2017 Air Quality Annual Status Report (ASR)

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

December 2018

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Executive Summary: Air Quality in Our Area.

The summary is designed to provide an overview for people who reside and work within the area of Runnymede Borough Council as to the air quality that was present within the Borough during 2017. The report also provides detail of how the issue of air quality is being addressed within the Borough and the intentions of the Council in determining any future action.

The main conclusions of the report are the following;-

1. Air quality within the Borough has generally seen a slow decline in nitrogen dioxide levels across the Borough over the time period that the Council has been monitoring the levels of nitrogen dioxide.
2. When directly comparing the air quality of 2016 to 2017,the air quality situation within the Borough has overall seen a slight general improvement year on year in so much that at 16 out of the 32 monitoring points where comparable measures were taken these showed a decrease in levels and at 8 sites these showed an increase from the previous year.
3. The levels of nitrogen dioxide are in the main generated by vehicular transport and problems can occur due to stationary traffic and congestion. It was interesting to note that when obvious and significant signage was placed out at a level crossing requesting drivers to turn their engines off while waiting for the barriers to lift this seems to have produced a positive result in that there was a slight decrease in nitrogen dioxide levels.
4. Difficulties have been encountered with the “watching brief” in relation to an area adjacent to a road junction controlled by traffic lights in Chertsey due to the fact that throughout 2017 most of the tubes located there went missing prior to collection. However, currently it seems as if this trend has now resolved itself in that the diffusion tubes in this area are now being routinely collected once again.
5. In 2017, there were 4 monitoring locations where annual average nitrogen dioxide levels exceeded the national air quality objective of 40µg/m3. These locations were alongside busy roads and/ or near major junctions. Using the DEFRA provided “*drop off in nitrogen dioxide levels with distance from kerbside calculator*” the air quality levels at the nearest residential property to those monitoring locations were calculated. Having done this, the level of

nitrogen dioxide is estimated to drop below the 40µg/m3 objective at all locations except one.

6. Consideration has been given to the prospect of un-declaring certain areas of the M25 AQMA, however it is considered prudent to wait until the further round of air quality modelling is undertaken in 2019 in order to ascertain if the situation has further improved and there is certainty in taking such action.

Air Quality in Runnymede Borough 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[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

Previous Review and Assessments within Runnymede Borough Council have concluded that concentrations of carbon monoxide, benzene, 1,3-butadiene, lead, sulphur dioxide and PM_{10} are compliant with the relevant national and European objectives.

Air Quality Management Areas (AQMAs) have however been declared at two locations in Runnymede Borough Council for exceedances of the annual mean nitrogen dioxide objective, namely land adjacent to the M25 and at a traffic light controlled junction in Addlestone town centre.

M25

Monitoring carried out in 2014 confirmed that nitrogen dioxide concentrations adjacent to the M25 AQMAs in Egham at the Pooley Green railway level-crossing were above the air quality objective at relevant locations and as a result the M25 AQMA was extended to include the area near to the level-crossing. Hence in 2015

[1] Environmental equity, air quality, socioeconomic status and respiratory health; a linkage analysis of routine data from the Health Survey for England , 2005
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

the department's available resource for air quality at that time was dedicated to declaring an extension of the AQMA to include the area adjacent to the crossing.

Addlestone

There is a four way traffic light controlled junction in Addlestone town centre which has been declared an AQMA. The general trend tends to indicate a slight decrease in nitrogen dioxide concentrations at locations that are located within the AQMA further away from the actual traffic lights themselves. These levels indicate that the objectives are being achieved away from the traffic lights. However, it is interesting to note that at the actual traffic light controlled junction at the centre of the AQMA, where there is a monitor located next to the façade of a residential premise, this location continues to indicate a level above the air quality objectives. In terms of the levels found at this location for 2017 when compared to 2016 the levels the 2017 have shown an increase of 3μg/m^3 over the previous year**.**

A photograph has been provided which depicts the proximity of the diffusion tube to the façade of the building at the traffic light controlled junction since this was highlighted when the previous Annual Status Report was submitted.

Picture 1 AQMA Addlestone traffic light junction – tube location

Investigation for a potential AQMA at Chertsey

At a busy roadside junction controlled by traffic lights in Chertsey it has been shown that there were exceedances in the air quality objective at the kerbside, however once distance correction factors were applied then the closest residential accommodation was within the objective limits. The Council is attempting to keep a "watching brief" at this site however the diffusion tubes which are put up on a monthly basis were reported missing. This has produced difficulties in the attempts to keep a watching brief and hence provide an accurate picture of the area in 2017

Details of the current AQMA can be found on the Defra UK Air website (www.uk-air.defra.gov.uk) or via the following link: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=26 .

Source of Air Pollution

Road

Modelling of annual nitrogen dioxide levels would show the influence of road traffic on levels across the Borough, with major trunk routes such as the M25 and M3 motorways and A roads such as the A30, A320,A308, A317 and A318. Modelling was undertaken in association with the Council's emerging Local Plan in 2018 .
Further air quality modelling work has been commissioned on a County wide scale by Surrey Air Alliance
The highways authority for Runnymede Borough Council area is Surrey County Council (SCC). The SCC Local Transport Plan (LTP3)[i] includes a number of supporting strategies including the Surrey Air Quality Strategy and the Surrey Climate Change Strategy.
The aim of the air quality strategy is to improve air quality in Air Quality Management Areas (AQMAs) on the county road network such that Surrey's Boroughs and Districts are able to look to un-declare these areas as soon as possible.
The other major roads within the Borough (M25, M3) are the responsibly of Highway England. Highway England maintenance contractor, Connect Plus, undertake monitoring of air quality within the M25 and there are several locations within the Borough which Connect Plus measure for nitrogen dioxide

Aircraft - Heathrow Airport expansion

Heathrow southern runway is at its nearest point some 4km from the boundary of Runnymede Borough Council. In 2017 there were discussions surrounding the expansion of Heathrow. In the first quarter of 2018, Heathrow Airport Ltd consulted on its proposal to expand the airport through construction of a third runway, new terminal capacity and other supporting infrastructure. At the end of June 2018, Parliament voted to pass the Airports National Policy Statement, new policy that sets out the criteria under which consent will be given for expansion of the airport. It is envisaged that if Heathrow manages to obtain development consent, construction of the new runway and associated infrastructure would probably begin sometime next decade.

The proposed new runway would be to the north of the existing runways (i.e. further away from Runnymede Borough Council's boundary).

In terms of air quality and overflights then according to information from DEFRA, once an aircraft reaches an altitude of greater then 450m then the on ground contribution to air quality from aircraft overhead would be negligible. Hence in terms of aircraft taking off from Heathrow airport, using the preferred routes and maintaining the required climb gradient then the aircraft would be above 450m height when entering into air space above the Borough and would therefore produce negligible direct on ground air quality issues in relation to the current air quality standards.

In should be noted that it has been suggested that there is to be a privately funded Heathrow Southern Railway line associated with an expanded Heathrow. The proposed route of the new railway line would take it from the southern Borough boundary to the northern boundary.

Actions to Improve Air Quality

- Consideration of how to improve air quality have been included in the Council's approved Air Quality Action Plan and this includes a raft of measures such as consideration for planning applications within or near the Borough's AQMA. Many planning applications have had conditions in relation to air quality requirements included due to the fact that the development was

close to or within a defined AQMA. For the full range of measures see Runnymede's Air Quality Action Plan.

- Runnymede Borough Council monitors local air quality through an extensive diffusion tube monitoring network within the Borough.
- Runnymede Borough Council, together with the other ten Surrey Local Authorities and representatives from Surrey County Council (Public Health and Transport) has established the Surrey Air Alliance Group which aims to coordinate certain actions to reduce air pollution within Surrey. The group has commissioned a modelling exercise of air pollution with emphasis on nitrogen dioxide and particulate matter across the county and this is expected to be completed in the summer of 2019.
- Since 2014 Runnymede Borough Council has enlarged an existing AQMA in the Egham area. In March 2016, six large banner signs were located on lampposts on the approaches to the railway level-crossing requesting drivers to switch off their engines whilst waiting at the railway level-crossing. These banner signs were in place until March 2017.

