Elmbridge Borough Council

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2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

June 2021

Stantec

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Executive Summary: Air Quality in Our Area

The following Annual Status Report (ASR) was prepared and written by Stantec UK Ltd (Stantec), on behalf of Elmbridge Borough Council ('the Council') in accordance with Local Air Quality Management (LAQM) Technical Guidance (TG) 2016[1], published by DEFRA on behalf of the devolved administrations. The 2021 ASR provides the latest information regarding air quality in Elmbridge for the reporting year of 2020. It also provides updates on actions to improve air quality that have occurred since the previous 2020 ASR was published.

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 the Council and others, including the public, are taking, or could take, to improve air quality. Air quality and a healthy environment is important to the Council and measures to improve air quality also feature in our Council Plan[2].

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[3,4].

[1] DEFRA. Local Air Quality Management Technical Guidance (LAQM: TG.16). April 2021.

[2] Elmbridge Borough Council. Council Plan 2020/2021.2020.

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

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

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[5], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[6].

The main air pollutants of concern within Elmbridge are nitrogen dioxide (NO_2) and particulate matter ($PM_{2.5}$). The air quality objectives relevant to LAQM in England are outlined in Appendix E. Monitoring in the Borough shows that there were no breaches of the annual mean objective for NO_2 in 2020 within the Council's AQMAs. However, it should be noted that measured NO_2 concentrations in 2020 were much lower than previous years due to the impact of COVID-19 restrictions on road traffic levels. Further information regarding the impact of COVID-19 on air quality in Elmbridge, including comparisons with previous years monitoring data, as well as constraints and opportunities presented by the pandemic, is provided in Appendix F. There was one exceedance at a new monitoring site for 2020 outside of any existing AQMAs, however the monitoring site is not considered to be representative of relevant exposure. A generally decreasing trend in measured concentrations is apparent at the majority of monitoring sites from 2016 to 2020.

Surrey-wide modelling of pollutant concentrations, undertaken by Cambridge Environmental Research Consultants (CERC)[7], provides source apportionment predictions for nitrogen oxides (NOx: nitric oxide (NO) plus NO_2) in Elmbridge. The largest contributor to NOx emissions in Elmbridge is road transport sources (48%), with diesel cars (20%) being the largest contributor within the road transport source group.

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. Furthermore, the Council is committed to targeting $PM_{2.5}$

[5] DEFRA. Air quality appraisal: damage cost guidance, July 2020

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

[7] CERC. Detailed Air Quality Modelling and Source Apportionment for Elmbridge Borough Council. Final Report. November 2019.

pollution through a range of interventions with the aim of reaching the World Health Organisation (WHO) recommended level of 10 µg/m^3 by 2030 within the Borough.

The 2019 Clean Air Strategy[8] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[9] 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.

The Council works to understand local air quality through an appropriate monitoring network within its administrative boundary. In March 2021 the Council's Environmental Services Team applied for Community Infrastructure Levy (CIL) funding for a new roadside automatic particulate monitor capable of monitoring both PM_{10} and $PM_{2.5}$ to be installed in Elmbridge. A decision on the funding will be made at the Councils Cabinet meeting on 7 July 2021. Several new NO_2 monitoring sites were deployed in 2020 following a review of the CERC modelling data undertaken by Stantec on behalf of the Council in December 2019 (see Appendix G). Further sites were deployed, and some removed, following a review of the suitability of monitoring locations undertaken by Stantec on behalf of the Council in April 2020 (see Appendix H). The new monitoring sites will assist in the identification of any exceedances of the annual mean NO_2 objective so that any additional AQMAs can be declared, which will enable measures to improve air quality to be targeted within these areas.

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, particularly within and adjacent to the Borough's six AQMAs. Air quality will also be embedded in the emerging Local Plan which is currently being prepared. The Council has committed to preparing two Supplementary Planning Documents (SPDs), that will provide detailed guidance on the implementation of policies set out in the Local Plan. This includes detailed guidance for dealing with air quality and will be aimed at those

[8] DEFRA. Clean Air Strategy, 2019

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

involved in the submission and determination of planning applications where air quality needs to be addressed.

The Council continues to fund and promote the airAlert pollution warning service to people living and working in the Borough. As of May 2021, 283 residents in Elmbridge had subscribed to receive airAlerts. The Council also utilises its website to display public information regarding air quality, including an animation of wood burning stoves which was added to the website in 2020 (see image below). This supported a joint campaign with the Surrey Air Alliance (SAA) for Clean Air Day that was delayed from June to October 2020 due to the Covid19 pandemic.

Clean Air Day on 17 June 2021 focused on promoting five practical steps the public can take to improve air quality in Elmbridge supported by a short animation. EBC also hosted a joint initiative with the Energy Saving Trust on “help your staff go electric this Clean Air Day” whereby council staff and colleagues across SCC and Surrey District and Boroughs attended a virtual meeting that gave impartial advice on making the switch to an electric vehicle.

