessment, Watford Borough Council, July 2007

Progress Report, Watford Borough Council, December 2008

Further Assessment, Watford Borough Council, April 2009

Combining Updating and Screening Assessment and Progress Report, Watford Borough Council, June 2010

Updated Air Quality Action Plan, Watford Borough Council, April 2011

Updating and Screening Assessment Watford Borough Council, June 2012

Progress Report, Watford Borough Council, July 2013

Appendices

Appendix A: Original and Revised Air Quality Management Areas

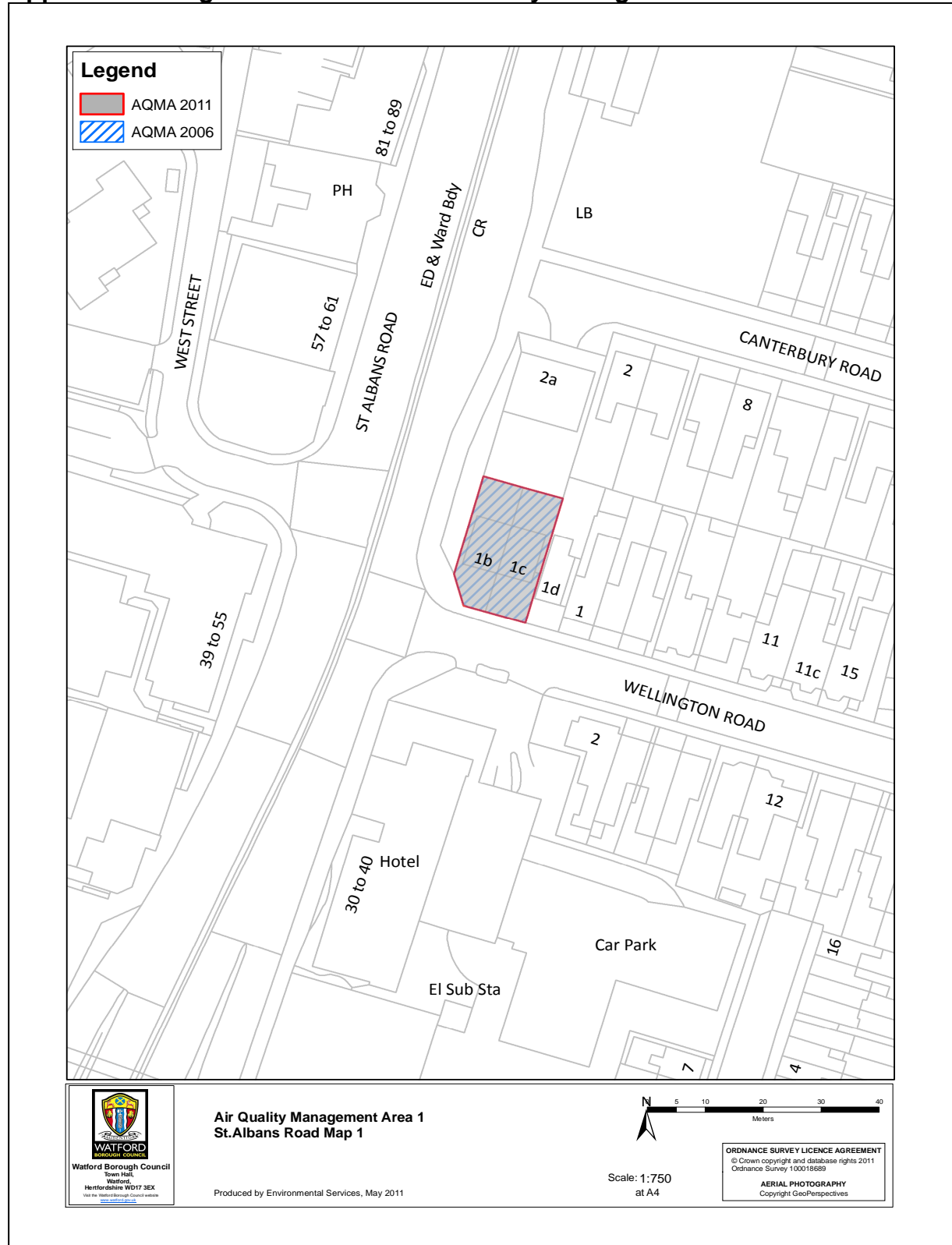