Picture 2 – Picture of signage erected at level-crossing 2016/2017 - Egham

A comparison was made of the nitrogen dioxide results measured during the year period prior to the signs installation was made with the results of the corresponding period when the signs were erected. The results indicate that there was a reduction of 1.9µg/m^3 when the signs were in place when compared to the results of the previous year (see section 2.2 for more details of the results and findings).

- In December 2017, a successful bid was made on behalf of the eligible Surrey Air Alliance Districts and Boroughs and in partnership with Surrey County Council to Defra for an Air Quality grant. The aim of the grant was to fund a Surrey-wide air quality awareness campaign in up to 40 schools across Surrey located within (or within proximity of) an AQMA.

  The £145k programme of measures to be delivered in 2018/19 includes:

  - Air quality themed Theatre in Education
  - Additional Bikeability cycle training for new age groups
  - Anti-idling campaigns
  - Rebranded Golden Boot sustainable transport challenge event
  - Educational resources and a teachers AQ Summit
- Emerging Local Plan

In order to meet the Borough's development needs and growth opportunities the Local Planning Authority has to have in place a Local Plan. Currently there is a new Local Plan being prepared and air quality is a related consideration. As a result, air quality modelling work was commissioned in 2018 in relation to the proposals within the emerging plan in order to understand the potential impact that the policies and plans of the emerging Local Plan would have on air quality.

Local Engagement and How to get Involved

The following information is available on Runnymede Borough Council's website, https://www.runnymede.gov.uk/article/5755/Air-quality

In relation to air quality issues within the Borough;-

- AQMAs within the Borough; areas where there are exceedances of the health bases air quality standards.

- Air Quality Action Plan; An action plan in relation to the AQMA and the measures to be adopted in order to reduce/effect a reduction in levels of air pollution.
- Copies of previous air quality reports.
- Regularly updated diffusion tube results.

Other areas relating to air quality include;-

Cycling around Runnymede see https://www.runnymede.gov.uk/article/5172/Cycling-around-Runnymede

Energy in transport and travel see https://www.runnymede.gov.uk/article/5950/Energy-in-transport-and-travel

As the majority of air pollution is associated with traffic Surrey County Council offer useful advice about such matters as consideration to alternatives to using a vehicle such as public transport, walking or cycling to help reduce emissions. Further ideas on minimising individual's impact on air quality impact can be found on Surrey County Council's 'Travel Smart' website www.travelsmartsurrey.info/.
When purchasing a new vehicle, consider vehicles with lower exhaust emissions, such as hybrid or electric vehicles, hydrogen fuel cell vehicles, or petrol cars instead of diesel to lower NO_x emissions.
Information on electric cars grants is available at www.gov.uk/plug-in-car-van-grants.

Air pollution impacts on people's health, especially those with heart or respiratory conditions such as asthma and COPD (chronic obstructive pulmonary disease). If residents feel that they wish advice on air quality then they can contact the Environmental Health department. If residents are of the opinion that an area within the Borough is an area where air quality is considered poor and the Council has not already considered/monitored that particular area then consideration can be given to including that area for air quality monitoring since the diffusion tube location network is reviewed in light of potential areas of concern

Further consideration is being given to Runnymede Borough Council joining the airAlert consortium within Surrey.

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1 Local Air Quality Management

This report provides an overview of air quality in Runnymede Borough Council during 2017. 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 and prepare an Air Quality Action Plan 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 Runnymede Borough 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.

A summary of AQMAs declared by Runnymede Borough Council can be found in Table 2.1. Further information related to declared AQMAs, including maps of AQMA boundaries are available within this report (see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA(s)). It should be noted that following the declaration of AQMAs there is an air quality action plan put in place to ensure that there are measures in place which seek to reduce levels to be consistently below the air quality objectives. It is suggested that once the Borough wide air quality modelling work is completed this will provide invaluable data as to the areas adjacent to the M25 which may be considered to be consistently below the nitrogen dioxide objectives. Consideration can then be given to revoking such areas of the AQMA. The AQMA within Addlestone has over the last few years shown slight decreases in levels of nitrogen dioxide at the measuring locations and hence the area is making steady progress towards achieving levels below the objective. It is however interesting to note that in 2017 the level of nitrogen dioxide at the traffic lights indicates an increase in levels above the objective levels. Nevertheless, once there is confidence that levels below the objective are being achieved, steps will be taken to revoke the AQMA.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan (inc. date of publication)
						At Declaration	Now	
AQMA M25	Declared 3/12/2001 Amended 20/10/2015	NO_2 annual mean	Runnymede	Entire length of M25 within the Borough and an extended area in December 2016 to include area in Egham near to railway crossing	Yes	unknown	Greater than 40 at some locations	Runnymede approved air quality action plan April 2014 https://www.runnymede.gov.uk/CHttpHandler.ashx?id=5497&p=0
AQMA Addlestone town	Declared 4/7/2008	NO_2 annual mean	Addlestone	Addlestone town centre traffic light 4 way junction- Brighton Road/Church Road/ Station Road/High Street	No	59 µg/m^3	47 µg/m^3	Runnymede approved air quality action plan April 2014 https://www.runnymede.gov.uk/CHttpHandler.ashx?id=5497&p=0

☒ **Runnymede Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

2.2 Progress and Impact of Measures to address Air Quality in Runnymede Borough Council

Defra's appraisal of the previous Annual Status Report concluded that because of ongoing improvements in air quality Runnymede Borough Council may wish to consider reviewing the air quality monitoring programme in order to check there are no other locations outside the existing AQMA's with exceedances. It was also suggested that consideration could be given towards proceeding to revoke AQMA's when results are consistently below the objectives.

Runnymede Borough Council has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More precise details on these measures can be found within the Council's Air Quality Action Plan 2014;-see

https://www.runnymede.gov.uk/CHttpHandler.ashx?id=5497&p=0

Key completed measures are:

- Consider planning applications near to or within the designated AQMAs to ensure that suitable measures are adopted in relation to air quality
- Supporting SCC with plans and funding bids to assist with improving air quality within the Borough
- Maintain a strong presence within Surrey Air Alliance group
- Three hydrogen refuelling stations located nearby; Cobham Motorway Services, Weybridge and Teddington, hence Runnymede Council is well placed to promote hydrogen fuel cell vehicles due to the availability of hydrogen within the area

Progress on the following measures has been slower than expected in relation to;-

- Highway infrastructure improvements – Liaison with agencies with responsibilities for transportation networks within AQMAs to deal with; --
  (i) improving the road layout and flow of traffic within AQMA.
  (ii) ensuring that any temporary road works to roads adjacent or within the

AQMA's have strict conditions applied to any permit to minimise additional congestion within the AQMA.

- Attempting to maintain a close "watching brief" on the nitrogen dioxide levels at Bridge Road /Weir Road Chertsey but has been hampered due to missing tubes.
- Modelling exercise of target pollutant levels to be carried out in association with the Surrey Air Alliance (to include PM_{10}, $PM_{2.5}$ & NO_2).
- Considering unification of an emissions policy for taxi licencing within all of Surrey to ensure continuity of approach to this matter.
- Consideration of joining the AirAlert scheme.

Cut engine signage at Pooley Green level crossing

In March 2016 signage was installed on lampposts on the approaches to the Pooley Green, Egham, level-crossing requesting that drivers switch off their engines while they were waiting for the level-crossing barriers to lift due to air pollution concerns. A further sign requesting that drivers switch off their engines while waiting was placed on railway land at the crossing itself.

The period April 2016 to February 2017 was the period when full monthly nitrogen dioxide results were available during the period when the signage was displayed. The levels of pollution from April 2015 to February 2016, when there was no signage displayed, was compared to the period when the signage was displayed. See table 2.1.A below

Table 2.1.A;- NO_2 results at level-crossing with and without signage

Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	ave	bias	result
15/16	35.0	33.0	55	50	48	50	53	53	43	63	45	**48**	**0.97**	**46.6**
16/17	*51*	*46*	*30*	*36*	*47*	*37*	*36*	*51*	*51*	*65*	*68*	**47.1**	**0.95**	**44.7**

It is evident from the results in the above table that the level of nitrogen dioxide has reduced by 1.9µg/m^3. It is suggested that in terms of air quality then overall the year 2016 was similar to the year 2015 since almost 50 percent of the site monitored showed an improvement in air quality whist just over 50% did the opposite. Hence overall it appears that, in general, there has been no significant improvement or

deterioration of air quality year on year. Therefore, it could be suggested that the introduction of signage may have had some beneficial effect at reducing levels of nitrogen dioxide by a slight amount. Looking further at the results it seems that the summer and autumn months are the months when there was a reduction in the monthly levels when the signage was in place. It may be that the signage is more noticeable in periods when there is more daylight and hence drivers on seeing the signage pay more attention to what is being requested of them?

