2022 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

July 2022

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Executive Summary: Air Quality in Our Area

Air Quality in Epsom & 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, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

In common with much of the region, the principal pollutant of concern in Epsom and Ewell has been nitrogen dioxide arising from road transport. The other potentially relevant pollutants contained within the national air quality strategy have long been screened out. 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. Details on the Ewell High Street AQMA can be found here https://uk-air.defra.gov.uk/aqma/details?aqma_ref=508. An action plan to begin to take measures to improve air quality and reduce exposure was subsequently developed, consulted on and delivered to the extent that was possible. It is recognised that work to improve air quality depends on close cooperation with other Epsom & Ewell Borough Council (EEBC), departments such as planning and partner 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. This is achieved through the Surrey Air Alliance – a collaborative group of all councils in Surrey.

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[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

[3] Defra. Air quality appraisal: damage cost guidance, July 2021

[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

Within the Borough, a gradual improvement in air quality has been noted for over a decade which has been aided by no new major transport or industrial related sources of emissions, nor has there been any new AQMA declarations in the past year. 2021 was the first year in which levels within the existing AQMA were below the national objective and should this continue, the Council will be in a position to undeclare the AQMA in subsequent years.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy[5] sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero[6] sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Air Quality is featured within the Council's Climate Change Action Plan. This includes the introduction of the 'Don't be Idle' campaign in order to monitor and reduce idling within key areas of concern in the borough. Joint collaboration with external groups including Surrey Climate Change Officer groups helps to provide information for opportunities/funding relating to improving air quality. The Council's ambitious target to achieve net zero status by 2035 includes a range of sustainable principles, from which we aim to develop further work in relation to improving air quality and combatting climate change.

Through the Surrey Air Alliance, a DEFRA grant has been awarded enabling the Council and its partner authorities to deliver an electric taxi project seeking to support taxi and private hire drivers in making the switch to electric vehicles. Following Covid-19, this project has had to be reshaped in order to retain relevancy for the taxi trade who have

[5] Defra. Clean Air Strategy, 2019

[6] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

been hard hit by the pandemic. It is expected to be sufficiently advanced to report on in the 2023 ASR.

Conclusions and Priorities

The quality of the air in Epsom and Ewell remains very good with all areas now within the national objectives. The new area of study in London Road Ewell appears to be well within the national objective which had been a concern following previous modelling which suggested a possible exceedance in this location.

Although 2021 was the first year in which the NO_2 levels within the AQMA were below the national objectives, it is prudent to confirm this through at least one further year's monitoring before the Council consults on undeclaring the AQMA.

The Council is unlikely to be revisiting the Air Quality Action Plan for Ewell High Street, having delivered all of the viable measures and seen the pollution levels fall as a result. Instead it will concentrate on pursuing the adopted Climate Change Action Plan and the electric taxi project referred to in this report.

Local Engagement and How to get Involved

The Council encourages individuals to change their behaviour so as to reduce emissions from transport, their home and their work. The Epsom and Ewell borough is compact with public transport links through to areas of south and south west London as well as routes to Sussex and the south coast. The Council operates an electric enforcement vehicle and has installed 8 electric vehicle charging points in its carparks with a further 8 to follow. whilst working together with the County Council in considering opportunities for on street charging. On behalf of residents, the Council pays an annual fee for membership of the air alert system whereby anyone can sign up for free text messages and/or use an App to receive information about predicted periods of poor air quality. For vulnerable people or those with respiratory conditions, this helps to provide a warning to allow them to plan their activities. There are 70 residents who currently benefit from the text service with many more able to benefit from the app.

Local Responsibilities and Commitment

This ASR was prepared by the Public Protection Service of Epsom & Ewell Borough Council.

This ASR has been approved by the Chair of the Environment and Safe Community Committee.

If you have any comments on this ASR please send them to contactus@epsom-ewell.gov.uk

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1 Local Air Quality Management

This report provides an overview of air quality in Epsom & Ewell during 2021. 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 are presented in Table E.1.

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 should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Epsom & Ewell Borough Council can be found in Table 2.1. The table presents a description of the single AQMA that is currently designated within Epsom & Ewell. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designation is the annual mean for NO_2.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
Ewell High Street AQMA	09/07/2007	NO_2 Annual Mean	An area encompassing the section of High Street, Ewell from the junction with Spring Street to the junction with Cheam Road and continues a further 30 metres south on High Street Ewell	NO	63µg/m^3	Levels within objective for this year at 32 µg/m^3	Ewell High Street Air Quality Action Plan 2010	here

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

☒ **Epsom & Ewell Borough Council confirm that all current AQAPs have been submitted to Defra.**

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

Defra's appraisal of last year's ASR concluded that the report is well structured, detailed, and provides the information specified in the Guidance. In particular, DEFRA were encouraged that the Council have considered to pursue the adopted Climate Change Action Plan demonstrating the Council's proactive and dedicated approach to improving air quality across the area.

A comment was made that the Ewell High Street AQMA Action Plan was very old and that it requires updating. Whilst the Council agrees that it is elderly and ideally would be reviewed, the levels within the AQMA are now compliant indicating that the existing plan, combined with national trends, have been successful in delivering improvements in the area. For this reason, the Council will not be updating the plan which is now presented for information only. The Council will continue to monitor with the expectation that should levels remain within the objective, it will be possible to revoke the declaration in the next 2 years.

Epsom & Ewell Borough Council anticipates that the measures stated above and in Table 2.2 will continue to achieve compliance in the Ewell High Street AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Remove the formally marked parking bays from 53 to 67 High Street	Transport Planning and Infrastructure	Other	Jun-14	2015	Surrey County Council	Surrey County Council	NO	Funded	< £10k	Completed	5 µg/m3	Complete Y/N	Completed	Combination of completed measures has contributed to a reduction of 20-25 µg/m3
2	Widen the road at 76 – 62 High Street	Transport Planning and Infrastructure	Other	Jun-14	2015	Surrey County Council	Surrey County Council	NO	Funded	£10k - 50k	Completed	5 µg/m3	Complete Y/N	Completed	Combination of completed measures has contributed to a reduction of 20-25 µg/m4
3	Remove on-street car parking on Church Street junction.	Transport Planning and Infrastructure	Other	-	2015	Surrey County Council	Surrey County Council	NO	Funded	< £10k	Completed	5 µg/m3	Complete Y/N	Completed	Combination of completed measures has contributed to a reduction of 20-25 µg/m5
4	Alter the junction of Cheam Road/High Street*	Transport Planning and Infrastructure	Other	2015	2015	Surrey County Council	Surrey County Council	NO	Funded	£50k - £100k	Completed	5 µg/m3	Complete Y/N	Completed	Combination of completed measures has contributed to a reduction of 20-25 µg/m6
5	Re-apply for traffic regulation order in relation to 7.5 tonne weight restriction	Freight and Delivery Management	Quiet & out of hours delivery	-		Surrey County Council	Surrey County Council	NO	Not Funded	< £10k	Aborted		none	Not proceeding	Not a priority for local transport service
6	Place restrictions on delivery times and stopping on High Street between Cheam Road and Spring Street junctions	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2015	2015	Epsom & Ewell Borough Council	Epsom & Ewell Borough Council	NO	Funded	< £10k	Completed		none	Completed	Combination of completed measures has contributed to a reduction of 20-25 µg/m6
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	Surrey County Council	NO	Not Funded	< £10k	Aborted		none	Not proceeding	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	Surrey County Council	NO	Not Funded	£100k - £500k	Aborted		none	Not proceeding	Kiln Lane link presently not going ahead
9	Pedestrianise Ewell High Street without Kiln Lane Link	Alternatives to private vehicle use	Other	-		Surrey County Council	Surrey County Council	NO	Not Funded	£100k - £500k	Aborted		none	Not proceeding	Not a priority for local transport service
10	Implement a one-way system	Transport Planning and Infrastructure	Other	-		Surrey County Council	Surrey County Council	NO	Not Funded	£50k - £100k	Aborted		none	Not proceeding	Dependent on Kiln Lane Link

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
11	Remove the traffic lights at the junction between Spring Street and High Street	Traffic Management	UTC, Congestion management, traffic reduction	-		Surrey County Council	Surrey County Council	NO	Not Funded	£10k - 50k	Aborted		none	Not proceeding	Judgement that the worsening of pedestrian safety was unacceptable
12	Replace the pelican crossing outside market parade with zebra crossing	Transport Planning and Infrastructure	Other	-		Surrey County Council	Surrey County Council	NO	Not Funded	£10k - 50k	Aborted		none	Not proceeding	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	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	-		Surrey County Council	Surrey County Council	NO	Not Funded	£50k - £100k	Aborted		none	Not proceeding	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 $PM_{2.5}$ (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.

