

# 2015 Updating and Screening Assessment for Watford Borough Council

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

August 2015

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## Executive Summary

This Updating and Screening Assessment forms part of the sixth round of air quality Review and Assessment carried out 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 the council should proceed to a Detailed Assessment for any reason.

### Air Quality Monitoring Data

This continues to be provided by real-time analysers monitoring oxides of nitrogen and PM<sub>10</sub> particles close to the Town Hall, As well as a network of diffusion tubes monitoring long term nitrogen dioxide concentrations. This network now stands at 17 tubes and includes new sites that will be able to assess long term trends in concentrations close to proposed Health Campus and associated link road, as well as concentrations in Gammons Lane, where local concerns about queuing traffic have been raised.

Concentrations across all of the nitrogen dioxide diffusion tube monitoring sites continue to decline and there are now only three existing and one new site where results suggest that the National Air Quality Objective level could be exceeded.

Previous reports suggested that if nitrogen dioxide concentrations within the St. Albans Road Air Quality Management Area continued to decrease then the council should carry out a Detailed Assessment of air quality at that location, with a view to checking whether the boundary needed to be amended. As concentrations are decreasing at all sites then it is prudent to carry out a Detailed Assessment for all Air Quality Management Areas, and this is one of the conclusions of this Report.

Funding has been secured from Hertfordshire County Council to monitor PM<sub>2.5</sub> fine particles. Whilst there is currently no National Air Quality Objective relating to PM<sub>2.5</sub>, concentrations of this pollutant are a useful health outcome indicator. The best ways to monitor this pollutant are being researched and monitoring results will be reported in the next Progress Report.

## 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 relevant locations.

## Revisions to existing Air Quality Management Areas

Since the last Progress report the Council has finalised its plans to revise the boundaries of the six Air Quality Management Areas that it declared in 2006, as a previous Further Assessment identified that changes were needed. The following changes have now been formally implemented by the council:

- 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, Pinner Road and Chalk Hill)
- Reducing the boundary of AQMA 5 (Horseshoe Lane)
- Revoking AQMA 6 (M1 / Meriden).

Accordingly there are now four Air Quality Management Areas in the borough:

- AQMA 1 St.Albans Road
- AQMA 2 Vicarage Road / The Hornets
- AQMA 3 Pinner Road and Chalk Hill
- AQMA 5 Horseshoe Lane

## Next Steps

- A Detailed Assessment of nitrogen dioxide concentrations in and around the existing Air Quality Management Areas will be carried out.
- Base line monitoring to assess the effects of the Health Campus and the associated link road will be continued on Willow Lane and the Lower High Street
- The 2016 Progress Report will be completed.
- Monitoring of PM<sub>2.5</sub> fine particles will be commenced

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# 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 93,700. 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 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<sup>3</sup> for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m <sup>3</sup>	Running annual mean	31.12.2003
	5.00 µg/m <sup>3</sup>	Running annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m <sup>3</sup>	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m <sup>3</sup>	Running 8-hour mean	31.12.2003
Lead	0.5 µg/m <sup>3</sup>	Annual mean	31.12.2004
	0.25 µg/m <sup>3</sup>	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m <sup>3</sup>	Annual mean	31.12.2005
Particles (PM <sub>10</sub> ) (gravimetric)	50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m <sup>3</sup>	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m <sup>3</sup> , 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 (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub>). 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 (AQMA) 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 NO<sub>2</sub> and PM<sub>10</sub> 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 NO<sub>2</sub>, 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. These AQMAs were formally updated in 2015 following a Further Assessment of air quality within them.

Maps of the current Air Quality Management Areas are shown in Appendix A

**Table 1.2 Summary of Watford AQMAs designated in February 2006**

<b>Watford AQMA no 1</b> St Albans Road	1B & 1C Wellington Road 155 – 157 St. Albans Road 211-215 St. Albans Road 164 – 454 St. Albans Road
<b>Watford AQMA no 2</b> Vicarage Road	28A – 30A Vicarage Road (Flats above shops) 85A-87A Vicarage Road (Flats above shops)
<b>Watford AQMA no 3</b> Aldenham Road	Residential Accommodation above The Railway Arms, Aldenham Road
<b>Watford AQMA no 4</b> Chalk Hill	12 Chalk Hill
<b>Watford AQMA no 5</b> A405 / Horseshoe Lane	3A – 5A Horseshoe Lane 887 St Albans Road 1026 St Albans Road
<b>Watford AQMA no 6</b> 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) and AQMA 5 (A405/Horseshoe Lane) should be retained. AQMA 2 (Vicarage Road), AQMA 3 (Aldenham Road) and AQMA 4 (Chalk Hill) should be extended, and AQMA 6 (M1 Meriden) should be revoked. These changes have now been implemented.

The recommendations of the Further Assessment were accepted by DEFRA in April 2009. In June 2012, the Council completed consultation on the Further Assessment, and as there have been no objections from residents and other interested parties, it

our intention take forward the recommendations and revoke , merge and enlarge the various AQMAs accordingly.

#### **1.4.7 Combined Updating and Screening Assessment and Progress Report (June 2010)**

This concluded that there were was no need to progress to a detailed assessment for any pollutant.

Annual mean NO<sub>2</sub> concentrations recorded during 2009 using passive diffusion tubes exceeded the annual mean objective of 40 µg/m<sup>3</sup> at some locations. These were either within existing Air Quality Management Area, or where there was no representative public exposure, so a Detailed Assessment was not required:

#### **1.4.8 Air Quality Action Plan (April 2011)**

In 2011 the Council completed the second draft of its Air Quality Action Plan that sets out how it aims to improve air quality within the Air Quality Management Areas. A consultation exercise was completed in June 2012 and as there were no objections to it, the Council proposes to take forward the suggested measures. The consultation exercise also resulted in some additional suggestions, made by residents, of measures to improve air quality and these will also be considered.

#### **1.4.9 Progress Report (June 2011)**

The 2011 Progress Report concluded that there was not a requirement to continue to a Detailed Assessment for any pollutant.

#### **1.4.10 Updating and Screening Assessment (July 2012)**

This concluded that concentrations of nitrogen dioxide and PM<sub>10</sub> 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.

**1.4.11 Progress Report (July 2013)**

This progress report concluded that concentrations across all of the sites had remained fairly constant in recent years. At a number of sites concentrations remained above the objective level, but as they were all in existing Air Quality Management Areas it was concluded that there was no need to progress to a Detailed Assessment.

**1.4.12 Progress Report (June 2014)**

The 2014 Progress Report concluded that there was not a requirement to continue to a Detailed Assessment for any pollutant. It also noted that nitrogen dioxide concentrations were generally declining.

**1.4.13 Amendments to the Air Quality Management Areas (June 2015)**

In June 2015, the council completed the Air Quality Management Area boundary amendments and revocations that were deemed necessary following a previous Further Assessment. There are now four AQMAs in the Borough, as follows:

1. AQMA 1 St.Albans Road
2. AQMA 2 Vicarage Road / The Hornets
3. AQMA 3 Pinner Road and Chalk Hill
4. AQMA 5 Horseshoe Lane

Maps of the current Air Quality Management Areas are shown in Appendix A.

## **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 NOX analyser from Envirotechnology; and
2. Rupprecht & Patashnick TEOM analyser, gathering PM<sub>10</sub> data.

The monitoring station is classified as a Roadside monitoring site, and is situated approximately 10 metres from the kerb of Rickmansworth Road. Details are shown in Table 2.1 and the location is shown in Figure 2.1.

Until October 2011, data was collected via modem by the King's College London Environmental Research Group (ERG). Since October 2011, since has been collected by Air Quality Data Management (AQDM), where the data is also validated and reported. Real time data, as well as weekly month and annual reports are available from Herts & Beds Air Pollution Monitoring Network website; [www.hertsbedsair.org.uk](http://www.hertsbedsair.org.uk).