Also Network Rail were contacted and asked if there are further measures that they could take on their land such as a countdown clock which shows drivers how much longer the barriers are planned to be down but Network Rail would not be seeking to progress such measures.

Table 2.2 – 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	Air Quality Action Plan produced and approved by committee	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Runnymede Borough Council		2014	AQAP published			2014	County with 2 tier authority
2	Established Surrey Air Alliance Group coordinating programmes to develop area wide strategies to reduce emissions and improve air quality	Policy Guidance and Development Control	Regional Groups	Surrey County Council and Surrey Local Authorities	2016	2016 Formation of group				Ongoing	
3	Permitted premises	Environmental Permits	Other measure through permit systems & economic instruments	Runnymede Borough Council			Ensuring that all permitted process operate within control limits			Ongoing	
4	Encourage adoption minimum emissions standards into taxi licensing procedures	Promoting Low Emission Transport	Taxi Licensing conditions/incentives	Runnymede Borough Council	2016	2018/19	Reduce tailpipe emissions in AQMA	yes	Air Quality officers representing the borough/district councils have suggested taxi licencing authorities for County wide policy on emissions.	2018	

5	Use of Planning regime to incorporate measures to reduce air pollution	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Runnymede Borough Council	2015			Air quality included in Development Planning			Ongoing
6	County and Borough modelling of key pollutants	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Surrey Air Alliance group	2016	2018	Modelling completed		Estimates obtained- tendering process to be followed	2017/18	
7	Support of bid to DEFRA re emission at schools	Promoting Low Emission Transport	Other	Surrey County Council and Surrey Local Authorities	2017	2017	Awareness raising			2018	
8	Extension to AQMA in Egham – erecting of large format signs on lampposts close to level crossing – switch off engines	Public information	Via other mechanisms	Runnymede BC	2015	2016	Signage erected	yes		ongoing	
9	Emerging Local Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Runnymede BC	2015	2018	Local Plan approved.		Central Government to consider	2018	ongoing

2.3 $PM_{2.5}$ – 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 $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Given the recent implementation of the Technical Guidance LAQM.TG16 and Policy Guidance LAQM.PG16, Runnymede Borough Council is working towards defining a strategy to reduce emissions or concentration of $PM_{2.5}$. This work is being undertaken in close association with the Director of Public Health at Surrey County Council. It is further expected that the modelling exercises being publicised will provide incisive and key information on $PM_{2.5}$ to assist with the production of a suitable strategy.

However, existing measures to improve air quality already in place can help reduce levels of $PM_{2.5}$, such as:

- Promoting driver awareness such as prevention of idling vehicles.
- Promoting low emission transport and provision of charging points and hydrogen refilling stations.
- Surrey County Council's Transport Plan (LTP3) and Air Quality Action Plan.

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

Runnymede Borough Council did not undertake any automatic (continuous) monitoring within the Borough during 2017 nor is it planning to introduce continuous monitoring.

3.1.2 Non-Automatic Monitoring Sites

Runnymede Borough Council undertook non- automatic (passive) monitoring of NO_2 at 32 sites during 2016 using diffusion tubes as supplied by Lambeth Scientific Services. Table A..1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites within the AQMAs and elsewhere in the Borough are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment considerations for the diffusion tubes are included in Appendix C.

3.2 Individual Pollutants

It should be noted that the air quality monitoring results presented in this section are, where relevant, adjusted for bias and distance correction. “Annualisation” of the areas where sampling collection data was below 75% was not undertaken because in many cases there was such a lack of sample points . Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Since Runnymede Borough Council do not have any continuous monitors it is difficult to consider in detail the nitrogen dioxide hourly mean concentrations . The air quality objective is 200µg/m^3, not being exceeded more than 18 times per year. However, a

comparison between the hourly objective and the annual mean objective can be made. It is understood that an **annual mean** of greater than than 60µg/m^3, provides an indication that an exceedence of the 1-hour mean objective could be likely at these sites.

Consideration of relevant exceedances

In 2017, following bias correction of the raw data and the application of distance correction, this showed one location in the Borough where there was an exceedance of the annual mean objective. See table 3.1 below.(Site RY14 is located within the Addlestone AQMA).

Table 3.1 – Annual exceedances

Site number	Reading - bias corrected	Distance correction
RY14	48.7	**48.7**
RY23	51.6	36
RY26	43.1	36.7

It is noted that for the hourly objective to be exceeded the annual mean would have to exceed 60µg/m^3. No site within the Borough had an annual mean greater than 60µg/m^3. **Hence there are no sites which exceed the hourly objective limit**. However, it is considered prudent to have a look at monthly results which exceed 60µg/m^3. (See table 3.2.). There were 9 measured concentrations greater than the equivalent bias corrected levels of 60µg/m^3 in 2017.Since the figure of 0.93 has been used as a bias correction this equates to an unbiased correct figure of greater than 64.5µg/m^3 (64.5 x0.95 = 60). It should be noted that all these individual **monthly** exceedances greater than 60µg/m^3 occurred during the colder weather periods when weather conditions are such that tend to cause an increase in nitrogen dioxide levels. Some of these values occurred within an already defined AQMA. The other sites outside an AQMA, namely RY23 and RY56 relate to an area in Bridge Street/Weir Road, an area which is currently under a “watching brief” in that should the air quality deteriorate then an AQMA would be declared.

The other two sites where there was a spike in levels related to the site RY63 in Addlestone town centre at the rear of the Council’s civic offices where there had been redevelopment work. During this period various delivery lorries would regularly stop on the road and would wait until they were directed into the site for unloading. Often such waiting vehicles ran up their engines while waiting. Since Council officers

use the same entrance these issues in relation to waiting delivery HGV s were reported to the Environmental Health department who then gave advice to the developer and thereafter an alternative regime was put in place to accept deliveries.

Table 3.2 – noted individual **Monthly** exceedances >60µg/m^3

Site number	Month	With bias (0.93) correction
RY14	January	68
RY23	February	60.5
RY23	October	60.5
RY23	November	68
RY26	January	60.5
RY26	February	63
RY52	January	61.5
RY56	January	64.6
RY63	February	102

When generally comparing 2017 bias corrected levels to 2016 bias corrected levels it shows that there has been a decrease in levels of nitrogen dioxide at 16 of the sampling locations. One location remained the same but there were an increase in nitrogen dioxide levels at the 8 other locations. This suggests that in comparing year 2017 to 2016 the air quality situation has overall, on balance improved very slightly. From the graphs produced in appendix A, these depict that over the past 7 years, between 2011 and 2017, concentrations tend to show a slight overall decreasing trend. Nevertheless, it is interesting to consider site RY14 located in the AQMA in Addlestone that has been monitored over the last 7 years which indicates that the levels of nitrogen dioxide at the central point where the traffic lights are located have actually shown an increase in levels for 2017. However the other locations where measurements have been taken within the Addlestone AQMA did show the expected reduction.

It was reported in 2016 Annual Status Report that the site RYMV near to New Haw railway station would be further considered due to some high reading within the winter period of 2016. From a full year's worth of data the average roadside level of nitrogen dioxide was established to be 33µg/m^3 (biased corrected). As it has been

shown to be below the national standards this monitor has now be relocated to a new area for investigation.

3.2.2 Particulate Matter (PM_{10})

PM_{10} is not currently monitored within the Runnymede Borough Council area. However, modelling work for levels of particulate matter within the Borough is being commissioned in order to ascertain, amongst other things, as to whether or not the previous assertions that particulate matter levels do not exceed air quality objectives were correct and to determine if there are potential areas where PM_{10} could actually be in breach of the relevant limits.

3.2.3 Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ is not currently monitored within the Runnymede Borough Council area. However, modelling work for levels of particulate matter within the Borough is being commissioned in order to ascertain ,amongst other things, as to whether or not the previous assertions that particulate matter levels do not exceed air quality objectives were correct and to determine if there are potential areas where $PM_{2.5}$ could actually be in breach of the relevant limits.