As was reported in the previous ASR, Epsom & Ewell Borough Council have modelled particulate concentrations across the borough in a greater resolution than provided by the national estimates. It found that the majority of $PM_{2.5}$ is background in nature with sources outside the borough but that concentrations remained within the EU Limit value. There is no one single source of $PM_{2.5}$ but instead road transport (exhaust and non exhaust fractions), and “other” (including combustion in commercial, institution and agricultural sectors) are the main contributors.

This modelling confirms the difficulties with any one single Council operating on its own in controlling $PM_{2.5}$. Nevertheless the Council will not completely disregard $PM_{2.5}$. It is concluded that actions to reduce other pollutants and particulates generally are appropriate to reduce $PM_{2.5}$ when combined with regional and national efforts through, for example, the Surrey Air Alliance.

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

This section sets out the monitoring undertaken in 2021 by Epsom & Ewell Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Epsom & Ewell Borough Council does not operate any automatic monitoring sites.

3.1.2 Non-Automatic Monitoring Sites

Epsom & Ewell Borough Council undertook non- automatic (i.e. passive) monitoring of NO2 at 24 sites and one unexposed control site during 2021. Table A.2 in Appendix A presents the details of the non-automatic 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 adjusted for bias. Owing to improve data collection there was no requirement for an annualisation adjustment and advice contained within Technical Guidance LAQM.TG016 para.7.78 was followed in respect of there being no need for any distance fall off corrections for any of the monitoring sites as none exceeded or were within 10 percent of exceeding the national objective. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2021 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

The Council has been monitoring a reduction in NO_2 concentrations for the past 5 years but in 2021 it is possible to conclude that this reduction was arrested, possibly by the effect of the Covid-19 recovery. However, the margin of uncertainty of the methodology causes the Council to be cautious about drawing strong conclusions from one year and the overall trends don't show any significant increases. One important change took place within the AQMA itself where monitoring results show a significant drop in NO_2 at site EE10 which is representative of exposure in the centre of the AQMA.

New sites established in 2019 are reported to be below the national objective but one of these recorded the highest reading in the borough consistent with earlier modelling which pointed towards a localised hotspot. Monitoring will continue into subsequent years to establish a trend.

3.2.2 Particulate Matter (PM_{10})

The Council does not undertake any monitoring of PM_{10}.

3.2.3 Particulate Matter ($PM_{2.5}$)

The Council does not undertake any monitoring of $PM_{2.5}$.

3.2.4 Sulphur Dioxide (SO_2)

The Council does not undertake any monitoring of SO_2.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

The Council does not operate any automatic monitoring sites.

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
EE1	The Clock tower-Roadside	Roadside	520732	160762	NO2	No	13.0	2.5	No	2.1
EE3	26 The Crescent-Background	Urban Background	519293	160026	NO2	No	9.0	2.0	No	2.0
EE6	Jct Kingston Rd/ Worcester Park Rd-Kerbside	Kerbside	520525	165040	NO2	No	8.2	6.8	No	2.1
EE7	Jct Ruxley Lane/Kingston Rd-Kerbside	Kerbside	520916	164636	NO2	No	4.2	6.8	No	2.3
EE9	Chessington Road, Ewell	Roadside	519830	163740	NO2	No	2.4	3.2	No	2.4
EE10	High Street, Ewell - kerbside	Kerbside	521998	162633	NO2	Yes - Ewell High Street AQMA	0.5	1.3	No	2.1
EE14	Hook Road Epsom-roadside	Roadside	520885	161308	NO2	No	3.4	1.6	No	2.0
EE16	Church Street/High Street Ewell	Roadside	522026	162624	NO2	Yes - Ewell High Street AQMA	0..1	1.1	No	1.7
EE17	40A High Street Ewell	Roadside	522025	162563	NO2	Yes - Ewell High Street AQMA	0.1	2.0	No	2.2
EE22	High Street, Epsom - roadside	Roadside	520965	160871	NO2	No	3.0	0.5	No	2.3
EE36	Capitol Square, Church Street	Urban Centre	521069	160817	NO2	No	0.2	9.2	No	2.1
EE37	British Heart Foundation, High Street	Roadside	520726	160857	NO2	No	0.6	4.5	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
EE38	Station approach south	Roadside	520726	160857	NO2	No	0.1	2.8	No	1.8
EE39	The Parade	Roadside	520844	160729	NO2	No	0.2	3.3	No	2.1
EE42	High Street/East Street	Roadside	521004	160901	NO2	No	0.0	7.7	No	2.1
EE43	Kiln Lane	Roadside	521478	161447	NO2	No	0.3	5.5	No	2.3
EE45	Castle Parade	Roadside	522211	163103	NO2	No	0.4	8.3	No	2.1
EE46	Waterloo Road	Kerbside	520724	161027	NO2	No	4.6	0.6	No	2.1
EE47	Chessington Road	Roadside	520713	162968	NO2	No	0.2	4.7	No	1.9
EE48	Ewell High Street South	Roadside	522022	162502	NO2	Yes - Ewell High Street AQMA	0.4	1.7	No	2.1
EE49	37 South Street, Epsom	Roadside	520580	160586	NO2	No	0.2	3.5	No	2.2
EE50	Major Plaice Ewell High Street	Kerbside	521975	162677	NO2	Yes - Ewell High Street AQMA	7.5	0.9	No	2.1
EE51	Station approach north	Roadside	520702	160872	NO2	No	3.0	3.3	No	1.8
EE52	77 London Road, Ewell	Roadside	522303	163213	NO2	No	0.5	4.6	No	1.8
EE53	115 London Road, Ewell	Roadside	522369	163289	NO2	No	0.0	14.5	No	1.8

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.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Epsom & Ewell did not carry out any automatic monitoring in 2021.

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2021 (%)	NO_2 Annual Mean Concentration (µg/m^3)				
						2017	2018	2019	2020	2021
EE1	520732	160762	Roadside	100	90.4	33.8	29.6	26.5	23.0	22.2
EE3	519293	160026	Urban Background	100	100.0	16.9	14.8	15.0	14.1	13.6
EE6	520525	165040	Kerbside	100	90.4	31.3	30.4	33.0	27.8	27.6
EE7	520916	164636	Kerbside	100	92.3	35.5	33.5	34.2	28.0	29.7
EE9	519830	163740	Roadside	100	100.0	23.2	23.5	24.4	20.6	21.2
EE10	521998	162633	Kerbside	100	75.0	**44.4**	34.8	**46.3**	**44.0**	32.3
EE14	520885	161308	Roadside	100	100.0	25.4	25.2	25.3	20.8	21.5
EE16	522026	162624	Roadside	100	84.6	30.7	25.5	27.8	22.4	22.6
EE17	522025	162563	Roadside	100	100.0	30.2	28.9	31.4	29.1	26.3