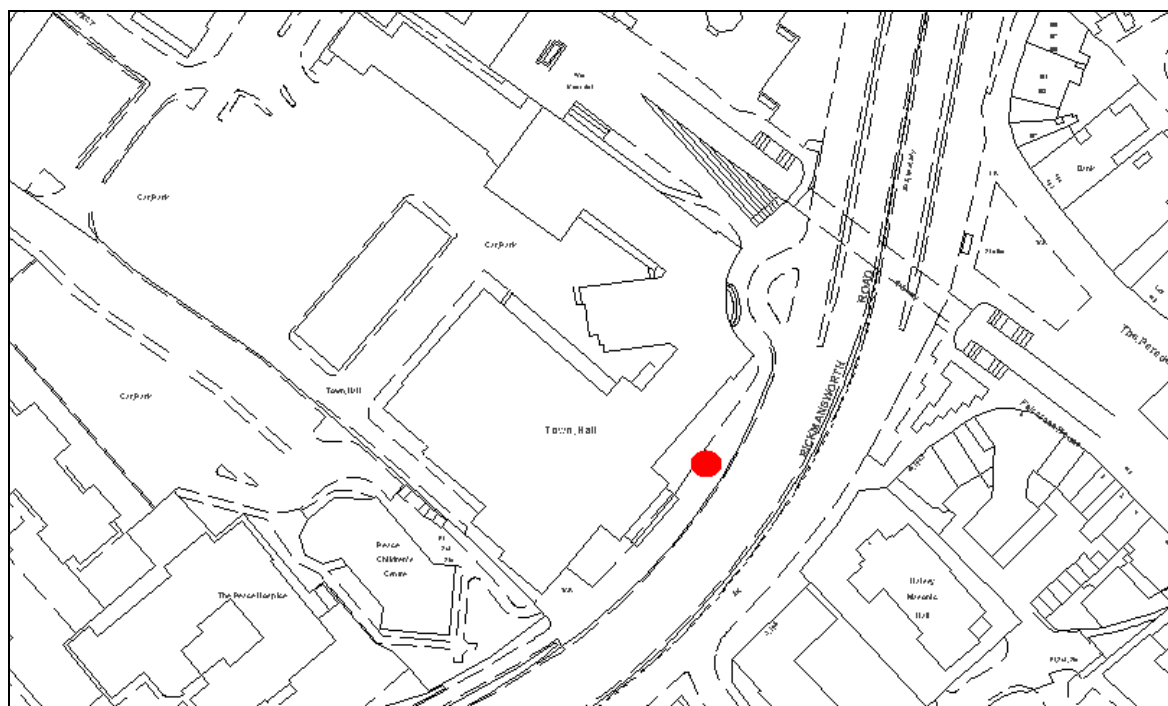
Since December 2014 servicing and maintenance has been overseen by Envirotechnology. Periodic calibration of the equipment is overseen by Kings College London. The equipment is audited annually by the National Physical Laboratory.

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

It should be noted that following receipt of funding from Hertfordshire County Council the council hopes to monitor PM<sub>2.5</sub> fine particles in the near future. It is acknowledged that there is currently no national air quality objective for PM<sub>2.5</sub> particles but concentrations of this pollutant are a useful health outcome indicator.

**Table 2.1 Details of Automatic Monitoring Sites**

Site Name	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure?	Distance to kerb of nearest road	Worst-case Location?
Watford Town Hall	X 510540 Y 196780	NO <sub>2</sub> , PM <sub>10</sub>	N	N	10m	Y

**Figure 2.1 Location of Watford Town Hall automatic monitoring station**

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).

### 2.1.2 Non-Automatic Monitoring Sites

Passive monitoring of nitrogen dioxide is currently undertaken using diffusion tubes at 18 locations within the Borough. Approximate locations are given in Figure 2.2 and site details are shown in Table 2.2. Monitoring results from these locations are constantly under review; if results are consistently below the annual average objective, then monitoring may be ceased. In addition monitoring at a new location may be started if there are local concerns



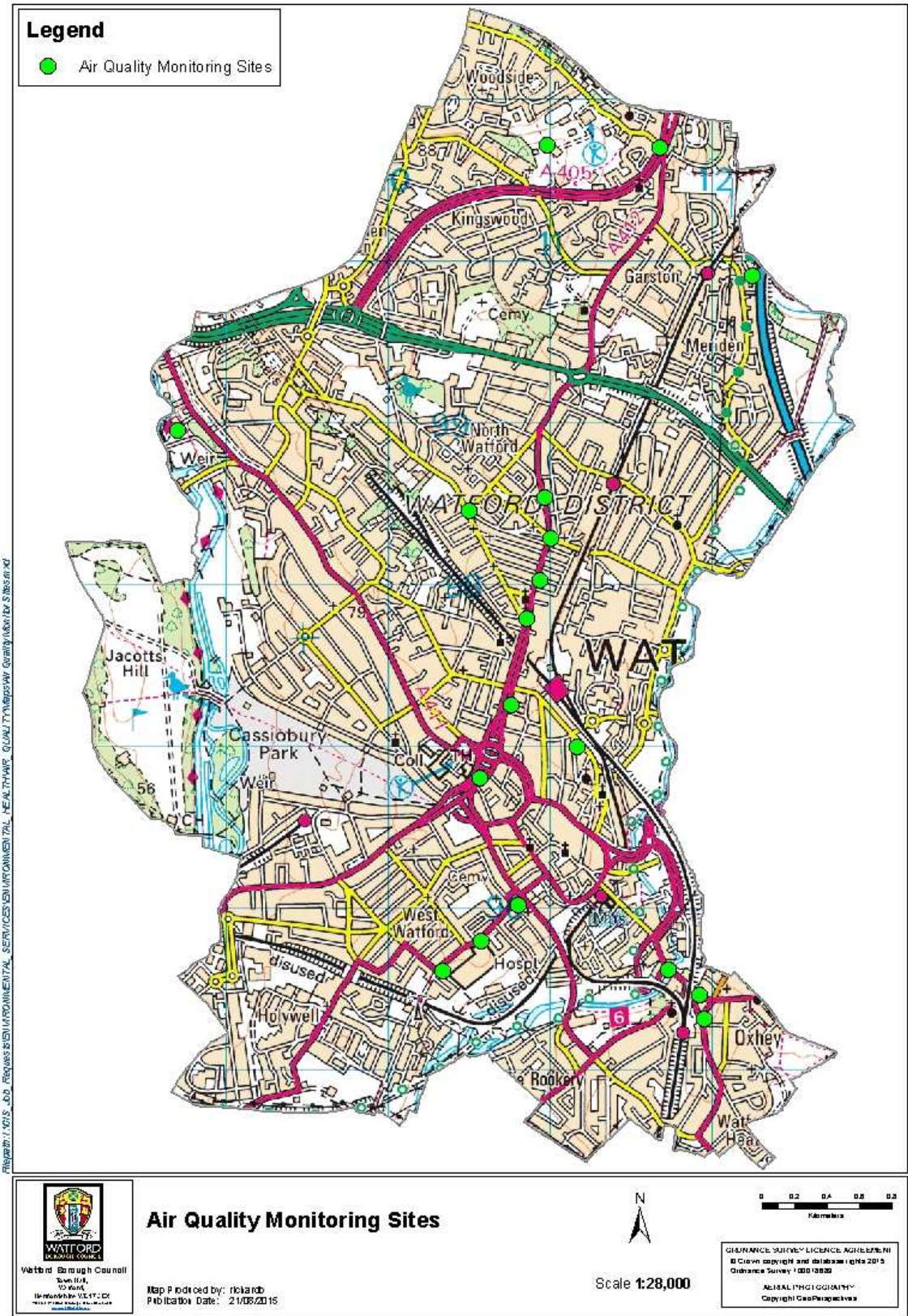


Figure 2.2 Approximate location of nitrogen dioxide diffusion tube monitoring sites