3.2.4 Sulphur Dioxide (SO_2)

Sulphur dioxide is not currently monitored within the Runnymede Borough Council area.

Appendix A: Monitoring Results

Table A.1 – 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) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated Continuous Analyser?	Height (m)
RY1	Civic Centre, Station Road, Addlestone	Roadside	X 505065	Y 164613	NO2	Y	8	3	N	2.3
RY4	Riverside , Pitson Close, Addlestone	Urban B/G	X 505727	Y 164624	NO2	N		43	N	2.0
RY8	Ongar Place First School, Milton Road, Addlestone	Suburban (near to M25)	X 504325	Y 163940	NO2	Y	28	21	N	1.9
RY14	1 High Street, Addlestone	Roadside	X 504991	Y 164601	NO2	Y	2	2	N	2.3
RY19	78 Woodham Lane, New Haw	Roadside	X 505227	Y162701	NO2	Y	11	3	N	2
RY21	London Street/Heriot Rd Chertsey	Roadside	X 504261	Y 166945	NO2	N	3	1	N	2
RY23	37 Bridge Rd, Chertsey	Roadside	X 504888	Y 166786	NO2	N	15	1	N	2.2
RY25	1 Pooley Green Rd, Egham	Roadside	X 501748	Y 171316	NO2	Y	10	22	N	2.4
RY26	19, Vicarage Road, Egham	Roadside	X 501716	Y 171383	NO2	Y	9	2	N	2.3

RY33	46 The Avenue, Egham	Intermediate (near M25)	X 501679	Y 171676	NO2	Y	6	15	N	2.1
RY34	St Judes Rd Englefield Green	Roadside	X400334	Y170689	NO2	N	3	2	N	2.3
RY39	Chobham Lane, Longcross,	Roadside	X 498827	Y 166217	NO2	N	New houses building in 2017/18		N	1.8
RY40	Homewood Park, Stonehill Road	Urban B/G	X 502052	Y 165313	NO2	N	-	68	N	2.5
RY43	114 Chertsey Close) Addlestone	Roadside	X 505000	Y 165339	NO2	N	19	2	N	2.3
RY44	87 Church Rd Addlestone	Roadside	X 504621	Y 164434	NO2	N	9	2	N	2.4
RY45	27/29 Weir Rd Chertsey	Roadside	X 504842	Y 166648	NO2	N	7	2	N	2.3
RY52	12 Thorpe Rd, Egham	Roadside	X 503011	Y 171333	NO2	N	6	2	N	2.3
RY53	1-22 Wyvern Place, High St, Addlestone	Roadside	X 504959	Y 164778	NO2	N	7	3	N	2.4
RY54	23 Brighton Rd, Addlestone	Roadside	X 505036	Y 164554	NO2	Y	5	2	N	2.3
RY55	158 Station Rd, Addlestone	Roadside	X 505589	Y 164844	NO2	N	3	0.4	N	2.3
RY56	34/36 Bridge Rd Chertsey	Roadside	X 504911	Y 166766	NO2	N	8	1	N	2.3
RY57	29 Bridge Rd, Cherstey	Roadside	X 504826	Y 166819	NO2	N	9	2	N	2.3

RY58	39 Weir Road. Chertsey	Roadside	X 504859	Y 166701	NO2	N	8	2	N	2.3
RY59	12 Thorpe Rd Egham	Roadside	X 503011	Y 171333	NO2	N	7	2	N	2.3
RY60	Renaissance flats, High Street Addlestone	Roadside	X 504970	Y 164800	NO2	Y	5	3	N	2.4
RY61	Pine Court, Addlestone	Roadside	X 504907	Y 164556	NO2	N	5	2	N	2.4
RY62	26/28 Brighton Road Addlestone	Roadside	X 505082	Y 164431	NO2	Y	5	2	N	2.3
RY63	Garfield Road, Middlesex Court Addlestone	Roadside	X 505248	Y 164518	NO2	N	9	3	N	2.5
RY64	Garfield Road, Addlestone	Roadside	X 505252	Y 164399	NO2	N	11	0.5	N	2.4
RY65	268 Station Road Addlestone	Roadside	X 505803	Y 165037	NO2	N	6	3	N	2.3
RY66	223 Station Rd, Addlestone	Roadside	X 505703	Y164953	NO2	N	12	2	N	2.3
RYMV	Westfield Byfleet Rd (Byfleet train station)	Roadside	X505798	Y162303	NO2	N	12	3	N	2.3

Notes:

(1) Distance from the edge of a public highway where there can be traffic free flowing is the nearest relevant receptor eg domestic property near to the point of measurement

(2) Distance from. the edge of a public highway where there can be traffic free flowing to the point of measurement ie location of diffusion tube

Table A.2 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)				
					2013	2014	2015	2016	2017
RY1	Roadside	Diffusion Tube	100	50	39.5	35	39	39.5	31.1
RY4	Urban Background	Diffusion tube	100	100	26.1	19.6	19.6	22.7	19.2
RY8	Roadside	Diffusion Tube	100	67	28.9	25.5	35.1	24	22
RY14	Roadside	Diffusion Tube	100	100	**54**	**48.2**	**48.6**	**45.6**	**52.4**
RY19	Roadside	Diffusion Tube	100	100	**43.9**	37.3	34.3	33.7	37.7
RY21	Roadside	Diffusion Tube	100	100	36.8	31.5	32.1	35.9	37.5
RY23	Roadside	Diffusion Tube	100	83	**49.4**	36	**42.2**	**42.5**	**55.5**
RY25	Roadside	Diffusion Tube	100	92	33.6	31.6	28.2	30.6	32.5
RY26	Roadside	Diffusion Tube	100	100	**53.8**	**53.9**	**41**	**44**	**46.4**
RY33	intermediate	Diffusion Tube	100	100	37.7	36.6	32.4	30.6	34.1
RY34	Roadside	Diffusion Tube	100	92	30.8	31.1	25.1	24.9	24.7
RY39	Roadside	Diffusion Tube	100	92		26.9	25.1	25.7	25.7
RY40	Urban background	Diffusion Tube	100	100		17.7	17	16.9	17.8
RY43	Roadside	Diffusion Tube	100	100		27.4	34.5	35.2	40.2
RY44	Roadside	Diffusion Tube	100	92		15.3	23.3	29.3	29.8
RY45	Roadside	Diffusion Tube	100	75		31.6	37.2	33.3	**41**
RY52	Roadside	Diffusion Tube	100	25		31.3	34.	30	34
RY53	Roadside	Diffusion Tube	100	100	**48.6**	38.4	39.2	**41.5**	37.6
RY54	Roadside	Diffusion Tube	100	75	37.9	32.7	36.4	33.4	33.4
RY55	Roadside	Diffusion Tube	100	92	38.8	36.2	35.9	34.1	36.4

RY56	Roadside	Diffusion Tube	100	25		**48.4**	**48.7**	**49.4**	34
RY57	Roadside	Diffusion Tube	100	17		31.5	36.7	30.8	43
RY58	Roadside	Diffusion Tube	100	50		35.2	33.4	31.7	42
RY59	Roadside	Diffusion Tube	100	83		31.2	34	34	34.9
RY60	Roadside	Diffusion Tube	100	100		32.6	38.8	36.3	35.8
RY61	Roadside	Diffusion Tube	100	100				32	34.5
RY62	Roadside	Diffusion Tube	100	100				32.7	37.3
RY63	Roadside	Diffusion Tube	100	67				22.5	51.3
RY64	Roadside	Diffusion Tube	100	75				25.5	28.3
RY65	Roadside	Diffusion Tube	100	100				26.1	29.3
RY66	Roadside	Diffusion Tube	100	100				28.7	27.2
RYMV	Roadside	Diffusion Tube	100	83				34.6	35.3

☒ **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_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 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.

