

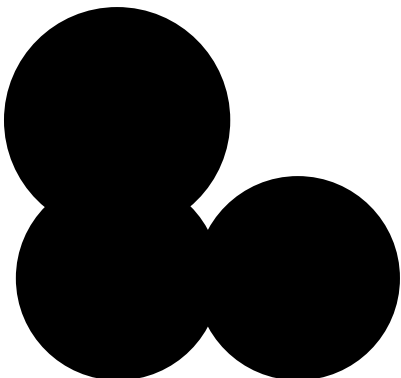


# Elmbridge Borough Council

*... bridging the communities ...*

## 2019 Air Quality Annual Status Report (ASR)

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



**Elmbridge Borough Council**

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Report Reference number	PBA46316/ASR2019
Date	July 2019

## Executive Summary: Air Quality in Our Area

The following Annual Status Report (ASR) was prepared and written by Peter Brett Associates (PBA), now part of Stantec, on behalf of Elmbridge Borough Council in accordance with Local Air Quality Management (LAQM) Technical Guidance (TG) 2016, published by Defra on behalf of the devolved administrations.

## Air Quality in Elmbridge

This report is designed to provide a summary for those living and working within the Borough of Elmbridge about the state of air quality in the area. It also provides progress on the actions that Elmbridge Borough Council (the Council) and others, including the public, are taking or could take to improve air quality.

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. Air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. In addition, there is often a strong correlation with equalities issues as areas with poor air quality are frequently the less affluent areas<sup>1,2</sup>.

In its most recent report, the Committee on the Medical Effects of Air Pollutants (COMEAP) advised that the range of estimates of the annual mortality burden of human-made air pollution in the UK is estimated as an effect equivalent to 28,000 to 36,000 deaths<sup>3</sup>. A conservative estimate for one type of air pollution (particulates) is that it reduces life expectancy in the UK by six months on average, worth £16 billion per year<sup>4</sup>.

## Actions to Improve Air Quality

Measures to improve air quality have been included in the Council's Development Management Plan and air quality is an important consideration for all planning applications within the Borough's seven Air Quality Management Areas (AQMAs).

The Council works to understand local air quality through an appropriate monitoring network within its administrative boundary.

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

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

<sup>3</sup> COMEAP. Associations of long-term average concentration of nitrogen oxide with mortality, 2018.

<sup>4</sup> Defra. Abatement cost guidance for valuing changes in air quality, May 2013

## **Elmbridge Borough Council**

The Surrey Air Quality Study Group, formed in May 2016, has developed into the Surrey Air Alliance (SAA) made up of officer representatives from all eleven District and Borough Councils, and Surrey County Council's (SCC) Highways and Public Health services.

The Council continues to be an active member of the SAA and assist in the delivery of the SAA workplan. A key workplan task on which the Council has taken the lead is the Surrey-wide air quality modelling project. The air quality modelling project will be used to establish a clear baseline for key pollutants (NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>) across Surrey. The modelling, undertaken by Cambridge Environmental Research Consultants (CERC), has recently been completed and the final reports will follow in 2019. The information will assist in the review of current AQMA's and alert to any potential areas that require investigating.

The second workplan project Elmbridge is involved in is directed at raising awareness of air quality within schools close to AQMAs. In Spring 2018 the SAA was awarded £145,188 from the Defra AQ Grant Fund to undertake an engagement and behaviour change programme with up to 40 schools across Surrey that were within 2km of an AQMA. The aim being to give school children an increased awareness of the health impacts of poor air quality and, where the AQMA is close to the school, to understand what they could do to improve local air quality and reduce exposure, seeking to change behaviours.

A total of seven schools within Elmbridge have taken part in a range of activities from theatre performances, cycle training, anti-idling campaigns and workshops on monitoring NO<sub>2</sub>.

The project was supported by a successful media campaign that included advertising on local radio. Social media posts were viewed 175,827 times, with 83% of residents saying the campaign discouraged them from using the car. An example of one of the posters promoting "scoot to school" is provided below.



Both of these SAA projects are funded, the remaining actions will progress as resources allow.

In the Council's Service Delivery Plan for 2019/2020, a Council objective is to improve local air quality for a healthier community. An action to raise public awareness included a bespoke animation on air quality as part of the Councils "Love Elmbridge" campaign.

See: <https://www.elmbridge.gov.uk/news/love-elbridge/>

The Council's Environmental Services Team continues to use three electric pool cars for staff work travel, which are increasingly being used by other parts of the Council. They also utilise the planning regime to increase the provision of electric vehicle charging points within the Borough.

The airAlert pollution warning service for residents continues to be funded and promoted to those living and working within the Borough

As part of its commitment to make Elmbridge a sustainable place, the Council is considering extending its fleet of electric staff pool cars and the feasibility of introducing electric vehicle charging points in a number of its car parks. As part of an upgrade to Holly Hedge car park in Cobham the OLEV funded rapid charger, now four years old, will be replaced in 2019 with two twin fast charging points; a significant increase in charging provision. In 2019, the Council took the decision to significantly reduce the cost of parking permits for fully electric vehicles.

## Conclusions and Priorities

Air quality monitoring has shown continued improvements at many locations across the Borough. However, further action is still required as exceedances of the annual mean NO<sub>2</sub> objective have been identified at four monitoring locations in 2018. Three of these sites are located within the Esher AQMA (Esher 1, Esher 7 and Esher 8), whilst one site (Esher 5) is not within an AQMA. The Esher 5 monitoring site is located at the Copsem Lane Roundabout, where Copsem Lane adjoins the A3 Esher Bypass (Figure D.7). The completion of the modelling project will allow a review of existing AQMAs that have shown levels below the objective in addition to alerting to any potential areas for further investigation under LAQM.

The areas prioritised for action in 2019/20 are:

- Working in partnership with the SAA to conclude the modelling project and provide a better understanding of air quality in Surrey;
- Reviewing existing AQMA's and investigate any potential areas for further investigation identified by the modelling project.
- Seeking provision of infrastructure through the planning process for the promotion and support of low emission vehicle usage;
- Utilising development management control within the Borough's AQMAs to avoid introducing more people to poor air quality or additional sources of pollution;
- Working collaboratively with other Surrey authorities, SCC Public Health team, Surrey's Clinical Commissioning Groups, SCC Local Highway and Transport Authority, in addition to actively participating in the SAA.
- Promoting air quality, raising awareness and seeking to change behaviours

- Increasing electric vehicle charging points in Council car parks and exploring further incentives for electric vehicle users.



## Local Engagement and How to get Involved

As part of the approach of local engagement we will use messages like the following:

- As the majority of air pollution is associated with traffic, consider alternatives to using your car; public transport, walking or cycling will help reduce emissions.
- When purchasing a new car, consider vehicles with lower exhaust emissions, such as hybrid or electric vehicles. Information on electric car grants is available at [www.gov.uk/plug-in-car-van-grants](http://www.gov.uk/plug-in-car-van-grants).
- If you are carrying out building works, consider future-proofing your home by installing an electric vehicle charge point. A fast (7kW) charger is recommended and there are grants available which can bring the cost down to under £300. More information can be found at: <https://www.gov.uk/government/collections/plug-in-vehicle-chargepoint-grants>.
- If installing or replacing an existing wood burning stove, consider purchasing one that has been approved for use in smoke control areas by DEFRA or an Eco-design ready stove to help reduce emissions <https://www.elmbridge.gov.uk/pollution/local-air-quality/>
- Air pollution can cause short term (acute) and long term (chronic) health problems. The most sensitive groups are adults and young children with

## Elmbridge Borough Council

respiratory conditions and adults with heart conditions. If you feel that you are in one of the higher risk groups or have particular concerns regarding air quality, you can sign up to our airAlert information service. For more information visit the airAlert website at:

<http://www.airalert.info/Surrey/Default.aspx>.





# Table of Contents

<b>Executive Summary: Air Quality in Our Area</b>	<b>i</b>
Air Quality in Elmbridge	i
Actions to Improve Air Quality	i
Conclusions and Priorities	iv
Local Engagement and How to get Involved	v
<b>1 Local Air Quality Management</b>	<b>1</b>
<b>2 Actions to Improve Air Quality</b>	<b>2</b>
2.1 Air Quality Management Areas	2
2.2 Progress and Impact of Measures to address Air Quality in Elmbridge	6
2.3 PM <sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations	13
<b>3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance</b>	<b>14</b>
3.1 Summary of Monitoring Undertaken	14
3.1.1 Automatic Monitoring Sites	14
3.1.2 Non-Automatic Monitoring Sites	14
3.2 Individual Pollutants	14
3.2.1 Nitrogen Dioxide (NO <sub>2</sub> )	15
3.2.2 Particulate Matter (PM <sub>10</sub> )	16
3.2.3 Particulate Matter (PM <sub>2.5</sub> )	16
3.2.4 Sulphur Dioxide (SO <sub>2</sub> )	16
<b>Appendix A: Monitoring Results</b>	<b>17</b>
<b>Appendix B: Full Monthly Diffusion Tube Results for 2018</b>	<b>32</b>
<b>Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC</b>	<b>36</b>
<b>Appendix D: Maps of Monitoring Locations and AQMAs</b>	<b>42</b>
	46
<b>Appendix E: Summary of Air Quality Objectives in England</b>	<b>51</b>
<b>Glossary of Terms</b>	<b>52</b>
<b>References</b>	<b>53</b>

## List of Tables

Table 2.1 – Declared Air Quality Management Areas.....	3
Table 2.2 – Progress on Measures to Improve Air Quality .....	8
Table A.1 – Details of Automatic Monitoring Sites.....	17
Table A.2 – Details of Non-Automatic Monitoring Sites .....	18
Table A.3 – Annual Mean NO <sub>2</sub> Monitoring Results .....	23
Table A.4 – 1-Hour Mean NO <sub>2</sub> Monitoring Results .....	31
Table B.1 – NO <sub>2</sub> Monthly Diffusion Tube Results – 2018 .....	32
Table E.1 – Air Quality Objectives in England .....	51

## List of Figures

Figure A.1 – Trends in Annual Mean NO <sub>2</sub> Concentrations at Esher .....	27
Figure A.2: Trends in Annual Mean NO <sub>2</sub> Concentrations at Hinchley Wood .....	27
Figure A.3: Trends in Annual Mean NO <sub>2</sub> Concentrations at Molesey .....	28
Figure A.4: Trends in Annual Mean NO <sub>2</sub> Concentrations at Hampton Court .....	28
Figure A.5: Trends in Annual Mean NO <sub>2</sub> Concentrations at Walton-on-Thames .....	29
Figure A.6: Trends in Annual Mean NO <sub>2</sub> Concentrations at Weybridge .....	29
Figure A.7: Trends in Annual Mean NO <sub>2</sub> Concentrations at Cobham .....	30

## 1 Local Air Quality Management

This report provides an overview of air quality in Elmbridge during 2018. 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 the 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 (AQMA) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority needs to 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 AQMA declared by Elmbridge Borough Council (the Council) can be found in Table 2.1. Further information related to declared or revoked AQMA, including maps of AQMA boundaries are available online at [https://uk-air.defra.gov.uk/aqma/local-authorities?la\\_id=98](https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98).

The Public Health Outcomes Framework data tool, compiled by Public Health England, quantifies the proportion of the population living within an AQMA. The tool is available online at <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/0/gid/1000049/pat/6/par/E12000008/ati/102/are/E10000030>.

The latest data available for 2017 shows that in England, the proportion of the population living within an AQMA is 0.2%, and in Surrey it is 0.5%. There is no data available for the proportion of the population living within an AQMA in Elmbridge.

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		
						At Declaration		Now		Name	Date of Publication	Link
Walton-on-Thames High Street	01/11/2013	NO <sub>2</sub> Annual Mean	Walton-on-Thames	An area encompassing part of the High Street, Walton-on-Thames, between its junction with Hepworth Way/Church Street and Ashley Road/Herhsam Road	YES	42.3	µg/m <sup>3</sup>	31.3	µg/m <sup>3</sup>	Air Quality Action Plan for Elmbridge Borough Council 2011	2011	<a href="https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98">https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98</a>
Weybridge High Street	17/11/2008	NO <sub>2</sub> Annual Mean	Weybridge	An area encompassing Balfour Road, Church Street, High Street and Monument Hill, Weybridge.	YES	62	µg/m <sup>3</sup>	39.6	µg/m <sup>3</sup>	Air Quality Action Plan for Elmbridge Borough Council 2011	2011	<a href="https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98">https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98</a>

# Elmbridge Borough Council

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		
						At Declaration		Now		Name	Date of Publication	Link
Hampton Court	17/11/2008	NO <sub>2</sub> Annual Mean	Molesey	An area encompassing parts of Hampton Court Way and Riverbank.	NO	50.7	µg/m <sup>3</sup>	38	µg/m <sup>3</sup>	Air Quality Action Plan for Elmbridge Borough Council 2011	2011	<a href="https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98">https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98</a>
Cobham High Street	17/11/2008	NO <sub>2</sub> Annual Mean	Cobham	An Area along the High Street, Cobham,	YES	39.5	µg/m <sup>3</sup>	33.3	µg/m <sup>3</sup>	Air Quality Action Plan for Elmbridge Borough Council 2011	2011	<a href="https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98">https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98</a>
Hinchley Wood	17/11/2008	NO <sub>2</sub> Annual Mean	Hinchley Wood	An area encompassing part of the A309 Kingston Bypass between Littleworth Road and Manor Road North.	YES	57.7	µg/m <sup>3</sup>	34.4	µg/m <sup>3</sup>	Air Quality Action Plan for Elmbridge Borough Council 2011	2011	<a href="https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98">https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98</a>

# Elmbridge Borough Council

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		
						At Declaration		Now		Name	Date of Publication	Link
Esher High Street	17/06/2005	NO <sub>2</sub> Annual Mean	Esher	An area extending along the High Street, Church Street and including parts of Esher Green and Lammas Lane.	YES	62.1	µg/m <sup>3</sup>	46.1	µg/m <sup>3</sup>	Air Quality Action Plan for Elmbridge Borough Council 2011	2011	<a href="https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98">https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98</a>
Walton Road, Molesey	17/06/2005	NO <sub>2</sub> Annual Mean	Molesey	An area extending 50m either side of the centre line of Walton Road, Molesey between its junction with Tonbridge Road and Esher Road/Bridge Road.	NO	55.8	µg/m <sup>3</sup>	35.7	µg/m <sup>3</sup>	Air Quality Action Plan for Elmbridge Borough Council 2011	2011	<a href="https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98">https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=98</a>

☒ Elmbridge Borough Council confirm the information on UK-Air regarding their AQMAs is up to date

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

Defra's appraisal of last year's ASR stated that the conclusions reached by the Council were acceptable for all sources and pollutants. The following recommendations were made to help inform future reports:

- The report could include links to Public Health Outcomes Frameworks;
- The Council could look at deriving a local bias adjustment factor, for comparison with the national factor;
- Annual mean NO<sub>2</sub> concentrations have been well below the objective in the Cobham AQMA for a number of years now. The Council should consider a detailed assessment of the area to inform possible revocation of the AQMA; and
- There are no current exceedances within Hinchley Wood AQMA, Walton-on-Thames AQMA and Molesey AQMA. It is recommended that monitoring continues until there are three years of results below 10% of the objective level, prior to considerations for revocation.