Table 2.2 Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure?	Distance to kerb of nearest road	Does this location represent worst-case exposure?
WF02	Grove Pumping Station	B	508700	198950	NO <sub>2</sub>	N	N	N	N/A	N
WF03	Hospital	K	510570	195800	NO <sub>2</sub>	N	N	N	4m	Y
WF06	Woodside Playing Fields	B	510985	200710	NO <sub>2</sub>	N	N	N	N/A	N
WF29	Pinner Road	K	511940	195320	NO <sub>2</sub>	AQMA3A	N	Y – 6m	2m	Y
WF36	Ravenscroft	I	512240	199910	NO <sub>2</sub>	N	N	Y – 8m	N/A	Y
WF37	358, St. Albans Road	K	510970	198535	NO <sub>2</sub>	AQMA1	N	Y – 5m	1m	Y
WF38	A405 / Horseshoe Lane	K	511680	200700	NO <sub>2</sub>	AQMA5	N	Y – 2m	4m	Y
WF39	Balmoral Road	K	511000	198270	NO <sub>2</sub>	AQMA1	N	N	1m	Y
WF40	Salisbury Road	K	510930	198000	NO <sub>2</sub>	AQMA1	N	N	2m	Y
WF41	Leavesden Road	K	510850	197780	NO <sub>2</sub>	AQMA1	N	N	1m	Y
WF42	Queens Road	K	511160	197000	NO <sub>2</sub>	N	N	Y – 4m	1m	Y
WF43	Farraline Road	K	510800	196020	NO <sub>2</sub>	AQMA2	N	Y – 4m	2m	Y
WF44	Chalk Hill	K	511920	195450	NO <sub>2</sub>	AQMA3A	N	Y – 6m	2m	Y
WF45	Wellington Road	K	510750	197230	NO <sub>2</sub>	AQMA1	N	Y-10m	4m	Y

**Watford Borough Council**

<b>Site ID</b>	<b>Site Name</b>	<b>Site Type</b>	<b>X OS Grid Ref</b>	<b>Y OS Grid Ref</b>	<b>Pollutants Monitored</b>	<b>In AQMA?</b>	<b>Is monitoring collocated with a Continuous Analyser (Y/N)</b>	<b>Relevant Exposure?</b>	<b>Distance to kerb of nearest road</b>	<b>Does this location represent worst-case exposure?</b>
WF46	Town Hall	R	510565	196800	NO <sub>2</sub>	N	Y	N	6m	Y
WF47	Willow Lane	K	510335	195610	NO <sub>2</sub>	N	N	Y - 3m	1m	Y
WF48	Lower High Street	K	511725	195619	NO <sub>2</sub>	N	N	Y - 4m	1m	Y
WF49	Gammons Lane	K	510499	198454	NO <sub>2</sub>	N	N	Y - 5m	1m	Y

*Note: B = background; K = kerbside; I = intermediate; R = roadside.*

Changes in the diffusion tube network

1. In April 2014 diffusion tube monitoring commenced on the Lower High Street. This was done so that the effects of the Dalton Way / Health Campus link road that commenced construction early in 2015 could be assessed. As the site is close to the northernmost edge of AQMA 3A (Chalk Hill and Pinner Road) it will also contribute to the assessment of concentrations at that location.
2. In January 2012 diffusion tube monitoring commenced on Willow Lane following concerns about queuing traffic raised by local residents. This location will also be used to monitor the effects of the Health Campus and the associated link road.
3. In May 2015 monitoring commenced on Gammons Lane following concerns about queuing traffic raised by a local resident.

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

The ESG laboratory participates in the field intercomparison scheme and the Workplace Analysis Scheme for Proficiency (WASP) programme, operated by the Health and Safety Laboratory (HSL). This compares results from diffusion tube monitoring and analysis with the those from automatic monitoring. For the period presented, ESG / Harwell Scientific demonstrated 'good' performance in the WASP scheme for analysis of NO<sub>2</sub> diffusion tubes. Results and bias corrections factors can be seen at:

<http://laqm.defra.gov.uk/diffusion-tubes/diffusion-tubes.html>

Collocation studies for ESG/ Harwell suggest:

- In 2014, 19 of the 30 studies were considered to be good precision (63%)
- In 2013, 36 of the 43 studies were considered to be good precision (84%)
- In 2012, 31 of the 37 studies were considered to be good precision (84%)
- In 2011, 29 of the 33 studies were considered to be good precision (90%)
- In 2010, 18 of the 20 studies were considered to be good precision (88%)

Unadjusted monthly diffusion tube data can be downloaded from

[http://www.hertsbedsair.org.uk/hertsbeds/asp/DiffusionTubes.asp?dt=.](http://www.hertsbedsair.org.uk/hertsbeds/asp/DiffusionTubes.asp?dt=)

The bias correction factors used are shown in Table 2.3, and the national spreadsheet can be found at: <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

**Table 2.3 Table of nitrogen dioxide diffusion tube bias correction factors**

Year	Bias Correction Factor	Source
2010	0.86	From national spreadsheet
2011	0.83	From national spreadsheet
2012	0.79	From national spreadsheet
2013	0.80	From national spreadsheet
2014	0.81	From national spreadsheet

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

### 2.2.1 Nitrogen Dioxide

#### Automatic Monitoring Data

The annual mean NO<sub>2</sub> concentrations recorded by the continuous analyser at Watford Town Hall for the period 2010-14 are presented in Table 2.4a.

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

Site ID	Site Type	In AQMA ?	Period of monitoring	Valid Data Capture 2014	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
					2010	2011	2012	2013	2014
Watford Town Hall	Roadside	N	Full year	96.7%	39	39	38	39	40

*Note: Data capture has been above 90% for all three of these years*

The annual mean objective of 40  $\mu\text{g}/\text{m}^3$  has not been exceeded during this time period, though it is not well below the objective.

Comparison with the hourly mean NO<sub>2</sub> objective is shown in Table 2.4b.

**Table 2.4b Results of Automatic Monitoring for NO<sub>2</sub>: Comparison with 1-hour Mean Objective**

Site ID	Site Type	In AQMA ?	Period of monitoring	Valid Data Capture 2014	Number of Exceedences of hourly mean (200 µg/m <sup>3</sup> )				
					2010	2011	2012	2013	2014
Watford Town Hall	Roadside	N	Full year	96.7	0	0	1	0	0

*Note: Data capture has been above 90% for all three of these years*

Table 2.4b shows that there have been no exceedences of the NO<sub>2</sub> hourly mean objective of 200 µg/m<sup>3</sup> at the Watford Town Hall site.

### Diffusion Tube Monitoring Data

Table 2.5 shows the results of the diffusion tube monitoring in 2014. There are no triplicate tubes, and as results exist for at least 9 months at all sites, data has not had to be annualised. There are no distance corrections. The choice of bias correction factors is described in section 2.1.2. Results for the monitoring that has recently commenced on Gammons Lane will be reported on in due course.