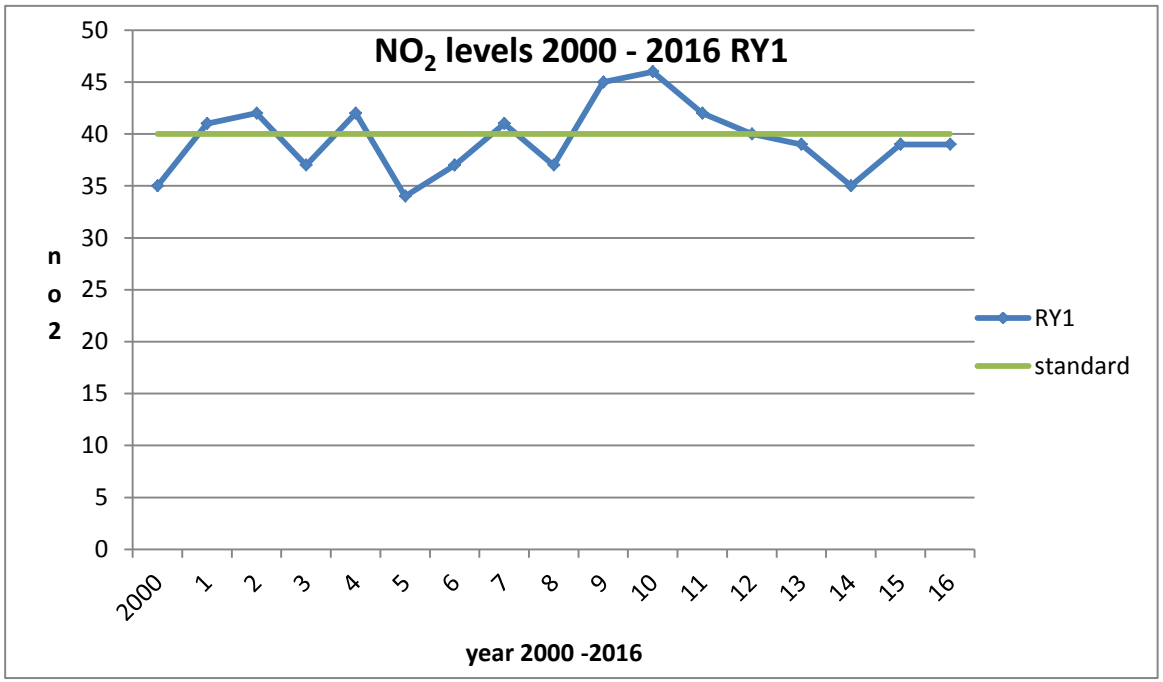
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(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.

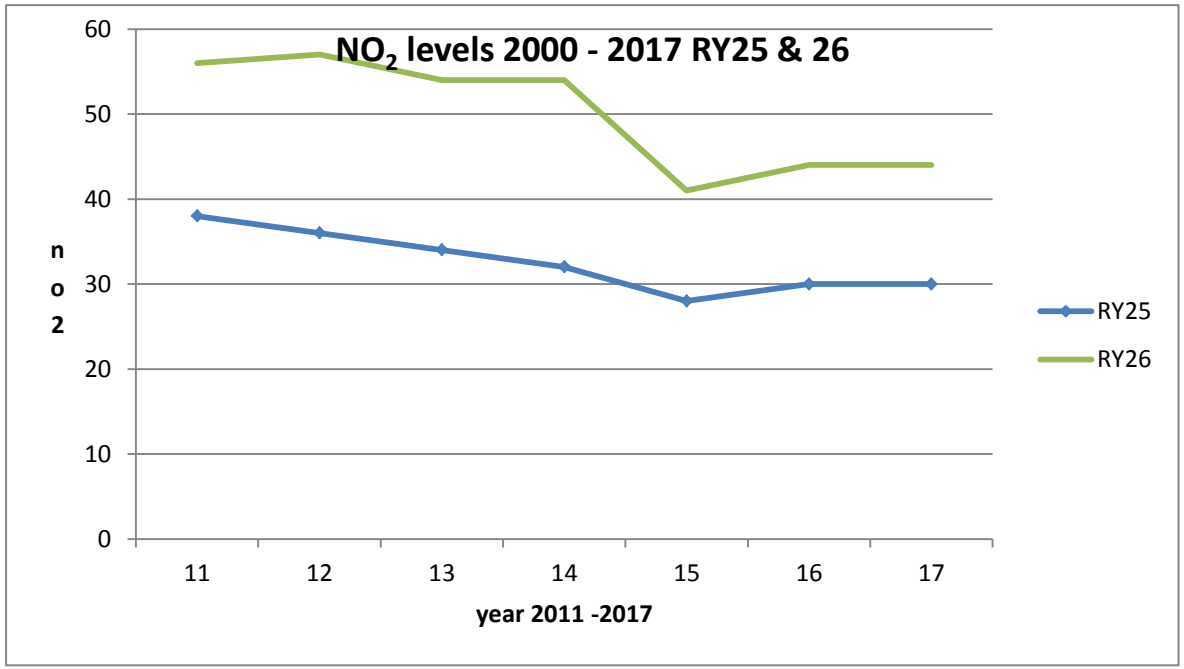
Figure A.1 – Graphical trends in Annual Mean NO_2 Concentrations

Graphs data sets; bias adjusted levels at the point of data collection

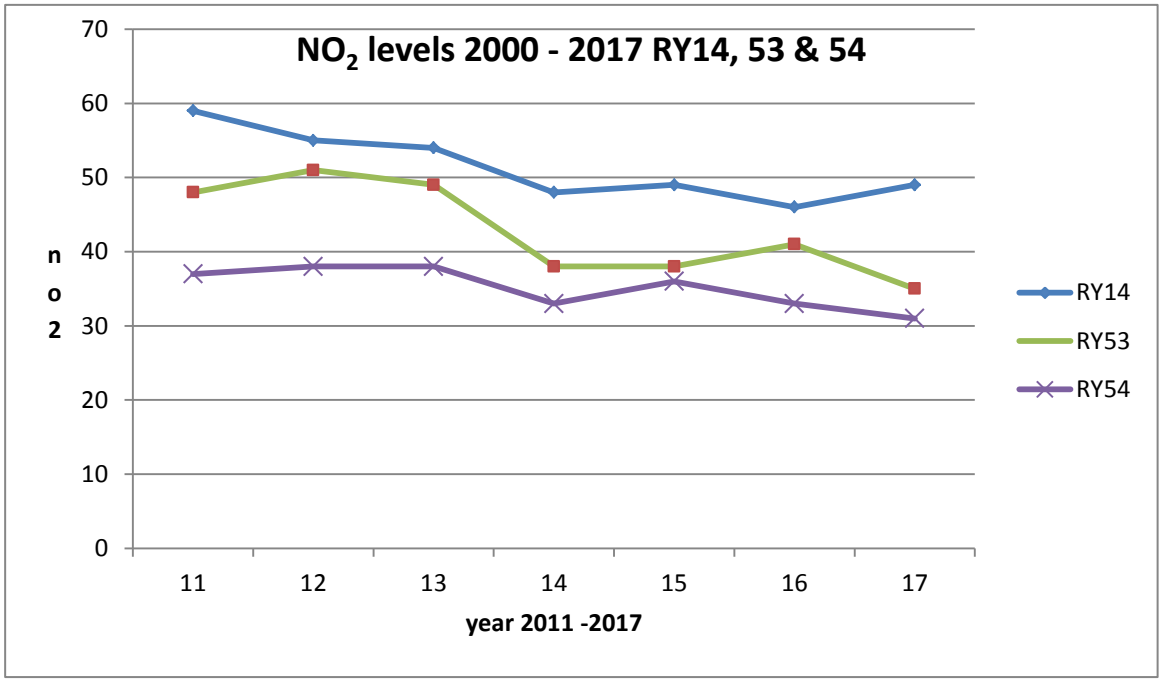
Graph of site RY1 – long term trend in Addlestone



