



# 2017 Air Quality Annual Status Report (ASR)

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

June 2017

**Welwyn Hatfield Council**

Local Authority Officer	Welwyn Hatfield Council
Department	Public Health and Protection
Address	Council Offices, Campus East, Welwyn Garden City
Telephone	01707 357 934
E-mail	t.vincent@welhat.gov.uk
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## Executive Summary: Air Quality in Our Area

### Air Quality in Welwyn Hatfield Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas<sup>1,2</sup>.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion<sup>3</sup>.

At this moment in time the authority do not have an air quality action area. We are pleased to report however that our monitoring regime has been a top priority since 2012. In 2012 there were 6 diffusion tube monitoring locations and in 2017 there are currently 29 locations with the addition of a roadside BAM 1020 PM2.5 monitor. This has allowed us to capture a much better picture of current air quality levels within the borough and to gain a better understanding of actions that maybe required in the future.

### Actions to Improve Air Quality

We take air quality issues very seriously and we are determined to continue to make improvements. We are focusing on monitoring current high risk areas now our extended monitoring network is fully established. The extended network has identified that there is the potential for a future air quality management area. To try and manage this we are applying for a growth bid for a further roadside monitor within the high risk area so we can obtain further evidence. We are regularly updating our members with air quality reports and keeping our executive board informed. We are part of the Hertfordshire and Bedfordshire air quality network which also joins in with a working group associated to the county council. Air quality is a key target for us and we have a dedicated officer committed for this purpose.

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<sup>1</sup> Environmental equity, air quality, socioeconomic status and respiratory health, 2010

<sup>2</sup> Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

<sup>3</sup> Defra. Abatement cost guidance for valuing changes in air quality, May 2013

## Conclusions and Priorities

The diffusion tube results highlight that in one particular area within the borough there is a location at a sensitive receptor that is on the limit value. However, we do not have 100% data capture for this location. We have annualised the data and this has reduced the data figure quite considerably. This clearly raised a concern and as a result contact was made with the air quality help desk (DEFRA). We made enquiries whether they would like us to undertake a detailed assessment. We were informed that we should monitor levels for a further 12 months and report back on the results to see if there are any improvements or whether the limit value is breached. They also advised that it is key to try and obtain 100% data capture for next year. We have a priority to monitor this area closely and this is something we are taking forward in 2017. Steps have been taken to inform our members and our executive board so that they are aware of our current situation.

## Local Engagement and How to get involved

We have made air quality one of our key priorities. We take the matter very seriously and link this in with our public health and protection targets. The council have just invested in two electric pool cars which are to be used by council staff and members of the public at evenings and at weekends. Whilst we do not currently have an air quality management area we do still consider air quality as a key factor for any planning consultations. We also request an air quality impact assessment where developments are within close proximity to any high risk areas.

We make all of our data and information on current air quality levels available on our website and the air quality England website.

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N/A.

## 1 Local Air Quality Management

This report provides an overview of air quality in Welwyn Hatfield Council during 2016. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 an exceedance is considered likely the local authority must 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. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Welwyn Hatfield Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

## 2 Actions to Improve Air Quality

### 2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives. Welwyn Hatfield Council currently does not have any AQMAs. For reference, a map of Welwyn Hatfield Council's monitoring locations is available in Appendix D.



## 2.2 Progress and Impact of Measures to address Air Quality in Welwyn Hatfield Council

Defra's appraisal of last year's ASR concluded that the monitoring results show that we have breached the air quality objective for NO<sub>2</sub> at one of the diffusion tube locations. However, the nearest receptor is over 60 metres from this location. This is significant and we are taking actions to carry out increased monitoring in the locality to ascertain the extent of the issue. We feel that it would be premature to declare an air quality action area based upon one monitoring location. Plans are now in place to step up the intensity of monitoring within this area.