EE22	520965	160871	Roadside	100	90.4	39.3	35.1	35.4	31.3	31.5
EE36	521069	160817	Urban Centre	100	100.0	26.3	23.5	23.3	19.9	20.6
EE37	520726	160857	Roadside	100	92.3	33.4	26.9	32.7	25.4	26.5
EE38	520726	160857	Roadside	100	90.4	25.1	23.3	24.2	16.2	17.8
EE39	520844	160729	Roadside	100	100.0	27.6	29.9	24.6	21.5	23.0
EE42	521004	160901	Roadside	100	92.3	28.8	23.1	24.5	20.1	19.4
EE43	521478	161447	Roadside	100	100.0	28.5	26.0	25.5	21.7	22.6
EE45	522211	163103	Roadside	100	100.0	22.5	23.9	21.3	17.7	19.0
EE46	520724	161027	Kerbside	100	84.6	24.6	27.1	27.9	21.5	22.5
EE47	520713	162968	Roadside	100	100.0	24.5	23.5	25.1	19.2	21.2
EE48	522022	162502	Roadside	100	100.0	29.0	27.8	28.4	22.1	23.5
EE49	520580	160586	Roadside	100	100.0	28.6	34.1	34.2	25.5	28.6

EE50	521975	162677	Kerbside	100	100.0	36.4	36.2	35.7	33.6	31.1
EE51	520702	160872	Roadside	100	100.0		30.1	25.0	21.0	23.2
EE52	522303	163213	Roadside	100	100.0			40.0	30.3	34.3
EE53	522369	163289	Roadside	100	82.7			23.0	16.0	18.2

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16**

☒ **Diffusion tube data has been bias adjusted**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction**

Notes:

The annual mean concentrations are presented as µg/m^3.

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**.

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

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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%).