Graph sites RY25 and RY26;- Pooley Green level crossing AQMA



Graph of RY14, RY,53 & RY54 – Addlestone AQMA



Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2017

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor) (1)	Distance Corrected to Nearest Exposure (2)
RY1	tm	tm	tm	tm	37	tm	tm	21	28	34	40	27	*31.1*	*29.8*	-
RY4	32	25	18	13	17	14	16	18	16	18	23	21	19.2	17.8	-
RY8	36	24	21	20	tm	15	tm	tm	tm	18	27	15	*22*	*20.5*	-
RY14	**73**	**59**	**57**	**41**	**44**	**49**	39	35	**51**	**57**	**63**	**61**	**52.4**	**48.7**	**48.7**
RY19	**44**	**43**	34	33	30	42	37	37	35	32	**49**	36	37.7	35.1	31.5
RY21	**54**	**46**	**42**	30	37	34	26	32	31	35	**47**	36	37.5	34.8	31.5
RY23	tm	**65**	**48**	33	tm	**57**	**53**	**53**	**47**	**65**	**74**	**60**	**55.5**	**51.6**	33.8
RY25	**49**	**42**	tm	28	16	30	28	27	29	34	**41**	34	32.5	30.2	28.6
RY26	**65**	**68**	tm	**48**	32	**43**	**43**	35	**42**	**43**	**54**	38	**46.4**	**43.1**	36.7
RY33	**52**	**46**	**45**	32	30	27	30	26	32	29	40	20	34.1	31.7	34.5
RY34	**45**	34	27	21	20	24	tm	10	22	26	26	17	24.7	23	22.2
RY39	38	26	28	15	tm	22	20	26	26	28	27	27	25.7	23.9	-
RY40	**59**	23	18	13	9	10	12	11	13	13	17	16	17.8	16.5	-
RY43	**54**	**52**	36	40	40	31	34	31	37	**50**	**47**	30	**40.2**	37.4	26.7
RY44	**49**	38	tm	24	18	21	27	27	29	29	32	34	29.8	27.7	25.9

RY45	tm	44	25	tm	tm	34	32	tm	**41**	**47**	**56**	**49**	**41**	38.1	32.5
RY52	**66**	tm	tm	32	tm	tm	tm	tm	tm	5	tm	tm	*34*	*31.6*	-
RY53	26	**52**	34	**48**	33	35	36	21	40	37	**48**	**41**	37.6	35	32.2
RY54	**52**	39	28	30	tm	tm	29	23	29	30	40	34	33.4	31.1	28.1
RY55	**62**	**42**	**41**	29	29	35	25	26	31	36	**44**	tm	36.4	33.8	28.7
RY56	tm	tm	**46**	tm	tm	tm	tm	tm	**52**	tm	**56**	tm	***51.3***	***47.7***	-
RY57	tm	tm	**41**	tm	tm	tm	tm	tm	tm	tm	**45**	tm	*43*	*40*	-
RY58	tm	tm	32	tm	tm	23	tm	tm	**53**	**41**	**55**	**49**	***42***	*39*	-
RY59	**57**	tm	31	39	24	22	25	31	tm	38	**47**	35	34.9	32.4	30.3
RY60	**44**	**48**	32	33	37	34	24	34	33	36	44	31	35.8	33.3	28.9
RY61	**48**	**41**	38	34	25	28	24	39	34	31	38	34	34.5	32.1	30.1
RY62	**61**	**48**	37	33	26	31	28	28	35	34	**45**	**42**	37.3	34.7	31.1
RY63		**110**	26	tm	tm	tm	18	23	27	tm	40	28	38.8	36	30.8
RY64	35	tm	26	23	**41**	37	20	23	24	tm	tm	26	28.3	26.3	22.4
RY65	**48**	42	34	26	16	21	18	18	29	32	38	30	29.3	27.2	22.4
RY66	**45**	36	31	20	26	30	20	24	19	24	27	24	27.2	25.3	22.1
RYMV	**53**	**50**	33	29	23	35	36	31	27	36	tm	tm	35.3	32.8	29.9

☒ **National bias adjustment factor used – see below for further information on selection of bias correction factor**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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

(2) Distance corrected to nearest relevant residential or public exposure where there was sufficient cogent information - .

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

Diffusion Tube Bias Adjustment Factors

Runnymede's diffusion tubes are supplied by Lambeth Scientific Services Limited. 50% triethanolamine (TEA) solution is the absorbent used to prepare the tubes.

The bias adjustment factor applied is a combined bias adjustment factor derived from the national database of co-location studies, available from the LAQM Support Website.
The selection of bias correction factors play an important part in relation to air quality. Currently there is much local debate over the selection of such criterial factors. The bias correction factors that have been used since 2000 are produced below in table C.1

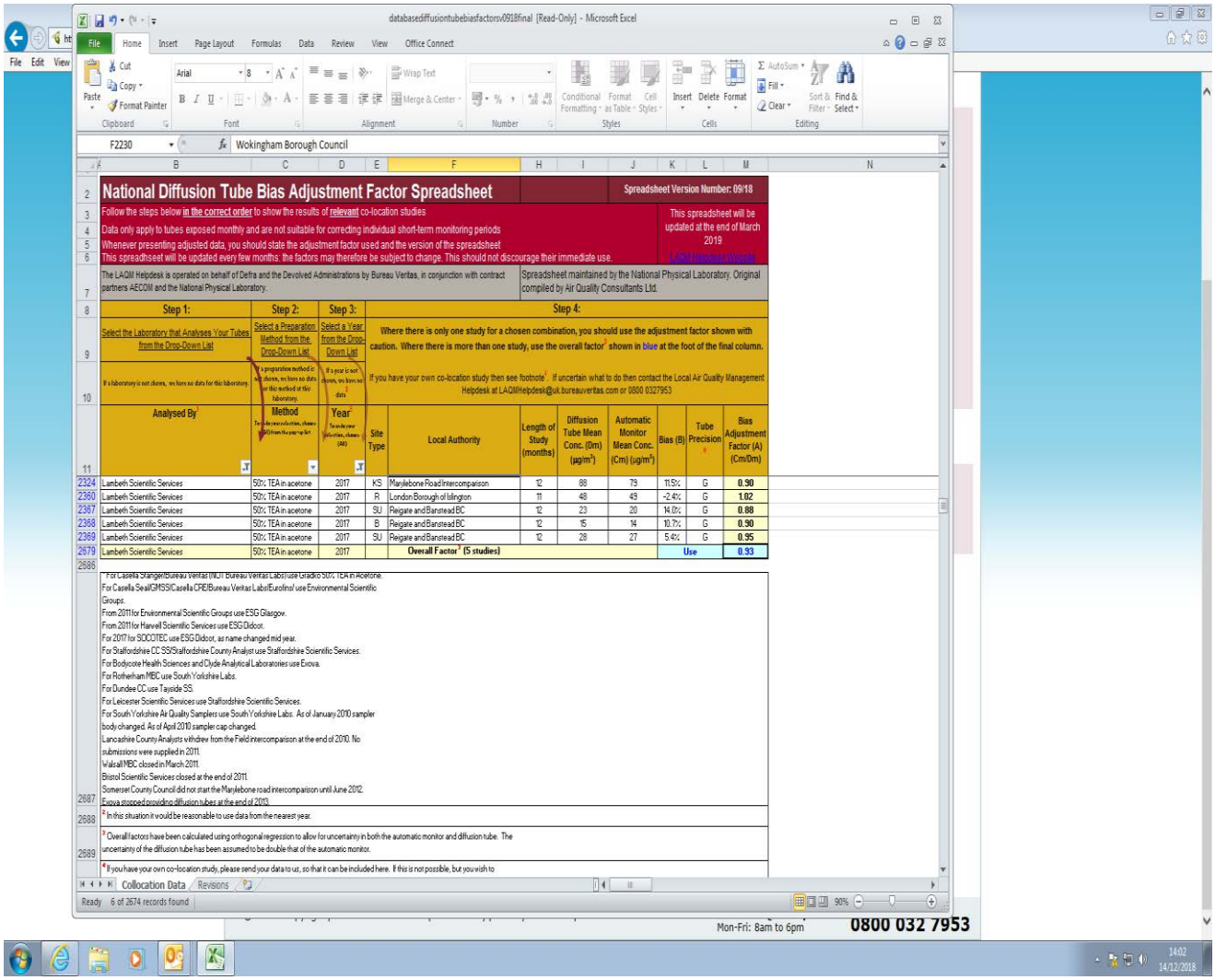
Table C.1 Diffusion Tube Bias Adjustment Factors, 2000-2016

Year	Bias Adjustment Factor
2000	0.97
2001	1.09
2002	1.15
2003	1.05
2004	1.19
2005	1.24
2006	1.28
2007	1.07
2008	0.98
2009	1.03
2010	1.06
2011	1.06
2012	0.87
2013	0.83
2014	0.89
2015	0.97
2016	0.95
2017	0.93

Bias correction factor 2017 = 0.93

Considerations used for the selection of 2017 bias correction factor;-

Figure C.1 -Screenshot of national website bias correction factors



Selection of a bias correction factor

Precision versus accuracy is detailed within DEFRA web site and it states "*where results show poor precision then they should be treated with caution and may not be suitable for their intended purpose. The aim should be to use results from tubes that are giving "good" precision as this will improve the overall reliability of the annual mean concentrations derived from the diffusion tubes*".