Figure A1.1 Air Quality Management Area 1 St. Albans Road Map 1

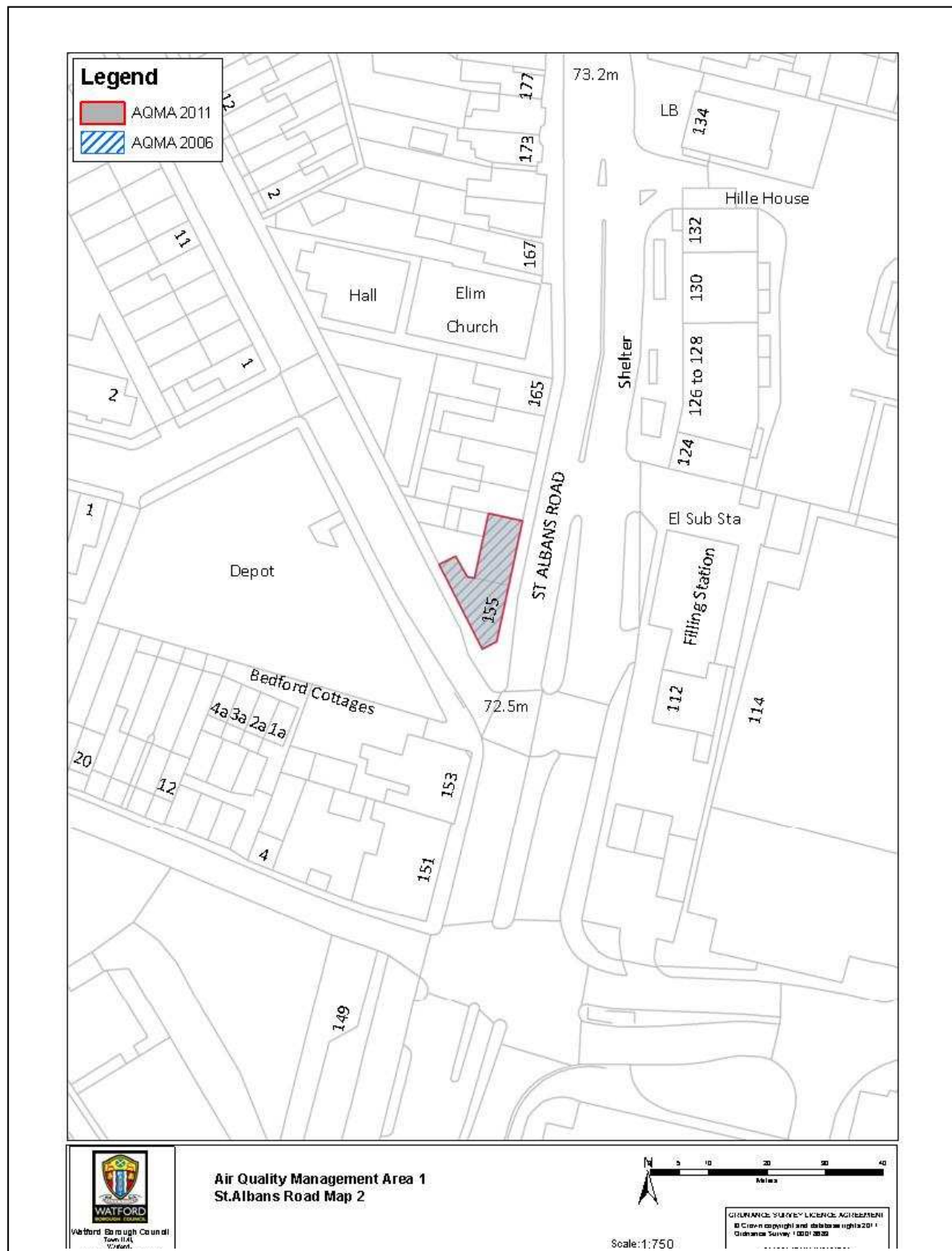


Figure A1.2 Air Quality Management Area 1 St. Albans Road Map 2



Figure A1.3 Air Quality Management Area 1 St.Albans Road Map 3

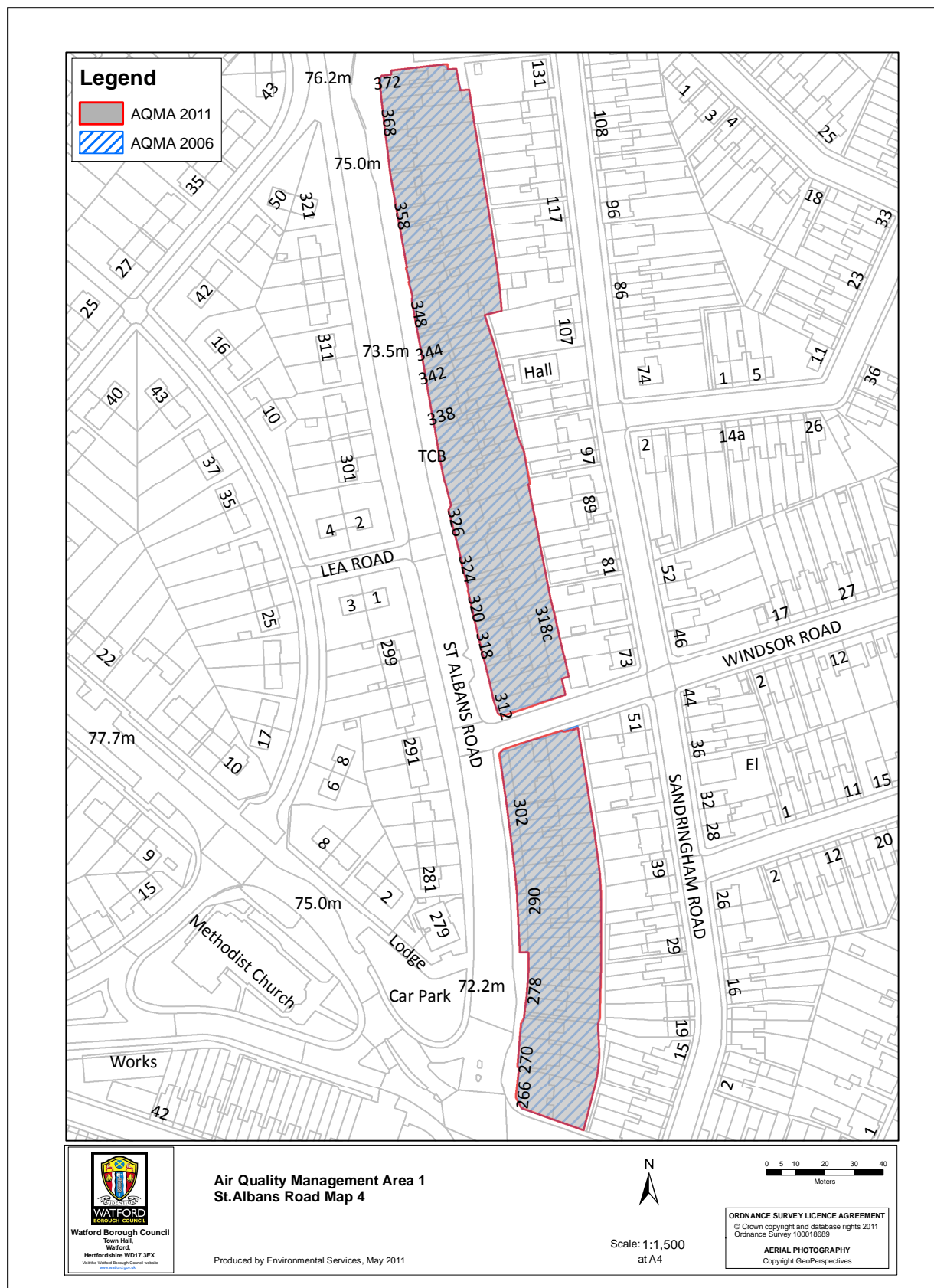


