# 2017 Air Quality Annual Status Report

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

## June 2017

Prepared by

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Epsom & Ewell Borough Council

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# Executive Summary: Air Quality in Our Area

## Air Quality in Epsom and Ewell

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].

In common with much of the region, the principle pollutant of concern is nitrogen dioxide arising from road transport. In response to a local hotspot in Ewell High Street, the Council declared an Air Quality Management Area (AQMA) in 2007 and modified the boundary in 2011. An action plan to begin to take measures to improve air quality and reduce exposure was subsequently developed and consulted on. It is recognised that work to improve air quality depends on close cooperation with other agencies. In particular the two tier working arrangements in this area require the local highways authority, Surrey County Council to be involved with air quality matters. Results for 2016 in the AQMA show a reduction from 5 monitoring sites in 2015 being over the objective level to just one site in 2016.

Within the Borough, generally speaking a slow and gradual reduction in nitrogen dioxide levels has been noted over the past decade or more and there have been no new major sources of emissions either transport related or industrial in nature. No new AQMAs have been declared in the past year.

Monitoring is taking place in High Street Epsom where there had been past indications of an exceedance of the nitrogen dioxide annual mean objective. However the most recent analysis using bias adjusted results adjusted for distance indicates any such exceedance is unlikely at the relevant receptor. It is therefore not

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[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

proposed to declare an AQMA for this locality. In addition significant alterations to the road network of Epsom Town Centre are underway and have been designed to remove a proportion of pass through traffic before it encounters the center portion of the town. It is envisaged that this will improve traffic flow and improve air quality at this locality.

The Council coordinates across the County, has local links with transport planners and contributes to the Air Alert system to advise vulnerable persons of a period of imminent poor air quality.

## Actions to Improve Air Quality

No recent actions have been brought forward to directly improve air quality. Actions which have previously been undertaken, specifically within the Ewell High Street area are being monitored to judge effectiveness.

Epsom and Ewell are undertaking detailed modelling of NO2, PM10 and PM2.5 across major roads in the Borough as part of a larger project with the other 10 local authorities within Surrey. It is proposed that modelling will be carried out to produce high resolution maps across the county, showing where objectives are predicted to be exceeded, source apportionment and local mortality burdens. This will allow Epsom and Ewell to better refine and target any future actions to tackle air quality within the Borough.

## Local Priorities and Challenges

The imminent adjustments to Epsom town centre traffic flows as a result of the “Plan E” changes will have an effect on air quality. These changes (currently underway), will involve the return of two way running in the southern end of the town with an expected net reduction in traffic levels in the remainder of the locality as a result. It is expected that an overall improvement in air quality will result and the Council will continue to monitor at key locations to assess changes.

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## List of Tables

# 1 Local Air Quality Management

This report provides an overview of air quality in the Epsom and Ewell district 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 Epsom & Ewell 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 the objectives.

A summary of the AQMA declared by Epsom & Ewell Borough Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=100

**Table 2.1 – Declared Air Quality Management Areas**

| AQMA Name | Pollutants and Air Quality Objectives | City / Town | One Line Description | Action Plan |
|---|---|---|---|---|
| Ewell High Street AQMA | $NO_2$ annual mean | Ewell | An area encompassing the section of High Street, Ewell from the junction with Spring Street to the mini roundabout at the junction with Cheam Road and continues a further 30 metres south on High Street Ewell. | Ewell High Street Action Plan |

## 2.2 Progress and Impact of Measures to address Air Quality in Epsom and Ewell

Epsom & Ewell Borough Council has largely worked through the achievable measures outlined in the Ewell High Street AQMA Action Plan. The remaining measures are judged to be unaffordable or non-viable at the present time. Table 2.2 contains an update on the original action plan, highlighting where actions have not progressed and indicating which measures have been delivered.

## Table 2.2 – Progress on Measures to Improve Air Quality

| Measure No. | Measure | EU Category | EU Classification | Lead Authority | Planning Phase | Implementation Phase | Key Performance Indicator | Target Pollution Reduction in the AQMA | Progress to Date | Estimated Completion Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Remove the formally marked parking bays from 53 to 67 High Street | Transport Planning and Infrastructure | Other | Surrey County Council | Complete | Complete | None | High | Complete | - | An evolution of this proposal was brought forward and delivered |
| 2 | Widen the road at 76 – 62 High Street | Transport Planning and Infrastructure | Other | Surrey County Council | Compete | Complete | None | High | Complete | - | Carried out in conjunction with above measure |
| 3 | Remove on-street car parking on Church Street junction. | Transport Planning and Infrastructure | Other | Surrey County Council | - | - | None | Medium | Not started | - | Opinion sought that proposal would be difficult to achieve and not offer exceptional air quality gains. |
| 4 | Alter the junction of Cheam Road/High Street* | Transport Planning and Infrastructure | Other | Surrey County Council | Complete | Complete | None | High | Complete | - | A conventional give way junction has replaced the mini roundabout. Queuing traffic now occurs away from AQMA. |
| 5 | Re-apply for traffic regulation order in relation to 7.5 tonne weight restriction | Traffic Management | Emission based parking or permit charges | Surrey County Council | - | - | - | Low | Not started | - | Not a priority for local transport service |