Hence in selecting the bias correction factor for 2017 the best quality data is sought and only the sites which could provide "good" precision and have followed the required methodology were selected to work out a "robust" bias correction factor. ((NB good precision is where the coefficient of variance(CV) of multiple exposed

tubes collated with a continuous monitor for eight or more period during the year is less than 20% and the average CV of all monitoring periods is less than 10%).

Since all 5 results posted on the website were considered to have good precision the resultant bias correction figure of 0.93 was selected as the most appropriate factor to be applied to the 2017 data following orthogonal regression averaging.

Annualisation

No annualisation was undertaken on the diffusion tubes results which had less than 75% capture due to the fact that many of the site had a very significant loss of basic data since in some cases only 2-3 months' worth of data was available. It was not therefore considered appropriate in these circumstances.

QA/QC of diffusion tube monitoring

Nitrogen dioxide

Laboratory Performance and WASP scheme

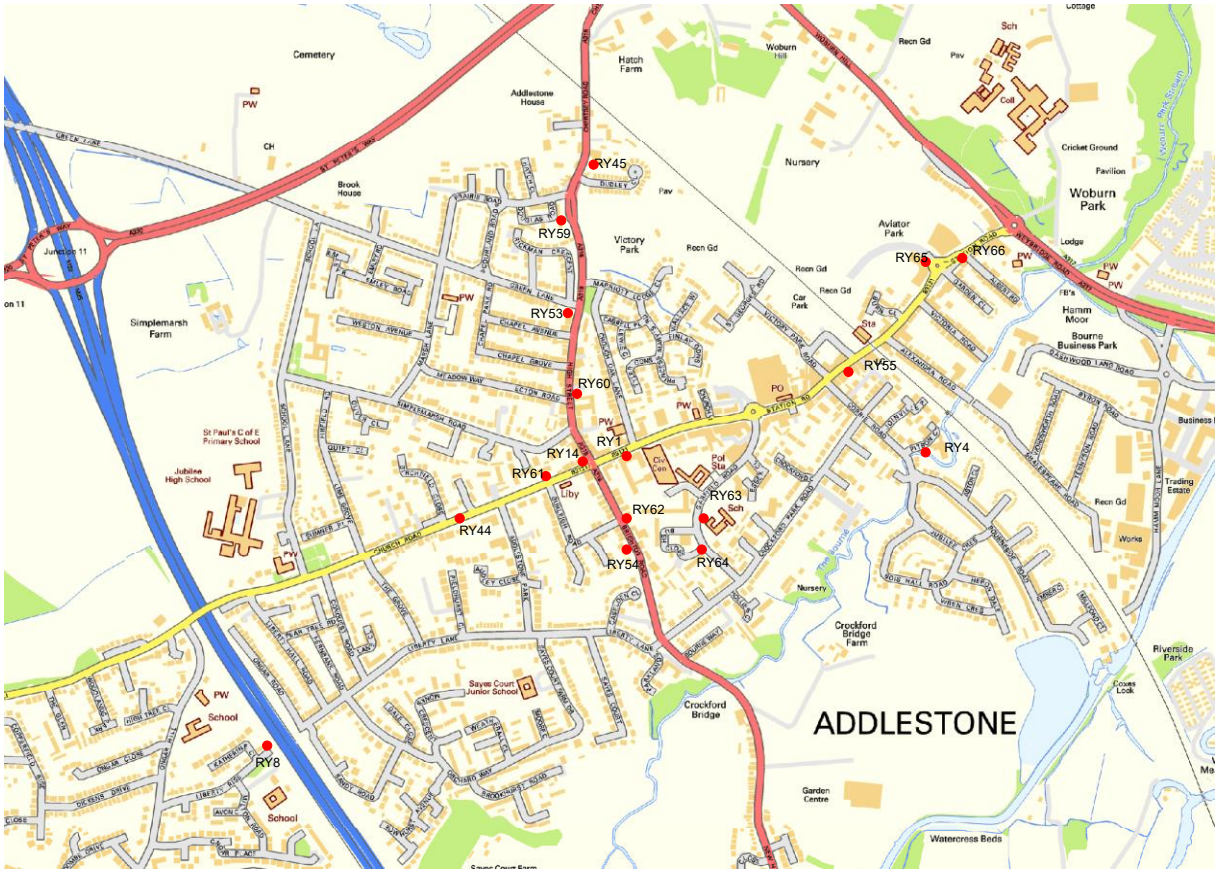
Lambeth Scientific Services Limited follows the procedures set out in the Harmonisation Practical Guidance and participates in the WASP scheme operated by the Health and Safety Laboratory.

Nitrogen dioxide fall-off with distance

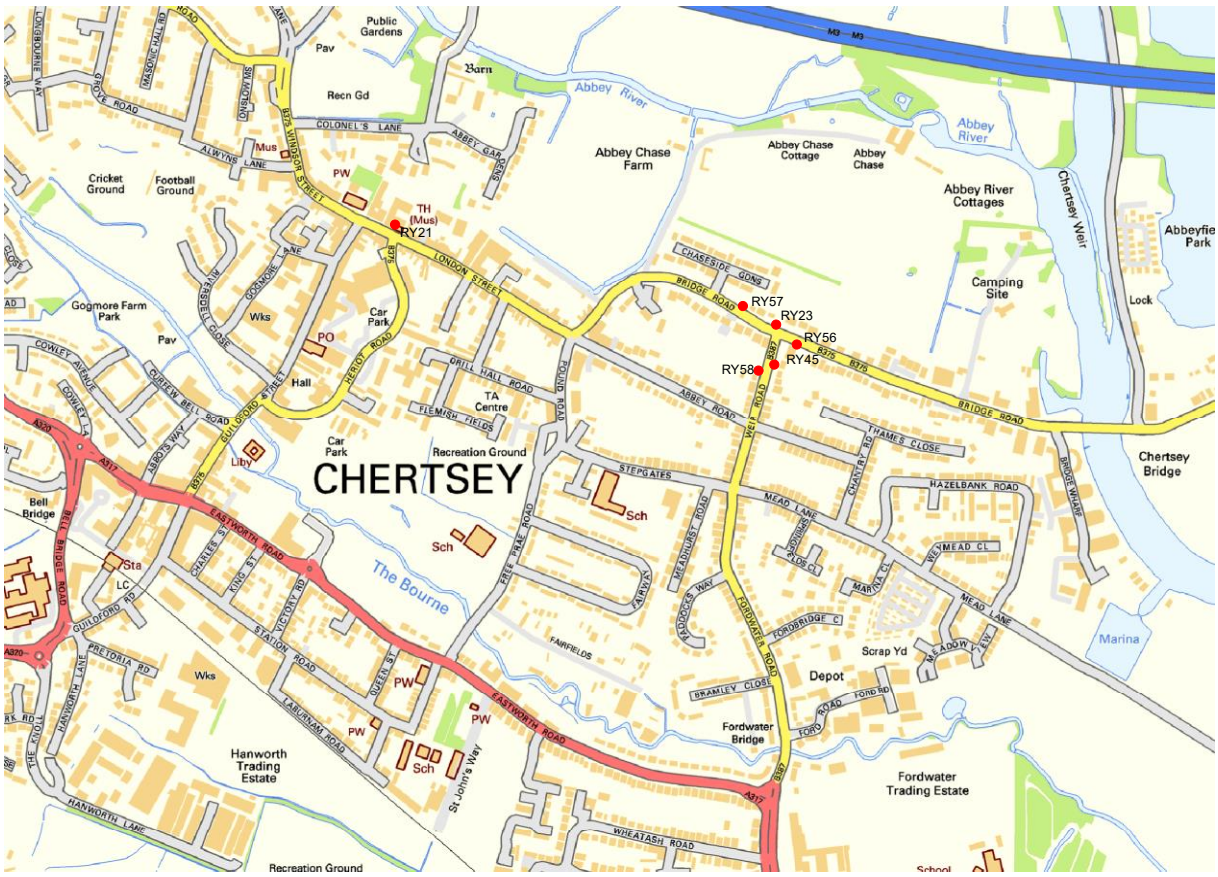
Use of DEFRAs on-line nitrogen dioxide fall-off with distance calculator – version v4.1 released April 2016.