**Table 2.5 Results of nitrogen dioxide diffusion tube monitoring in 2014**

Site ID	Location	Site Type	Within AQMA?	Data Capture 2014	Annual mean concentration (Bias Adjustment factor = 0.81)
					2014 (µg/m <sup>3</sup> )
WF02	Grove Pumping Station	B	N	12 months	16
WF03	Hospital	K	N	10 months	33
WF06	Woodside Playing Fields	B	N	12 months	20
WF29	Pinner Road	K	AQMA 3A	11 months	49
WF36	Ravenscroft	I	N	12 months	30
WF37	358, St. Albans Road	K	AQMA 1	9 months	36
WF38	A405/Horseshoe Lane	K	AQMA 5	12 months	39
WF39	Balmoral Road	K	AQMA 1	12 months	37
WF40	Salisbury Road	K	AQMA 1	12 months	35
WF41	Leavesden Road	K	AQMA 1	12 months	36

## Watford Borough Council

Site ID	Location	Site Type	Within AQMA?	Data Capture 2014	Annual mean concentration (Bias Adjustment factor = 0.81)
					2014 ( $\mu\text{g}/\text{m}^3$ )
WF42	Queens Road	K	N	12 months	32
WF43	Farraline Road	K	AQMA 2	12 months	46
WF44	Chalk Hill	K	AQMA 3A	12 months	80
WF45	Wellington Road	K	AQMA 1	11 months	33
WF46	Town Hall	R	N	12 months	33
WF47	Willow Lane	K	N	10 months	32
WF48	Lower High Street	K	N	12 months	42

*Note: B = background; K = kerbside; I = intermediate; R = roadside.*

*Note: Bias adjusted annual means in excess of the  $40 \mu\text{g}/\text{m}^3$  annual mean  $\text{NO}_2$  objective are shaded grey. Annual means  $> 60 \mu\text{g}/\text{m}^3$  are underlined, indicating a potential exceedence of the  $\text{NO}_2$  hourly mean objective*

In all cases data capture was at least 9 months (i.e. 75%) so no corrections from short term to long term monitoring results has been needed. Table 2.6 shows nitrogen dioxide diffusion tube monitoring results for 2010 - 2014.

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2010 to 2014)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2010* (Bias Adjustment Factor = 0.86)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.79)	2013 (Bias Adjustment Factor = 0.80)	2014 (Bias Adjustment Factor = 0.81)
WF02	Grove Pumping Station	N	22	18	21	18	16
WF03	Hospital, Vicarage Road	N	44	38	38	36	33
WF06	Woodside Leisure Centre	N	27	22	25	21	20
WF29	Pinner Road	AQMA 3A	<u>62</u>	52	56	51	49
WF36	Ravenscroft	N	34	30	25	29	30
WF37	St Albans Road 2	AQMA 1	46	36	40	35	36
WF38	A405 Horseshoe Lane	AQMA 5	45	38	40	37	39
WF39	Balmoral Road	AQMA 1	51	45	(45)	43	37
WF40	Salisbury Road	AQMA 1	48	41	42	39	35
WF41	Leavesden Road	AQMA 1	40	33	36	36	36
WF42	Queens Road	N	39	33	(37)	34	32
WF43	Farraline Road	AQMA 2	58	48	55	49	46

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2010* (Bias Adjustment Factor = 0.86)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.79)	2013 (Bias Adjustment Factor = 0.80)	2014 (Bias Adjustment Factor = 0.81)
WF44	Chalk Hill	AQMA 3A	<u>91</u>	<u>83</u>	<u>(84)</u>	<u>84</u>	<u>80</u>
WF45	Wellington Road	AQMA 1	42	36	40	35	33
WF46	Town Hall collocation	N	39	37	37	34	33
WF47	Willow Lane	N	n/a	n/a	35	35	32
WF48	Lower High Street	N	n/a	n/a	n/a	n/a	42

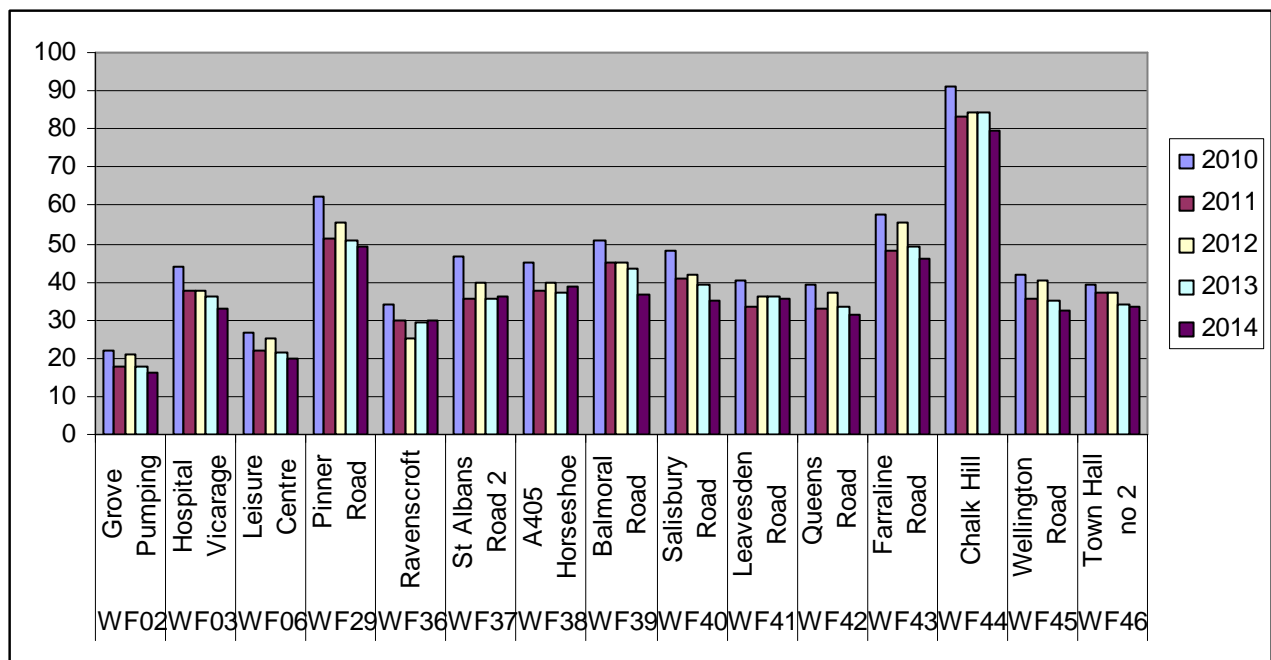
*Note: Bias adjusted annual means in excess of the  $40 \mu\text{g}/\text{m}^3$  annual mean  $\text{NO}_2$  objective are shaded grey.  
Annual means  $> 60 \mu\text{g}/\text{m}^3$  are underlined, indicating a potential exceedence of the  $\text{NO}_2$  hourly mean objective  
Figures in brackets are those for which data capture was below 75%*



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The gradual decline in annual average nitrogen dioxide concentrations noted in recent Progress Reports has continued. This seems to be the case for locations within and outside the existing Air Quality Management Areas, as shown in Figure 2.3. There are now only two locations where results suggest it may be above the objective level; in and around the Bushey Arches junction and in and around the Vicarage Road / Hornets junction.

Concentrations along St. Albans Road have continued to decrease and there are now no sites where the annual average is above the objective level. In the 2014 Progress Report the decline in concentrations was noted and it was suggested that if it continued a Detailed Assessment should be carried out. As the decline has continued the report recommends that Watford Borough Council proceed to Detailed Assessment for the St. Albans Road Air Quality Management Area (AQMA no.1). The site at Horseshoe Lane (AQMA No.5) is also showing lower concentrations so this location should also be included in the Detailed Assessment. With concentrations decreasing at all sites it is prudent to carry out a Detailed Assessment for all of the AQMAs.



**Figure 2.3 Annual Average Nitrogen Diffusion Tube Concentrations 2010-2014**  
in  $\mu\text{g}/\text{m}^3$

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It is also important to consider any concentrations above of  $60 \mu\text{g}/\text{m}^3$  as these indicate a risk that the 1-hour objective may also be exceeded. In Watford, there is one location where this is the case, Chalk Hill, but as this is an existing Air Quality Management Area there is no need to progress to a Detailed Assessment.

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

The results of the automatic PM<sub>10</sub> particle monitoring at the Town Hall are shown in Tables 2.7 and 2.8.