Figure A.1 – Trends in Annual Mean NO_2 Concentrations

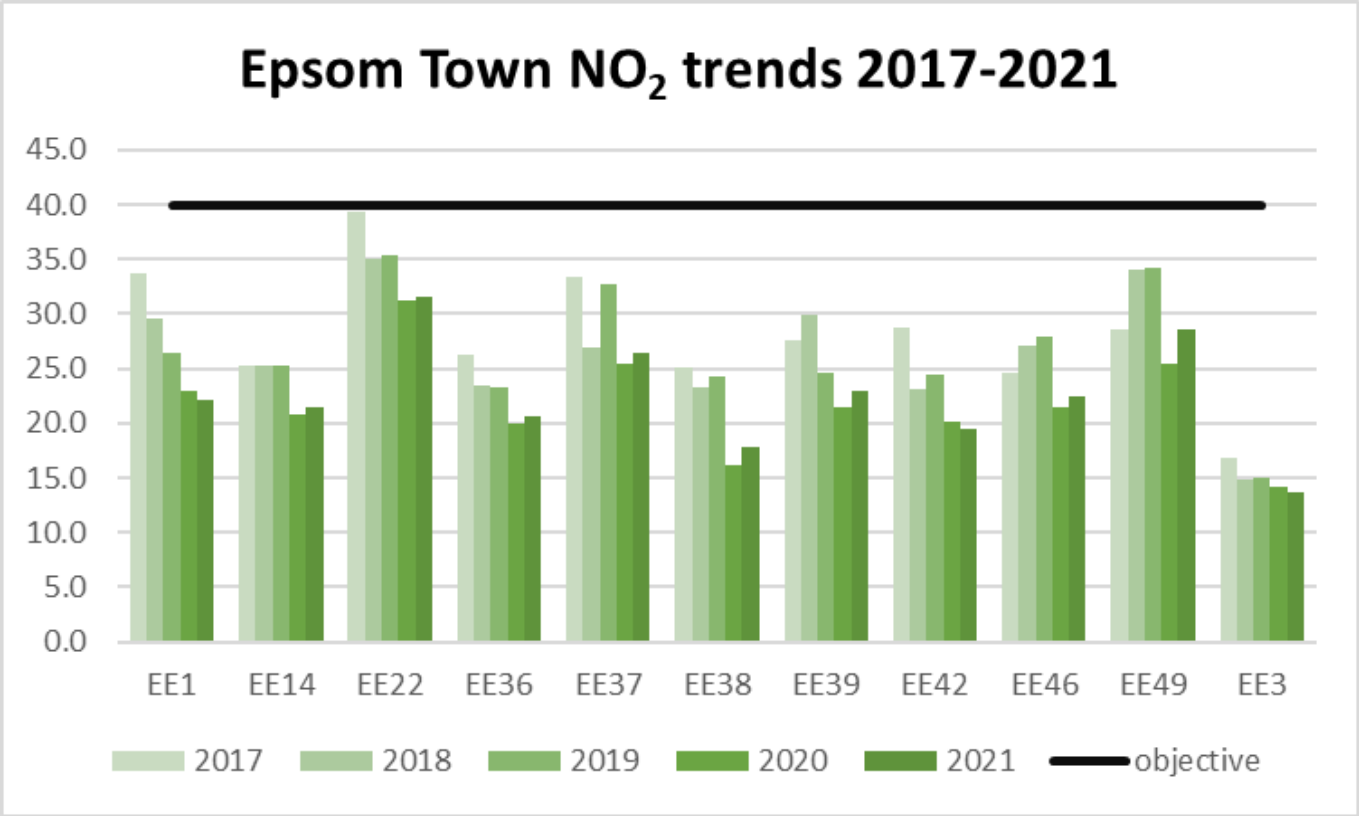


Figure 1 - Trends in nitrogen dioxide 2017-2021 Epsom

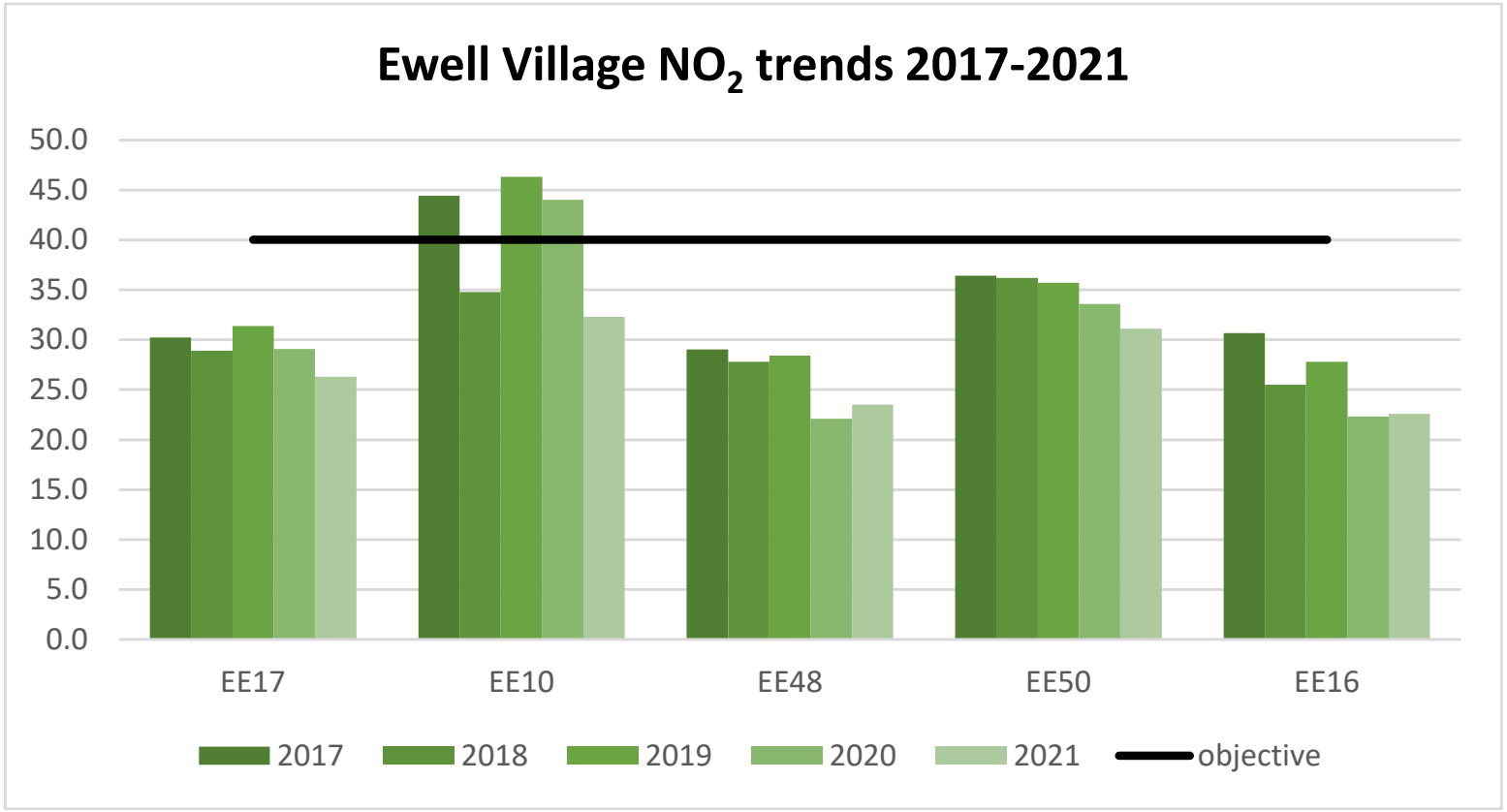


Figure 2 - Trends in nitrogen dioxide 2017-2021 Ewell Village

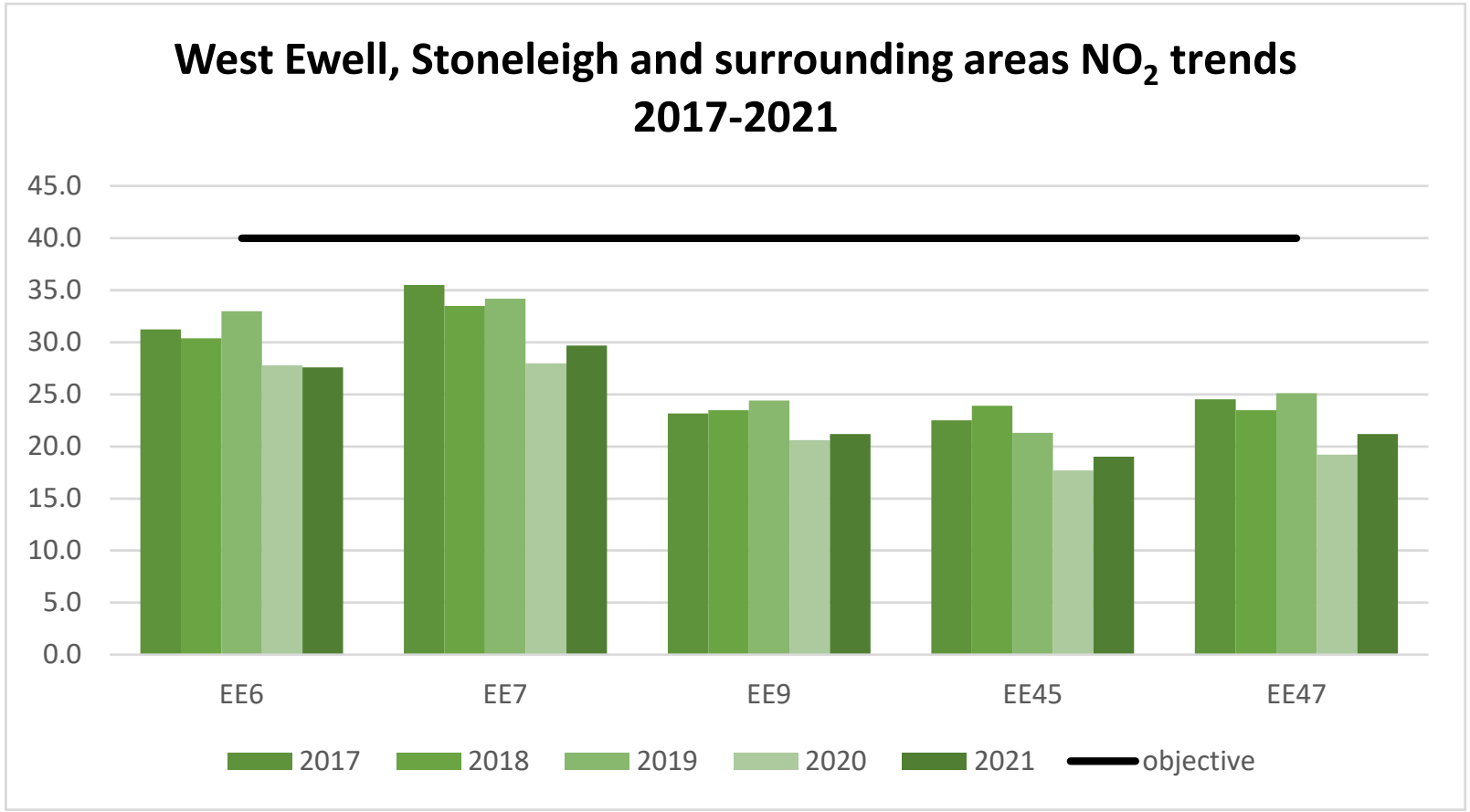


Figure 3 - Trends in nitrogen dioxide 2017-2021 West Ewell, Stoneleigh and surrounding areas

Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Automatic monitoring is not carried out by the Council

Figure A.2 – Trends in Number of NO_2 1-Hour Means > 200µg/m^3

Automatic monitoring is not carried out by the Council

Table A.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Particulate monitoring is not carried out by the Council

Figure A.3 – Trends in Annual Mean PM_{10} Concentrations

Particulate monitoring is not carried out by the Council

Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Particulate monitoring is not carried out by the Council