| Measure No. | Measure | EU Category | EU Classification | Lead Authority | Planning Phase | Implementation Phase | Key Performance Indicator | Target Pollution Reduction in the AQMA | Progress to Date | Estimated Completion Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | Place restrictions on delivery times and stopping on High Street between Cheam Road and Spring Street junctions | Traffic Management | Parking Enforcement on highway | Epsom & Ewell Borough Council | Complete | Complete | None | Medium | Complete | Complete | Stopping/Delivery restrictions in place in the most pollution sensitive area |
| 7 | Paint 'keep clear' lines at entrance to junctions of High Street with Church Street and West Street. | Transport Planning and Infrastructure | Other | Surrey County Council | - | - | - | Medium | Not started | - | No longer favoured by local transport service |
| 8 | Pedestrianise Ewell High Street in conjunction with Kiln Lane Link | Transport Planning and Infrastructure | Other | Surrey County Council | - | - | None | High | Not started – non viable | - | Kiln Lane link presently unfunded |
| 9 | Pedestrianise Ewell High Street without Kiln Lane Link | Transport Planning and Infrastructure | Other | Surrey County Council | - | - | None | High | Not started – non viable | - | Feedback indicates not a priority |
| 10 | Implement a one-way system | Transport Planning and Infrastructure | Other | Surrey County Council | - | - | None | High | Not started – non viable | - | Dependent on Kiln Lane Link |
| 11 | Remove the traffic lights at the junction between Spring Street and High Street | Transport Planning and Infrastructure | Other | Surrey County Council | - | - | None | High | Not started – non viable | - | Judgement that the worsening of pedestrian safety was unacceptable |

| Measure No. | Measure | EU Category | EU Classification | Lead Authority | Planning Phase | Implementation Phase | Key Performance Indicator | Target Pollution Reduction in the AQMA | Progress to Date | Estimated Completion Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | Replace the pelican crossing outside market parade with zebra crossing | Transport Planning and Infrastructure | Other | Surrey County Council | - | - | None | Medium | Not started - unnecessary | - | Clarification was received that these lights were linked with traffic control signals and had no effect on traffic flow |
| 13 | Implement a one-way system on Church Street/West Street | Transport Planning and Infrastructure | Other | Surrey County Council | - | - | None | Medium | Not started | - | Non viable at present |

## 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 PM2.5 (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM2.5 has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases. Epsom & Ewell Borough Council does not intend to proactively monitor for $PM_{2.5}$ but will make use of national and local modelling. In general, measures to reduce emissions of $NO_2$ will have a complementary effect on PM2.5 and it is not foreseen that any actions will flow to address PM2.5 in isolation.

Given the low concentration and difficulty in modelling PM2.5 all local authorities in Surrey are in preliminary proposals to undertake detailed modelling for this and other pollutants, source apportionment and, optionally, the calculation of local mortality burdens related to air quality, to be carried out across the eleven Surrey local authorities for the year 2015. All major roads within Surrey will be modelled explicitly. It is proposed that modelling will be carried out to produce high resolution maps across the county, showing where objectives are predicted to be exceeded. It is also envisaged that calculations of local mortality burdens will be carried out, based on the modelled annual average concentrations of NO2, PM10 and PM2.5, combined with population data by ward area. This will include attributable deaths and associated life-years lost, by pollutant. Where possible, the combined impact of both pollutants will be calculated. The Council is in preliminary stages of procurement process for this and if successful, it is proposed to go ahead in late 2017.

# 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.

Epsom & Ewell Borough Council undertook automatic (continuous) monitoring at one site during from 2007-2016. This site was closed in January 2017. Table A.1 in Appendix A shows the details of the site. A map showing the former location of the monitoring site is provided in Appendix D. Further details on how the monitors were calibrated and how the data has been adjusted are included in Appendix C.

### 3.1.2 Non-Automatic Monitoring Sites

Epsom & Ewell Borough Council undertook non- automatic (passive) monitoring of $NO_2$ at 26 sites during 2016 having added a site at the south side of Ewell High Street. Table A.2 in Appendix A shows the details of the site. Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

## 3.2 Individual Pollutants

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

### 3.2.1 Nitrogen Dioxide ($NO_2$)

Table A.3 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 2016 bias adjusted dataset of monthly mean values is provided in Appendix B. Five tubes displayed annual mean concentrations above the

objective. Three are in the existing Ewell High Street AQMA including two which were collocated with the automatic analyser and consequently they are not a particular additional cause for concern. The other sites located in the AQMA have now fallen below the objectives except for one – EE10 which has consistently recorded concentrations above the objective since 2003 but which has seen its exposure reduce in recent years from a peak in 2009.

The other two sites showing an exceedance is are EE7 and EE22 both of which are located away from relevant receptors. Table 3.1 details these tubes and includes corresponding calculated concentrations at the nearest receptor.

**Table 3.1 - Tube Exceedances**

| Site ID | Site Name | Distance to Relevant Exposure (m) | Distance to kerb of nearest road (m) | Height (m) | 2016 bias adjusted annual mean | Calculated annual mean at receptor* |
|---|---|---|---|---|---|---|
| EE22 | High Street Epsom | 3 | 0.1 | 2 | 48.1 | 35 |
| EE7 | Junction Ruxley Lane/Kingston Road | 4 | 7.8 | 2 | 41.8 | 39.2 |

*based on methodology contained in LAQM TG16 and the tool at laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

Table A.4 in Appendix A displays the ratified continuous monitored $NO_2$ hourly mean concentrations for 2016 with the air quality objective of 200µg/m$^3$, not to be exceeded more than 18 times per year. Although data relating to certain earlier years is not readily available, the fact that the recorded annual mean concentrations do not approach 60µg/m$^3$ strongly indicates the hourly objective has not been offended in any year.