**Table 2.7 Results of Automatic Monitoring of PM<sub>10</sub>: Comparison with Annual Mean Objective**

Site ID	Site Type	Within AQMA ?	Valid Data Capture 2014 %	Confirm Gravimetric Equivalent	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
					2010	2011	2012	2013	2014
Watford Town Hall	Road side	N	91.8	Y	24	25	22	24	21

Data capture was above 90% for all years

**Table 2.8 Results of Automatic Monitoring for PM<sub>10</sub>: Comparison with 24-hour mean Objective**

Site ID	Site Type	Within AQMA ?	Valid Data Capture 2014 %	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean ( $50 \mu\text{g}/\text{m}^3$ )				
					2010	2011	2012	2013	2014
Watford Town Hall	Road side	N	91.8	Y	7	20	13	7	6

Data capture was above 90% in all years

The annual average has remained fairly constant in recent years and is well below the objective level. In addition there were no exceedences of the hourly mean objective in the period 2010 to 2014.

### 2.2.3 Summary of Compliance with AQS Objectives

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

However, nitrogen dioxide annual average concentrations in and around AQMA 1 (St. Albans Road) and AQMA 5 (Horseshoe Lane) are now consistently below the objective level. In addition annual average concentrations are decreasing at all locations so it is recommended that Watford Borough Council proceed to a Detailed Assessment to determine whether the boundaries of these two AQMAs need to be amended, or whether it is appropriate to revoke any of the Air Quality Management Areas. It is also considered prudent to undertake a Detailed Assessment of air quality in all Air Quality Management Areas at this time.

## **3 Road Traffic Sources**

Watford Borough Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

### **3.1 Busy Streets Where People May Spend 1-hour or More Close to Traffic**

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

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

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

### **3.3 Junctions**

Watford Borough Council confirms that there are no new/newly identified busy junctions/busy roads.

### **3.4 New Roads Constructed or Proposed Since the Last Round of Review and Assessment**

The new road scheduled for construction as part of the Health Campus commenced construction in March 2015. It is due to be completed in 2016.

As described in the 2014 Progress Report, a pre-application 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 average nitrogen dioxide concentrations could rise by up to 2µg/m<sup>3</sup> 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.

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.

Watford Borough Council has assessed new/proposed roads meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

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

Up to date traffic data for sites in Watford, for the period 2015 to 2013 and gathered by Hertfordshire County Council had been reviewed. The raw data, in the form of Annual Average Weekday Flow (AAWD) is available on line at:

<http://webmaps.hertsdirect.org/generic/index.htm?layers=19,20&title=Traffic%20Counts%20Map>

The data is also presented in Appendix B and shows that there are no new or newly identified roads with significantly changes traffic flows.

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

### **3.6 Bus and Coach Stations**

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

## **4 Other Transport Sources**

### **4.1 Airports**

Watford Borough Council confirms that there are no airports in the Local Authority area.

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

#### **4.2.1 Stationary Trains**

Watford Borough Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

#### **4.2.2 Moving Trains**

Watford Borough Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

### **4.3 Ports (Shipping)**

Watford Borough Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

## **5 Industrial Sources**

### **5.1 Industrial Installations**

#### **5.1.1 New or Proposed Installations for which an Air Quality Assessment has been carried out**

Watford Borough Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

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

Watford Borough Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

#### **5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment**

Watford Borough Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

### **5.2 Major Fuel (Petrol) Storage Depots**

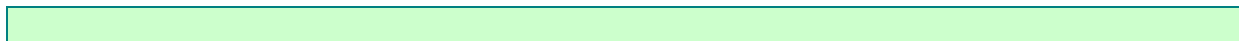
There are no major fuel (petrol) storage depots within the Local Authority area.

### **5.3 Petrol Stations**

Watford Borough Council confirms that there are no petrol stations meeting the specified criteria.

### **5.4 Poultry Farms**

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





## **6 Commercial and Domestic Sources**

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

The council is aware of three locations where biomass combustion plant has been installed in recent years.

1. West Herts Collage, Hempstead Road
2. Rainbow House, Water Lane
3. Sainsbury's, Albert Road South.

The first two of these were assessed against Section D.1a of chapter 5, TG(09) prior to construction. It was ensured that stack height and efflux velocity were sufficient to ensure adequate dispersal of pollutants.

In addition, these installations were considered in previous Review and Assessments and Progress reports, so they do not need to be considered again.

The biomass boiler installed at Sainsbury's was a smaller unit located away from residential premises so a formal assessment was not carried out. The council is confident that there is adequate disposal of pollutants.

Watford Borough Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

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

The council is not aware of any location in the borough where the combined effects of biomass combustion could lead to the PM<sub>10</sub> objective being exceeded.

Watford Borough Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

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

The whole of the borough is subject to a series of Smoke Control Orders which means that domestic solid fuel burning must be carried out using an approved appliance or approved fuel.

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

## **7 Fugitive or Uncontrolled Sources**

Watford Borough Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

## **8 Conclusions and Proposed Actions**

### **8.1 Conclusions from New Monitoring Data**

Air quality monitoring has not identified any potential or actual exceedences of air quality objective.

For the St. Albans Road Air Quality Management Area (No.1) and the Horseshoe Lane Air Quality Management Area (No.5) monitoring results are now consistently below the nitrogen dioxide annual average objective so it may be appropriate to review the boundaries of these AQMAs or revoke them.

This, coupled with the fact that annual average nitrogen dioxide concentrations are decreasing at all of the sites where this pollutant is monitoring suggests that a Detailed Assessment of air quality in all AQMAs is prudent.

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

The assessment of new or significantly changes sources has not identified any potential exceedences outside existing AQMAs.

### **8.3 Proposed Actions**

- 8.3.1** A Detailed Assessment of nitrogen dioxide concentrations in and around the existing Air Quality Management Areas will be carried out
- 8.3.2** Base line monitoring to assess the effects of the Health Campus and the associated link road will be continued on Willow Lane and the Lower High Street
- 8.3.3** The 2016 Progress Report will be completed
- 8.3.4** Monitoring of PM<sub>2.5</sub> fine particles will be commenced

## 9 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

Progress Report, Watford Borough Council, July 2014

Local Air Quality Management DEFRA Technical Guidance LAQM.TG (09)