The 2019 ASR has addressed these comments in the following ways:

- Links to the Public Health Outcomes Framework have been provided. Data on mortality burden of PM<sub>2.5</sub> and percentage of the population living within an AQMA have been summarised;
- A local bias adjustment factor has been calculated and compared against the national bias adjustment factor (Appendix C provides further details). The local bias adjustment factor has been applied to the 2018 non-automatic monitoring data;
- Surrey-wide modelling of pollutants has been undertaken and this can be used to inform the detailed assessment of the Cobham AQMA; and
- Monitoring was continued in the Hinchley Wood, Walton-on-Thames and Molesey AQMAs throughout 2018.

The Council has taken forward a number of direct measures during the current reporting year of 2018 in pursuit of improving local air quality. Details of all measures



completed, in progress or planned are set out in Table 2.2. Key completed measures are:

- Assisting in delivery of the SAA workplan and leading on the Surrey-wide modelling project for key pollutants;
- Modelling of target pollutant levels to be carried out as part of a Surrey-wide exercise (PM<sub>10</sub>, PM<sub>2.5</sub> and NO<sub>2</sub>);
- Providing support to the production of an Electric Vehicle Charging Strategy for Surrey, and adoption of the Strategy in Elmbridge; and
- Reducing parking permit charges for electric vehicles.

The Council expects the following measures to be completed over the course of the next reporting year:

- Adoption of a revised Air Quality Action Plan;
- Continue to support the Surrey Schools Air Quality Programme project;
- Installation of electric vehicle charging points in at least two main town car parks
- Use the results of the Surrey Wide modelling project to review existing AQMA's and explore the need to declare any new AQMA's
- Explore further parking incentives for electric vehicle owners
- Promotion of air quality, raising awareness and seeking to change behaviours

**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	To establish the Surrey Air Quality Study Group (now Surrey Air Alliance (SAA))	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area-wide Strategies to reduce emissions and improve air quality	SAA	2015	Ongoing	Formation of Group		Constitution adopted and workplan produced. Regular meetings held.	Ongoing	Progress on delivery of the work plan is dependent on resources
2	Support through the SAA, an electric vehicle strategy for Surrey.	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	SAA	2017	2019	SCC draft strategy	Reduction of NO <sub>2</sub> emissions	Electric Vehicle Strategy produced and adopted by Elmbridge Borough Council		
3	Produce a SAA Work Plan	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area-wide Strategies to reduce emissions and improve air quality	SAA	2017	2018-2021	Adoption of Work Plan		Work Plan produced	Ongoing	Progress on the work plan is dependent on resources

## Elmbridge Borough Council

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
4	Surrey-wide modelling for key pollutants through the SAA.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	SAA	2016	2019	Modelling completed		Modelling completed and draft reports issued by CERC	The reports have been received	
5	Produce Surrey-wide guidance for Private Hire Vehicles and Taxi Licensing policy to encourage lower emission vehicles	Promoting Low Emission Transport	Taxi Licensing conditions	SAA	2017	2019	Adoption of policy	Reduction of NO <sub>2</sub> emissions	Guidance provided for consistent licensing approach	No agreed date	2018 moved on to SAA work plan. See below EBC position on a Council scheme
6	Maintain the EV charger in council Cobham car park	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	EBC	2015	Ongoing	Charger accessed >30 times a month	Reduction of NO <sub>2</sub> emissions	Charger fees reduced Sept 2017.		As part of an upgrade to council, car parks this charger will be replaced with two twin fast charging points in 2019
7	Lease of three electric vehicles for use by staff visiting the Borough	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	EBC	2015	2015	Usage of >1900 miles/month to be cost effective	Reduction of NO <sub>2</sub> emissions	Usage of 21,387 miles in 2018 (average of 1782 miles/month)	Ongoing	Current plan (2019/20) to increase from 3 to 7 staff electric cars
8	Produce updated Elmbridge AQAP, compatible with the Local Plan and Development	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	EBC	2019	2020-2024	Development control consultation on AQAP		Draft AQAP produced for consultation	Spring 2020	Delayed due to staff changes and policy direction. Now due for completion in Spring 2020

## Elmbridge Borough Council

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
	Management Plan.										
9	Use of a tiered fee structure for taxi licensing to benefit operators with lower emission vehicles	Promoting Low Emission Transport	Taxi emission incentives	EBC	2019	2019	Possible Inclusion in Hackney carriage and private hire licensing policy	Reduction of NO <sub>2</sub> emissions	Consultation phase	2020	Taxi policy under review. Consultation in progress July - October 2019.
10	Use of the EBC website to promote public awareness of the Elmbridge AQMAs and air quality in general.	Public Information	Via the Internet	SCC and Surrey Local Authorities	2017	Ongoing	Latest ASR available on website		Standard information compiled by the SAA	Completed Together with on-going updating	Completed Summer 2018, ongoing updating required. Love Elmbridge Campaign includes air quality advice and bespoke animation.
11	Install electric vehicle charging points in at least two main town car parks	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	EBC	2019	2020	Charging points installed	Reduction of NO <sub>2</sub> emissions		Dec-19	On going
12	Devise a medium-term action plan to reduce traffic emissions through a series of measures	Traffic Management	UTC, Congestion management, traffic reduction	EBC / SCC	2019	2019	Action Plan produced	Reduction of NO <sub>2</sub> emissions		Mar-20	

## Elmbridge Borough Council

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
	including tackling congestion, in partnership with businesses, transport operators, the local transportation authority (SCC) and the local community										
13	Low Emission Transport Strategy for Surrey	Policy Guidance and Development Control	Low Emissions Strategy	Lead: Surrey County Council	2017 - 2018	2018	Suite of indicators associated with quantum and distribution of air pollution, travel behaviour and delivery of infrastructure for low emission transport options.	Reduced vehicle emissions	Completed, in use	2018	Those action plans that result from this strategy will necessarily be constrained by funding. In particular, revenue funding constraints will limit what can be achieved with regards travel behaviour and monitoring activities.
14	Brooklands Business Park Accessibility Project	Transport Planning and Infrastructure	Other	Lead: Surrey County Council. Funding: Enterprise M3 Local Enterprise Partnership and others	2017 - 2019	2019 - 2021	No. of journeys made on foot, by bike and by bus in the Brooklands and Weybridge areas	Reduced and avoided vehicle emissions, from modal shift	Detailed design and procurement work underway	2021	N/A

## Elmbridge Borough Council

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
15	School Air Quality Programme	Public Information	Other	Lead: Surrey Air Alliance Funding: DEFRA	2017 - 2018	2018 - 2019	No. children reached by promotional / engagement activities	Reduced vehicle emissions, from modal shift	All elements delivered or in delivery; will complete at close of academic year	2019	Desirable to continue this initiative into next school year
16	Euro 6 buses introduced on Elmbridge bus route	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	Lead: Local bus operator, working with Surrey County Council	N/A	2018	Euro engine rating	Reduced vehicle emissions	Completed, in use	2018	N/A
17	Workplace Travel Plans	Promoting Travel Alternatives	Workplace Travel Planning	Lead: Planning applicants; monitoring reports audited by Surrey County Council	Ad-hoc, in response to planning applications	Ad-hoc, in response to planning applications	Mode share of single occupancy vehicle trips	Reduced and avoided vehicle emissions, from modal shift	Ongoing	N/A	Surrey County Council has been unable to proactively influence behavioural change.

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

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

The Public Health Outcomes Framework data tool compiled by Public Health England quantifies the mortality burden of PM<sub>2.5</sub> within England, as well as on county and local authority scales. The tool is available online at

<https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/0/gid/1000049/pat/6/par/E12000008/ati/102/are/E10000030>.

The latest available data for 2017 shows that the percentage of mortality attributable to PM<sub>2.5</sub> pollution across England is 5.1%. The percentage within Surrey is 5.7% and within Elmbridge is 5.9%. Elmbridge has a higher percentage of mortality attributable to PM<sub>2.5</sub> pollution when compared to England and Surrey as a whole.

Given the implementation of the Technical Guidance LAQM.TG16 and Policy Guidance LAQM.PG16, the Council is working towards defining a strategy to reduce emissions or concentration of PM<sub>2.5</sub>. However, existing measures to improve air quality already in place can help reduce levels of PM<sub>2.5</sub>, such as:

- Allocating Council funding to carry out PM<sub>2.5</sub> dispersion modelling to gain a better understanding of the current situation;
- Promoting travel alternatives;
- Promoting low emission transport;
- Implementing Surrey County Council's Transport Plan (LTP3) and Air Quality Strategy (January 2016).

The Surrey-wide dispersion modelling of PM<sub>2.5</sub> concentrations has recently been completed and the reports are expected to be finalised during 2019. The reports will provide information on PM<sub>2.5</sub> source apportionment and mortality burden, as well as modelled PM<sub>2.5</sub> concentrations across Elmbridge.

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

### **3.1 Summary of Monitoring Undertaken**

This section sets out what monitoring has taken place in 2018, and how it compares with the national objectives.

#### **3.1.1 Automatic Monitoring Sites**

The Council undertook automatic (continuous) monitoring at two sites during 2018, Weybridge High Street and Hampton Court Parade. Table A.1 in Appendix A provides details of the sites and their locations are shown in Figure D.1.

Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

#### **3.1.2 Non-Automatic Monitoring Sites**

The Council undertook non-automatic (passive) monitoring of NO<sub>2</sub> at 40 sites during 2018. Triplicate diffusion tubes are co-located with the Hampton Court Parade and Weybridge High Street automatic monitors (from January 2013). Table A.1 in Appendix A provides the details of the sites and their locations are shown in Figure D.2.

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 bias, annualisation and distance correction. Further details on adjustments are provided in Appendix C.

Reflecting feedback under the LAQM review process, the UK Government has decided to retain Benzene, 1,3-Butadiene, Carbon Monoxide and Lead in the Regulations for England. However, in recognition of the fact that the objectives for these pollutants have been met for several years and are well below limit values, local authorities in England do not have to report on these pollutants unless local circumstances indicate otherwise; there are no such local circumstances in Elmbridge.



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

Table A.3 in Appendix A compares the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the annual air quality objectives.

Table A.4 in Appendix A compares the ratified continuous monitored NO<sub>2</sub> hourly mean concentrations for the past five years with the hourly NO<sub>2</sub> objective of 200µg/m<sup>3</sup> (not to be exceeded more than 18 times per year).

#### **Automatic Monitoring**

During 2018, the Council undertook automatic monitoring of NO<sub>2</sub> concentrations at Weybridge High Street and Hampton Court Parade. Annual mean NO<sub>2</sub> concentrations at both automatic monitoring sites met the objective. NO<sub>2</sub> concentrations at both the Hampton Court Parade and Weybridge High Street automatic monitoring locations reduced in 2018 compared to previous years. Data capture during 2018 was good (>90%) at both analysers.

Hourly mean concentrations at Hampton Court Parade were below the objective throughout 2018. At Weybridge High Street, the hourly mean objective was exceeded twice during 2018, however up to 18 exceedances per year are permitted.

#### **Non-Automatic Monitoring**

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Table B.1, in Appendix B.

In 2018, exceedances of the annual mean NO<sub>2</sub> objective were measured at the Esher 1, Esher 5, Esher 7 and Esher 8 monitoring sites. Esher 1, Esher 7 and Esher 8 are all located within the Esher AQMA (shown in Figure D.7). Esher 5 recorded the highest NO<sub>2</sub> concentration in 2018 (46.1 µg/m<sup>3</sup>) and is located outside the Esher AQMA at the Copsem Lane Roundabout, where Copsem Lane adjoins the A3 Esher Bypass (Figure D.7). However, this monitoring site is not considered to be representative of relevant exposure as the closest residential properties are located more than 100 m from this monitoring site.

Distance correction has been carried out in order to estimate concentrations at the nearest locations of relevant exposure in the vicinity of Esher 1, Esher 7 and Esher 8 monitoring sites. Once distance corrected, exceedances of the annual mean objective

remain at the nearest locations of relevant exposure to Esher 1 (41.8  $\mu\text{g}/\text{m}^3$ ) and Esher 8 (41.7  $\mu\text{g}/\text{m}^3$ ).

During 2018, there were no measured concentrations greater than 60 $\mu\text{g}/\text{m}^3$ , and therefore it is considered unlikely that the hourly mean objective is exceeded within the Borough.