# Appendix A: Monitoring Results

### Table A.1 – Details of Automatic Monitoring Sites (Closed Jan 2017)

| 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) (1) | Distance to kerb of nearest road (m) (2) | Inlet Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EWE2 | Ewell High Street | Roadside | 521982 | 162657 | $NO_2$ | Y | Chemiluminescent | 5 | 3 | 1.5 |

(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) (1) | Distance to kerb of nearest road (m) (2) | Tube collocated with a Continuous Analyser? | Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EE1 | The Clock Tower | Roadside | 520732 | 160762 | $NO_2$ | N | 18 | 6.1 | N | 2 |
| EE3 | 26 The Crescent-Background | Urban Background | 519293 | 160026 | $NO_2$ | N | 9 | 2 | N | 2 |
| EE6 | Jct Kingston Rd/ Worcester Park Rd | Roadside | 520525 | 165040 | $NO_2$ | N | 7.5 | 8 | N | 2 |
| EE7 | Jct Ruxley Lane/Kingston Rd | Roadside | 520916 | 164636 | $NO_2$ | N | 0 | 8.5 | N | 2 |
| EE9 | Chessington Road, Ewell | Kerbside | 519830 | 163740 | $NO_2$ | N | 9.2 | 4 | N | 2 |
| EE10 | High Street, Ewell | Kerbside | 521998 | 162633 | $NO_2$ | Y | 1 | n/a | N | 2 |
| EE14 | Hook Road Epsom- | Kerbside | 520885 | 161308 | $NO_2$ | N | 5 | n/a | N | 2 |
| EE16 | Church Street/High Street Ewell | Kerbside | 522026 | 162624 | $NO_2$ | N | 0 | n/a | N | 2 |
| EE17 | High Street Ewell | Kerbside | 522025 | 162563 | $NO_2$ | Y | 0 | 2.2 | N | 2 |

| 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 with a Continuous Analyser? | Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EE22 | High Street, Epsom | Kerbside | 520965 | 160871 | $NO_2$ | N | 3 | n/a | N | 2 |
| EE24 | Ewell High Street- Triplicate | Roadside | 521069 | 160817 | $NO_2$ | Y | 0 | 2.5 | Y | 1.8 |
| EE25 | Ewell High Street- Triplicate | Roadside | 521069 | 160817 | $NO_2$ | Y | 0 | 2.5 | Y | 1.8 |
| EE26 | Ewell High Street- Triplicate | Roadside | 521069 | 160817 | $NO_2$ | Y | 0 | 2.5 | Y | 1.8 |
| EE36 | Capitol Square, Church Street | Roadside | 521069 | 160817 | $NO_2$ | N | 0 | 10 | N | 2 |
| EE37 | British Heart Foundation, High Street | Roadside | 520726 | 160857 | $NO_2$ | N | 0 | 5 | N | 2 |
| EE38 | Station Approach | Roadside | 520726 | 160857 | $NO_2$ | N | 0 | 4 | N | 1.5 |
| EE39 | The Parade | Roadside | 520844 | 160729 | $NO_2$ | N | 0 | 3.6 | N | 2 |
| EE40 | Derby Square | Roadside | 521982 | 162661 | $NO_2$ | N | 0 | 21 | N | 2.5 |
| EE41 | Derby Square/High Street | Roadside | 521982 | 162660 | $NO_2$ | N | 0 | 33.5 | N | 2 |

| 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 with a Continuous Analyser? | Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EE42 | High Street/East Street | Roadside | 521004 | 160901 | $NO_2$ | N | 0 | 10 | N | 2 |
| EE43 | Kiln Lane | Roadside | 521478 | 161447 | $NO_2$ | N | 0 | 7 | N | 1.5 |
| EE45 | Castle Parade | Roadside | 522211 | 163103 | $NO_2$ | N | 0 | 8 | N | 2 |
| EE46 | Waterloo Road | Roadside | 520724 | 161027 | $NO_2$ | N | 0 | 10 | N | 2 |
| EE47 | Chessington Road | Roadside | 520713 | 162968 | $NO_2$ | N | 0 | 4.5 | N | 2 |
| EE48 | Ewell High Street South | Roadside | 522022 | 162502 | $NO_2$ | N | 0 | 2.5 | N | 2 |

(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.

## Table A.3 – Annual Mean $NO_2$ Monitoring Results

| Site ID | Site Type | Monitoring Type | Valid Data Capture 2016 (%) [2] | $NO_2$ Annual Mean Concentration ($\mu g/m^3$) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2012 | 2013 | 2014 | 2015 | 2016 |
| EWE2 | Roadside | Automatic | 96 | **47** | **49** | -* | **44** | **45** |

Notes: Exceedances of the $NO_2$ annual mean objective of 40$\mu g/m^3$ are shown in **bold**.

* - Data unreliable/missing

## Table A.4 – 1-Hour Mean $NO_2$ Monitoring Results

| Site ID | Site Type | Monitoring Type | Valid Data Capture 2016 (%) [2] | $NO_2$ 1-Hour Means > 200$\mu g/m^3$ [3] |
|---|---|---|---|---|
| | | | | 2016 |
| EWE2 | Roadside | Automatic | 96 | 2 |

Notes: Exceedances of the $NO_2$ 1-hour mean objective (200$\mu g/m^3$ not to be exceeded more than 18 times/year) are shown in **bold.**