We have been successful with regard to the amount of reliable data capture we have achieved this year. In the past new monitoring locations have been affected by members of the public stealing the diffusion tubes. Measures are now in place to keep the diffusion tubes secure and the data capture demonstrates this. We have devoted a lot of resource to improving our monitoring network and we are pleased to report on the success of this work. We currently have very good coverage throughout the borough and the monitoring locations are well established. This will enable us to accurately monitor trends in air quality levels for the future.

In the main the bias adjusted results have stayed fairly consistent over the past few years. In fact the results for 2015 are slightly better than previous years. This is most likely attributed to the reduction of old motor vehicles on our road network and the introduction of more fuel efficient cleaner vehicles.

We will continue to monitor in same locations with the addition of the new BAM 1020 continuous analyser along with the extra 3 diffusion tube locations. While we are satisfied with the improvements that have been made to our monitoring network there is always still room for improvement. Air quality is a key priority for us which is why we will seek further funding to develop the network in the future as one of our ongoing targets.

Welwyn Hatfield Council has taken forward a number of direct measures during the current reporting year of 2016 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1.

Key completed measures are:

- Introduce further diffusion tubes close to the area where the level breached – near a receptor
- Consider funding for a roadside NO<sub>2</sub> analyser
- Introduction of electric council pool vehicles

Welwyn Hatfield Council expects the following measures to be completed over the course of the next reporting year: These measures will allow us to get a better understanding of the pollution levels at a representative receptor within the high risk area. We require a roadside NO<sub>2</sub> analyser so that we can gain a better understanding of hourly and daily levels to back up the diffusion tube data. The introduction of the council's electric pool vehicles will help us reduce our carbon foot print for any council related inspections or visits.

Welwyn Hatfield Council's priorities for the coming year are focus on our monitoring network and to ensure we gather relevant and accurate data close to the receptors within the high risk area.

The principal challenges and barriers to implementation that Welwyn Hatfield Council anticipates facing are that we can only gather limited diffusion tube later in the areas in question. It would be very useful to have a roadside NO<sub>2</sub> analyser so that we can gain a better understanding on the hourly and daily levels. We do have limited funding at this time so we are making use of the resources we have available.

Welwyn Hatfield Council anticipates that the measures stated above and in Table 2.1 will assist us in ascertaining whether or not we will be required to declare and air quality management area.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Electric pool car	Low emission transport	Company vehicle procurement	Local Authority & E Car	Sept 2016	June 2017	100%	Reduced vehicle emissions	In place	June 2017	Time
2	Car sharing for all AQ work	Low emission transport	N/A reducing emissions	Public Health & Protection	Since 2016	2016	100%	Reduced vehicle emissions	In place	2016	No issues
3	Taxi licensing	Low emission transport	Taxi emission incentives	Local Authority Public Health & Protection & Hackney Carriage	Jan – Dec 2017	Jan – June 2018	50%	Reduced vehicle emissions	Implementation on-going	June 2018	Planning successful monitoring of taxi ranks currently ongoing
4	Planning consultations	Policy guidance development control	Other policy	Local authority	Since 2015	2015	100%	Air quality impact assessments for planning developments	In place	2015 – ongoing	No issues
5	Air quality working group	Policy guidance development control	Regional working groups	Local authority	Implemented many years ago	N/A	100%	Joint working and sharing of resources	In Place	Ongoing	Difficulties with meeting dates and information sharing
6	Cycle to work scheme	Transport planning and infrastructure	Promotion of cycling	Local authority	June 2016	December 2016	100%	Encourage staff to cycle to work	In place	April 2017	The scheme was promoted and put in place with relative ease
7	Pool bike hire scheme for staff	Transport planning and infrastructure	Promotion of cycling	Local authority	2012	2012	100%	Encourage staff to cycle to visits	In place	Ongoing	No issues

## 2.3 PM<sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Welwyn Hatfield Council is taking the following measures to address PM<sub>2.5</sub>:

The BAM 1020 PM<sub>2.5</sub> air quality monitor was installed at the roadside in Hatfield in spring 2016. Prior to this we have not had the facility to monitor this pollutant due to lack of funding. The results have shown that levels are in majority low to moderate which is a positive result. There was however one day reported to be high and very high. This was in February 2017 and was relevant to exceptionally cold weather and still air with pollution spreading from central London.