In 2018,  $\text{NO}_2$  concentrations worsened at 29 sites, and improved or remained stable at 11 sites in Elmbridge when compared with 2017 concentrations. Data trends for all current sites for the past five years are provided in Appendix A, Figures A.1 – A.7. Overall, between 2014 and 2018, concentrations have fluctuated, however a general decrease in concentrations is evident across all sites since 2014.

### **3.2.2 Particulate Matter ( $\text{PM}_{10}$ )**

$\text{PM}_{10}$  is not currently monitored but has been included within the modelling exercise undertaken by CERC. The modelling report is expected to be finalised in 2019, and results from the modelling exercise will be discussed in the 2020 Annual Status Report.

### **3.2.3 Particulate Matter ( $\text{PM}_{2.5}$ )**

$\text{PM}_{2.5}$  is not currently monitored but has been included within the modelling exercise undertaken by CERC. The modelling report is expected to be finalised in 2019, and results from the modelling exercise will be discussed in the 2020 Annual Status Report.

### **3.2.4 Sulphur Dioxide ( $\text{SO}_2$ )**

$\text{SO}_2$  is not currently monitored by Elmbridge Borough Council.

## Appendix A: Monitoring Results

**Table A.1 – Details of Automatic Monitoring Sites**

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Inlet Height (m)
Weybridge High Street	Weybridge High Street	Roadside	507480	164923	NO2	YES	Chemiluminescence	6.5	0.6	1.8
Hampton Court Parade	Hampton Court Parade	Roadside	515388	168282	NO2	YES	Chemiluminescence	10	2	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.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?	Height (m)
<b>Esher</b>										
Esher 1	Lamp post outside The Hair Gallery, Church St	Roadside	513840	164693	NO <sub>2</sub>	YES	0.4	1.5	NO	2.6
Esher 4	Bus stop opp Sandown House on Portsmouth Rd	Urban Centre	514058	164855	NO <sub>2</sub>	YES	n/a	4.7	NO	2.4
Esher 5	Roundabout, Copsem Lane/A3	Roadside	514150	162470	NO <sub>2</sub>	NO	n/a	1.4	NO	2.4
Esher 7	35-37 High St	Roadside	513982	164750	NO <sub>2</sub>	YES	2.3	0.6	NO	2.3
Esher 8	Outside 9 Church St	Urban Centre	513832	164684	NO <sub>2</sub>	YES	0.1	3.2	NO	2.4
Esher 9	Lamp post next to Churchyard, Church St	Roadside	513821	164712	NO <sub>2</sub>	YES	n/a	0.6	NO	2.6
Esher 10	Traffic Sign, outside 15 Esher Green	Urban Centre	513886	164767	NO <sub>2</sub>	YES	4.3	2.1	NO	2.4
Esher 11	The Bear, Copsem Lane side	Urban Centre	513893	164607	NO <sub>2</sub>	YES	0.1	5.1	NO	2.6
Esher 13	Panahar Tandoori, 124-126 High St	Roadside	513736	164489	NO <sub>2</sub>	YES	2.7	0.9	NO	2.4
<b>Hinchley Wood</b>										

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?	Height (m)
Hinchley Wood 1	Kingston By Pass (opp Fire Station)	Urban Centre	515248	165535	NO <sub>2</sub>	YES	n/a	4.5	NO	2.4
Hinchley Wood 2	Lamp post outside gate. Brooklands, Westmont Road, Esher	Urban Centre	515218	165578	NO <sub>2</sub>	YES	3.5	9.8	NO	1.9
<b>Molesey</b>										
Molesey 1	113 Walton Rd.	Roadside	514450	168134	NO <sub>2</sub>	YES	n/a	1.1	NO	2.5
Molesey 8	44-46 Walton Rd	Urban Centre	514716	167960	NO <sub>2</sub>	YES	0.1	2.6	NO	2.5
Molesey 9	Tesco, Walton Rd	Urban Centre	514507	168086	NO <sub>2</sub>	YES	4.2	2.6	NO	2.4
Molesey 10	Molesey Mart 264 Walton RD	Urban Centre	514169	168152	NO <sub>2</sub>	YES	0.1	4.9	NO	2.4
<b>Hampton Court</b>										
Hampton Court 1	Lamp post nr bus stop, entrance to Summer Road, Hampton Court Way	Roadside	515379	167946	NO <sub>2</sub>	YES	n/a	0.9	NO	2.2
Hampton Court 2	Air Quality Station, Hampton Court Parade	Roadside	515338	168292	NO <sub>2</sub>	YES	10	1.9	YES	1.7
Hampton Court 3	Air Quality Station, Hampton Court Parade	Roadside	515338	168292	NO <sub>2</sub>	YES	10	1.9	YES	1.7

Elmbridge Borough Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?	Height (m)
Hampton Court 4	Air Quality Station, Hampton Court Parade	Roadside	515338	168292	NO <sub>2</sub>	YES	10	1.9	YES	1.7
Hampton Court 5	Traffic sign, 1 Creek Road	Roadside	515329	168390	NO <sub>2</sub>	YES	3.5	0.4	NO	2.4
<b>Walton-on-Thames</b>										
Walton 3	Woolwich Building Soc, 27 High St. Walton	Urban Centre	510132	166336	NO <sub>2</sub>	YES	2.7	0.4	NO	2.6
Walton 5	10 Hersham Rd, Walton	Urban Centre	510702	165471	NO <sub>2</sub>	NO	n/a	0.9	NO	2.3
Walton 8	Leaders, 46 High St	Urban Centre	510154	166281	NO <sub>2</sub>	YES	2	2.9	NO	2.6
Walton 9	Traffic Sign, Café Nero, 18 High St	Urban Centre	510082	166379	NO <sub>2</sub>	YES	2.2	2.6	NO	2.5
Walton 10	The Bees Knees, 34 Church St	Urban Centre	510140	166522	NO <sub>2</sub>	YES	2	3.3	NO	2.6
Walton 11	Traffic Sign, Ex Dukes Head, Hepworth Way	Urban Centre	510000	166401	NO <sub>2</sub>	NO	n/a	2.3	NO	2.4
<b>Weybridge</b>										
Weybridge 1	Café Nero, 40a High St.	Urban Centre	507448	164900	NO <sub>2</sub>	YES	3.8	1	NO	2.5
Weybridge 4	Right of 6 Monument Hill	Urban Centre	507705	164907	NO <sub>2</sub>	YES	5	2	NO	2.4
Weybridge 5	Pizza Express, 1 Monument Hill	Roadside	507609	164966	NO <sub>2</sub>	YES	0.4	1.6	NO	2.3

Elmbridge Borough Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?	Height (m)
Weybridge 6	Outside Bradford & Bingley, 41 High St	Urban Centre	507511	164936	NO <sub>2</sub>	YES	5.5	0.5	NO	2.3
Weybridge 7	Prezzo, 44 Church St	Roadside	507199	164804	NO <sub>2</sub>	YES	0.1	1.5	NO	2.4
Weybridge 8	Lloyd Roberts Opticians, 60A Church St	Urban Centre	507150	164761	NO <sub>2</sub>	YES	0.1	4.6	NO	2.4
Weybridge 9	Norfolk House, 39 Portmore Park Rd	Urban Centre	507065	164815	NO <sub>2</sub>	YES	0.8	13.1	NO	1.6
Weybridge 10	Air Quality Station, outside 42 High Street, Weybridge, KT13 8AB	Roadside	507480	164923	NO <sub>2</sub>	YES	6.5	0.6	YES	1.8
Weybridge 11	Air Quality Station, outside 42 High Street, Weybridge, KT13 8AB	Roadside	507480	164923	NO <sub>2</sub>	YES	6.5	0.6	YES	1.8
Weybridge 12	Air Quality Station, outside 42 High Street, Weybridge, KT13 8AB	Roadside	507480	164923	NO <sub>2</sub>	YES	6.5	0.6	NO	1.8
<b>Cobham</b>										
Cobham 1	Opposite the Lemon Tree	Roadside	510828	159996	NO <sub>2</sub>	YES	2.7	0.6	NO	2.4

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?	Height (m)
Cobham 6	Harlequin Dry Cleaners, 2 Anyards Road	Urban Centre	510814	160099	NO <sub>2</sub>	NO	4	6	NO	2.4
Cobham 7	Exclusively Surrey, 38A High Street	Urban Centre	510861	159906	NO <sub>2</sub>	YES	4.2	3.1	NO	2.4
Downside 3	Downside Village Hall	Rural	511429	157606	NO <sub>2</sub>	NO	n/a	1.1	NO	2.3

**Notes:**

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

(2) N/A if not applicable.



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

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2018 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
					2014	2015	2016	2017	2018
Weybridge High Street	Roadside	Automatic	99.8	99.8	<b>40</b>	<b>37.5</b>	<b>38</b>	33	32
Hampton Court Parade	Roadside	Automatic	97.0	97.0	<b>46.9</b>	39.7	<b>44</b>	<b>41</b>	38
<b>Esher</b>									
Esher 1	Urban Centre	Diffusion Tube	100.0	100.0	<b>48.0</b>	<b>48.8</b>	<b>44.9</b>	37.1	<b>43.2</b>
Esher 4	Urban Centre	Diffusion Tube	100.0	100.0	<b>45.5</b>	<b>43.4</b>	39.8	33.4	35.6
Esher 5	Urban Centre	Diffusion Tube	100.0	100.0	<b>51.8</b>	<b>50.6</b>	<b>44.4</b>	<b>42.6</b>	<b>46.1</b>
Esher 7	Urban Centre	Diffusion Tube	100.0	100.0	<b>53.1</b>	<b>48.4</b>	<b>40.5</b>	39.2	<b>41.9</b>
Esher 8	Urban Centre	Diffusion Tube	91.7	91.7	<b>51.1</b>	<b>44.4</b>	<b>42.0</b>	38.6	<b>41.9</b>
Esher 9	Urban Centre	Diffusion Tube	100.0	100.0	37.3	32.1	32.7	28.7	33.4
Esher 10	Urban Centre	Diffusion Tube	100.0	100.0	36.1	33.0	30.2	28.5	28.2
Esher 11	Urban Centre	Diffusion Tube	100.0	100.0	39.1	38.9	32.9	32.7	33.7
Esher 13	Urban Centre	Diffusion Tube	91.7	91.7	37.8	39.8	35.7	31.5	31.5
<b>Hinchley Wood</b>									
Hinchley Wood 1	Urban Centre	Diffusion Tube	100.0	100.0	<b>47.6</b>	<b>44.8</b>	38.3	35.4	34.4
Hinchley Wood 2	Urban Centre	Diffusion Tube	100.0	100.0	34.7	33.0	31.2	30.8	31.0
<b>Molesey</b>									
Molesey 1	Urban Centre	Diffusion Tube	100.0	100.0	37.1	34.2	32.1	28.2	32.9

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2018 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
					2014	2015	2016	2017	2018
Molesey 8	Urban Centre	Diffusion Tube	100.0	100.0	<b>45.7</b>	<b>41.9</b>	35.6	31.2	35.7
Molesey 9	Urban Centre	Diffusion Tube	100.0	100.0	<b>40.9</b>	39.1	34.1	32.3	32.5
Molesey 10	Urban Centre	Diffusion Tube	91.7	91.7	33.3	28.5	26.6	27.5	28.5
<b>Hampton Court</b>									
Hampton Court 1	Urban Centre	Diffusion Tube	91.7	91.7	<b>45.4</b>	<b>42.2</b>	36.9	35.4	32.1
Hampton Court 2	Urban Centre	Diffusion Tube	100.0	100.0	<b>45.7</b>	<b>43.1</b>	38.0	34.8	37.0
Hampton Court 3	Urban Centre	Diffusion Tube	91.7	91.7	<b>45.7</b>	<b>43.0</b>	38.7	35.0	36.3
Hampton Court 4	Urban Centre	Diffusion Tube	100.0	100.0	<b>49.6</b>	<b>45.2</b>	38.7	34.7	37.3
Hampton Court 5	Urban Centre	Diffusion Tube	100.0	100.0	33.4	30.6	28.7	25.3	28.9
<b>Walton-on-Thames</b>									
Walton 3	Urban Centre	Diffusion Tube	100.0	100.0	34.3	32.7	30.2	30.1	29.4
Walton 5	Urban Centre	Diffusion Tube	33.3	33.3	38.2	35.4	29.8	27.5	34.4
Walton 8	Urban Centre	Diffusion Tube	100.0	100.0	<b>43.7</b>	38.0	32.3	30.5	33.2
Walton 9	Urban Centre	Diffusion Tube	100.0	100.0	<b>40.8</b>	37.9	31.5	30.2	32.4
Walton 10	Urban Centre	Diffusion Tube	100.0	100.0	<b>47.2</b>	<b>43.8</b>	36.8	33.2	34.9
Walton 11	Urban Centre	Diffusion Tube	100.0	100.0	36.0	38.8	33.7	30.5	35.9
<b>Weybridge</b>									
Weybridge 1	Urban Centre	Diffusion Tube	100.0	100.0	39.2	36.1	31.9	30.1	28.4