# Appendix B: Full Monthly Diffusion Tube Results for 2016

## Table B.1 – $NO_2$ Monthly Diffusion Tube Results - 2016

| Location | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Raw Data | Bias Adjusted(1) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EE1 The Clock tower-Roadside | 41 | 31 | 49 | 42 | 29 | 29 | 30 | 29 | 36 | | 43 | 51 | 37.27 | 39.14 |
| EE3 26 The Crescent-Background | 25 | 24 | 26 | 17 | 16 | 15 | 11 | 11 | 15 | 19 | 21 | 31 | 19.25 | 20.21 |
| EE6 Jct Kingston Rd/ Worcester Park Rd-Kerbside | 43 | 38 | 29 | 39 | 28 | 25 | 25 | 25 | 30 | 42 | 53 | 52 | 35.75 | 37.54 |
| EE7 Jct Ruxley Lane/Kingston Rd-Kerbside | 43 | 38 | 41 | 47 | 37 | 30 | | 31 | | 40 | 40 | 51 | 39.80 | 41.79 |
| EE9 Chessington Road, Ewell | 38 | 35 | 32 | 31 | 19 | 23 | 22 | 24 | 26 | 20 | 31 | 40 | 28.42 | 29.84 |
| EE10 High Street, Ewell - kerbside | 68 | 47 | 53 | 49 | 33 | 46 | 44 | 43 | | 50 | 51 | 67 | 50.09 | 52.60 |
| EE14 Hook Road Epsom-roadside | 36 | 31 | 38 | 27 | 21 | 15 | 21 | 18 | 24 | 24 | 34 | 42 | 27.58 | 28.96 |
| EE16 Church Street/High Street Ewell | 39 | 30 | 36 | 33 | 20 | 28 | 26 | 26 | 29 | 35 | 39 | 43 | 32.00 | 33.60 |
| EE17 40A High Street Ewell | 42 | 34 | 41 | 31 | 32 | 29 | 26 | 33 | 29 | 32 | 39 | 43 | 34.25 | 35.96 |
| EE22 High Street, Epsom - roadside | 49 | 40 | 57 | 35 | 41 | 48 | 47 | 42 | | 47 | 49 | 49 | 45.82 | 48.11 |
| EE24 Ewell High Street-Triplicate | 48 | 30 | 41 | 49 | 34 | 40 | 38 | 37 | 50 | | 43 | 41 | 41.00 | 43.05 |
| EE25 Ewell High Street-Triplicate | 48 | 32 | 44 | 48 | 33 | 38 | 39 | 27 | 44 | 28 | 45 | 53 | 39.92 | 41.91 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EE26 Ewell High Street-Triplicate | 41 | 33 | 44 | 32 | 35 | 30 | 35 | 18 | 41 | 32 | 42 | 47 | 35.83 | 37.63 |
| EE36 Capitol Square, Church Street | 30 | 20 | 38 | 25 | 19 | 24 | 24 | 25 | 23 | 36 | 33 | 35 | 27.67 | 29.05 |
| EE37 British Heart Foundation, High Street | 44 | 27 | 48 | 37 | 30 | 33 | | 32 | 38 | | 42 | | 36.78 | 38.62 |
| EE38 Hudson House | 33 | 27 | 34 | 31 | 22 | 21 | | 18 | 27 | 32 | 31 | | 27.60 | 28.98 |
| EE39 The Parade | 39 | 39 | 39 | 33 | 32 | 26 | 30 | 29 | 32 | 37 | 31 | 40 | 33.92 | 35.61 |
| EE40 Derby Square | 31 | 22 | 39 | 35 | 19 | 21 | 20 | 25 | 22 | 23 | | 37 | 26.73 | 28.06 |
| EE41 Derby Square/High Street | 32 | 25 | 36 | 39 | 30 | 33 | 32 | 29 | 17 | 39 | 45 | 39 | 33.00 | 34.65 |
| EE42 High Street/East Street | 30 | 32 | 34 | 29 | 22 | 31 | 32 | 27 | 32 | 37 | 33 | 37 | 31.33 | 32.90 |
| EE43 Kiln Lane | 39 | 32 | 41 | 32 | 28 | 28 | 30 | 27 | 27 | 33 | 33 | 43 | 32.75 | 34.39 |
| EE44 Ewell High Street/ Spring Street | | | | | | | | | | | | 36 | 36.00 | 37.80 |
| EE45 Castle Parade | 26 | 26 | 35 | 25 | 25 | 25 | 23 | 21 | 24 | 32 | 30 | 31 | 26.92 | 28.26 |
| EE46 Waterloo Road | | 27 | 26 | 19 | 16 | 19 | 21 | 9 | | | | 38 | 21.88 | 22.97 |
| EE47 Chessington Road | 28 | | 37 | 32 | 31 | 27 | 28 | | 23 | 30 | 33 | 45 | 31.40 | 32.97 |
| EE48 Ewell High Street South | 38 | 30 | 34 | 24 | 22 | 29 | 30 | 27 | 34 | 39 | | | 30.70 | 32.24 |

(1) See Appendix C for details on bias adjustment

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

No significant sources or alteration to road layout and traffic flows have been introduced. Monitoring is taking place in High Street Epsom where there had been an indication of an exceedance of the nitrogen dioxide annual mean objective. However the most recent analysis using bias adjusted annualised results adjusted for distance indicates any such exceedance is unlikely at the relevant receptor. It is not proposed to declare an Air Quality Management Area on the basis of these marginal results alone. In addition significant alterations to the road network of Epsom Town Centre has been designed to remove a proportion of pass through traffic before it encounters the centre portion of the town and it is envisaged that this will improve traffic flow and improve air quality at this locality to the degree that this marginal site will become acceptable to all.