At this time due to reported levels being low in the majority we are not planning to take any further action at this time other than to continue to monitor levels. Priority must be given to other high risk areas.

## 3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

### 3.1 Summary of Monitoring Undertaken

#### 3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Welwyn Hatfield Council undertook automatic (continuous) monitoring at 1 site during 2016. Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

#### 3.1.2 Non-Automatic Monitoring Sites

Welwyn Hatfield Council undertook non- automatic (passive) monitoring of NO<sub>2</sub> at 29 sites during 2016. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

### 3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

#### 3.2.1 Nitrogen Dioxide (NO<sub>2</sub>)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past 5 years with the air quality objective of 40µg/m<sup>3</sup>.

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B.

Table A.4 is left blank as we do not have a continuous NO<sub>2</sub> analyser.

We have no exceedances at receptor locations. However, one location highlights that it is on the limit value of  $40\mu\text{g}/\text{m}^3$ . This however was the case before the annualisation process was undertaken.

### **3.2.2 Particulate Matter (PM<sub>10</sub>)**

We did not undertake any monitoring for this pollutant.

### **3.2.3 Particulate Matter (PM<sub>2.5</sub>)**

Table A.7 in Appendix A presents the ratified and adjusted monitored PM<sub>2.5</sub> annual mean concentrations for the past 5 years. The results show that levels of PM<sub>2.5</sub> within the borough are low for the majority of the time and moderate on occasion.

### **3.2.4 Sulphur Dioxide (SO<sub>2</sub>)**

We did not undertake any monitoring for this pollutant.

## Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Inlet Height (m)
BAM1	BAM1020 PM2.5	Roadside	523292	209172	PM <sub>2.5</sub>	NO	Beta Attenuation	10	8	1.5

**Notes:**

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.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?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?	Height (m)
WH1	Dicket Mead	Near road	523439	216315	NO <sub>2</sub>	NO	10	6	NO	2.0
WH2	Parkway	Roadside	523656	213133	NO <sub>2</sub>	NO	10	3	NO	2.0
WH2*	Bus Station, WGC	Near road	523918	213069	NO <sub>2</sub>	NO	5	6	NO	2.0
WH3	Great North Rd	Roadside	524991	205525	NO <sub>2</sub>	NO	60	3	NO	2.0
WH4	New Barnfield	Kerbside	522863	206489	NO <sub>2</sub>	NO	245	1	NO	2.0
WH5	Coopers Lane Rd	Kerbside	529402	200929	NO <sub>2</sub>	NO	438	1	NO	2.0
WH6	Bradgate	Kerbside	529933	203654	NO <sub>2</sub>	NO	9	1	NO	2.0
WH7	Parkhouse Court	Near road	521575	208645	NO <sub>2</sub>	NO	5	6	NO	2.0
WH8	Far End	Near road	522609	206718	NO <sub>2</sub>	NO	13	6	NO	2.0
WH9	Mount Pleasant Close	Urban background	523519	209890	NO <sub>2</sub>	NO	14	50	NO	2.0
WH10	The Ryde	Urban background	523377	209858	NO <sub>2</sub>	NO	8	50	NO	2.0
WH11	Thistle Grove	Urban background	526249	211617	NO <sub>2</sub>	NO	8	50	NO	2.0