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2018 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
					2014	2015	2016	2017	2018
Weybridge 4	Urban Centre	Diffusion Tube	33.3	33.3	<b>43.8</b>	36.6	32.4	30.2	32.1
Weybridge 5	Urban Centre	Diffusion Tube	100.0	100.0	<b>49.4</b>	<b>42.8</b>	27.0	34.0	34.0
Weybridge 6	Urban Centre	Diffusion Tube	25.0	25.0	36.0	30.1	30.9	28.1	27.7
Weybridge 7	Urban Centre	Diffusion Tube	33.3	33.3	<b>55.6</b>	<b>50.8</b>	<b>45.0</b>	<b>40.6</b>	39.6
Weybridge 8	Urban Centre	Diffusion Tube	100.0	100.0	<b>42.0</b>	37.2	37.4	35.5	31.9
Weybridge 9	Urban Centre	Diffusion Tube	91.7	91.7	28.9	25.1	25.8	22.7	25.4
Weybridge 10	Urban Centre	Diffusion Tube	100.0	100.0	39.8	35.8	34.4	31.3	32.5
Weybridge 11	Urban Centre	Diffusion Tube	100.0	100.0	39.9	36.6	34.9	30.9	32.0
Weybridge 12	Urban Centre	Diffusion Tube	100.0	100.0	<b>40.4</b>	35.8	34.2	32.0	31.7
<b>Cobham</b>									
Cobham 1	Urban Centre	Diffusion Tube	91.7	91.7	<b>42.3</b>	34.9	33.1	30.1	33.3
Cobham 6	Urban Centre	Diffusion Tube	100.0	100.0	32.8	28.4	28.6	24.6	27.0
Cobham 7	Urban Centre	Diffusion Tube	100.0	100.0	<b>42.5</b>	36.4	34.1	32.2	31.6
Downside 3	Rural	Diffusion Tube	100.0	100.0	31.4	26.3	21.3	19.1	20.3

☒ Diffusion tube data has been bias corrected

☒ Annualisation has been conducted where data capture is <75%

**Notes:**

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

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

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

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

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

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

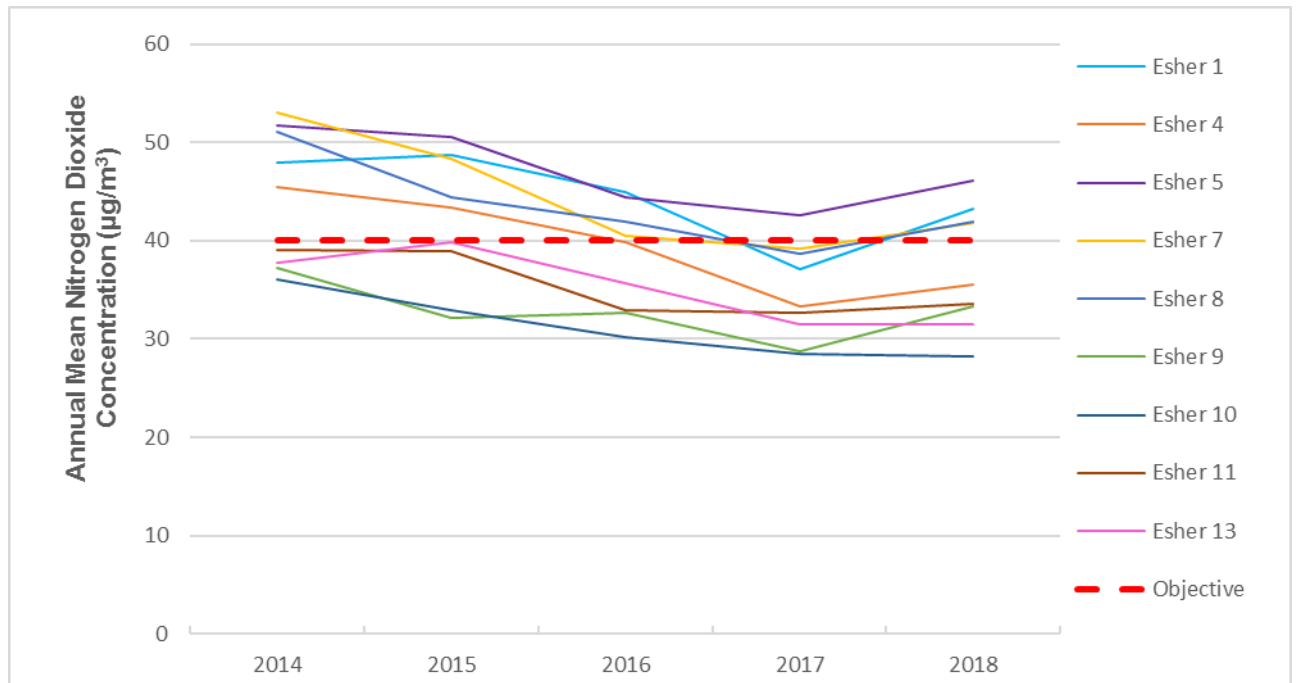


Figure A.2: Trends in Annual Mean NO<sub>2</sub> Concentrations at Hinchley Wood

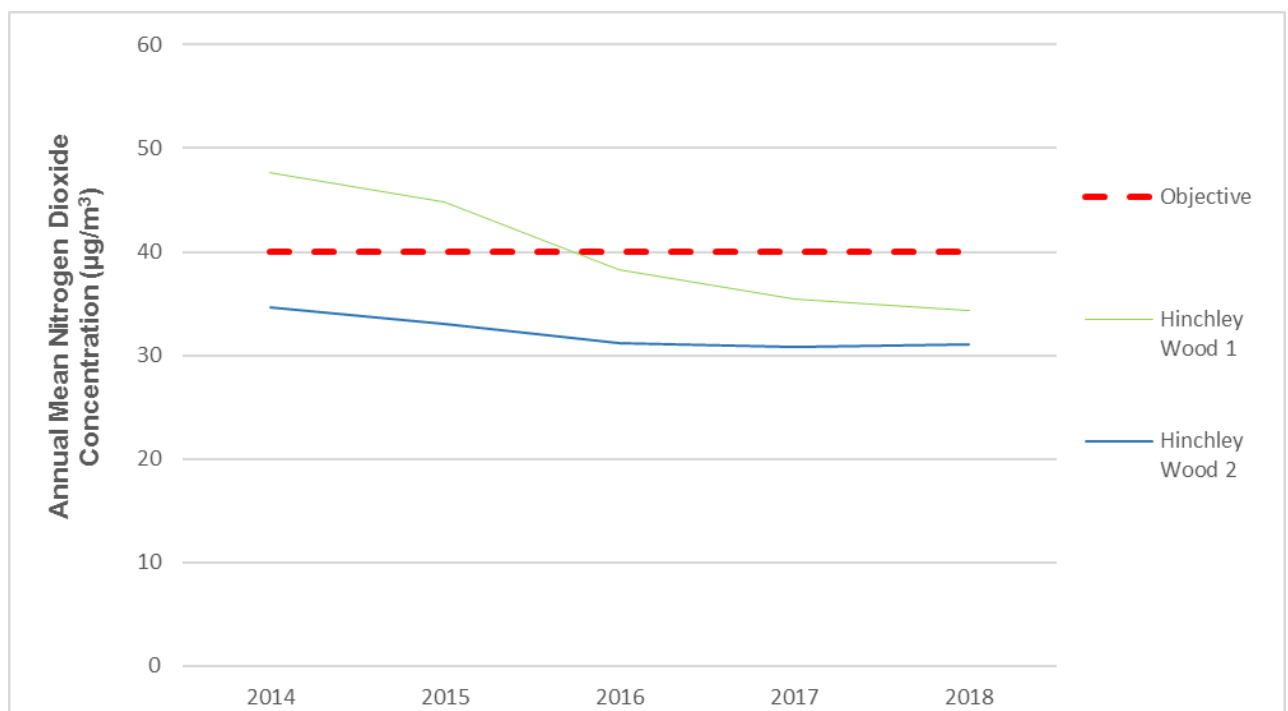


Figure A.3: Trends in Annual Mean NO<sub>2</sub> Concentrations at Molesey

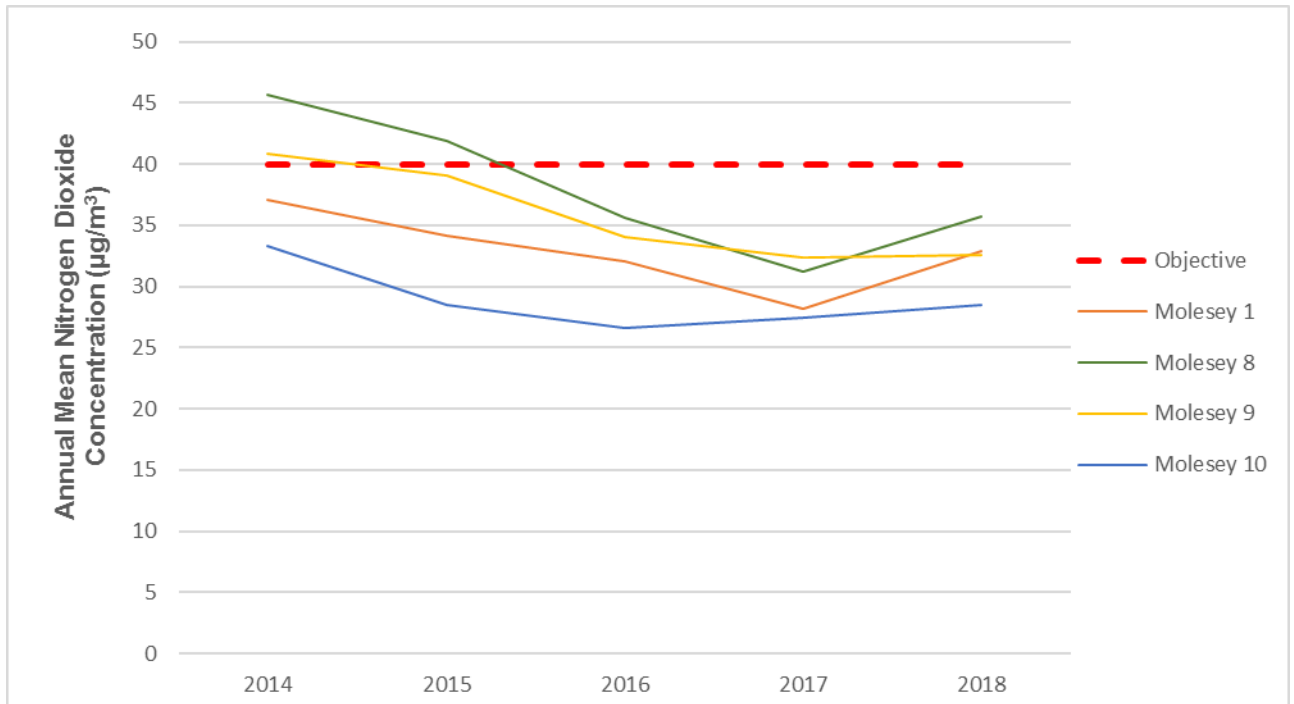
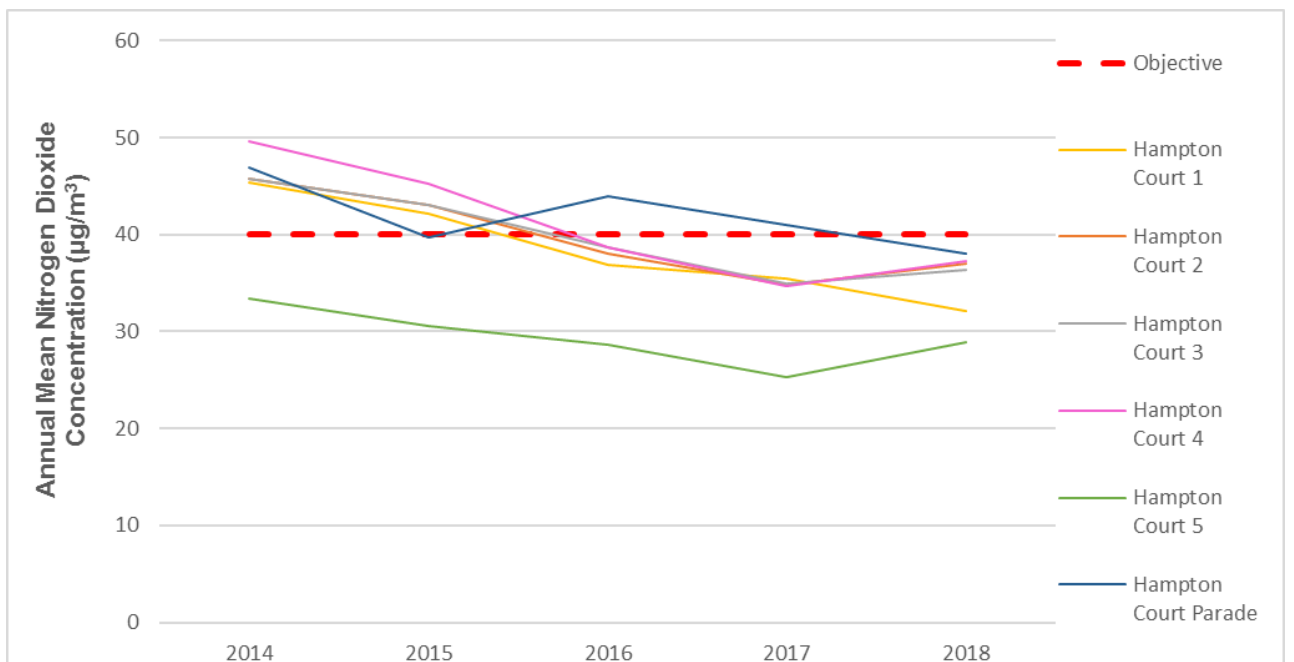
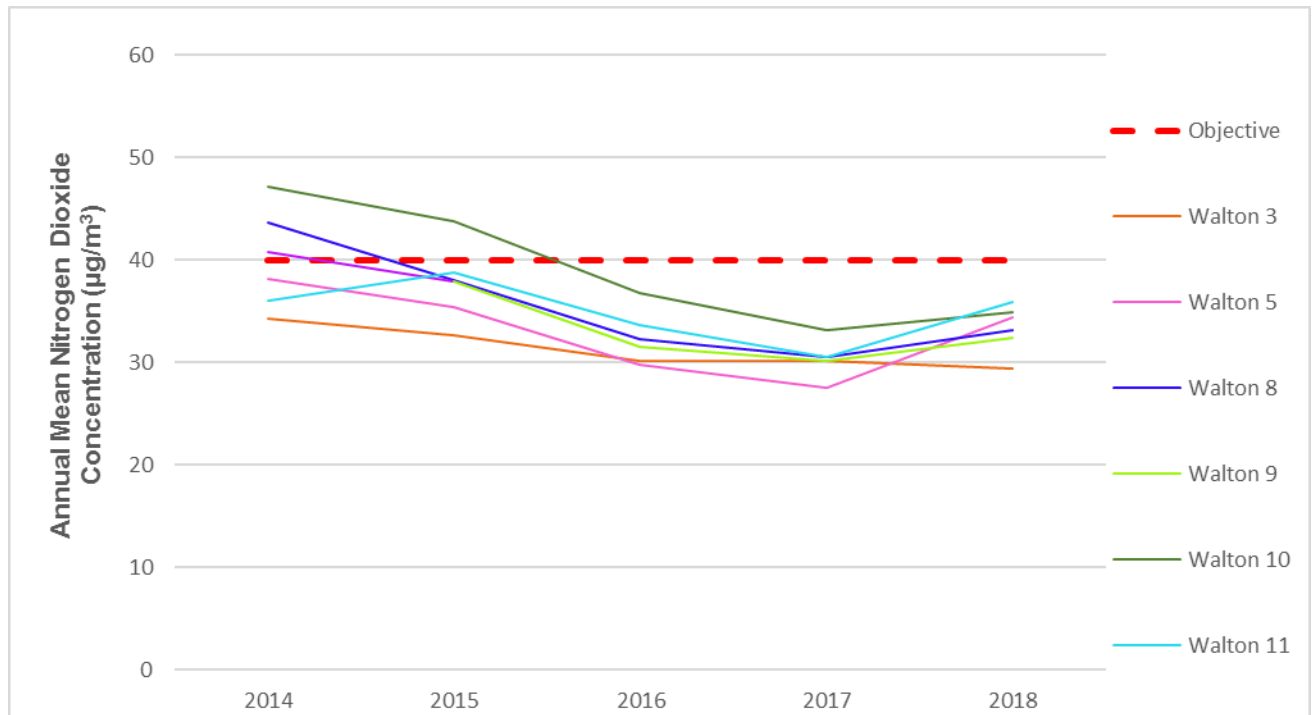