Figure A.4 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m^3

Particulate monitoring is not carried out by the Council

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

Particulate monitoring is not carried out by the Council

Figure A.5 – Trends in Annual Mean $PM_{2.5}$ Concentrations

Particulate monitoring is not carried out by the Council

Table A.9 – SO_2 2021 Monitoring Results, Number of Relevant Instances

SO_2 monitoring is not carried out by the Council

Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO_2 2021 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.94	Annual Mean: Distance Corrected to Nearest Exposure	Comment
EE1	520732	160762	27.0	22.0	25.0		20.0	24.0	24.0	15.0	27.0	21.0	30.0	25.0	23.6	22.2	-	
EE3	519293	160026	20.0	16.0	18.0	14.0	11.0	12.0	11.0	11.0	12.0	15.0	19.0	15.0	14.5	13.6	-	
EE6	520525	165040	32.0	30.0	25.0	30.0	27.0	29.0		19.0	27.0	33.0	43.0	28.0	29.4	27.6	-	
EE7	520916	164636	35.0	29.0	33.0	31.0	29.0	29.0	29.0	25.0		31.0	42.0	35.0	31.6	29.7	-	
EE9	519830	163740	25.0	22.0	22.0	21.0	20.0	24.0	17.0	15.0	25.0	26.0	29.0	24.0	22.5	21.2	-	
EE10	521998	162633	37.0	37.0	37.0	36.0	37.0	36.0	32.0	30.0				27.0	34.3	32.3	-	
EE14	520885	161308	30.0	29.0	24.0	23.0	16.0	18.0	18.0	15.0	22.0	31.0	28.0	21.0	22.9	21.5	-	
EE16	522026	162624	28.0	23.0	25.0	22.0		21.0	21.0		25.0	24.0	30.0	21.0	24.0	22.6	-	
EE17	522025	162563	34.0	24.0	32.0	27.0	27.0	27.0	23.0	21.0	29.0	27.0	35.0	30.0	28.0	26.3	-	
EE22	520965	160871	39.0	32.0	33.0	32.0	32.0	36.0		23.0	35.0	35.0	41.0	31.0	33.5	31.5	-	
EE36	521069	160817	29.0	22.0	24.0	21.0	18.0	19.0	20.0	15.0	21.0	23.0	27.0	24.0	21.9	20.6	-	
EE37	520726	160857	28.0	31.0	33.0	27.0	25.0	25.0	27.0	19.0		30.0	34.0	31.0	28.2	26.5	-	
EE38	520726	160857	13.0	20.0	20.0	21.0	15.0	17.0		14.0	21.0	22.0	23.0	22.0	18.9	17.8	-	
EE39	520844	160729	27.0	23.0	24.0	26.0	19.0	23.0	21.0	18.0	27.0	26.0	33.0	26.0	24.4	23.0	-	
EE42	521004	160901	23.0	22.0	23.0	21.0	17.0		18.0	16.0	23.0	23.0	26.0	15.0	20.6	19.4	-	
EE43	521478	161447	31.0	28.0	28.0	22.0	19.0	20.0	19.0	16.0	27.0	25.0	32.0	22.0	24.1	22.6	-	
EE45	522211	163103	25.0	23.0	21.0	27.0	16.0	20.0	17.0	14.0	20.0	20.0	21.0	18.0	20.2	19.0	-	
EE46	520724	161027	25.0	24.0	25.0	23.0	21.0	23.0	21.0			24.0	29.0	24.0	23.9	22.5	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.94	Annual Mean: Distance Corrected to Nearest Exposure	Comment
EE47	520713	162968	27.0	21.0	25.0	26.0	18.0	21.0	21.0	15.0	26.0	22.0	27.0	21.0	22.5	21.2	-	
EE48	522022	162502	27.0	26.0	28.0	28.0	20.0	23.0	21.0	18.0	25.0	25.0	33.0	26.0	25.0	23.5	-	
EE49	520580	160586	32.0	29.0	30.0	33.0	30.0	29.0	31.0	20.0	35.0	32.0	35.0	29.0	30.4	28.6	-	
EE50	521975	162677	37.0	30.0	37.0	33.0	31.0	34.0	28.0	21.0	38.0	34.0	41.0	33.0	33.1	31.1	-	
EE51	520702	160872	28.0	20.0	23.0	28.0	20.0	25.0	23.0	33.0	24.0	22.0	34.0	16.0	24.7	23.2	-	
EE52	522303	163213	37.0	33.0	45.0	33.0	35.0	46.0	31.0	27.0	43.0	34.0	45.0	29.0	36.5	34.3	-	
EE53	522369	163289	23.0	19.0	23.0			19.0	16.0	14.0	19.0	20.0	24.0	17.0	19.4	18.2	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1**.

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **Regional bias adjustment factor used.**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **Epsom & Ewell Borough Council confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

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**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Epsom and Ewell During 2021

Epsom & Ewell Borough Council has not identified any new sources relating to air quality within the reporting year of 2021.

Additional Air Quality Works Undertaken by Epsom & Ewell Borough Council During 2021

Epsom & Ewell Borough Council has not completed any additional works within the reporting year of 2021.

QA/QC of Diffusion Tube Monitoring

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 Quality Assurance / Quality Control (QA/QC).

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Epsom and Ewell recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube

monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Epsom & Ewell Borough Council was able to utilise the partnership resources within the Surrey Air Alliance to compute a regional bias adjustment factor of 0.94 which compares favourably with the equivalent national bias adjustment of 0.95 taken from the national bias adjustment spreadsheet for the relevant laboratory and preparation method combination (version 6/22). The calculations for this appear in table C.3.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	County	-	0.94
2020	County	-	0.97
2019	County	-	0.92
2018	National	06/19	1.03
2017	National	06/18	0.9
2016	National	06/17	1.05

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within Epsom and Ewell required distance correction during 2021.

QA/QC of Automatic Monitoring

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Epsom and Ewell required distance correction during 2021.

Table C.2 – Annualisation Summary (concentrations presented in µg/m3)

No annualisation calculations were necessary in 2021.

Table C.3 – Local Bias Adjustment Calculation

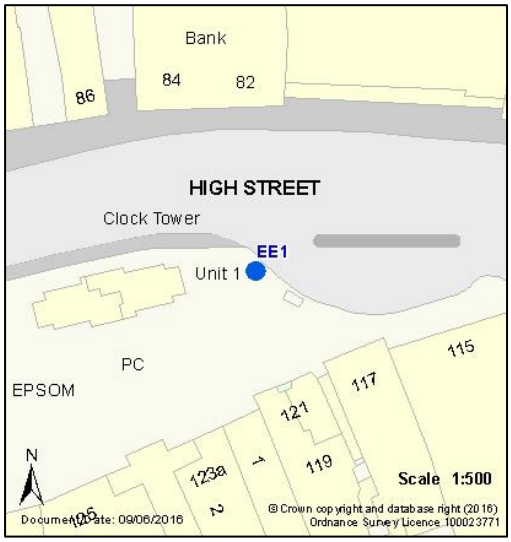
	Data Capture (total)	Data Capture for period where CV <20%)	Bias factor A	Bias B
Elmbridge 1		98%	0.93	7%
Elmbridge 2	100%	100%	0.91	9%
Reigate 1	99%	99%	0.98	3%
Reigate 3	98%	98%	0.84	19%
Reigate 6	97%	97%	0.89	13%
Reigate 7	95%	94%	1.04	-4%
Spelthorne 1		98%	0.97	4%
Spelthorne 2		100%	1.00	0%
			Av Bias B	**6.4%**
			Factor	**0.06**
			Add 1	**1.06**
			Inverse	**0.94**

Table C.4 – NO2 Fall off With Distance Calculations (concentrations presented in µg/m3)

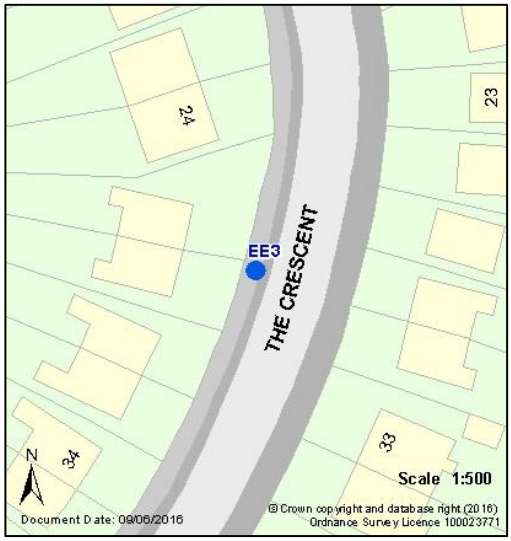
No fall off calculations were required for 2021.

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

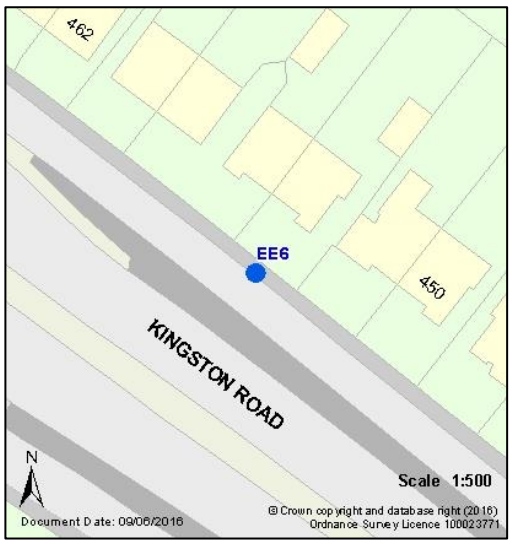
Figure D.1 – Map of Non-Automatic Monitoring Sites