WH12	The Commons	Urban background	525852	211187	NO <sub>2</sub>	NO	14	50	NO	2.0
WH13	Alconbury	Urban background	527150	212966	NO <sub>2</sub>	NO	6	50	NO	2.0
WH14	Green Lanes	Kerbside	522013	209707	NO <sub>2</sub>	NO	13	1	NO	2.0
WH15	Great North Rd	Urban background	522604	210859	NO <sub>2</sub>	NO	19	50	NO	2.0
WH16	The Runway	Near road	521052	208998	NO <sub>2</sub>	NO	1	2	NO	2.0
WH17	Great North Rd	Near road	523293	209164	NO <sub>2</sub>	NO	12	8	NO	2.0
WH18	Broadwater Rd	Roadside	524285	212988	NO <sub>2</sub>	NO	37	2	NO	2.0
WH19	Comet Way	Roadside	522144	209516	NO <sub>2</sub>	NO	65	3	NO	2.0
WH20	Queensway	Near road	522497	208544	NO <sub>2</sub>	NO	30	6	NO	2.0
WH21	Essendon A414	Roadside	527258	210364	NO <sub>2</sub>	NO	8	3	NO	2.0
WH22	Garden Village	Kerbside	521801	209471	NO <sub>2</sub>	NO	60	1	NO	2.0
WH23	South Way	Near road	521998	206243	NO <sub>2</sub>	NO	20	20	NO	2.0
WH24	Ellenbrook	Roadside	521164	207740	NO <sub>2</sub>	NO	47	5	NO	2.0
WH25	West View 1	Near road	522093	209431	NO <sub>2</sub>	NO	7	13	NO	2.0
WH26	West View 2	Near road	522064	209328	NO <sub>2</sub>	NO	7	15	NO	2.0
WH27	West View 3	Near road	522060	209289	NO <sub>2</sub>	NO	7	12	NO	2.0

WH28	Taxi Rank WGC	Roadside	523815	212960	NO <sub>2</sub>	NO	5	2	NO	2.0
WH29	Taxi Rank Hatfield	Roadside	523267	208803	NO <sub>2</sub>	NO	5	2	NO	2.0

**Notes:**

- (1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).
- (2) N/A if not applicable.

**\*Please note that reference WH2 is used twice as the diffusion tube location was moved.**

Table A.3 – Annual Mean NO<sub>2</sub> Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2016 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
					2012	2013	2014	2015	2016
WH1	Near road	Diffusion tube		100	26	27	27	23	22
WH2	Roadside	Diffusion tube		83	30	27	25	24	24
WH2	Near road	Diffusion tube		25					43
WH3	Roadside	Diffusion tube		100	32	30	28	26	28
WH4	Kerbside	Diffusion tube		100	34	34	31	27	31
WH5	Kerbside	Diffusion tube		100	26	24	24	20	21
WH6	Kerbside	Diffusion tube		100	23	20	20	17	18
WH7	Near road	Diffusion tube		100	N/A	34	30	30	31
WH8	Near road	Diffusion tube		100	N/A	23	21	20	20
WH9	Urban background	Diffusion tube		92	N/A	23	22	21	22
WH10	Urban background	Diffusion tube		100	N/A	25	21	20	22
WH11	Urban background	Diffusion tube		100	N/A	21	18	15	18
WH12	Urban background	Diffusion tube		100	N/A	21	19	15	18
WH13	Urban background	Diffusion tube		100	N/A	18	17	14	16

WH14	Kerbside	Diffusion tube		100	N/A	34	29	28	29
WH15	Urban background	Diffusion tube		100	N/A	19	28	22	24
WH16	Near road	Diffusion tube		100	N/A	26	29	21	26
WH17	Near road	Diffusion tube		100	N/A	N/A	47	34	30
WH18	Roadside	Diffusion tube		92	N/A	N/A	42	35	40
WH19	Roadside	Diffusion tube		100	N/A	N/A	52	55	56
WH20	Near road	Diffusion tube		100	N/A	N/A	0	31	31
WH21	Roadside	Diffusion tube		100	N/A	N/A	0	30	32
WH22	Kerbside	Diffusion tube		100	N/A	N/A	42	37	37
WH23	Near road	Diffusion tube		100	N/A	N/A	38	28	22
WH24	Roadside	Diffusion tube		100	N/A	N/A	58	39	44
WH25	Near road	Diffusion tube	100	67	N/A	N/A	N/A	N/A	44
WH26	Near road	Diffusion tube	100	67	N/A	N/A	N/A	N/A	37
WH27	Near road	Diffusion tube	100	67	N/A	N/A	N/A	N/A	37
WH28	Roadside	Diffusion tube	100	33	N/A	N/A	N/A	N/A	33
WH29	Roadside	Diffusion tube	100	33	N/A	N/A	N/A	N/A	44