Figure A.4: Trends in Annual Mean NO<sub>2</sub> Concentrations at Hampton Court



**Figure A.5: Trends in Annual Mean NO<sub>2</sub> Concentrations at Walton-on-Thames**



**Figure A.6: Trends in Annual Mean NO<sub>2</sub> Concentrations at Weybridge**

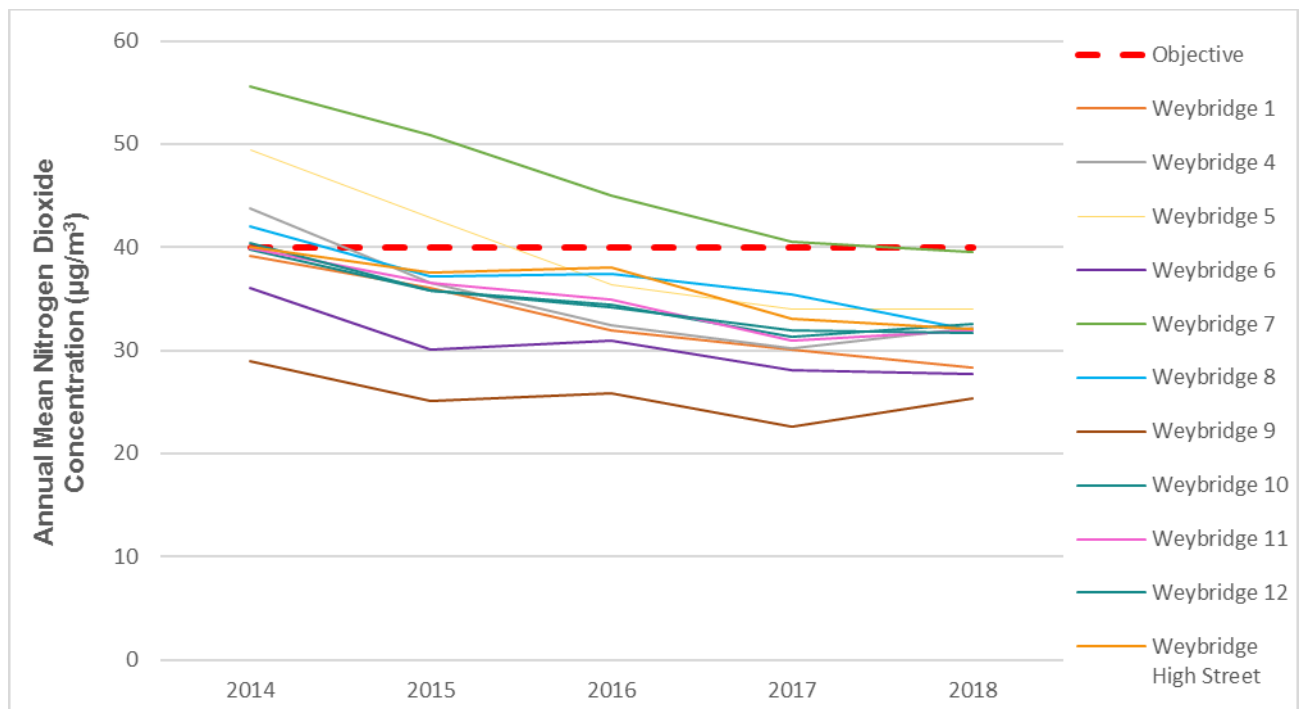
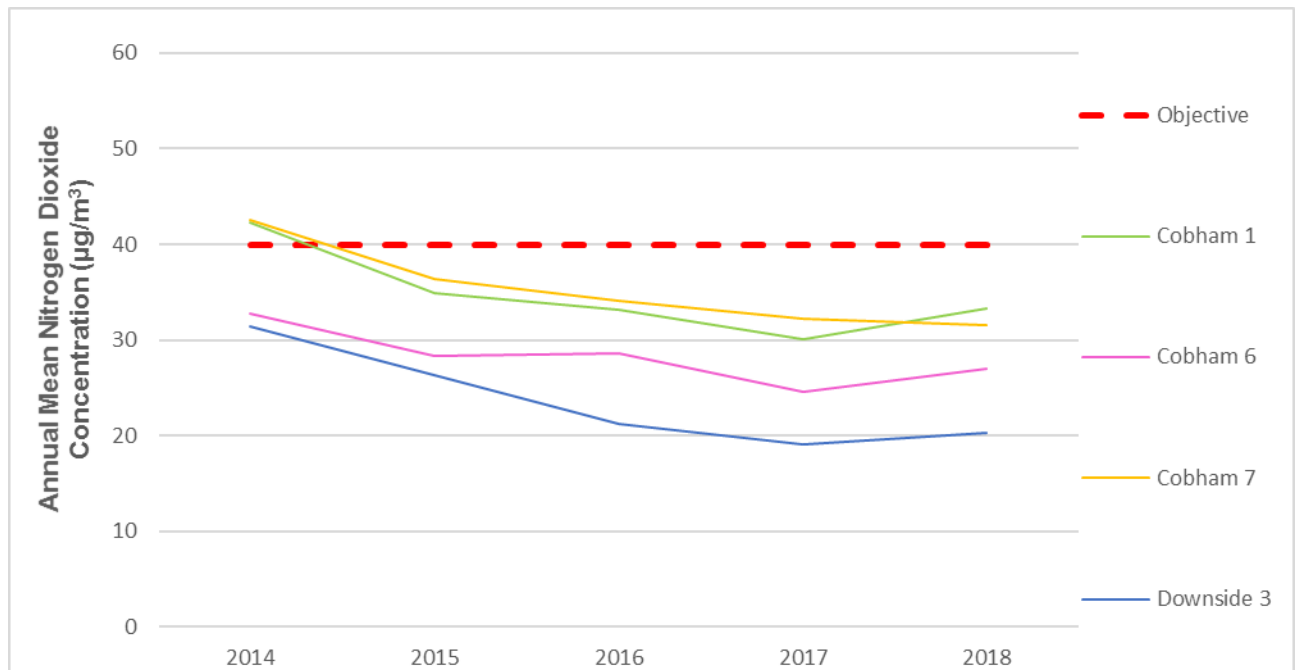


Figure A.7: Trends in Annual Mean NO<sub>2</sub> Concentrations at Cobham





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

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2018 (%) <sup>(2)</sup>	NO <sub>2</sub> 1-Hour Means > 200µg/m <sup>3</sup> <sup>(3)</sup>				
					2014	2015	2016	2017	2018
Weybridge High Street	Roadside	Automatic	99.8	99.8	0	0	0	0	2
Hampton Court Parade	Roadside	Automatic	96.3	96.3	0	0	2	0	0

**Notes:**

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

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

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

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

## Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO<sub>2</sub> Monthly Diffusion Tube Results – 2018

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (1.12) and Annualised <sup>(1)</sup>	Distance Corrected to Nearest Exposure <sup>(2)</sup>
Esher															
Esher 1	41.0	32.0	44.0	27.0	35.0	45.0	40.0	29.0	41.0	48.0	44.0	39.0	38.8	43.2	41.8
Esher 4	36.0	41.0	36.0	24.0	34.0	31.0	40.0	29.0	26.0	33.0	19.0	34.0	31.9	35.6	n/a
Esher 5	55	39	37	33	34	30	37	31	36	43	72	49	41.3	46.1	n/a
Esher 7	37	29	48	29	36	30	-	38	35	47	39	45	37.5	41.9	34.6
Esher 8	29	30	41	34	35	31	48	37	42	47	37	40	37.6	41.9	41.7
Esher 9	25	29	35	29	28	26	34	25	29	30	37	32	29.9	33.4	n/a
Esher 10	28	27	32	18	27	20	32	14	21	26	25	34	25.3	28.2	n/a
Esher 11	27	35	32	22	27	26	40	27	24	-	35	37	30.2	33.7	n/a
Esher 13	30	33	25	26	22	19	36	23	31	-	33	33	28.3	31.5	n/a
Hinchley Wood															
Hinchley Wood 1	28	26	25	31	21	24	38	34	41	40	29	33	30.8	34.4	n/a
Hinchley Wood 2	23	25	39	23	31	16	36	29	27	32	21	32	27.8	31.0	n/a
Molesey															

# Elmbridge Borough Council

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (1.12) and Annualised <sup>(1)</sup>	Distance Corrected to Nearest Exposure <sup>(2)</sup>
Molesey 1	27	30	40	30	26	18	32	23	29	34	31	34	29.5	32.9	n/a
Molesey 8	31	29	42	25	22	26	37	26	27	41	36	42	32.0	35.7	n/a
Molesey 9	33	29	35	-	18	32	27	23	27	37	22	38	29.2	32.5	n/a
Molesey 10	31	25	33	17	29	16	26	21	25	29	22	33	25.6	28.5	n/a
Hampton Court															
Hampton Court 1	21	37	33	22	27	21	35	26	24	34	36	30	28.8	32.1	n/a
Hampton Court 2	36	29	-	21	26	23	41	29	35	38	44	43	33.2	37.0	n/a
Hampton Court 3	35	34	44	25	24	25	31	29	28	43	38	35	32.6	36.3	n/a
Hampton Court 4	38	32	44	24	23	18	38	32	37	42	31	42	33.4	37.3	n/a
Hampton Court 5	26	23	32	16	32	19	33	20	26	30	26	28	25.9	28.9	n/a
Walton-on-Thames															
Walton 3	30	-	-	18	-	22	-	-	-	-	-	38	27.0	29.4	n/a
Walton 5	32	24	30	27	39	30	32	29	24	38	28	37	30.8	34.4	n/a
Walton 8	34	30	31	29	23	19	37	27	29	39	18	41	29.8	33.2	n/a
Walton 9	35	25	37	28	24	20	23	29	26	37	25	40	29.1	32.4	n/a
Walton 10	31	28	38	32	21	23	27	25	37	39	38	37	31.3	34.9	n/a

Elmbridge Borough Council

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (1.12) and Annualised <sup>(1)</sup>	Distance Corrected to Nearest Exposure <sup>(2)</sup>
Walton 11	28	38	38	25	26	32	24	28	34	39	38	36	32.2	35.9	n/a
Weybridge															
Weybridge 1	30	26	35	27	-	-	-	-	-	-	-	-	29.5	28.4	n/a
Weybridge 4	25	27	40	17	44	19	22	28	22	39	28	35	28.8	32.1	n/a
Weybridge 5	35	29	47	-	-	-	-	-	-	-	-	-	37.0	34.0	n/a
Weybridge 6	31	30	31	23	-	-	-	-	-	-	-	-	28.8	27.7	n/a
Weybridge 7	39	37	42	25	25	24	29	37	42	44	35	47	35.5	39.6	n/a
Weybridge 8	28	32	28	20	29	19	30	-	31	34	24	40	28.6	31.9	n/a
Weybridge 9	24	24	27	21	21	16	22	18	24	29	24	23	22.8	25.4	n/a
Weybridge 10	25	39	38	25	29	22	25	22	32	39	28	26	29.2	32.5	n/a
Weybridge 11	25	35	38	27	27	16	23	27	25	37	29	35	28.7	32.0	n/a
Weybridge 12	23	36	37	25	28	-	27	21	28	37	19	32	28.5	31.7	n/a
Cobham															
Cobham 1	37	35	35	29	15	19	26	28	31	37	30	36	29.8	33.3	n/a
Cobham 6	19	23	29	24	28	20	21	23	24	31	23	26	24.3	27.0	n/a

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (1.12) and Annualised <sup>(1)</sup>	Distance Corrected to Nearest Exposure <sup>(2)</sup>
Cobham 7	24	27	39	19	20	23	35	34	23	35	23	38	28.3	31.6	n/a
Downside 3	17	21	19	16	28	11	15	14	17	19	18	24	18.3	20.3	n/a

- ☒ Local bias adjustment factor of 1.12 has been used
- ☒ Annualisation has been conducted where data capture is <75%
- ☒ Where applicable, data has been distance corrected for relevant exposure

**Notes:**

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

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

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

(2) Distance corrected to nearest relevant public exposure.