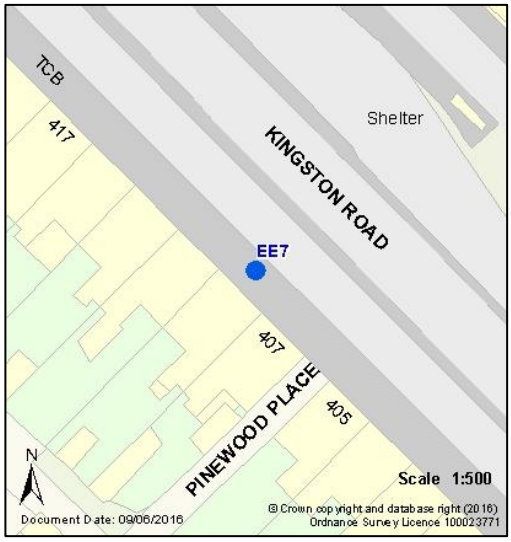
EE1 Clock Tower Epsom



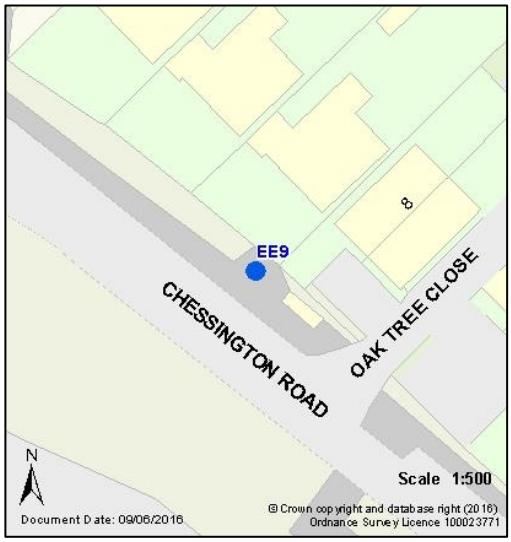
EE3 The Crescent Epsom



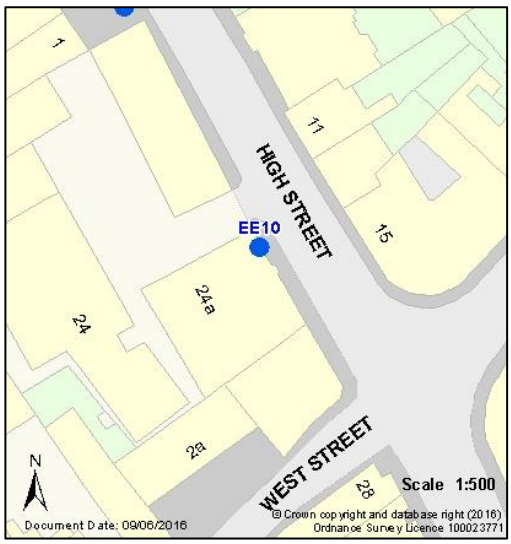
EE6 Kingston Road, Ewell



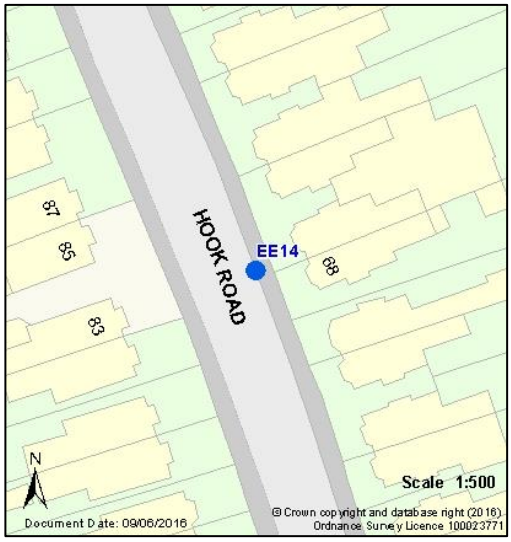
EE7 Kingston Road Ewell



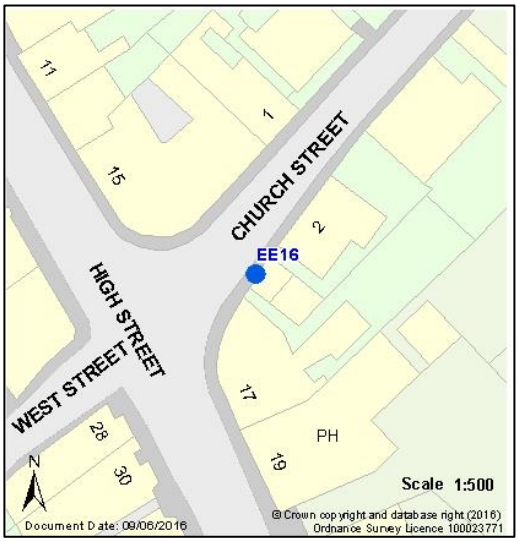
EE9 Chessington Road Ewell



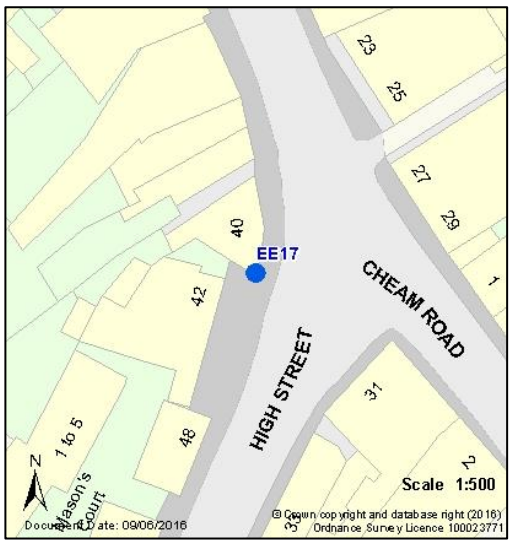
EE10 High Street Ewell



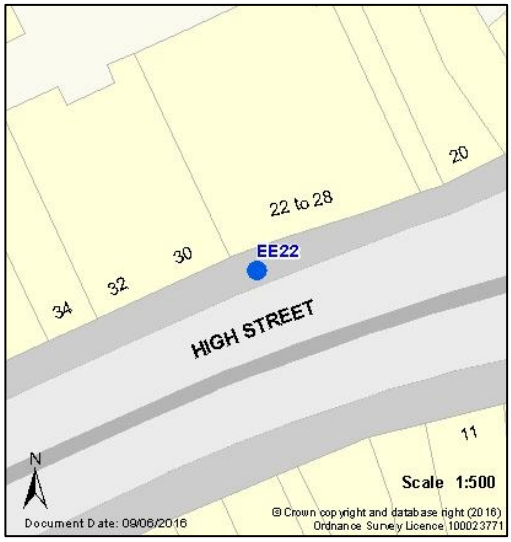
EE14 Hook Road Epsom



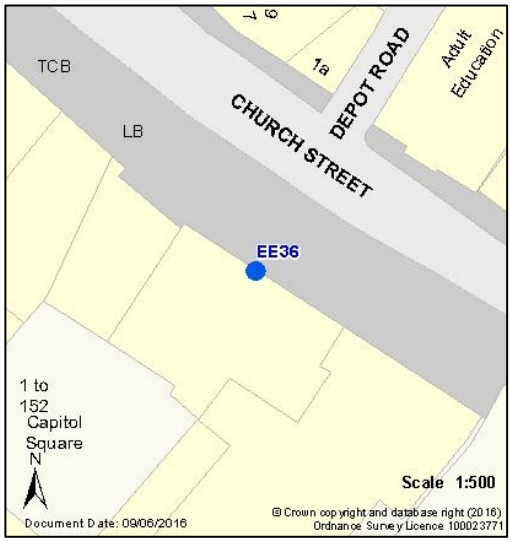
EE 16 Church Street Ewell



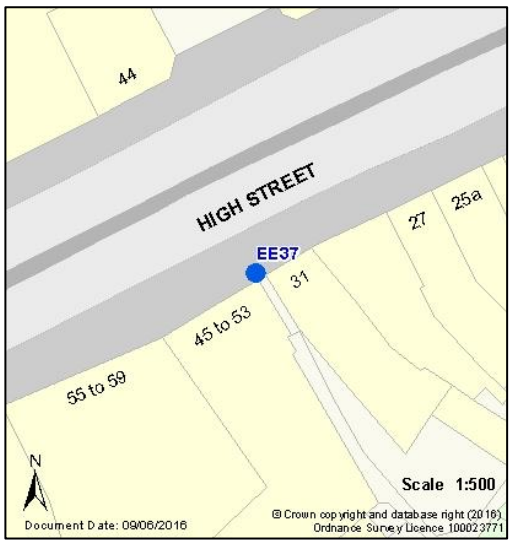
EE17 High Street Ewell



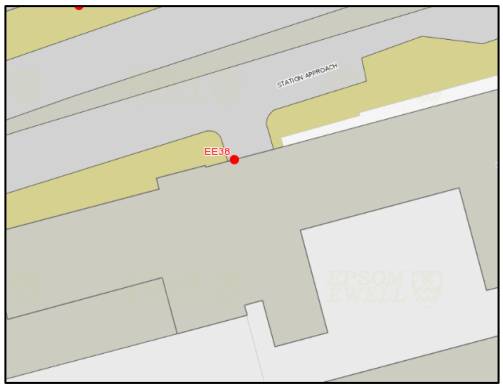
EE22 High Street Epsom



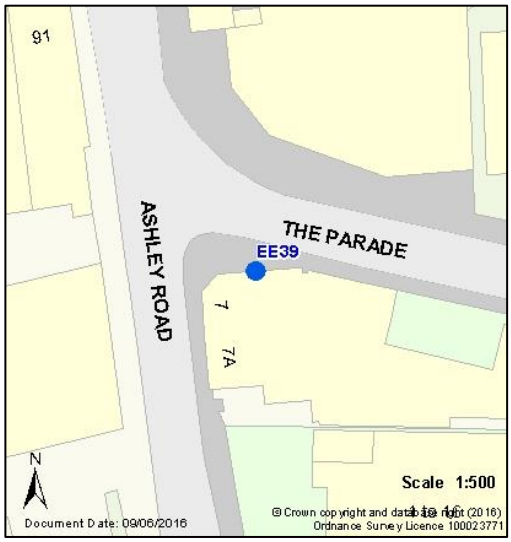