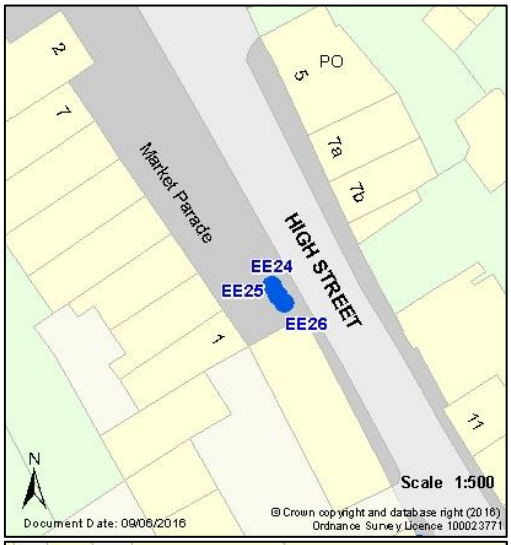
The diffusion tubes are supplied and analysed by Lambeth Scientific Services. The method of preparation is 50% TEA in acetone. The lab follows the procedures set out in the Practical Guidance Documents.

The analysing laboratory participates in the AIR $NO_2$ Proficiency Testing Scheme for diffusion tubes which provides a Quality Assurance / Quality Control (QA/QC). It achieved a 100 percent score for the last four rounds of this scheme.

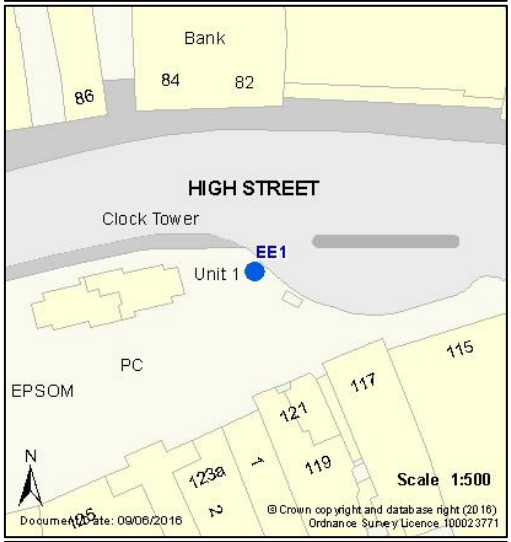
During the final drafting of this report a revised Diffusion Tube Bias Adjustment Factor spreadsheet became available containing additional studies of relevance. Local data has been incorporated into this national set in accordance with the advice contained within the spreadsheet to produce a bias adjustment factor of 1.05 and all calculations revised.

The automatic analyser LSO visits were carried out by Officers from the Environmental Health Team every two weeks in line with manufacturer recommendations. This included a calibration check and basic functional checks. A maintenance contract ensured the device received a full service every six months and the data acquisition, scaling and ratification was carried out by consultants on behalf of the Council. This is monitoring station has now closed and the Council is looking to undertake modelling in partnership with a number of Surrey Local Authorities.

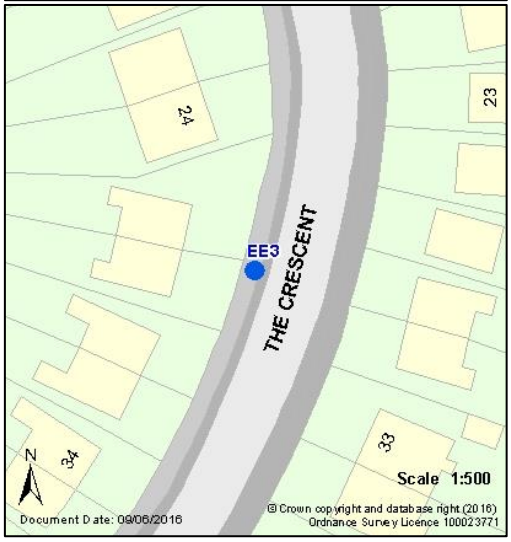
# Appendix D: Map(s) of Monitoring Locations