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

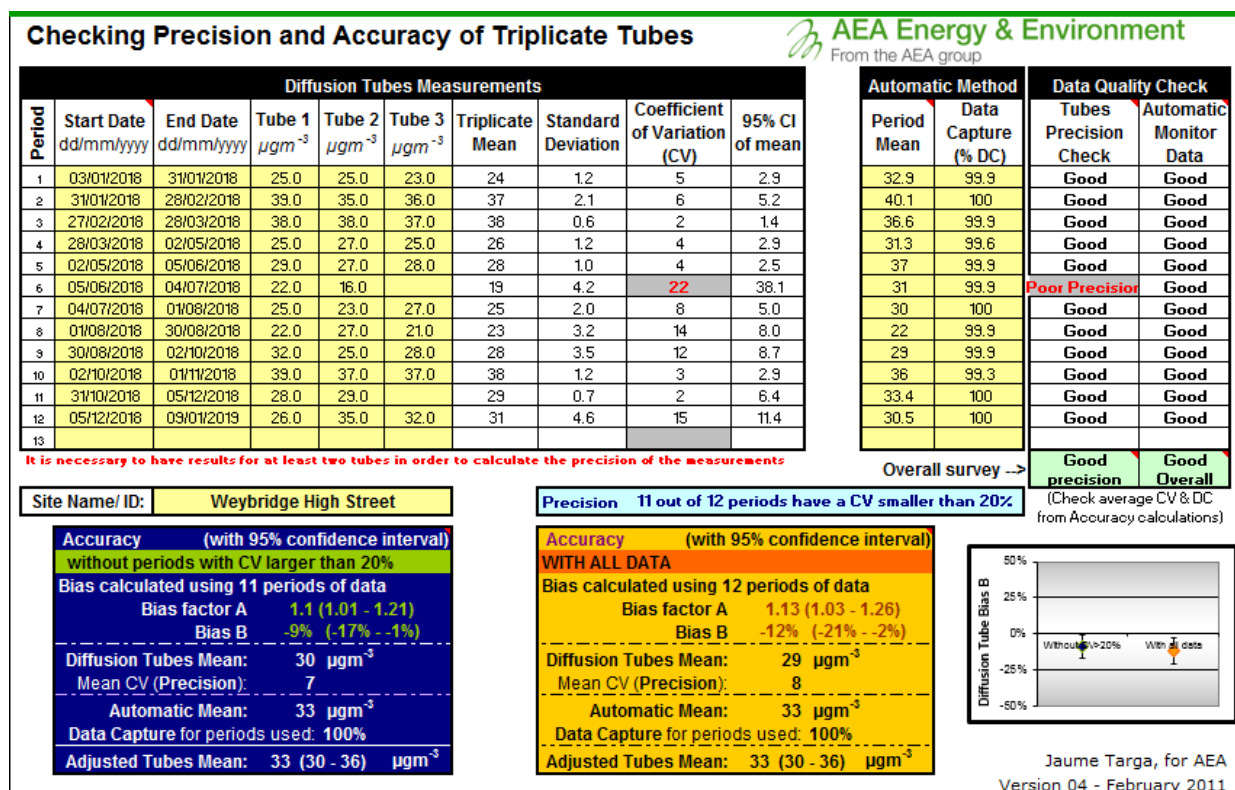
### Nitrogen Dioxide Diffusion Tube QA/QC

#### **Diffusion Tube Bias National Adjustment Factor**

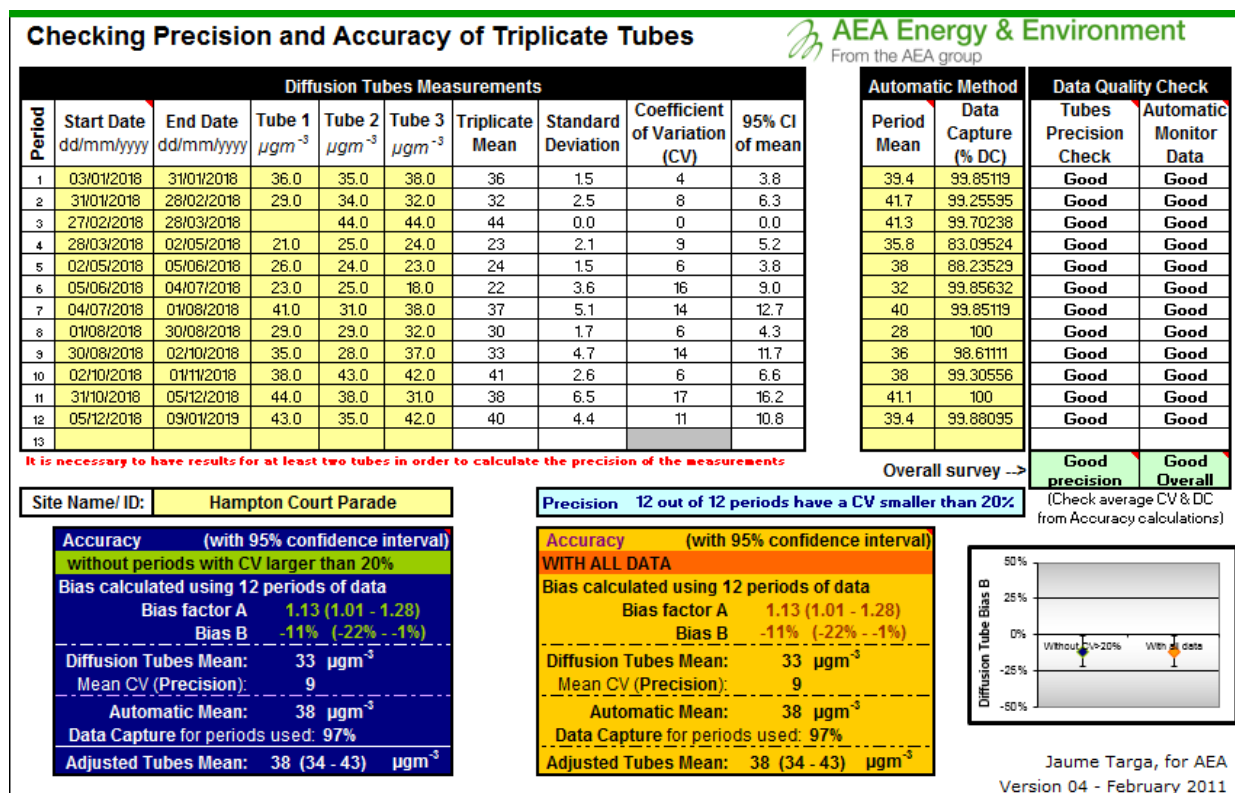
The diffusion tubes for 2018 were supplied and analysed by Lambeth Scientific Services and the preparation method used was 50% TEA in acetone. The national bias adjustment factor for Lambeth Scientific Services, 50% TEA in acetone, is 1.03, based on seven studies (spreadsheet version 03/19).

#### **Diffusion Tube Local Bias Adjustment Factor**

There are two triplicated diffusion tube monitoring sites located in Elmbridge which are collocated with the Weybridge High Street and Hampton Court Parade automatic monitoring stations. Local bias adjustment factors have been calculated using the 'Checking Precision and Accuracy of Triplicate Tubes' spreadsheet (v.04, 2011) available on Defra LAQM website. The outputs from the spreadsheet for the two collocation sites are provided in Figures C.1 and C.2. For Hampton Court Parade, the bias adjustment factor calculated using all 12 periods of data has been used as tube precision and automatic monitor data quality are good for all periods. For Weybridge High Street, the bias adjustment factor calculated using periods with a coefficient of variation less than 20% has been used as one period of data had poor diffusion tube precision. The local bias adjustment factors for Weybridge High Street and Hampton Court Parade monitoring sites are presented in Table C.1.



**Figure C.1 – Local Bias Adjustment Factor Correction Output – Weybridge High Street**



**Figure C.2 – Local Bias Adjustment Factor Correction Output – Hampton Court Parade**

**Table C.1 – Local Bias Adjustment Factors**

Location	Diffusion Tube Data Capture (%)	Automatic Monitor Data Capture (%)	Diffusion Tube Annual Mean ( $\mu\text{g}/\text{m}^3$ )	Automatic Monitor Annual Mean ( $\mu\text{g}/\text{m}^3$ )	Ratio
Weybridge High Street	100	99.8	29	33	1.11
Hampton Court Parade	100	97	33	38	1.13

### Justification for Choice of Factor Applied

The diffusion tube data has been corrected using a bias adjustment factor, which is an estimate of the difference between diffusion tube and continuous monitoring concentrations; the latter is assumed to be a more accurate method of monitoring. The Defra Technical Guidance LAQM.TG(16) 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<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

The Defra Technical Guidance LAQM.TG(16) recommends the use of a local bias adjustment factor where available and relevant to diffusion tube sites.

A local bias adjustment factor of 1.13 has been derived for the Hampton Court Parade site. The measurements obtained from automatic monitor and diffusion tubes at this site have good data capture and overall data precision.

A local bias adjustment factor of 1.11 has been derived for the Weybridge High Street site. The measurements obtained from the automatic monitor and diffusion tubes at this site also had good data capture and overall data precision.

Given the agreement between the local bias adjustment factors, the good data capture and data precision for the Weybridge High Street and Hampton Court Parade sites, an averaged local bias adjustment factor of 1.12 obtained from these two sites has been used to bias adjust the diffusion tube data for 2018.



## Diffusion Tube Annualisation

Where data capture is less than 75% for a full calendar year, the diffusion tube results were ‘annualised’ following the methodology outlined in LAQM TG (16). Annualisation was carried out for four sites, Walton 3, Weybridge 1, Weybridge 5 and Weybridge 6 where diffusion tubes went missing.

Continuous monitoring data from the London Hillingdon, London North Kensington London Bloomsbury, Reading New Town and London Westminster urban background sites, part of the Automatic Urban and Rural Network (AURN) were used. The monitoring periods for which data were available for Walton 3, Weybridge 1, 5 and 6 are shown in Table C2. Details of the annualisation calculations are provided in Tables C3-C5 below.

**Table C.2 – Monitoring Periods for Sites Requiring Annualisation**

Monitoring Site	Monitoring Period
Walton 3	03/01/18 - 31/01/2018, 28/03/18 - 02/05/18, 05/06/18 - 04/07/18, 05/12/18 - 09/01/18
Weybridge 1 and 6	03/01/18 - 02/05/18
Weybridge 5	03/01/19 – 28/03/18

**Table C.3 – Short-term to long-term adjustment, Walton 3**

Long-term Site	Annual Mean 2018 (AM)	Period Mean 2018 (PM)	Ratio (AM/PM) *
London Hillingdon	46.2	47.3	0.98
London N. Kensington	29.3	29.1	1.00
London Bloomsbury	36.6	37.9	0.97
Reading New Town	26.1	27.6	0.95
London Westminster	32.0	32.2	0.99
Average (R <sub>a</sub> )			<b>0.98</b>

(\*) Based on unrounded numbers

**Table C.4 – Short-term to long-term adjustment, Weybridge 1 and 6**

Long-term Site	Annual Mean 2018 (AM)	Period Mean 2018 (PM)	Ratio (AM/PM) *
London Hillingdon	46.2	54.0	0.85
London N. Kensington	29.3	33.1	0.88
London Bloomsbury	36.6	43.4	0.84
Reading New Town	26.1	31.3	0.84
London Westminster	32.0	35.7	0.90
Average (R <sub>a</sub> )			<b>0.86</b>

(\*) Based on unrounded numbers

**Table C.5 – Short-term to long-term adjustment, Weybridge 5**

Long-term Site	Annual Mean 2018 (AM)	Period Mean 2018 (PM)	Ratio (AM/PM) *
London Hillingdon	46.2	53.4	0.86
London N. Kensington	29.3	35.4	0.83
London Bloomsbury	36.6	45.0	0.81
Reading New Town	26.1	33.9	0.77
London Westminster	32.0	38.0	0.84
Average (R <sub>a</sub> )			<b>0.82</b>