Figure A1.4 Air Quality Management Area 1 St. Albans Road Map 4

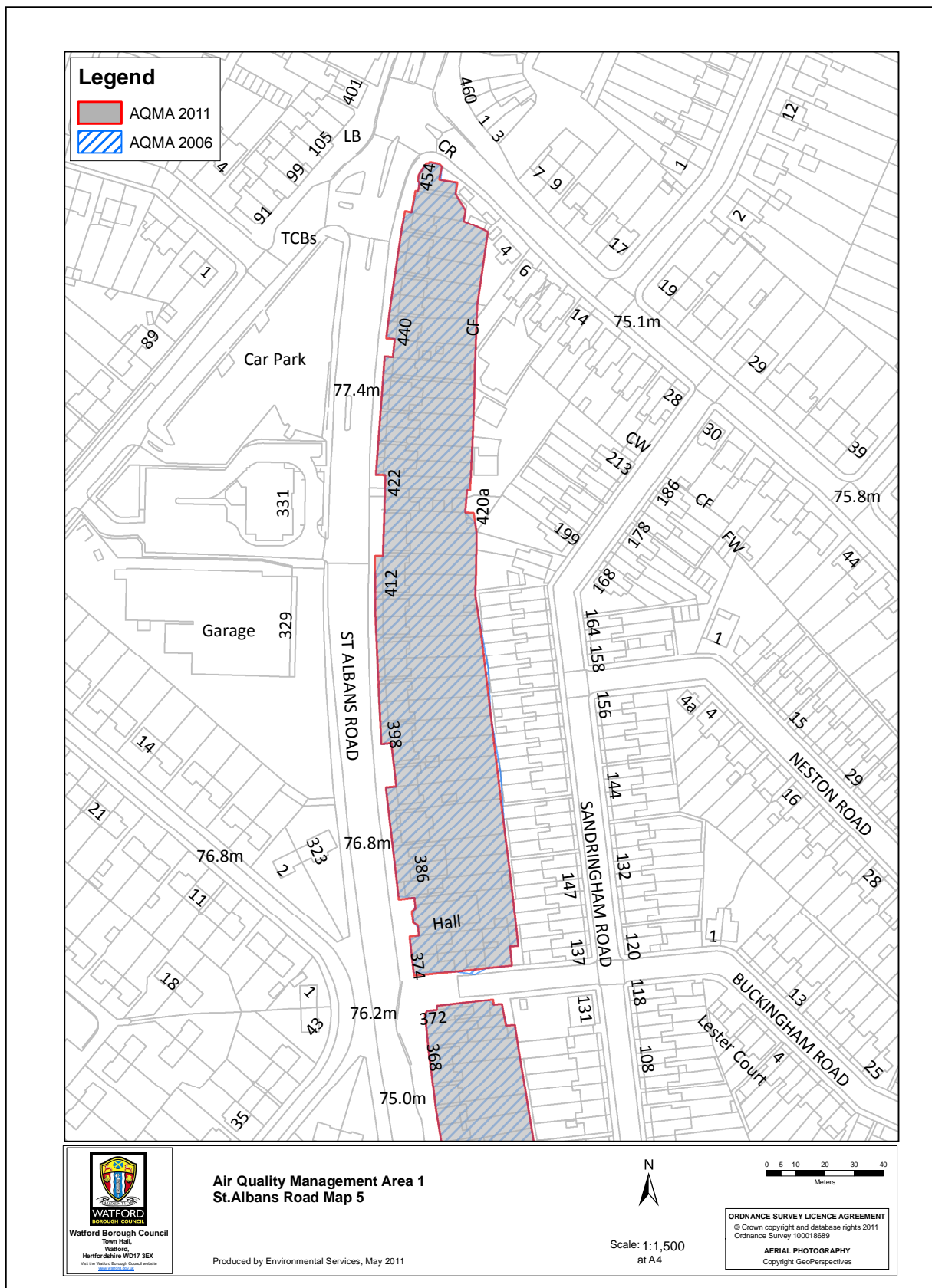


Figure A1.5 Air Quality Management Area 1 St. Albans Road Map 5

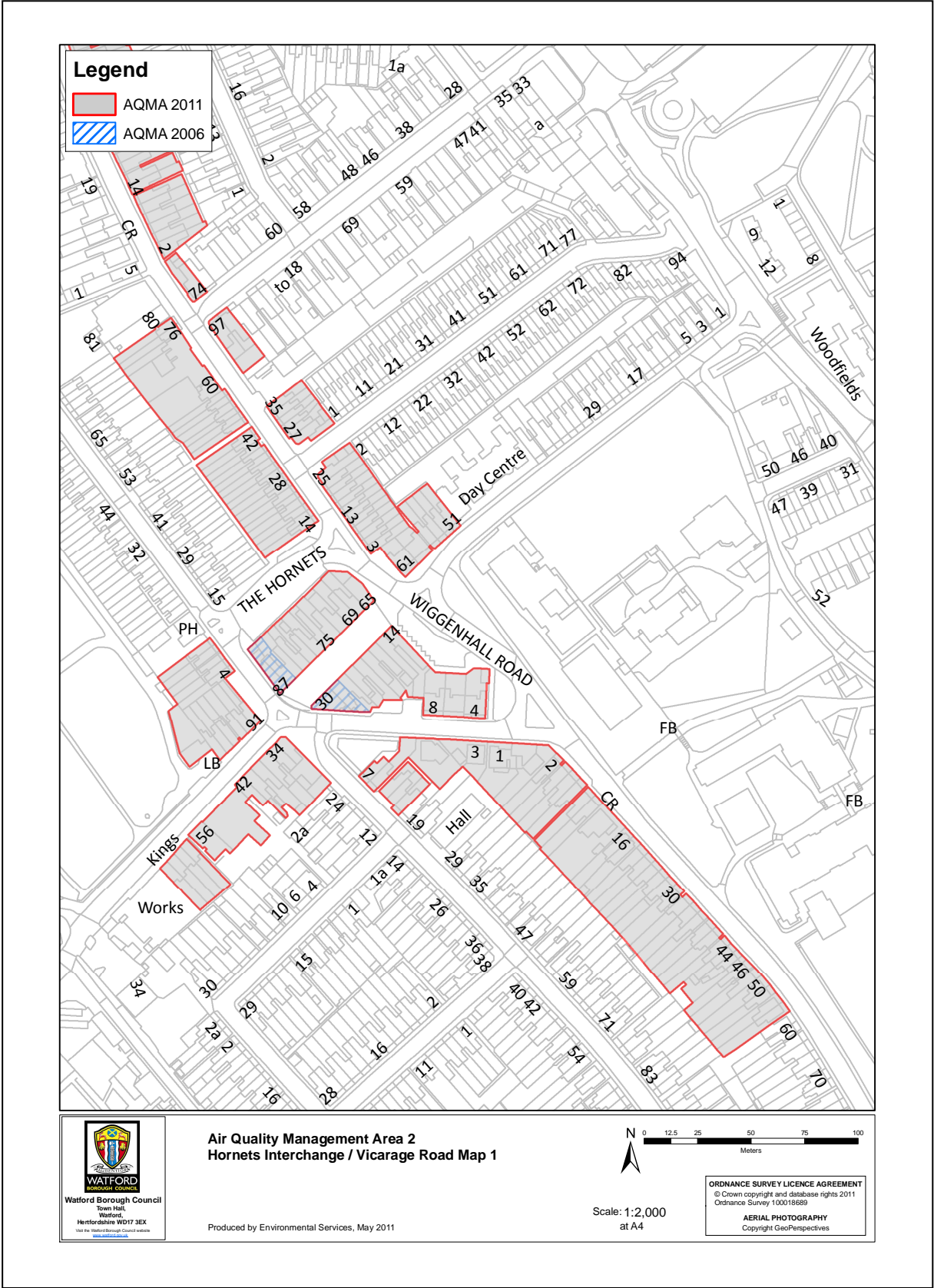


Figure A1.6 Air Quality Management Area 2 Hornets Interchange / Vicarage Road Map 1