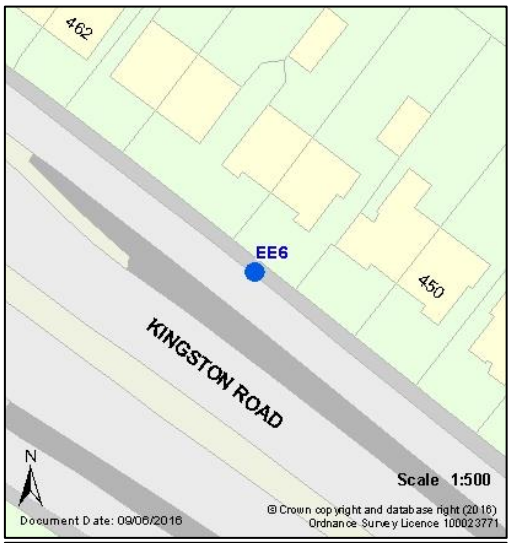

Continuous Analyser Ewell High Street



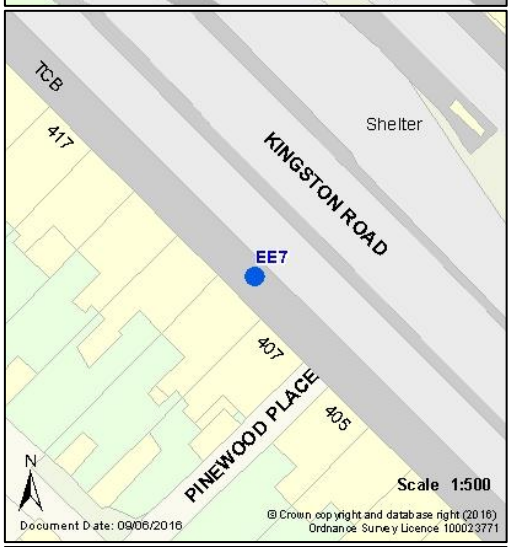

EE1 Clock Tower Epsom



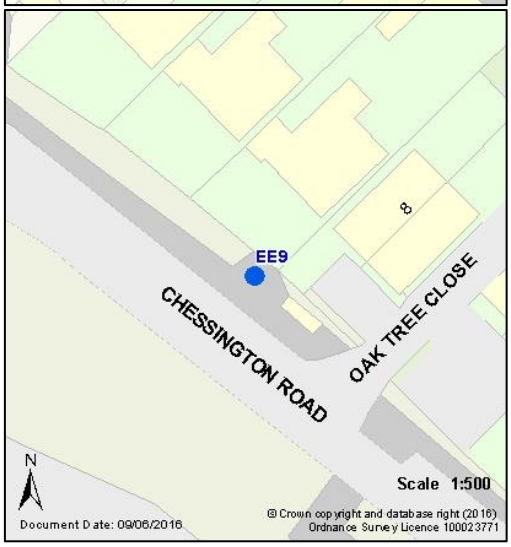

EE3 The Crescent Epsom




EE6 Kingston Road, Ewell

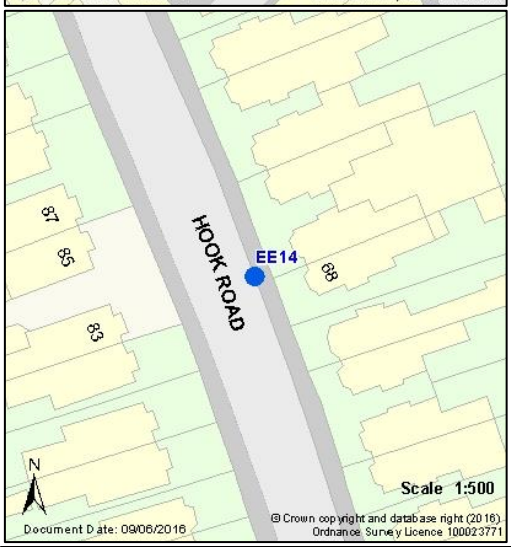



EE7 Kingston Road Ewell

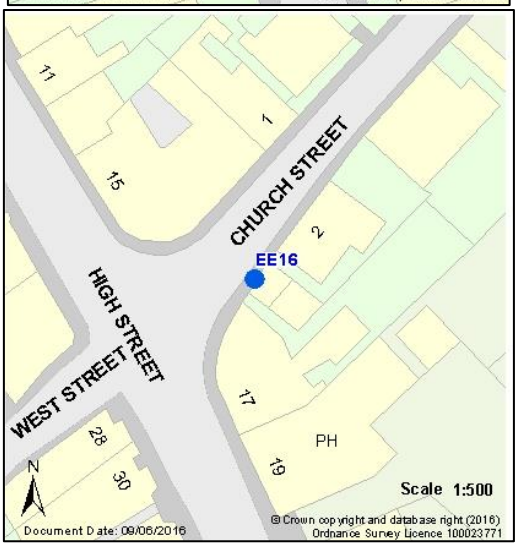



EE9 Chessington Road Ewell

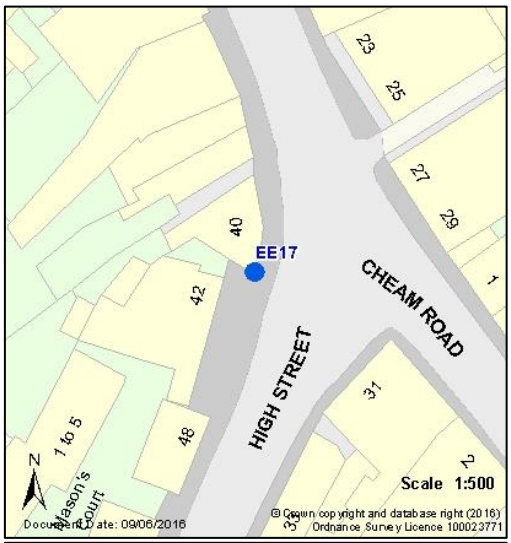

EE10 High Street Ewell




EE14 Hook Road Epsom




EE 16 Church Street Ewell

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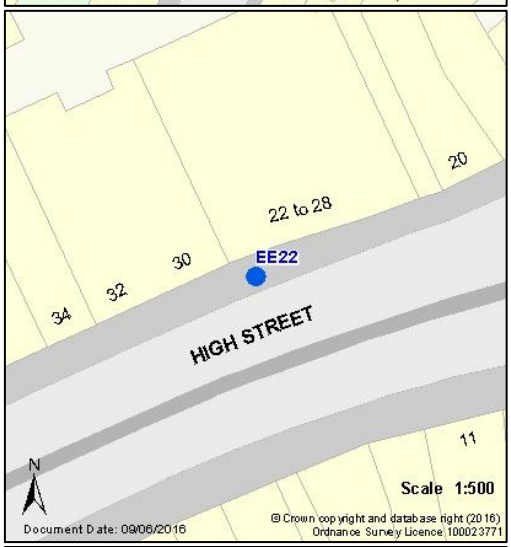