(\*) Based on unrounded numbers

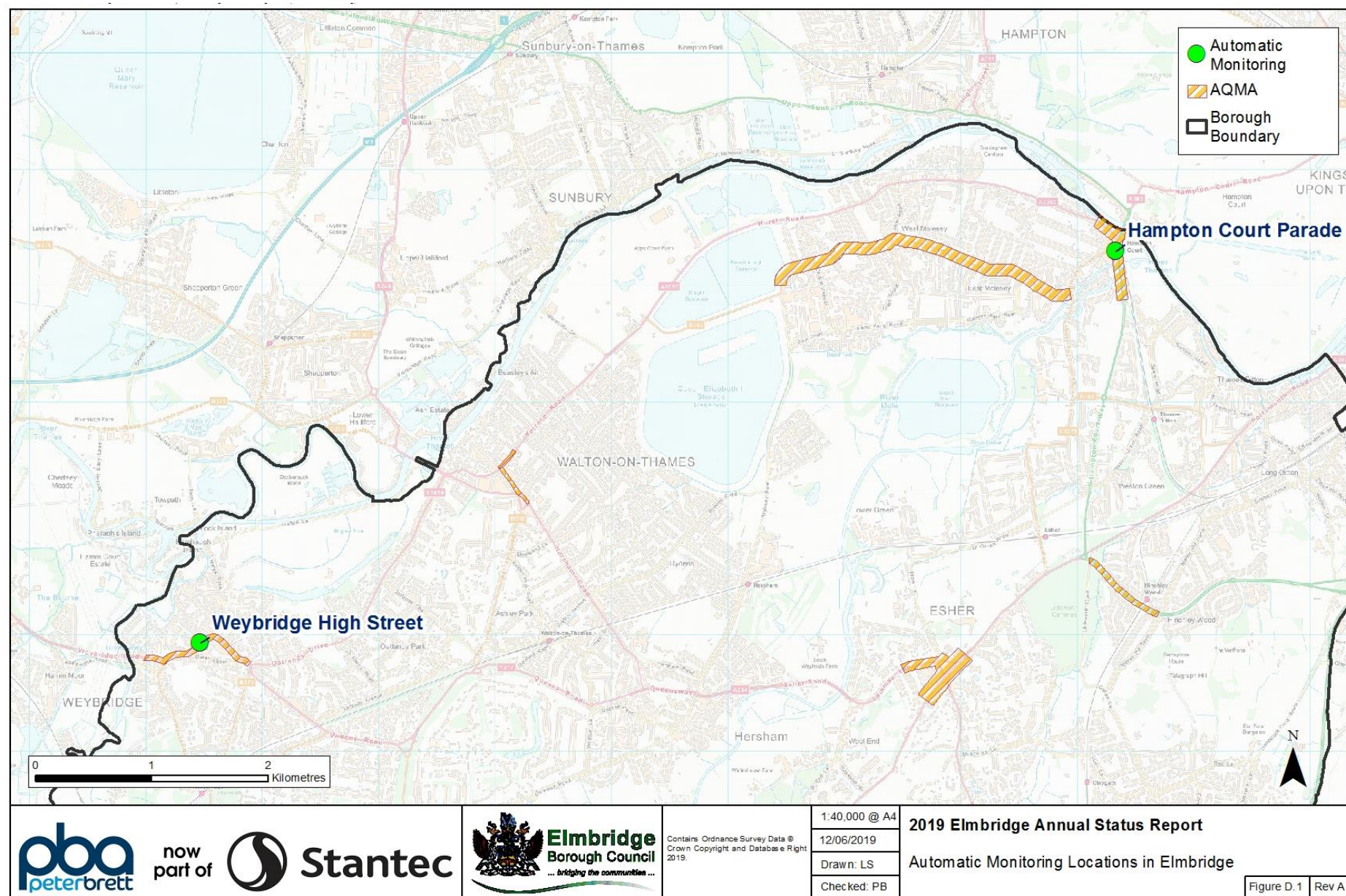
## WASP

Lambeth Scientific Service take part in the analytical proficiency testing scheme (AIR-PT), formerly known as the Workplace Analysis Scheme for Proficiency (WASP), operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). During 2018, for the one month results were available, 25% of samples were determined to have been satisfactory (1st quarter: no results reported; 2nd quarter: no results reported; 3rd quarter: no results reported; 4th quarter: 25%).

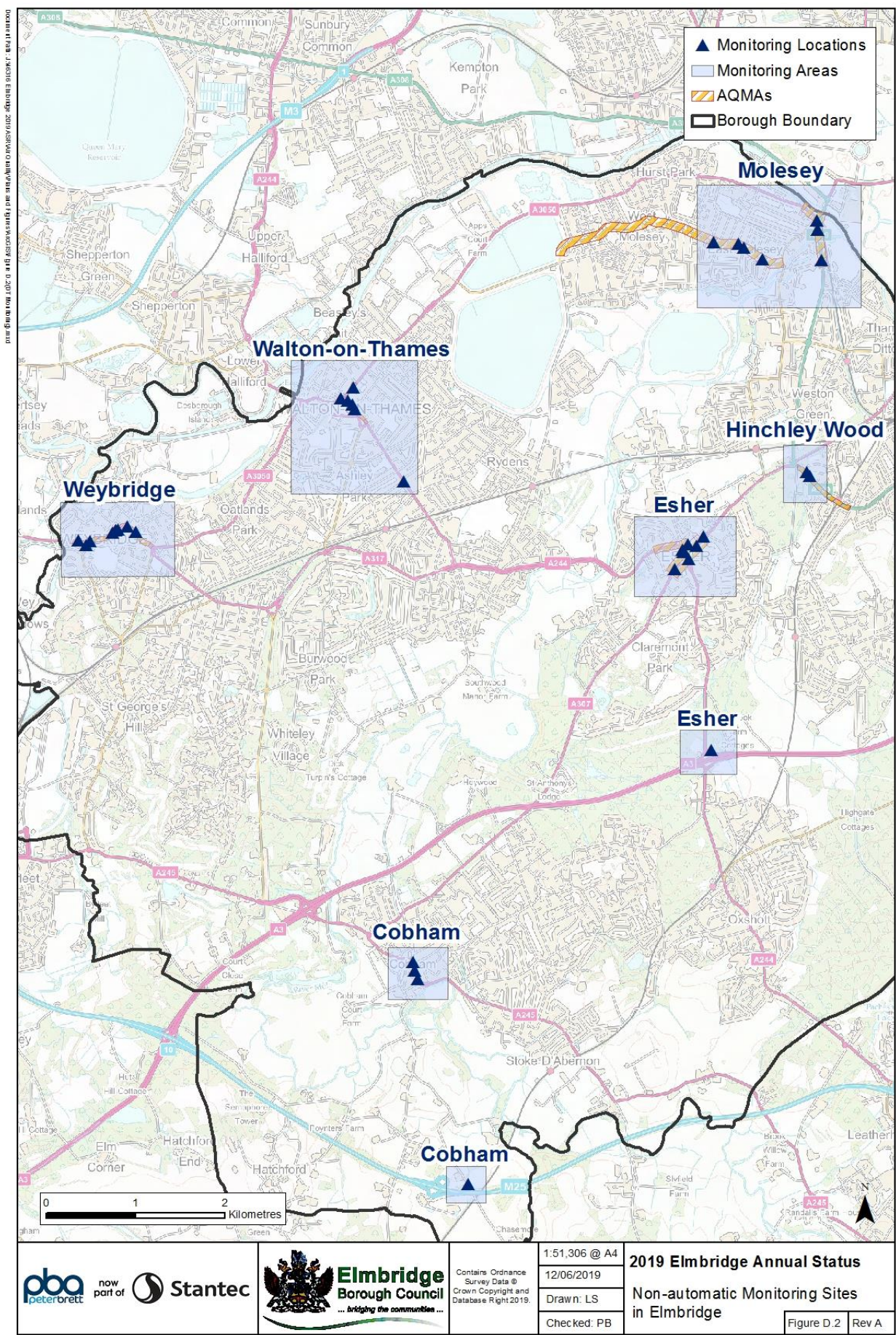
**Automatic Monitoring QA/QC**

All monitoring data are ratified by Air Quality Data Management (AQDM) in accordance with the LAQM TG (16) standards.

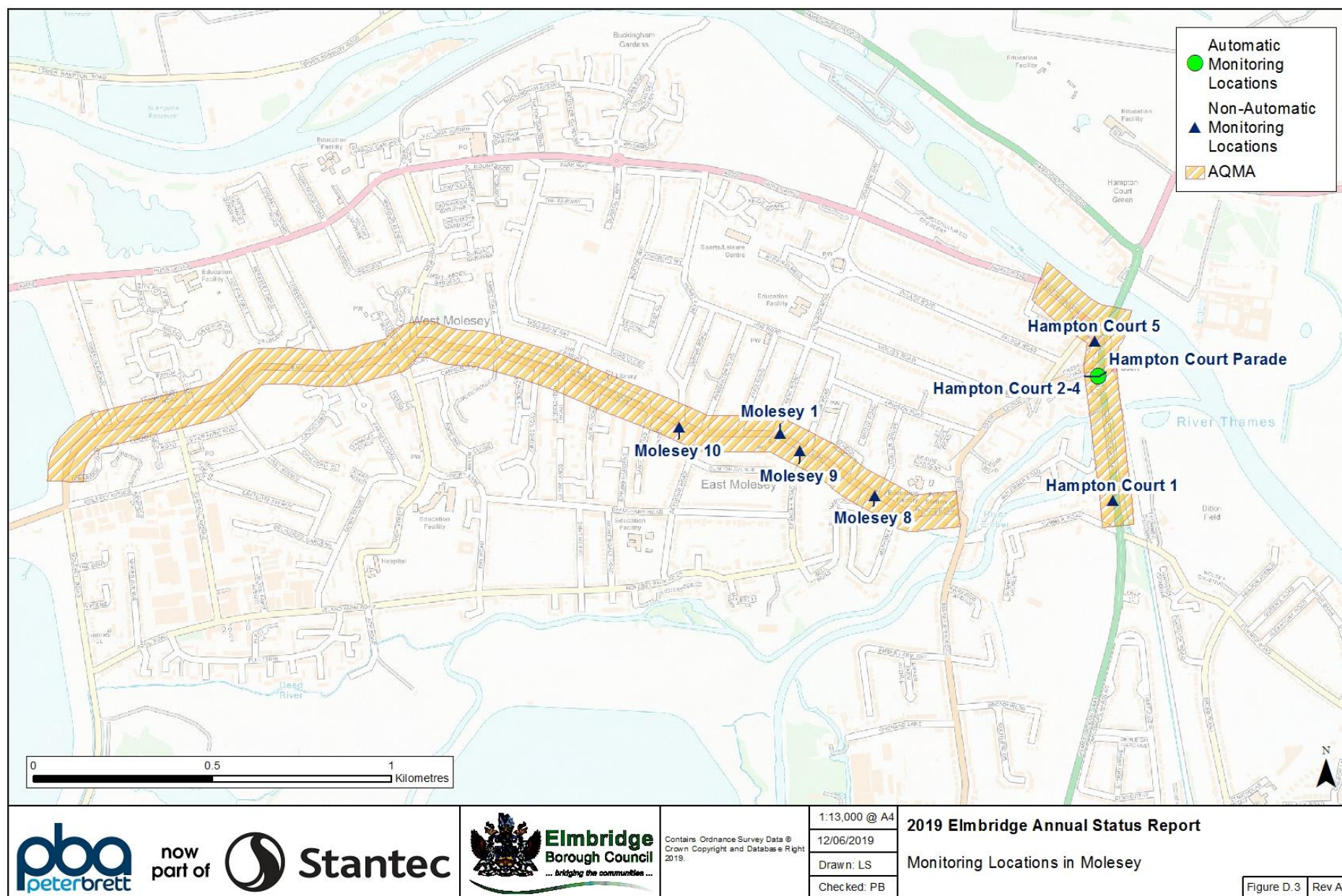
## Appendix D: Maps of Monitoring Locations and AQMAs