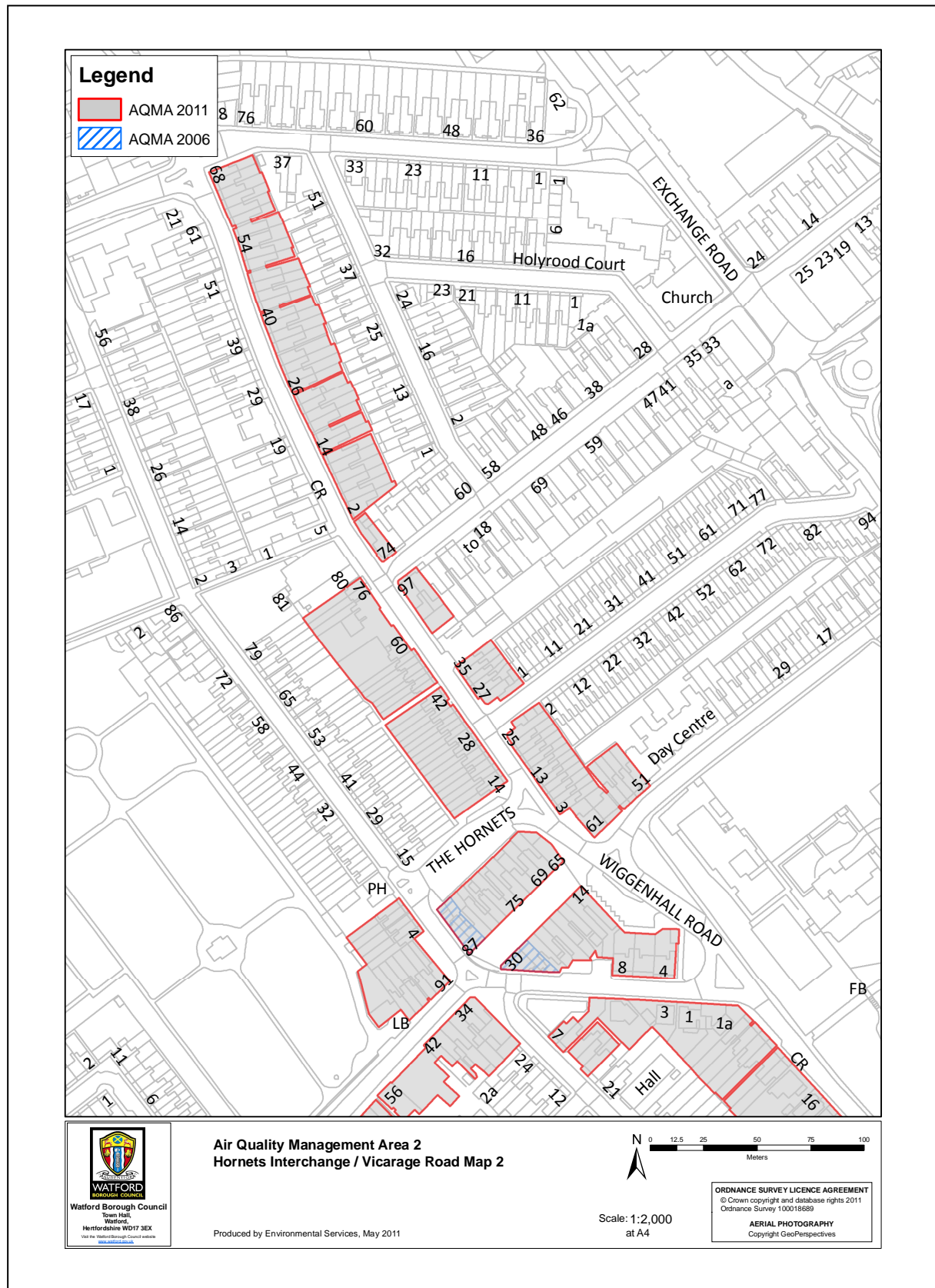


Figure A1.7 Air Quality Management Area 2 Hornets Interchange / Vicarage Road Map 2