# Appendices

## Appendix A

### Current Air Quality Management Areas

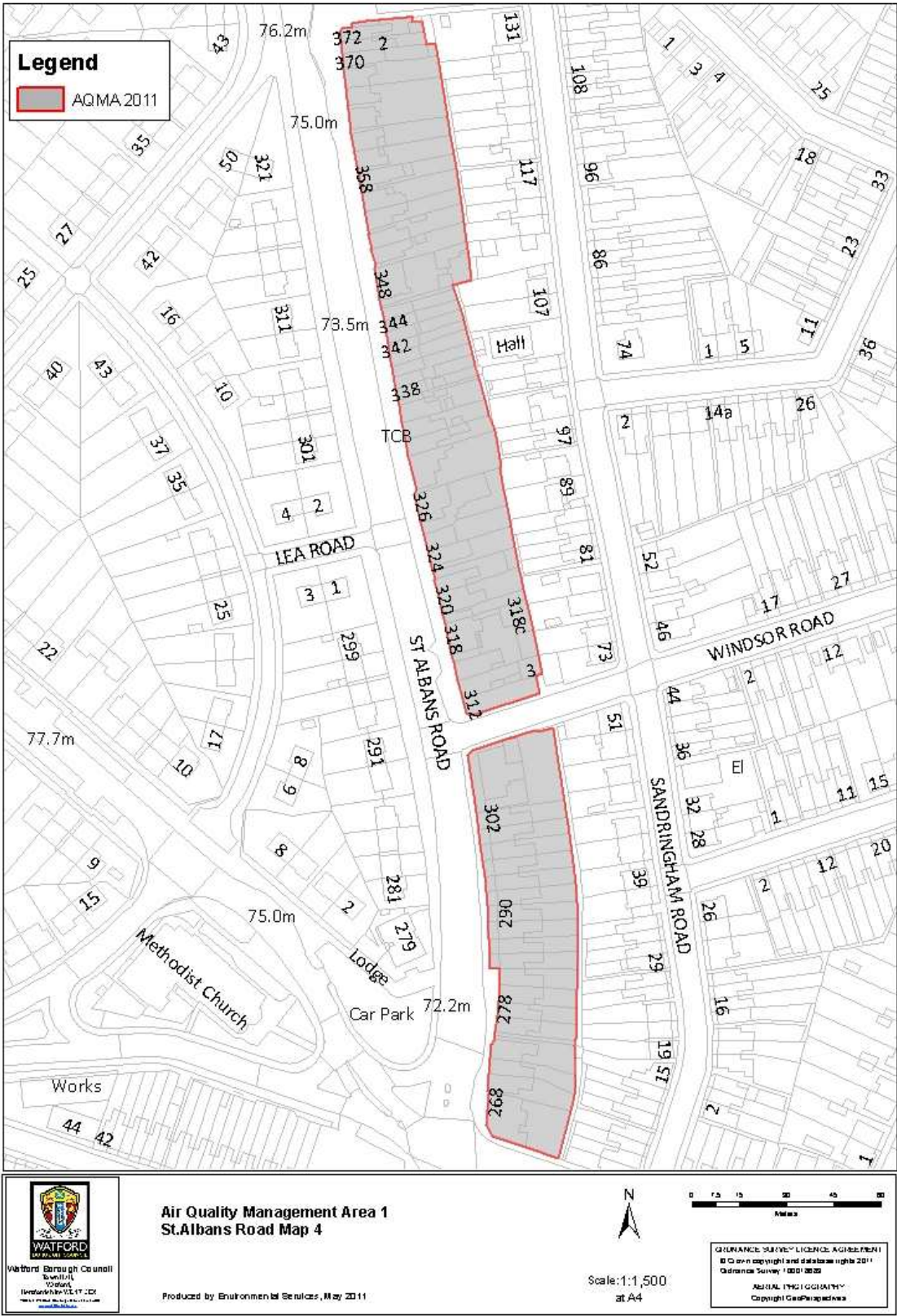


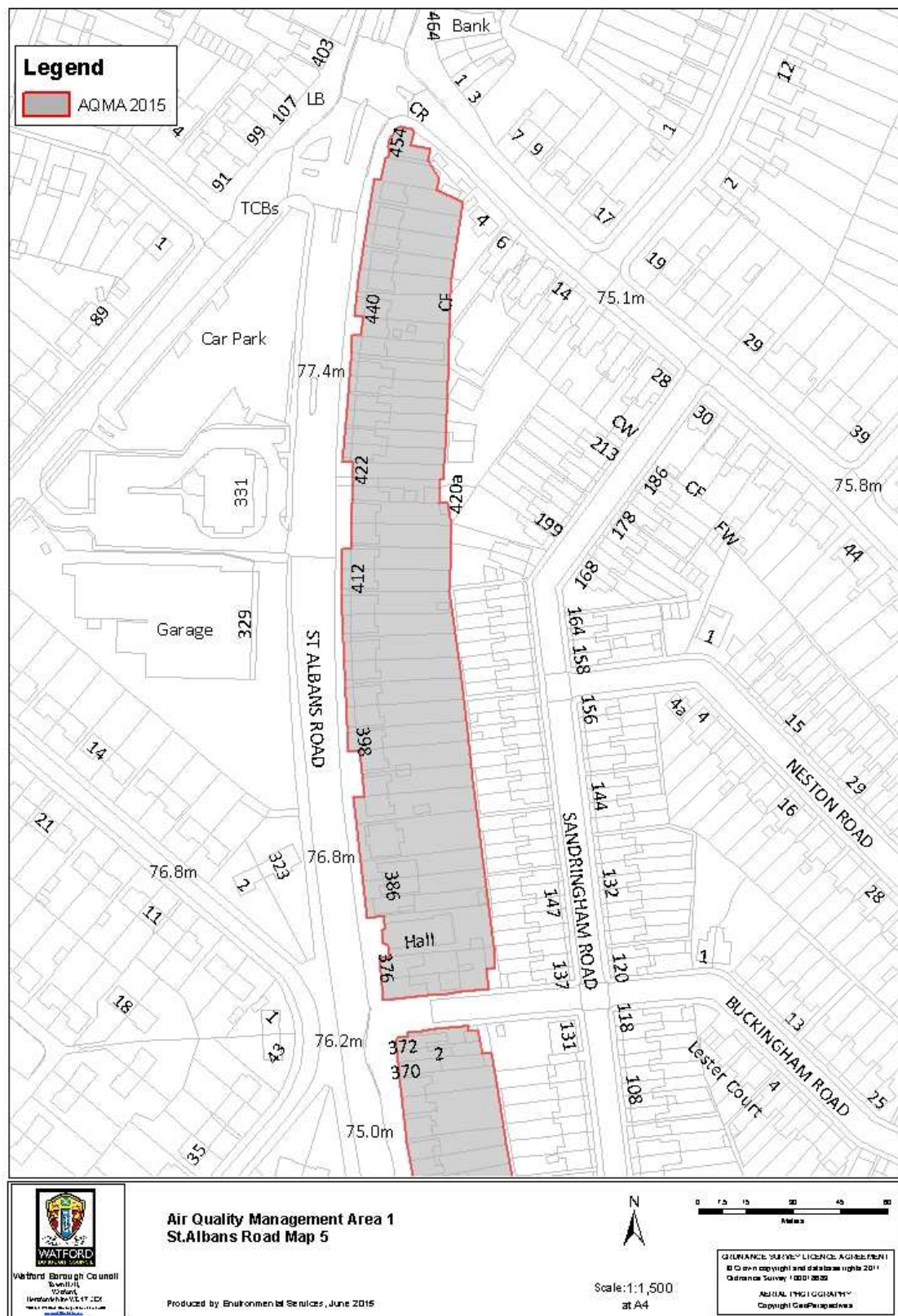






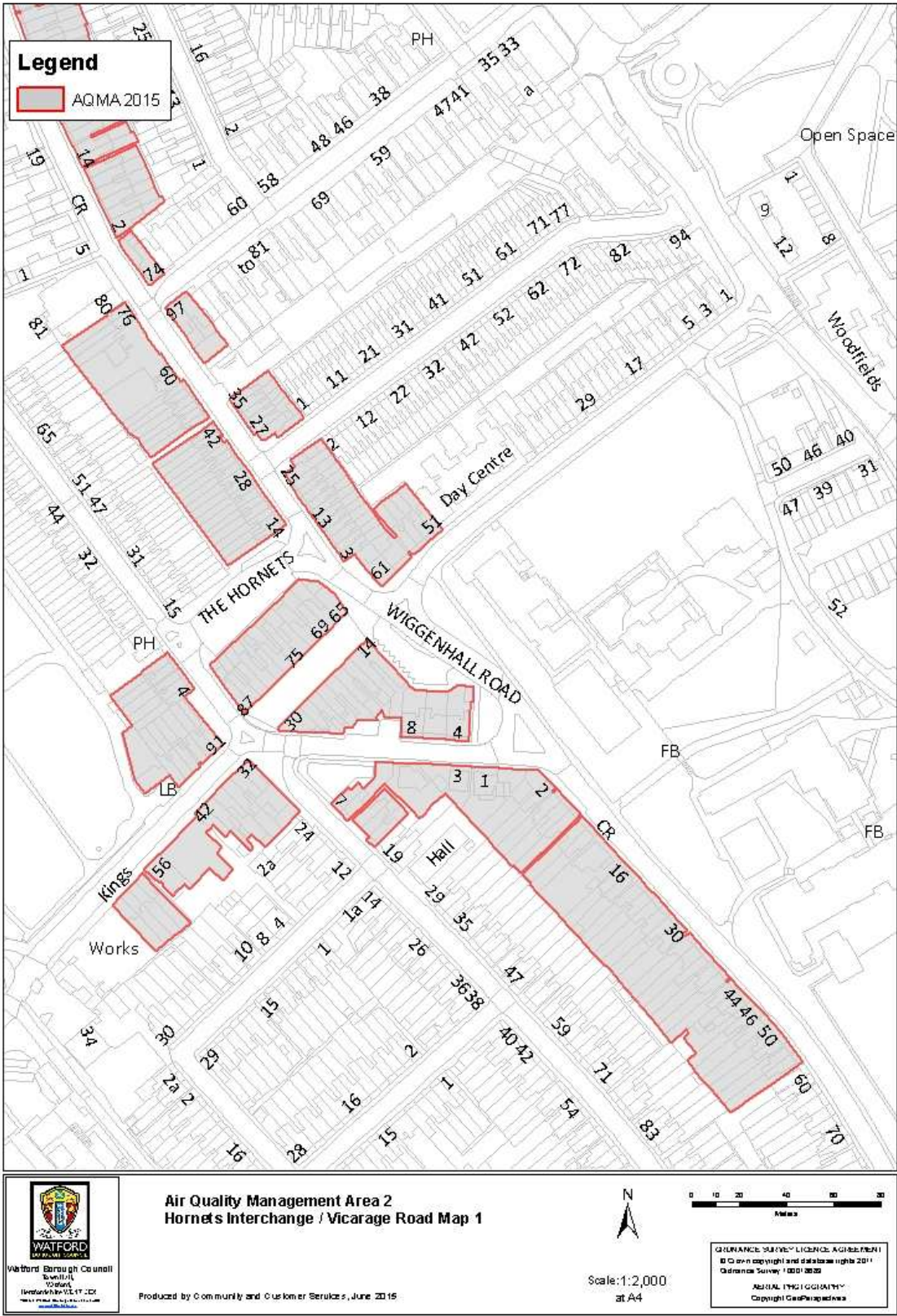




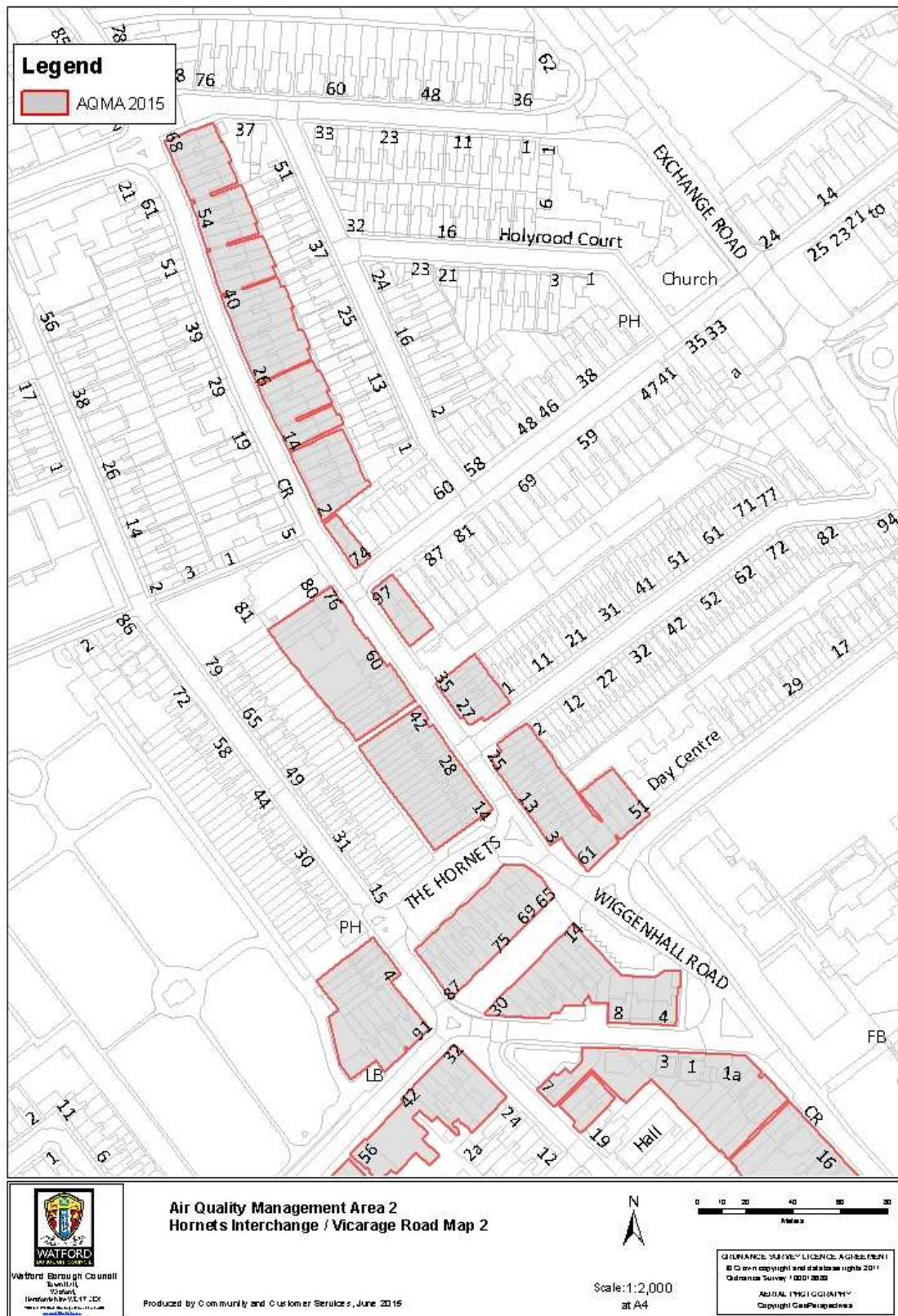


**Figures A1-A5 Maps showing St. Albans Road Air Quality Management Area No.1**

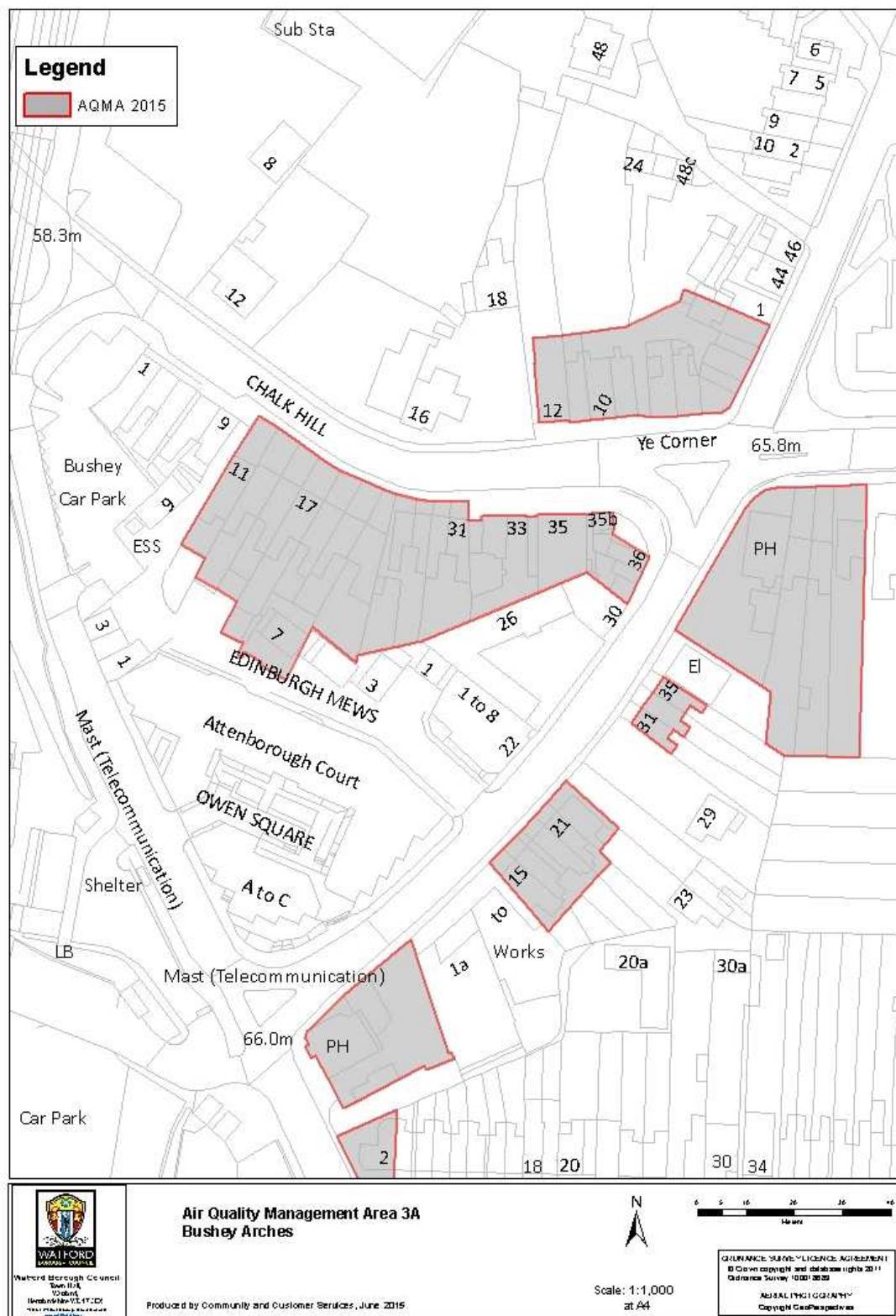




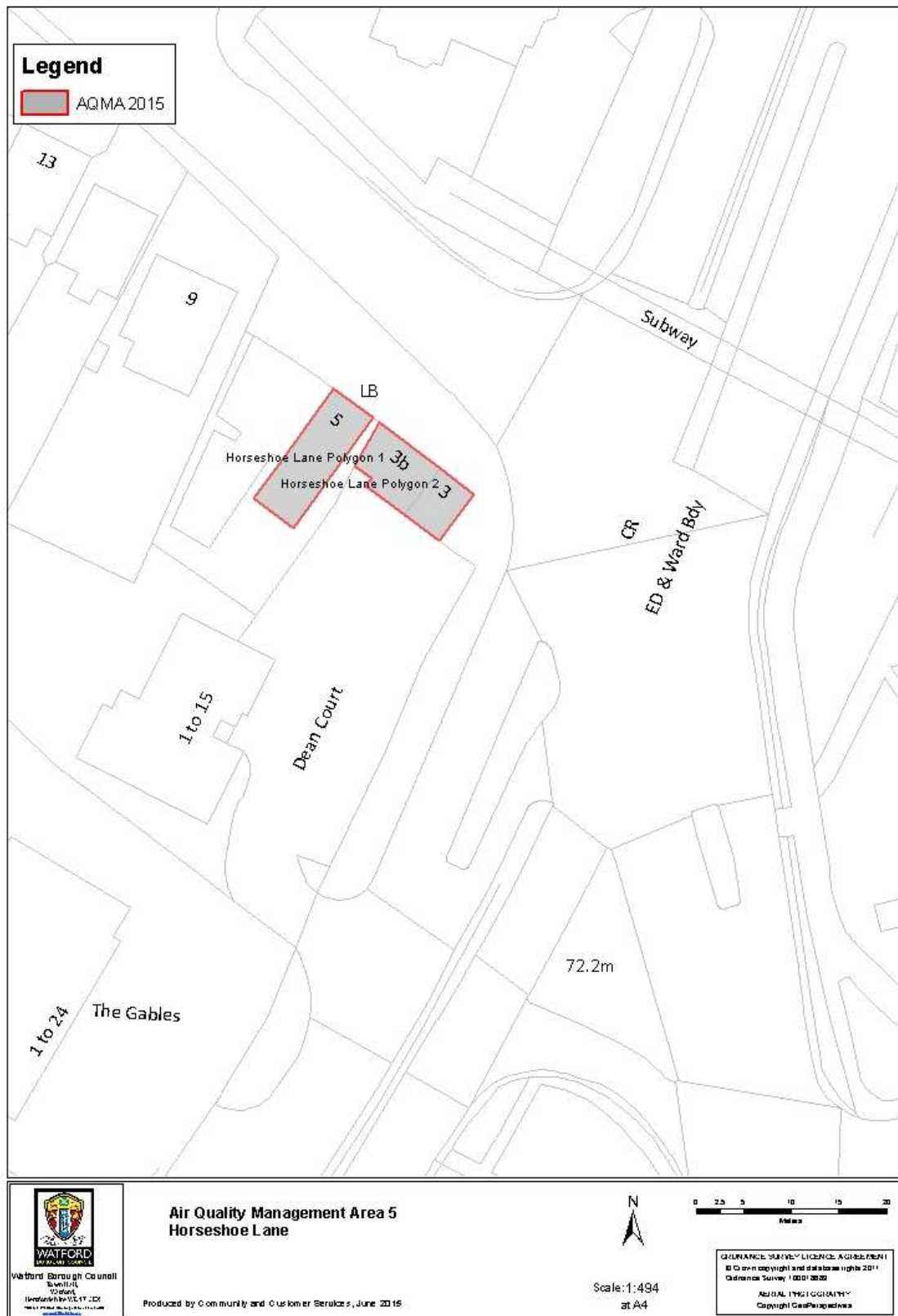




**Figures A6-A7: Maps showing Vicarage Road / Hornet Air Quality Management Area No.2**



**Figure A8: Map showing Chalk Hill / Pinner Road Air Quality Management Area