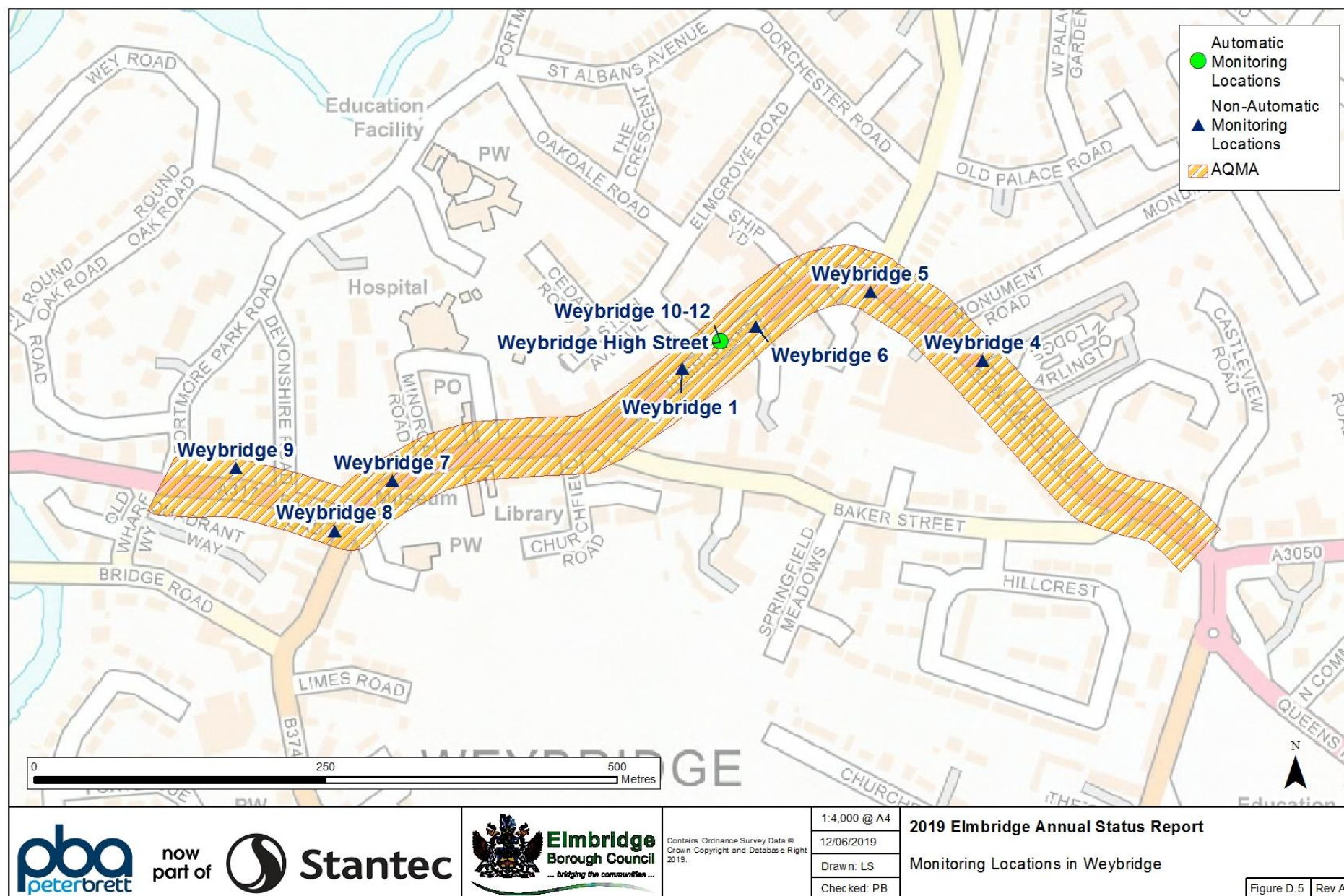


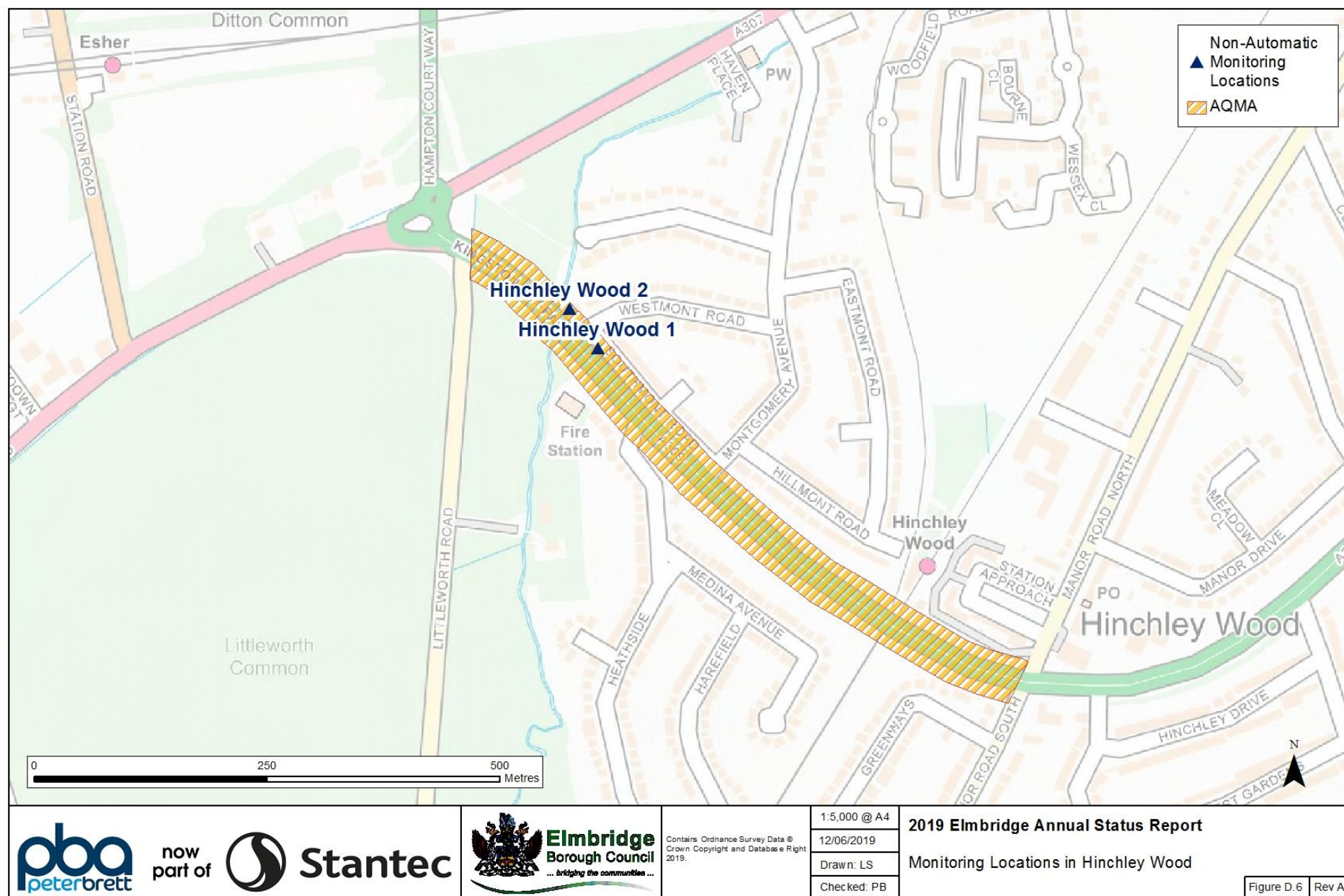




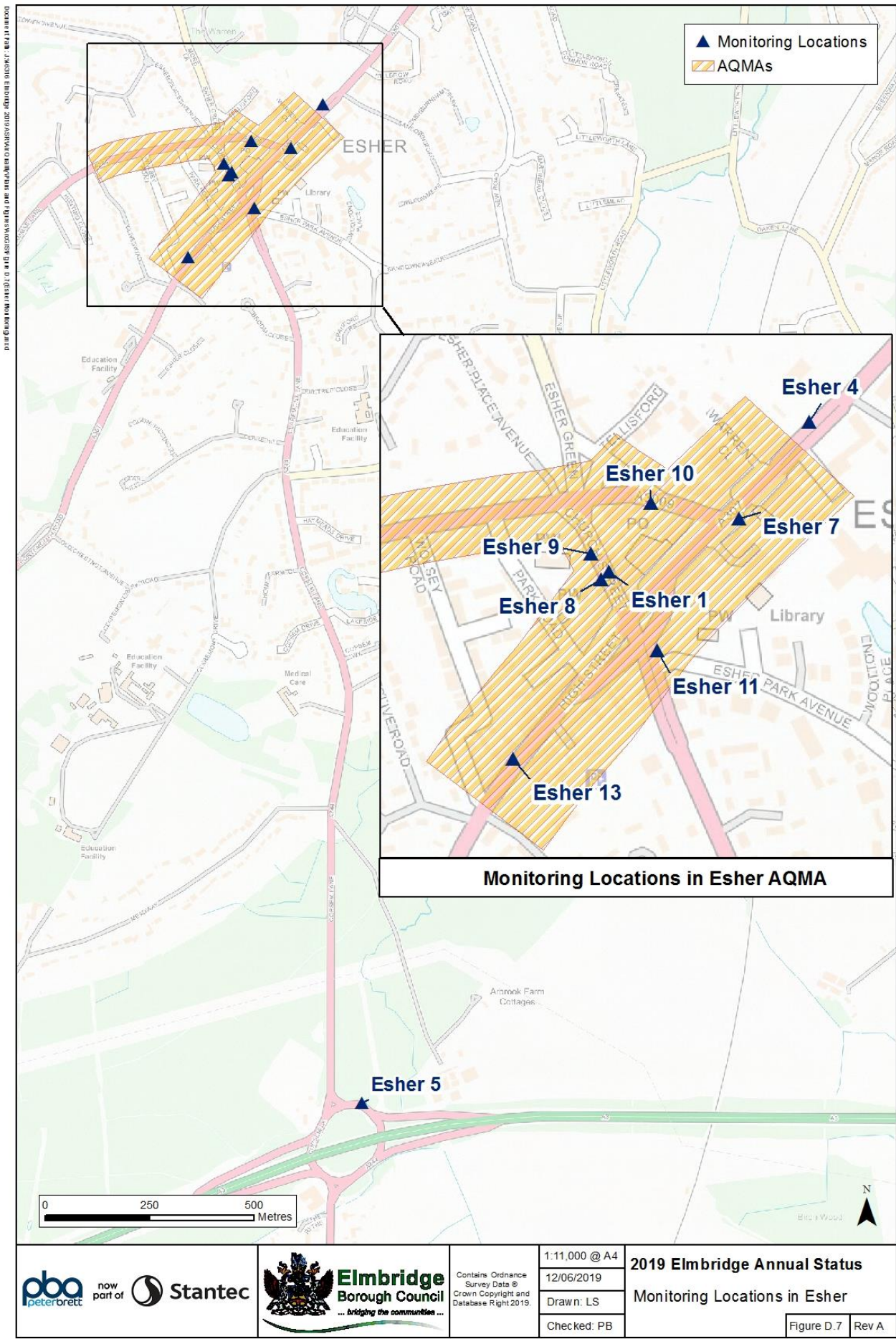




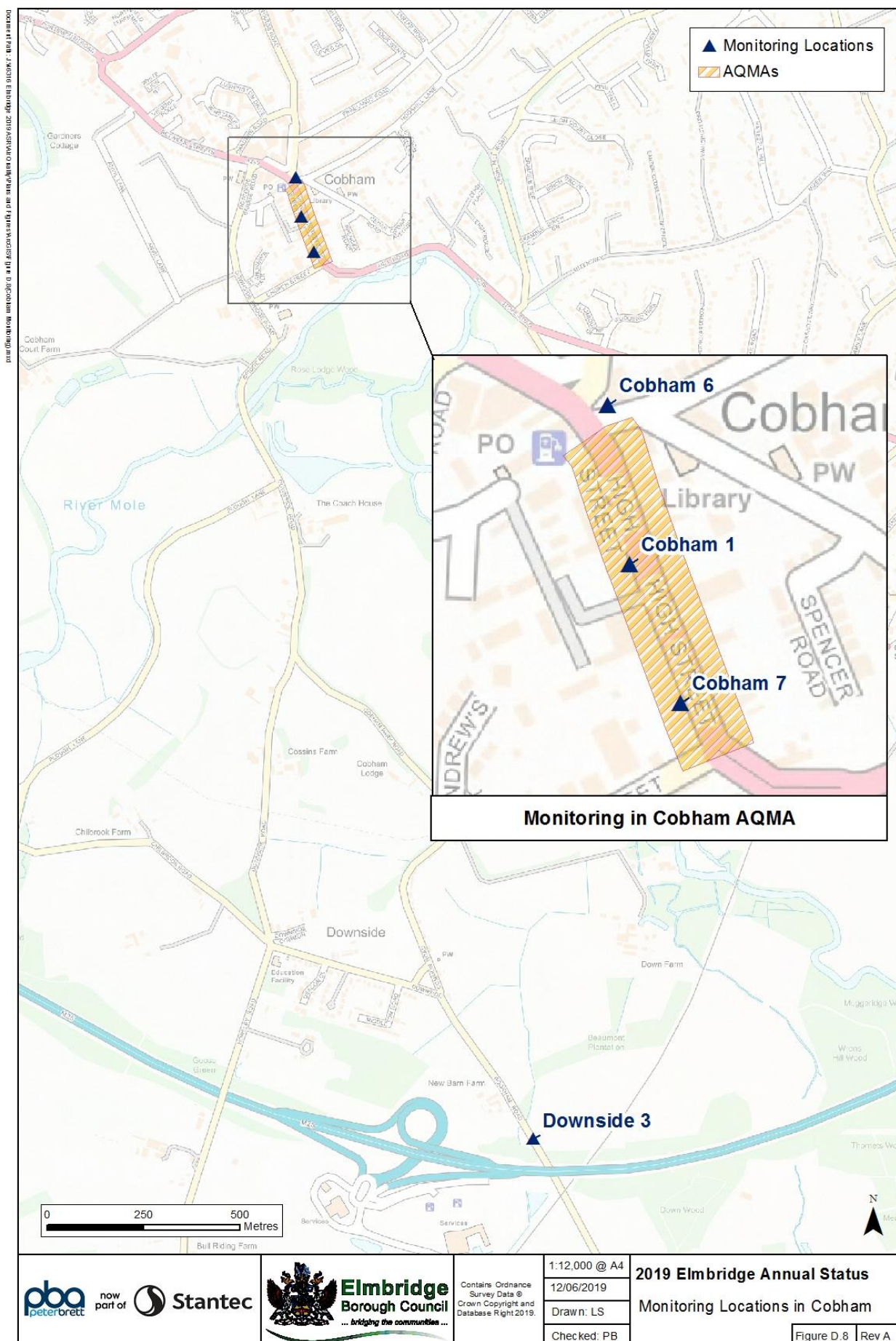












## Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives and Pollutants in England

Pollutant	Air Quality Objective <sup>5</sup>	
	Concentration	Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m <sup>3</sup>	Annual mean
Particulate Matter (PM <sub>10</sub> )	50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m <sup>3</sup>	Annual mean
Particulate Matter (PM <sub>2.5</sub> )	Work towards reducing emissions/concentrations of fine particulate matter (PM <sub>2.5</sub> )	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean
Benzene (C <sub>6</sub> H <sub>6</sub> )	5 µg/m <sup>3</sup>	Annual mean
1,3-Butadiene (C <sub>4</sub> H <sub>4</sub> )	2.25 µg/m <sup>3</sup>	Running annual mean
Carbon Monoxide (CO)	10 mg/m <sup>3</sup>	Maximum daily running 8-hour mean
Lead	0.25 µg/m <sup>3</sup>	Annual mean

<sup>5</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## Glossary of Terms

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

## References

Department for Environment, Food and Rural Affairs (Defra), 2016. Local Air Quality Management Technical Guidance (LAQM.TG16). Available at:  
<http://laqm.defra.gov.uk/supporting-guidance.html>

Department for Environment, Food and Rural Affairs (Defra), 2016. Local Air Quality Management Policy Guidance (LAQM PG16). Available at:  
<http://laqm.defra.gov.uk/supporting-guidance.html>

Department for Environment, Food and Rural Affairs (Defra), 2007. Air Quality Strategy for England, Scotland Wales and Northern Ireland, 2007.

Elmbridge Borough Council, 2018. 2018 Air Quality Annual Status Report (ASR). Available at: <http://www.elmbridge.gov.uk/pollution/local-air-quality/>

Spreadsheet of Diffusion Tube Bias Adjustment Factors, version 03/19. Available at:  
<https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>