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

If applicable, all data has been distance corrected for relevant exposure

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

**Figure A.1 – Trends in Annual Mean NO<sub>2</sub> Concentrations**

N/A

### Table A.4 – 1-Hour Mean NO<sub>2</sub> Monitoring Results

N/A

**Notes:**

Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> not to be exceeded more than 18 times/year) are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8<sup>th</sup> percentile of 1-hour means is provided in brackets.

Figure A.2 – Trends in Number of NO<sub>2</sub> 1-Hour Means > 200µg/m<sup>3</sup>

N/A



**Table A.5 – Annual Mean PM<sub>10</sub> Monitoring Results**

N/A

**Figure A.3 – Trends in Annual Mean PM<sub>10</sub> Concentrations**

N/A

**Table A.6 – 24-Hour Mean PM<sub>10</sub> Monitoring Results**

N/A

**Notes:**

Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> not to be exceeded more than 35 times/year) are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 90.4<sup>th</sup> percentile of 24-hour means is provided in brackets.

**Figure A.4 – Trends in Number of 24-Hour Mean PM<sub>10</sub> Results >50µg/m<sup>3</sup>**

N/A

**Table A.7 – PM<sub>2.5</sub> Monitoring Results**

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2016 (%) <sup>(2)</sup>	PM <sub>2.5</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
				2012	2013	2014	2015	2016
BAM Hatfield	Near road		60.29	N/A	N/A	N/A	N/A	9

Annualisation has been conducted where data capture is <75%

**Notes:**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

**Figure A.5 – Trends in Annual Mean PM<sub>2.5</sub> Concentrations**

N/A

**Table A.8 – SO<sub>2</sub> Monitoring Results**

N/A

**Notes:**

Exceedances of the SO<sub>2</sub> objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year)

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the relevant percentiles are provided in brackets.

**Figure A.6 – Trends in SO<sub>2</sub> Concentrations**

N/A



## Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO<sub>2</sub> Monthly Diffusion Tube Results - 2016

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.79) and Annualised <sup>(1)</sup>	Distance Corrected to Nearest Exposure <sup>(2)</sup>
WH1	33	29	31	30	20	27	17	19	27	26	39	42	28	22	20.4
WH2	35	39	30	32	29	24	22	23	38	0	0	0	30	24	21.1
WH2	0	0	0	0	0	0	0	0	0	50	57	56	54	34	30.6
WH3	31	46	33	39	33	31	25	25	37	36	46	43	35	28	N/A
WH4	51	49	33	38	34	31	33	31	47	29	38	58	39	31	N/A
WH5	33	32	22	25	20	22	18	18	28	24	29	41	26	21	N/A
WH6	18	29	19	23	19	17	17	16	23	22	28	43	23	18	16.2
WH7	42	39	35	38	35	30	34	29	41	44	51	47	39	31	29.2
WH8	31	33	25	21	21	17	19	18	30	20	33	38	26	20	19
WH9	0	36	29	22	23	20	18	20	28	28	36	44	28	22	N/A
WH10	34	61	26	25	21	20	18	20	28	25	19	42	28	22	N/A
WH11	29	33	19	21	11	14	13	13	25	18	34	42	23	18	N/A
WH12	26	30	19	33	14	15	15	13	21	19	29	34	22	18	N/A
WH13	27	29	16	17	13	13	13	13	23	18	30	38	21	16	N/A
WH14	49	43	30	36	29	29	25	23	42	34	44	55	37	29	24.3