No.3A**



**Figure A9: Map showing Horseshoe Lane / A405 Air Quality Management Area No.5**



## Appendix B Traffic Data

Location	North Western Avenue	Horseshoe Lane	North Orbital Road	St. Albans Road 1	High Road Leavesden	Hempstead Road	St. Albans Road 2	Colne Way	M1 Link Road	Whippendell Road	Vicarage Road	Wiggenhall Road
Site no.	154	453	160	214	454	208	215	153	378	423	424	361
Year												
2005	32564	8537	19463	18753	6199	25250	15000	34894	44131	9891	18586	21651
2006	32841	8276	19558	19079	6163	25267	15698	34235	45803	10369	18642	22360
2007	32104	8442	19551	18546	6025	24766	14661	33704	44160	10385	18715	21194
2008	31598	8835	18852	18729	6119	24385	14384	33491	42789	10626	18455	21532
2009	29673	8684	22691	19606	6166	24356	14580	32491	45820	9152	19197	21197
2010	29271	8380	21455	19382	6036	23554	15104	32380	55075	9481	19131	19022
2011	29552	8450	19088	18525	5852	24097	14383	32472	45751	9234	19331	18646
2012	28691	8378	17632	18079	5868	23722	14450	30914	45165	9144	17799	17750
2013	28758	8479	17491	n/a	5876	n/a	n/a	29275	n/a	9341	18229	19784

**Figure B1 Hertfordshire County Council Traffic Data 2005-2013, expressed as Annual Average Weekday Flow (AAWD)**