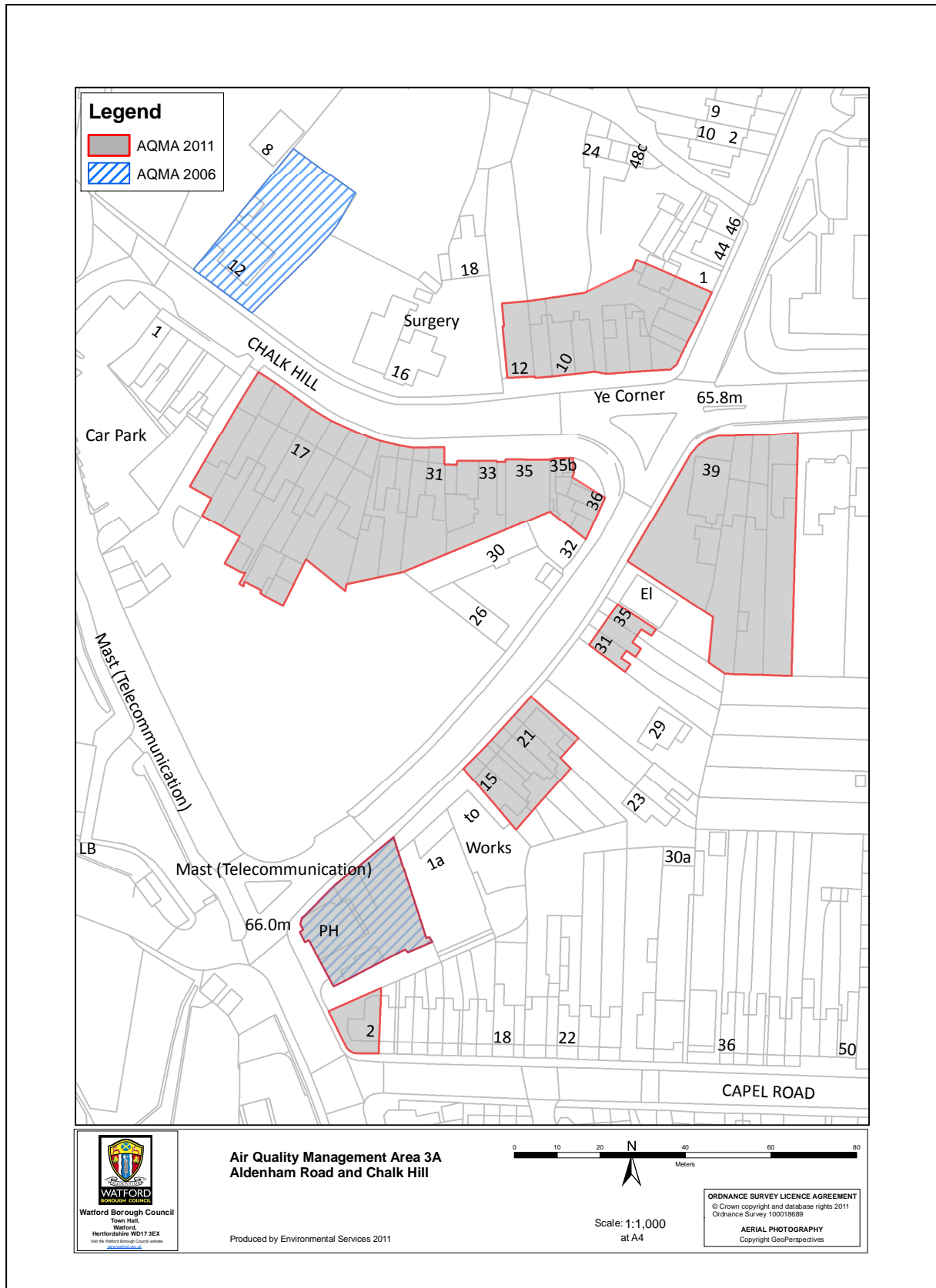


Figure A1.8 Air Quality Management Area 3A Aldenham Road / Chalk Hill

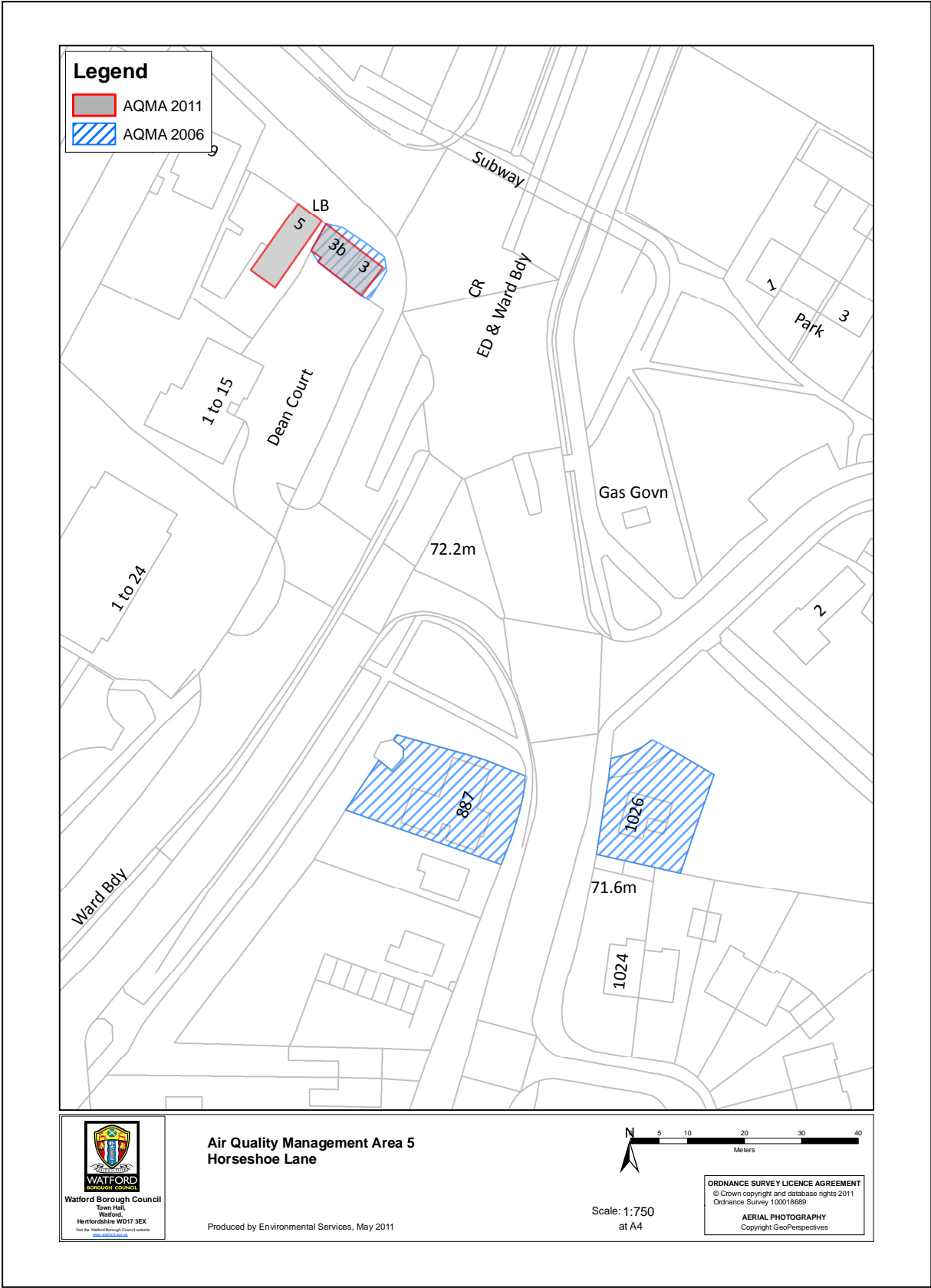


Figure A1.9 Air Quality Management Area 5 Horseshoe Lane



Figure A1.10 Air Quality Management Area 6 M1 / Meriden Map 1

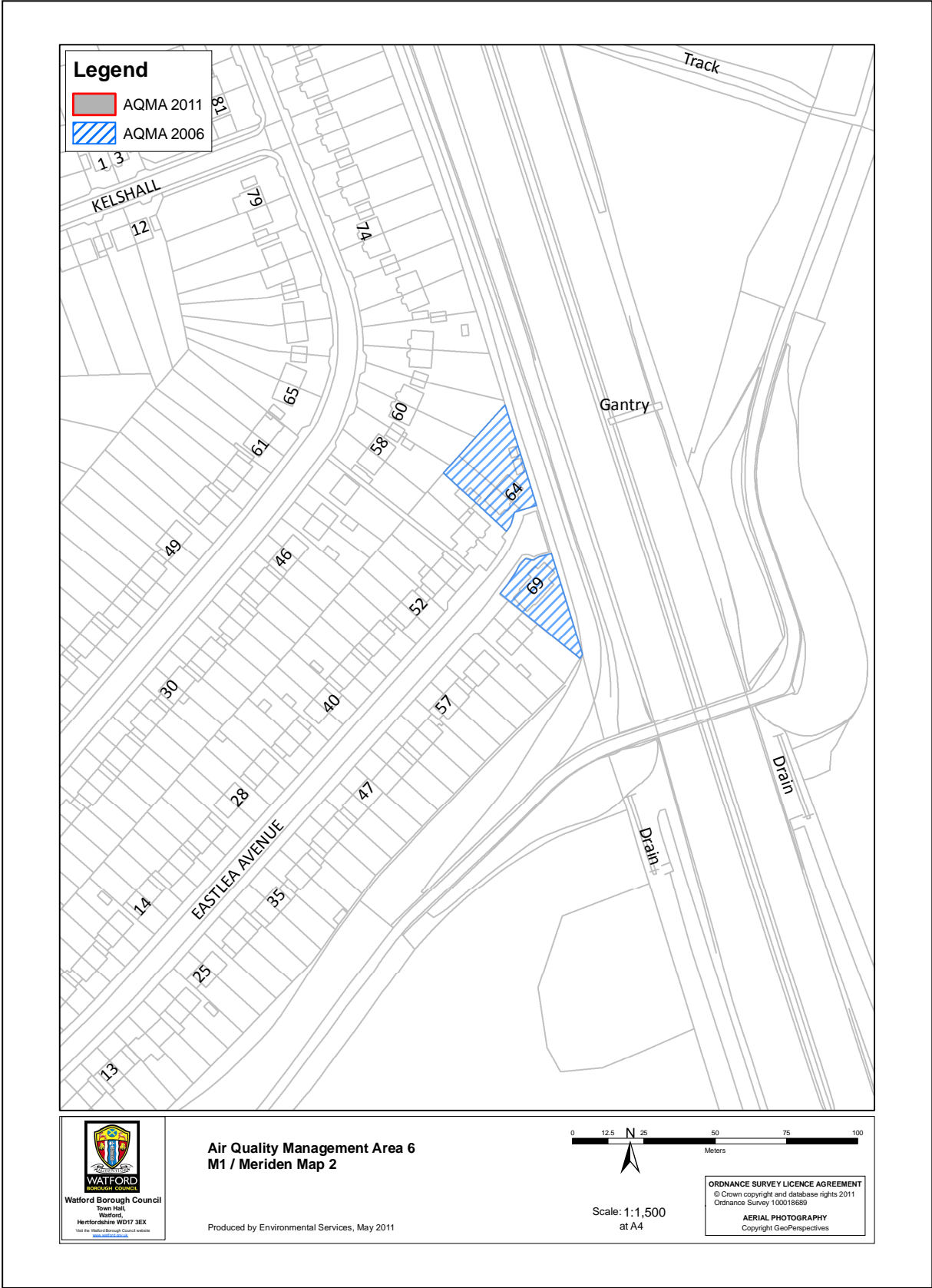


Figure A1.11 Air Quality Management Area 6 M1 / Meriden Map 2

Appendix B: Diffusion Tube Bias Adjustment Factors

The bias adjustment factors used as given in section 2.2.1

PM Monitoring Adjustment

As part of the contract that the Council has with AQDM to collect and ratify data from the automatic monitoring station, PM₁₀ data collected using the TEOM instrument is converted by them to reference equivalence using the volatile correction method (VCM).