EE36 Church Street Epsom



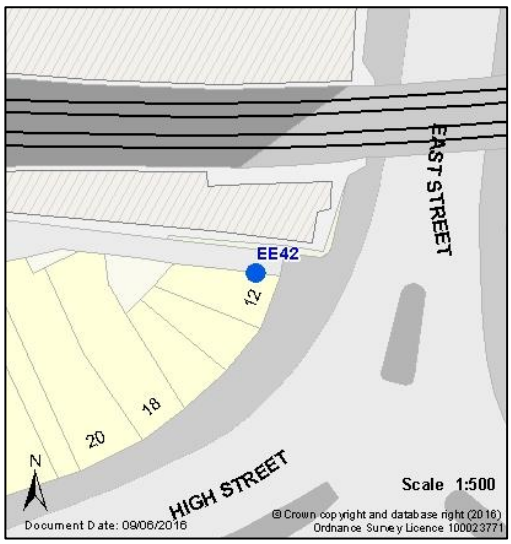
EE37 High Street Epsom



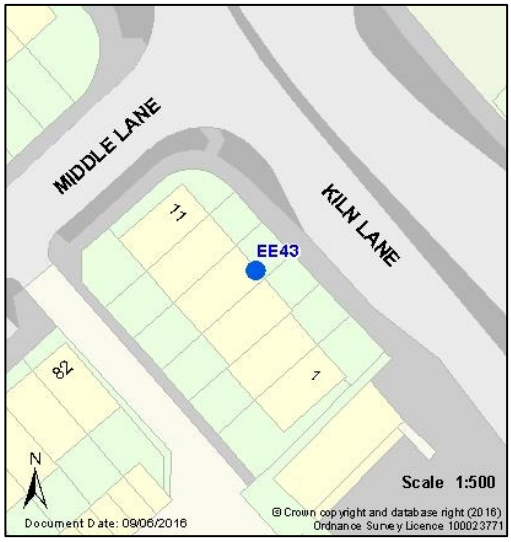
EE38 Station Approach
South Epsom



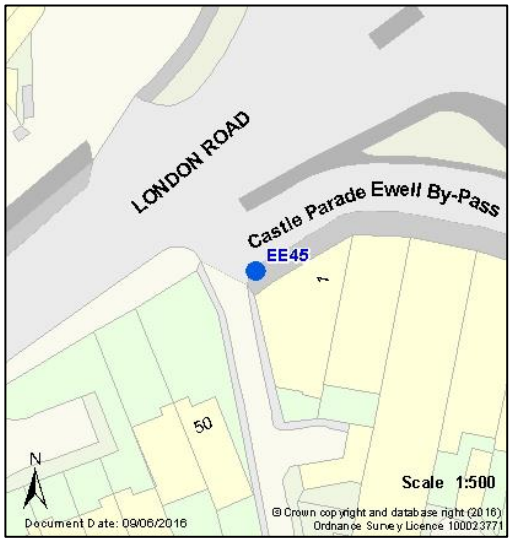
EE39 The Parade Epsom



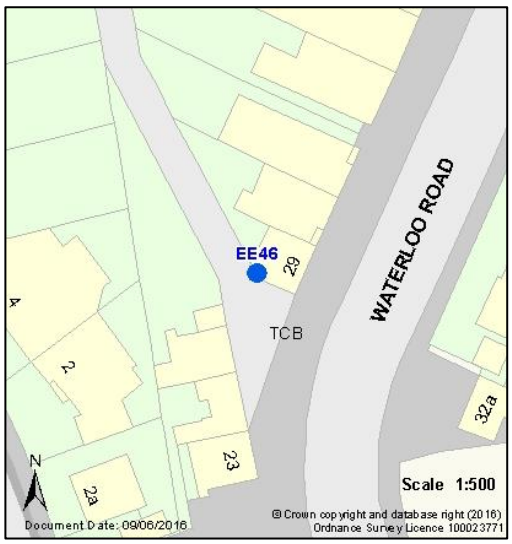
EE42 East Street Epsom



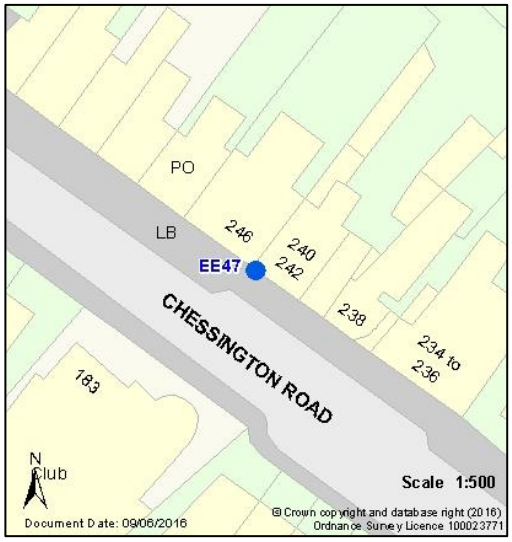
EE43 Kiln Lane Epsom



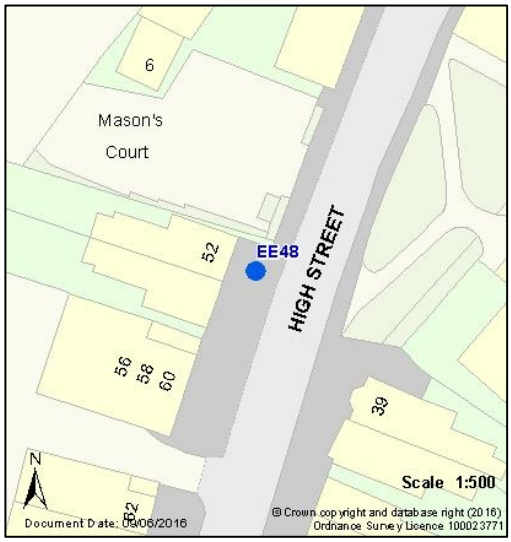
EE45 Castle Parade Ewell



EE46 Waterloo Road
Epsom

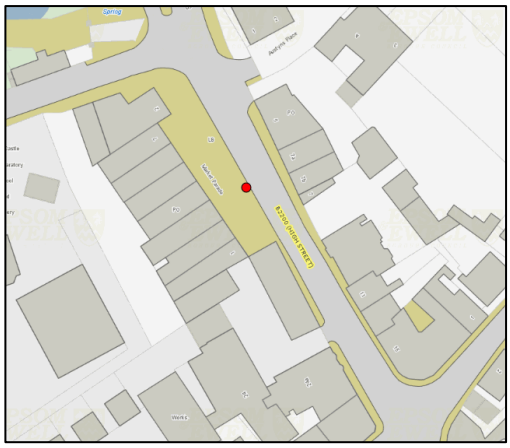


EE47 Chessington Road
Ewell

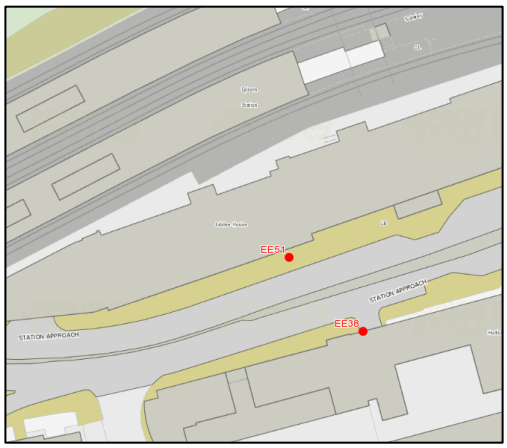


EE48 High Street Ewell

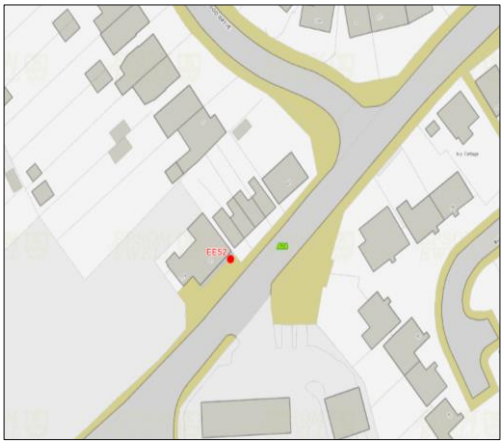
EE49 – South Street Epsom



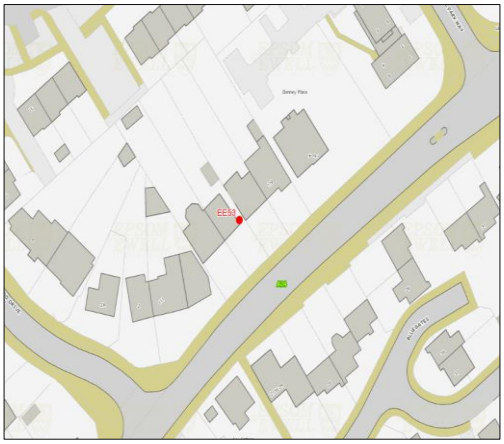