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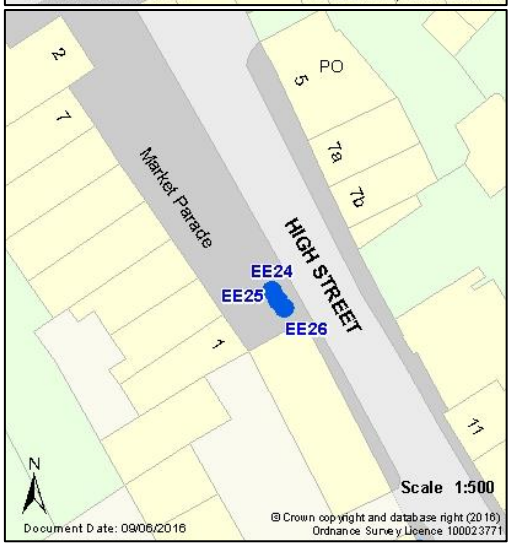
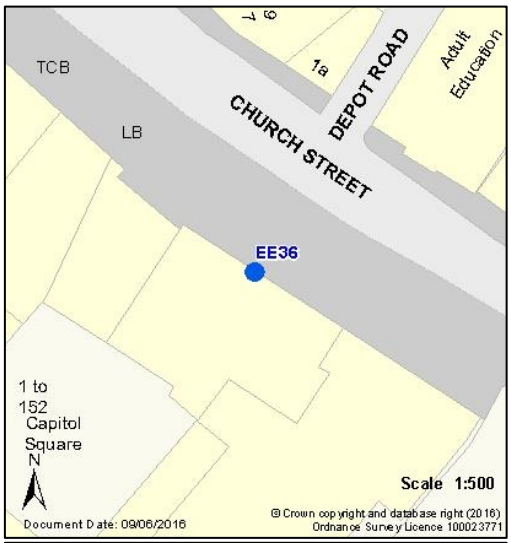



EE24
EE25
EE26
High Street Ewell (co located with automatic analyser)

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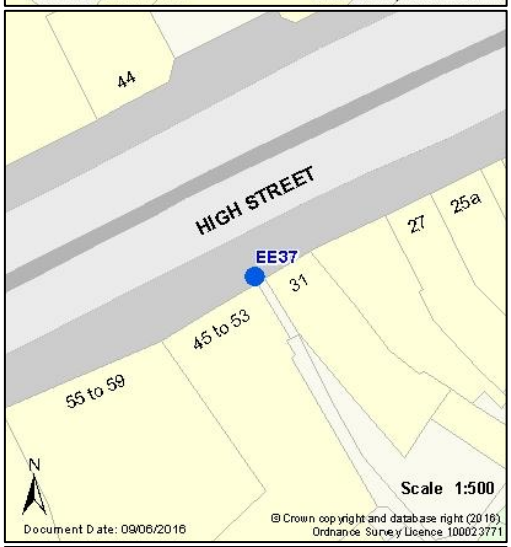


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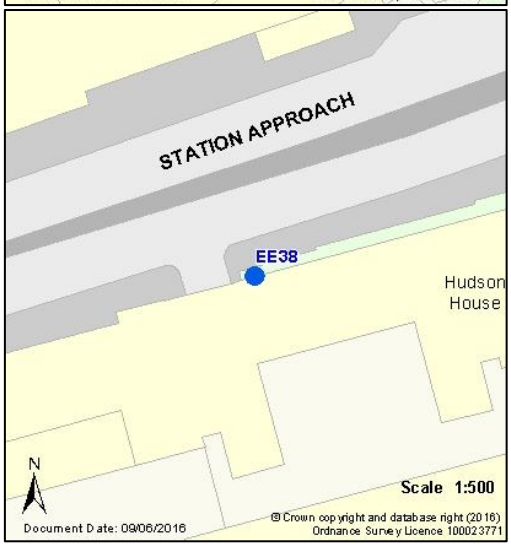
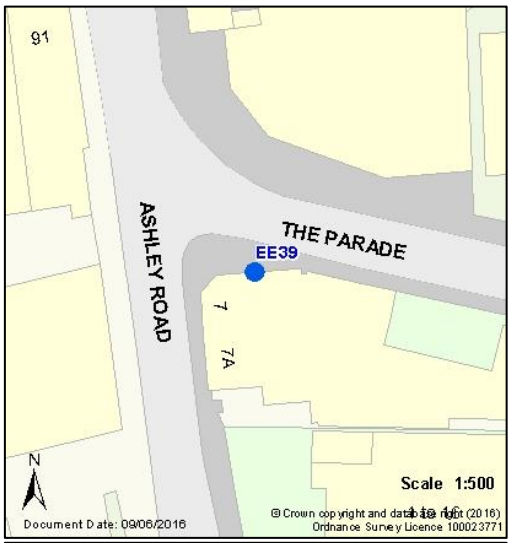
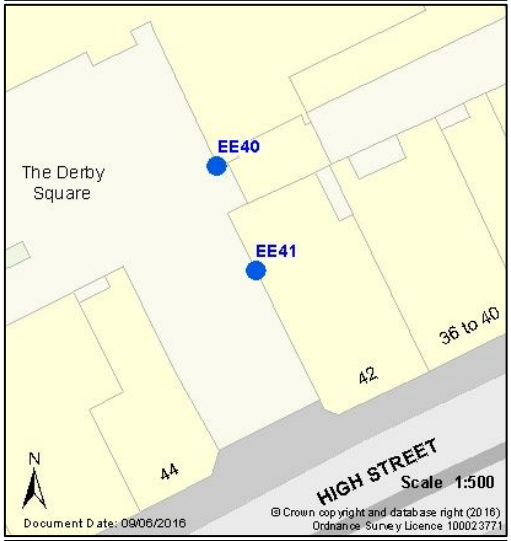