## Welwyn Hatfield Council

WH15	34	40	31	26	26	24	18	21	32	26	40	45	30	24	N/A
WH16	30	37	29	27	64	22	17	19	31	32	38	46	33	26	25.6
WH17	43	39	34	34	31	29	34	29	45	33	49	53	38	30	26.8
WH18	40	0	50	54	51	45	39	41	50	58	66	62	51	40	25.1
WH19	84	87	72	60	55	65	67	64	63	63	84	81	70	56	N/A
WH20	47	63	34	38	31	29	31	28	40	31	47	56	40	31	24.9
WH21	26	55	45	45	37	19	34	36	40	49	50	51	41	32	26.1
WH22	3	59	44	49	44	35	40	41	54	49	71	68	46	37	N/A
WH23	35	38	25	26	24	21	18	19	29	29	31	45	28	22	21.2
WH24	56	63	64	60	53	51	38	42	52	64	70	61	56	44	N/A
WH25	0	0	0	0	53	48	56	47	52	50	70	72	56	34	31.5
WH26	0	0	0	0	44	46	42	42	51	42	59	71	47	29	27.5
WH27	0	0	0	0	43	38	40	39	47	37	64	71	47	29	27.4
WH28	0	0	0	0	0	0	0	0	37	39	30	60	42	26	24.2
WH29	0	0	0	0	0	0	0	0	50	43	64	67	56	34	30.4

Local bias adjustment factor used

National bias adjustment factor used

Annualisation has been conducted where data capture is <75% - Please note that annualised figures are highlighted in blue

### Notes:

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

**N/A means that distances to receptor are too far for distance correction calculations to be carried out.**

## Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

### Air Quality Monitoring Data QA/QC

#### Diffusion Tubes

The samples have been analysed in accordance with ESG's (Didcot) standard operating procedure ANU/SOP/1015 Issue 1. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes For Ambient NO<sub>2</sub> Monitoring: Practical Guidance.'

The tubes were prepared by spiking acetone:triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection. All samples were received in good condition, unless otherwise stated in the comments field of results table. Please note:

- (i) As set out in the practical guidance, the results were initially calculated assuming an ambient temperature of 11°C, the reported values **have** been adjusted to 20°C to allow for direct comparison with EU limits.
- (ii) The reported results have not been bias adjusted.