QA/QC of automatic monitoring

The QA/QC procedures for the Herts and Beds Air Quality Monitoring Network are equivalent to that of the AURN with the following exceptions:

- No chart recorders are used.
- NO₂ span gas is used at routine site visits.

QA/QC procedures are detailed in the UK Automatic Network Site Operator's Manual available on www.airquality.co.uk.

Broadly speaking, the QA/QC procedures for the AURN are:

Data measured by the analysers are retained by the data loggers as 15 minute, raw averages. These values are collected remotely every 12 hours by telemetry automatically by the central computer, where calibration factors are applied to calculate scaled 15 minute average pollutant concentrations. At each polling, algorithms are used to apply automatic validity checks and flag any suspect measurements for possible future editing, rescaling or rejection. In addition to the automatic systems, trained staff inspect the results each morning (365 days per year) and investigate any suspicious data. The resulting provisional data sets are then released as data or statistics to the network internet pages and distributed to interested parties via daily or weekly emails.

In addition to this initial screening process, data are further scrutinised in monthly blocks, then again at the end of each calendar year, in order to provide a final ratified dataset. These definitive results are suitable for publication and use by local authorities for LAQM analysis. This data ratification process requires the detailed examination of a variety of site and analyser outputs. These include site records, calibration records, network intercalibration results, site servicing and equipment records supplied by the site operators and equipment engineers.

QA/QC of diffusion tube monitoring

Tubes are supplied and analysed by Harwell Scientific Services, a UKAS accredited laboratory. The tubes are prepared using 50% TEA (triethanolamine) in acetone.

The Harwell Scientific laboratory participates in the field intercomparison scheme and the Workplace Analysis Scheme for Proficiency (WASP) programme, operated by the Health and Safety Laboratory (HSL). For the period presented, Harwell Scientific

demonstrated 'good' performance in the WASP scheme for analysis of NO₂ diffusion tubes (<http://www.laqmsupport.org.uk/no2qaqc.php>).

Appendix C: Watford Borough Council Air Quality Planning Policies

3.58 SE20 Air Quality

In determining planning applications it will be important to consider the impact of a development in terms of the effects on air quality caused by both the operational characteristics of the development (industrial, commercial and domestic) and the traffic generated by it. The Council will have regard to the potential effects of a development on local air quality when determining planning applications.

- 3.59** In considering the impact of a proposed development on air quality, the Council will liaise with the pollution control authorities (the local Environmental Health and Licensing Service or Environment Agency). The Council may require the submission of information and modelling to indicate the potential impact of atmospheric emissions, or the effect on background pollution concentrations. This should particularly be the case where a development is proposed in, or close to, an Air Quality Management Area (AQMA). Where local air quality is identified as being a risk to health, and the potential problem is incapable of being overcome by a condition or planning obligation, then this may be cause for refusal of planning permission.

3.60 SE21 Air Quality Management Areas

Any development within areas designated as air quality management areas in Watford must have regard to guidelines for ensuring air quality is maintained at acceptable concentrations as set out in the national air quality strategy. In addition, where developments are close to AQMAs, and a significant increase in road traffic is predicted, similar regard to air quality concentrations must be had.

- 3.61** Major developments can have an effect on air quality. Road related development as well as some types of industry can both increase emissions. The Environment Act 1995 places a duty on local authorities to review and assess air quality in their districts. Those areas that are expected to exceed national guidelines in the year 2005 will be deemed Air Quality Management Areas (AQMA) and a strategy will need to be devised by the Council to reduce pollution concentrations accordingly.
- 3.62** The Council completed its initial assessment of air quality across the Borough in 2001. This identified six areas where the objectives laid down in the Air Quality Regulations 2000 could, on occasion, be exceeded, as follows:
- Close to the M1
 - Close to the A41
 - Close to the A4008 (Pinner Road)
 - Close to the A4178 (Cassio Road/Wiggenhall Road)

- Close to the A411 (Hempstead Road)
- Close to the A412 (Rickmansworth Road)

In each case, the pollutants of concern were nitrogen dioxide and 'PM₁₀' particles (small particles of dust). Both are traffic-related pollutants. As no significant public exposure was identified in any of these areas, no Air Quality Management Areas were declared. However, the areas remain of concern.

- 3.63 The Council is currently repeating the Review and Assessment process. Early indications are that nitrogen dioxide and 'PM₁₀' particles may again be problems in areas close to some of the Borough's busiest roads.
- 3.64 Air Quality is an issue of sustainability, identified as a key element in the reduction of health risks from environmental pollution and hazards, also impacting on the built and natural environment. Its improvement is a major factor in the quality of life received by Watford's population. Air Quality is being monitored at a number of sites across the Borough including at the Town Hall. Diffusion Tube Bias Adjustment Factors