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

Map of monitoring points in and around Addlestone AQMA

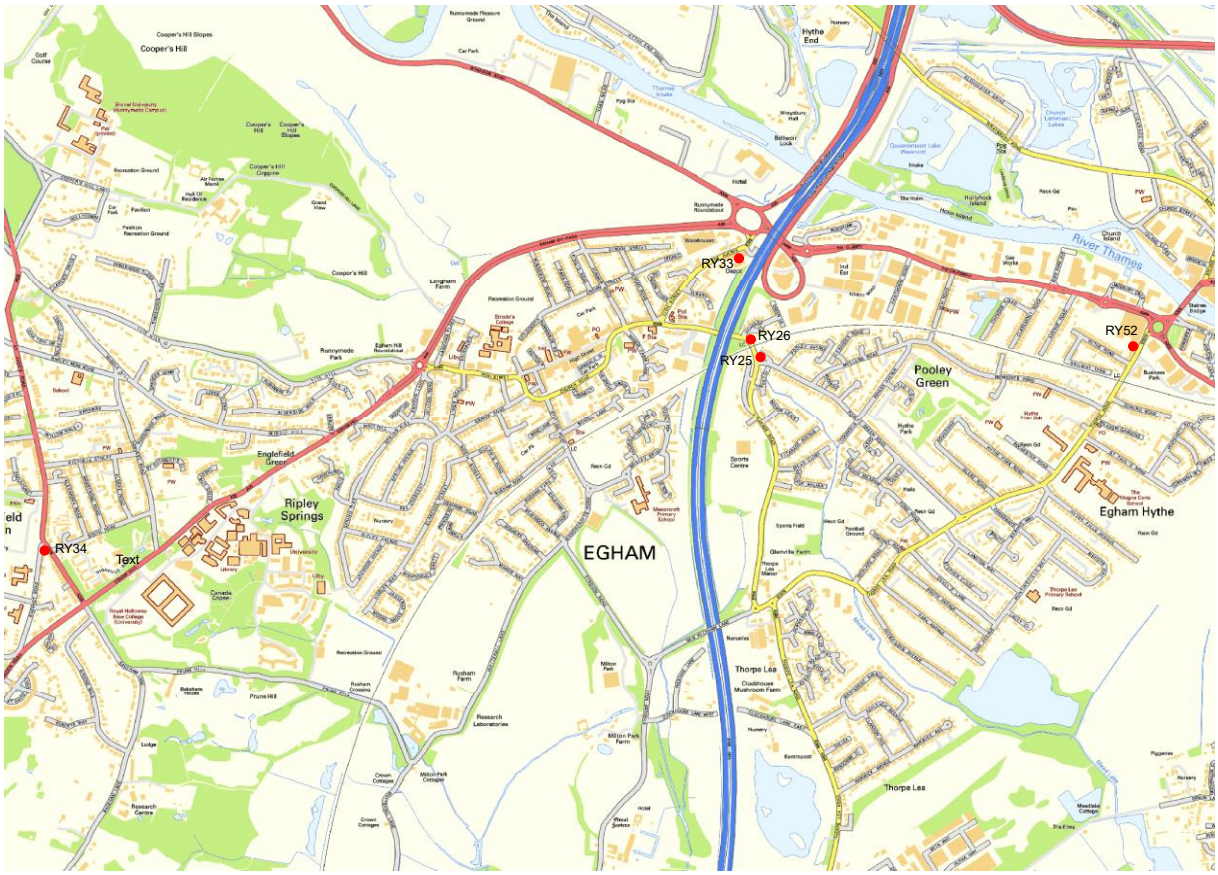


Monitoring sites located within Addlestone AQMA = RY1, RY14, RY54, RY60, RY62,

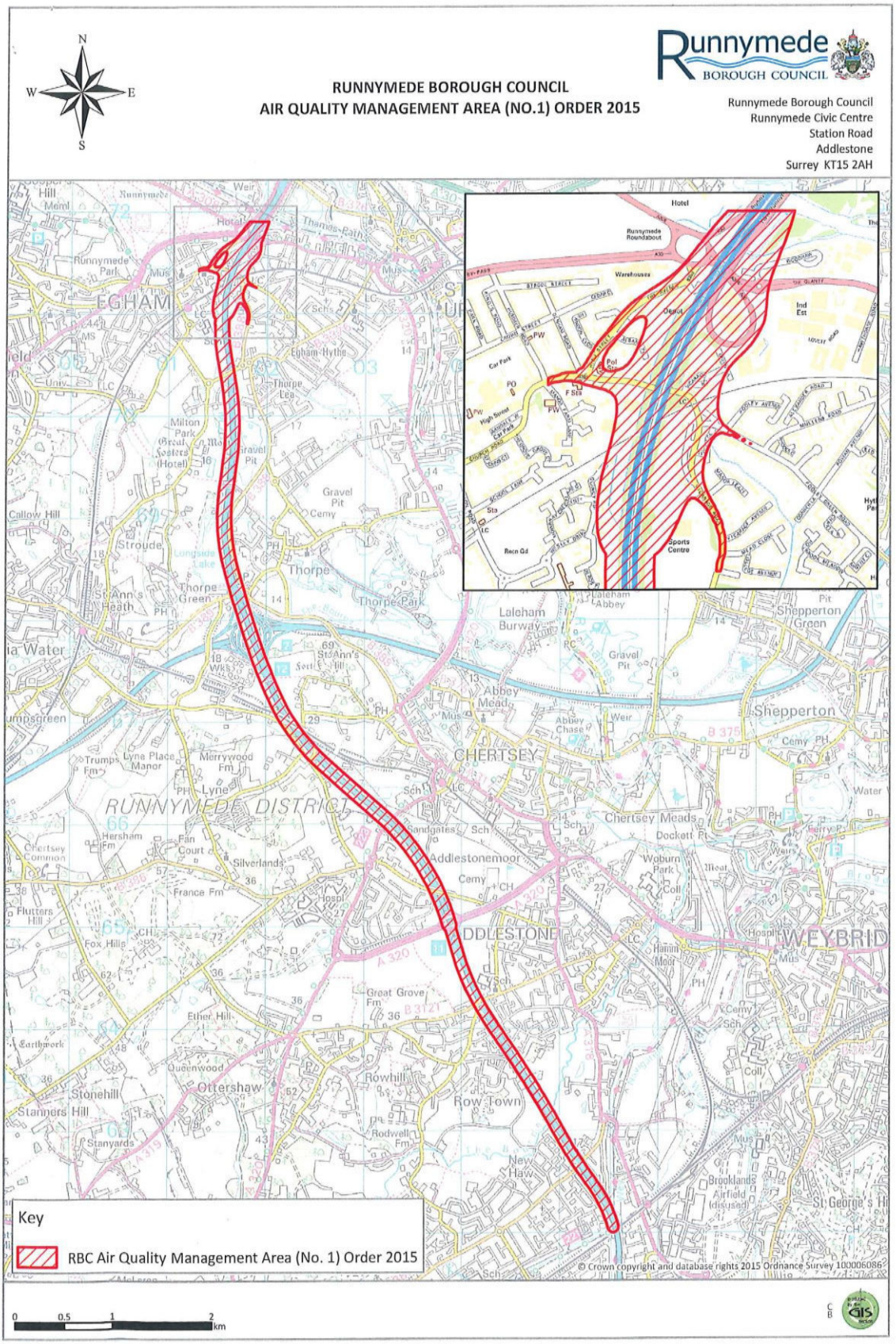


Map of monitoring locations at Weir Rd / Bridge Rd

Map of monitoring locations in Egham



Monitoring sites located within M25(Egham) AQMA= RY25,RY26,RY33



Monitoring sites within M25 AQMA =RY8, RY19, RY25, RY26, RY33

M25 + Egham extension - AQMA
Map of Addlestone AQMA

Monitoring sites located within Addlestone AQMA = RY1, RY14, RY54, RY60, RY62

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[4]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[4] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

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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_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
…	…

References

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- Department for Environment, Food and Rural Affairs [Defra] (April 2016) NO2 Fall-Off with Distance Calculator (Version 4.1). The calculator and supporting guidance document can be downloaded from https://laqm.defra.gov.uk/tools-monitoringdata/no2-falloff.html .