In July 2019, the Council declared a 'Climate Emergency' and have pledged to take action locally to contribute to national carbon neutral targets through the development of policies and practices, together with the aim of making the Council a carbon neutral organisation by 2030. In the Council's Service Delivery Plan for 2020/2021, a Council key priority is to respond to the climate change emergency and carbon neutral aim. The Council has created a new post within the Environmental Services Team and has agreed a Carbon Management and Reduction Plan[10] in 2020 to assist in the delivery of this commitment. There are number of carbon reduction measures proposed which will also benefit air quality, including the installation of electric car charging points in the key Council car parks, refreshing the air quality action plan for cleaner air and encouraging the use of sustainable transport modes.

[10] Elmbridge Borough Council (2020). Carbon Management and Reduction Plan. Available at: https://www.elmbridge.gov.uk/pollution/climate-change-and-sustainability/

Air Quality Action Plan 2021 – 2026

Throughout 2020, the Council has worked to progress the Air Quality Action Plan (AQAP) 2021 – 2026, despite resourcing challenges resulting from COVID-19. Steering Group meetings were held in August 2020 with stakeholders to develop suitable action plan measures. The AQAP went out for public consultation between 10th March – 5th May 2021 and is currently being finalised with adoption expected in Summer 2021. Progress on measures to improve air quality within the draft AQAP have been reported in this ASR.

Surrey Air Alliance

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 Surrey Air Alliance (SAA) and assist in the delivery of the SAA workplan. A key workplan task on which the Council has taken the lead on is the Surrey-wide air quality modelling project. The air quality modelling project, undertaken by CERC, was completed in 2019 and establishes a clear baseline for key pollutants (NO_2, PM_{10} and $PM_{2.5}$) across Surrey. The Council will work with the SAA to deliver an update to the Surrey-wide modelling in 2024. The interactive contour maps of modelled pollutant concentrations have continued to be hosted on the SCC website throughout 2020:
https://surreycc.maps.arcgis.com/apps/webappviewer/index.html?id=43910ffb100248ed972115b7a9b49d20

The second workplan project Elmbridge is involved in is directed at raising awareness of air quality within schools close to AQMAs. The SAA applied to DEFRA for a further

£264,819 of funding to support schools across Surrey close to AQMAs to develop School Travel Plans, develop and pilot a new cycle training course for secondary school children and an overarching media campaign. In March 2020, DEFRA confirmed that the project scored well, and was put before the final panel, but was unsuccessful on this occasion. The SAA continues to support SCC in delivering anti-idling campaigns at schools and developing the 'Green Boot Challenge', which is an action outstanding from the 2018 DEFRA Grant Fund. The new Green Boot Challenge will pilot an App (iOS and Android compatible) with 20 schools to enable parents to detail the mode of travel and record a journey to enable an emission saving calculation. Those who are unable to use the App will still be able to compete in a hands-up survey in class. It is hoped that the use of the App will increase reach to and awareness for both parents and children about how their actions can improve local air quality.

The COVID pandemic has delayed the full roll out of the App supporting the Green Boot Challenge, therefore the existing Golden Boot challenge will run alongside the Green Boot challenge in 2021.

The pandemic has resulted in the face-to-face air quality education moving to a virtual platform. From September 2021, SCC will offer a virtual air quality education package to all schools in Surrey.

Encouraging uptake of Sustainble Travel Modes

During 2020, a Local Cycling and Walking Infrastructure Plan (LCWIP) for Elmbridge began the early stages of its development. The LCWIP is being developed in accordance with Department for Transport (DfT) guidance[11] and will include the following:

- identification of where good walking and cycling facilities would be most beneficial;

[11] DfT. Local Cycling and Walking Infrastructure Plans. Technical Guidance for Local Authorities. April 2017.

- identify what improvements are required at these locations; and
- plan how these improvements can be delivered, and which to prioritise first.

It is expected that once implemented in 2022, the LCWIP will have benefits in relation to encouraging walking and cycling in Elmbridge.

Encouraging uptake of Electric Vehicles

The Council's Environmental Services Team continues to use electric pool cars for work travel. As part of its commitment to make Elmbridge a sustainable place, the Council is considering extending of the use of electric staff pool cars. They also utilise the planning regime to increase the provision of electric vehicle charging points within the Borough. The Council's Parking Enforcement Contractor has also implemented a move towards an electric and hybrid vehicle fleet with the purchase of four electric motorbikes, two electric cars and a low emissions van.

As part of an upgrade to Holly Hedge car park in Cobham, the Office for Low Emission Vehicles (OLEV) funded rapid charger was replaced in 2021 with four fast charging points and infrastructure for a further two - a significant increase in charging provision. The chargers will be fully operational by the end of June 2021. Similar upgrades to the charging points in Churchfield Car Park, Weybridge and the Civic Centre Car Park, Esher are planned later in 2021.