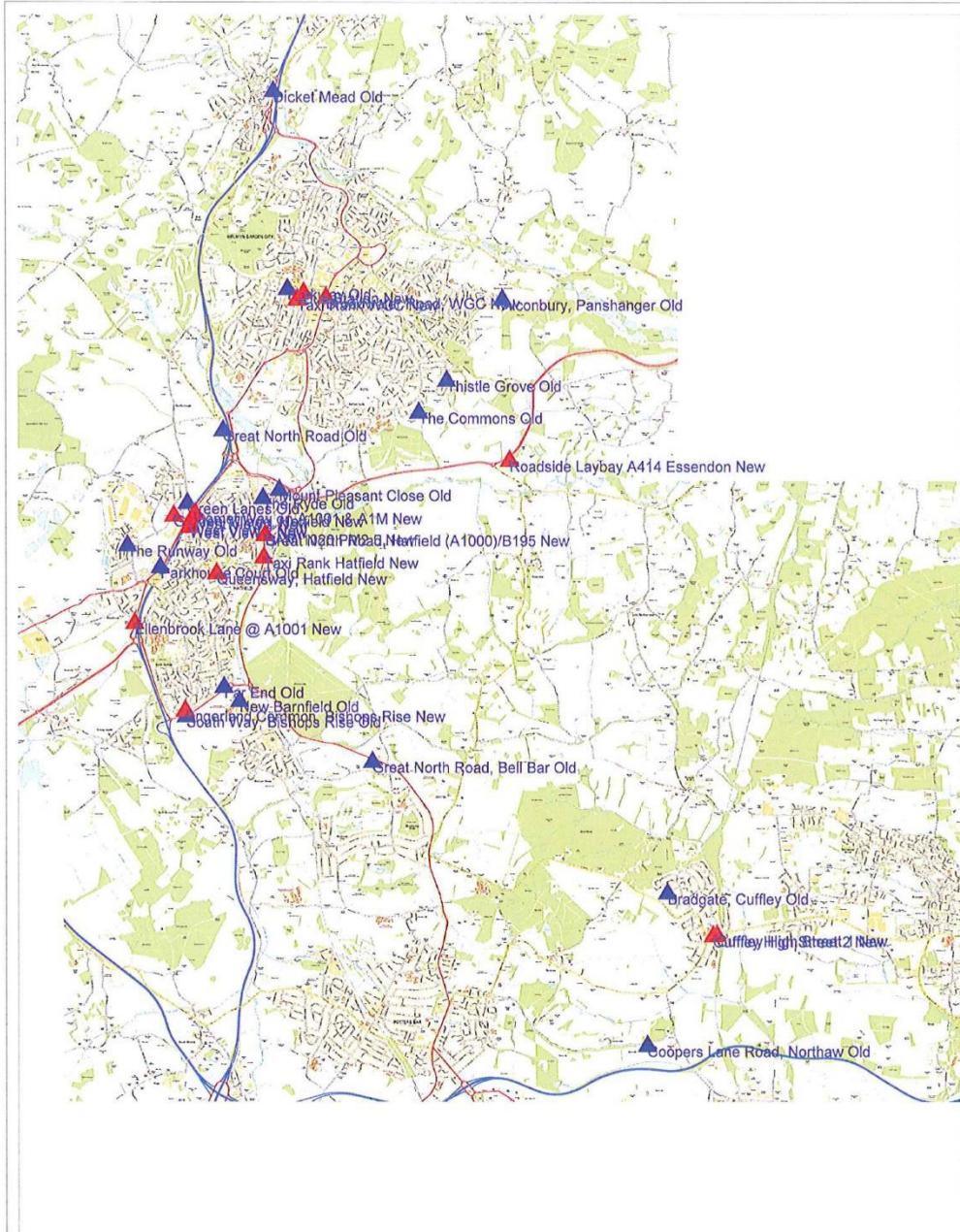
This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of our UKAS schedule. Any further calculations and assessments requiring exposure details and conditions fall outside the scope of our accreditation. In the WASP intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, ESG currently holds the highest rank of a satisfactory laboratory.


#### QA/QC of automatic monitoring

Automatic measurements of PM<sub>2.5</sub> were made using a BAM-1020, a beta attenuation mass monitor.

All measurements were logged by the instruments themselves and collected by Enviro Technology hourly. Measurements from the monitoring site were validated by Ricardo using the most up to date calibration factors and publicly disseminated in near real time on the HBAQN web page [http://www.airqualityengland.co.uk/local-authority/?la\\_id=408](http://www.airqualityengland.co.uk/local-authority/?la_id=408)

## Appendix D: Map(s) of Monitoring Locations and AQMAs



 <p><b>WELWYN HATFIELD</b></p> <p>Council Offices, The Campus, Welwyn Garden City, Herts. AL8 6AE</p>	Title:	Scale:
	Project:	Date: 18th July 2017
	Drawing Number:	Drawn:
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## Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective <sup>4</sup>	
	Concentration	Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m <sup>3</sup>	Annual mean
Particulate Matter (PM <sub>10</sub> )	50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m <sup>3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean

<sup>4</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide
...	...

## References

ESG (Diffusion tube laboratory), Unit 12 Moorbrook, Southmead Industrial Estate, Didcot, Oxfordshire, OX11 7HP.

Enviro Technology Services, Kingfisher Business Park, London Road, Stroud, Gloucestershire, GL5 2BY, UK.

Ricard Energy and Environment.

<https://laqm.defra.gov.uk/documents/LAQM-TG16-April-16-v1.pdf>

<https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>