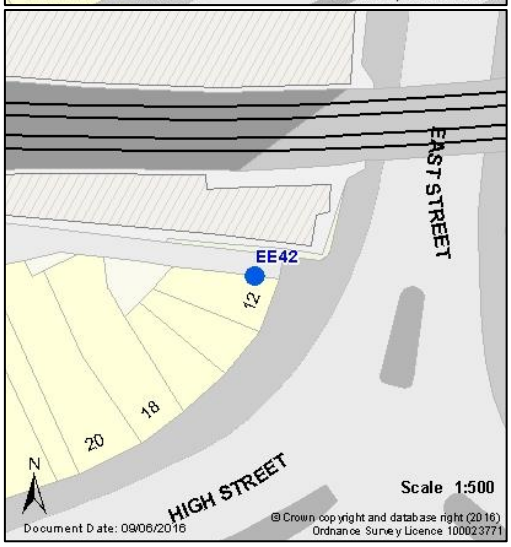

EE38 Station Approach Epsom



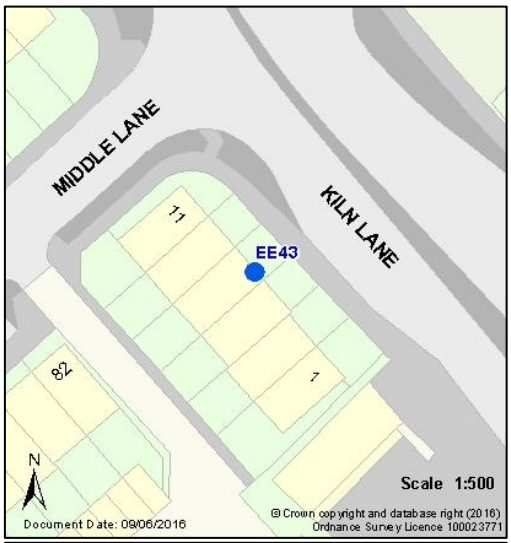

EE39 The Parade Epsom



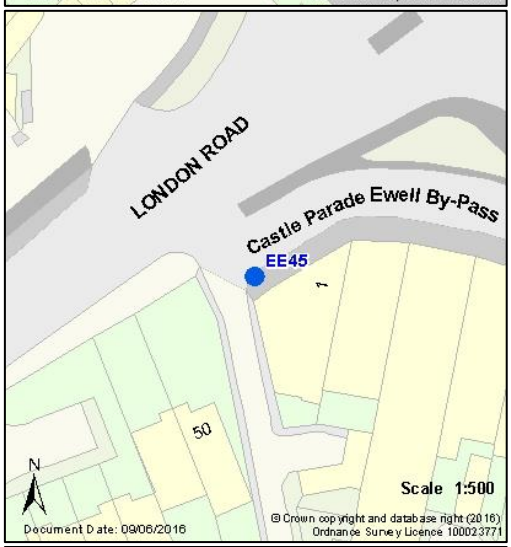

EE40
EE41
Derby Square Epsom



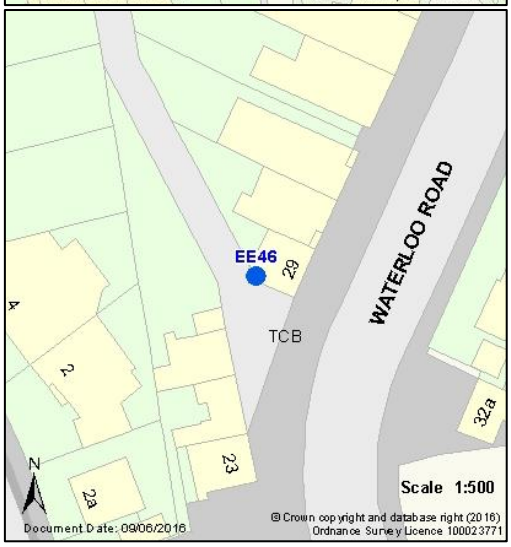

EE42 East Street Epsom



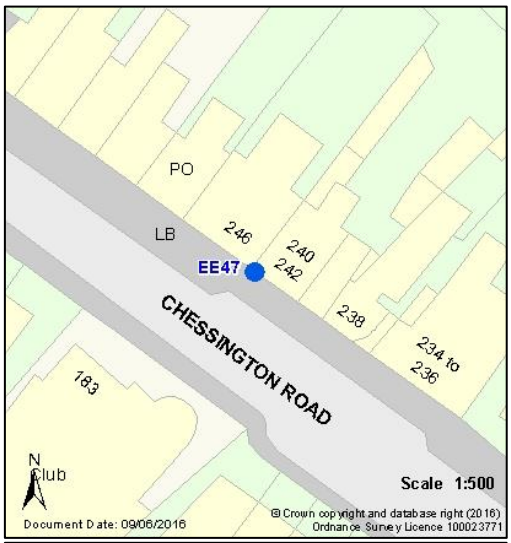

EE43 Kiln Lane Epsom



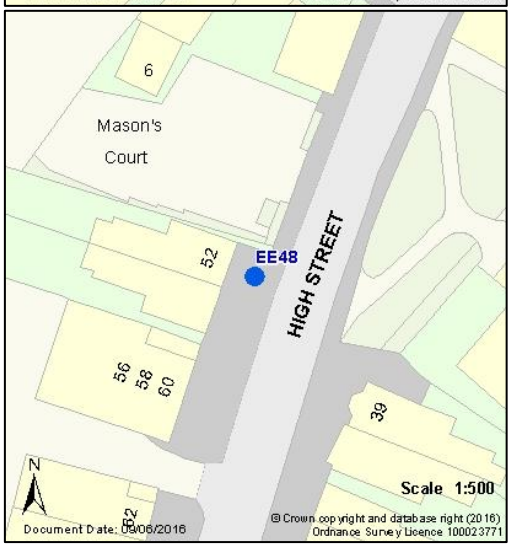

EE45 Castle Parade Ewell




EE46 Waterloo Road Epsom




EE47 Chessington Road Ewell




EE48 High Street Ewell

# 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

| 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 |
| LSO | Local Site Operator |
| $NO_x$ | 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 |