EE50 High Street Ewell



EE51 Station Approach North



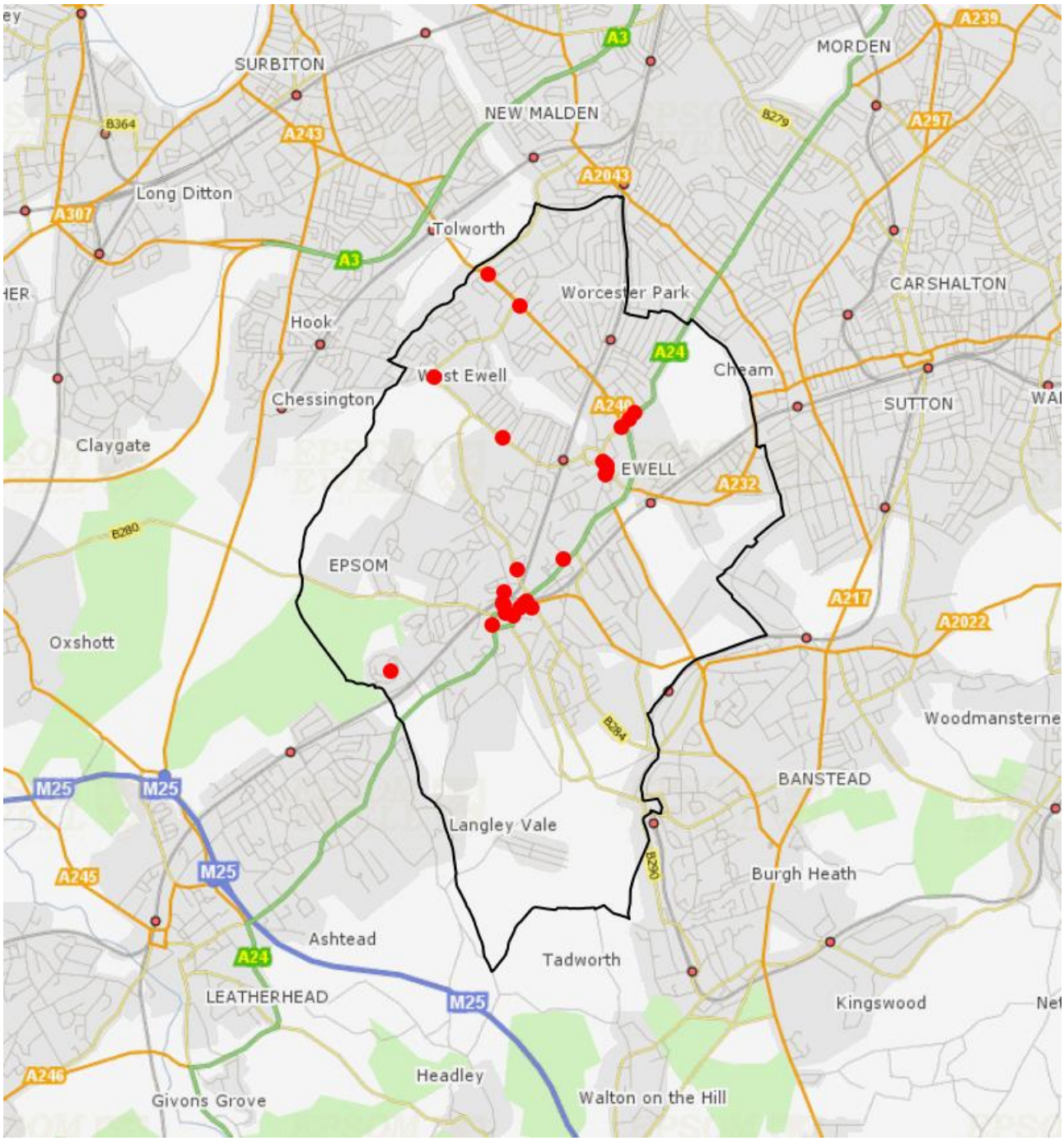
EE52 – London Road Ewell (1)



EE53 – London Road Ewell (2)

Map of monitoring locations within Ewell High Street Air Quality Management Area

Map of monitoring locations in Epsom and Ewell



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

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

[7] 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	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
EEBC	Epsom & Ewell Borough Council
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 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

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.