In 2020, the SAA applied for a DEFRA 2020/21 Air Quality Grant to fund a project to encourage a greater uptake of electric vehicle taxis across seven eligible Boroughs and Districts in Surrey. Taxis were selected as the target vehicles given the high mileage and multiple trips the vehicles make within Surreys Air Quality Management Areas and also the nature of the journeys which take the vehicles into areas frequented by the members of our communities who are most sensitive to air pollution such as to hospitals, care facilities and schools. In March 2021, the project was awarded £256,686 from the DEFRA AQ Grant Fund. The project will utilise telematic devices to give taxi drivers insights into the potential savings to be made by using an electric vehicle compared to their diesel and petrol vehicles and will offer vehicle trials allowing drivers to road test an electric vehicle as a taxi. The telematics will also help informing locations for new electric charging points. The project is linked to Low Carbon Across the South East funding from the European Regional Development Fund through Surrey County Council, to provide grants to assist taxi drivers in switching to an electric vehicle through a subsidy. The Council is

participating in this project and the Council's Licensing and Pollution Teams are involved in the preparing for the project which is planned to be implemented later this year.

In July 2020 the Council adopted a new Taxi and private hire licencing policy 2020 – 2025 that came into force on 1 September 2020. The new policy recognises the need to ensure the health and wellbeing of residents and aims to improve local air quality by encouraging the use of low and ultra-low emissions taxi and private hire vehicles such as electric, hybrid or liquified petroleum gas (LPG). From 1 September 2020 the Council will not issue new licences for diesel vehicles and all new petrol vehicles must meet the latest Euro emission standards. By 1 January 2026 the Council will phase out the use of all diesel vehicles, and petrol vehicles that do not meet the latest Euro emission standards.

Conclusions and Priorities

Air quality monitoring has shown a general decrease in NO_2 concentrations across the Borough since 2016. Monitoring in the Borough shows that there were no breaches of the annual mean objective for NO_2 in 2020 within the Council's AQMAs. However, it should be noted that measured NO_2 concentrations in 2020 were much lower than previous years due to the impact of COVID-19 on road traffic levels. There was one exceedance at a new monitoring site in 2020 which is outside of any existing AQMAs, however the monitoring site is not considered to be representative of relevant exposure. Further action is still required as there is uncertainty surrounding future trends in air quality following the return of traffic flows to pre-pandemic levels. Furthermore, the Council is committed to targeting $PM_{2.5}$ pollution through a range of interventions with the aim of reaching the World Health Organisation (WHO) recommended level of 10 µg/m^3 by 2030 within the Borough. Achieving this target will require a move towards the use of more active travel modes across the Borough.

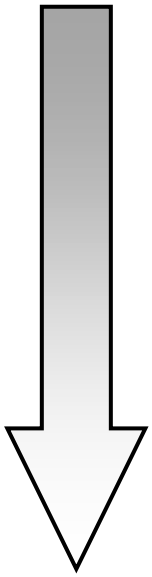
Concentrations have remained below the annual mean NO_2 objective at monitoring sites in the Hinchley Wood, Walton-on-Thames High Street and Walton Road, Molesey AQMAs since 2015. Furthermore, measured annual mean NO_2 concentrations in the Molesey AQMA were more than 10% below the annual mean NO_2 objective in 2016, 2017 and 2018. In the Hinchley Wood and Walton-on-Thames High Street AQMAs, measured annual mean NO_2 concentrations were more than 10% below the annual mean NO_2 objective in 2017 and 2018. However, due to elevated concentrations in 2019, the Hinchley Wood, Walton-on-Thames High Street and Walton Road, Molesey AQMAs have not been considered for revocation at this time as a minimum of three consecutive years of

concentrations more than 10% below the annual mean NO_2 objective is required. Monitoring will continue in the AQMAs until there is robust monitoring evidence to support the revocation of the AQMAs.

Measured annual mean NO_2 concentrations within the former Cobham High Street AQMA (Cobham 1 and Cobham 7) have been more than 10% below the annual mean NO_2 objective for five consecutive years. The decision was therefore made by the Council to revoke the AQMA in 2019 and this was subsequently approved by DEFRA in 2020.

Following the review of CERC modelling data and suitability of existing monitoring locations carried out by Stantec, an additional eight diffusion tube monitoring sites were deployed in January 2020, the monitoring results from which have been reported in this ASR. The technical review of the CERC modelling data is provided in Appendix G. Stantec was also commissioned by the Council to undertake a review of existing diffusion tubes in April 2020 to advise on any sites that should be relocated to a more suitable location. The technical review of existing monitoring sites is provided in Appendix H. Five diffusion tube monitoring sites were relocated in May 2020 as a result of the review, the results from which have also been reported in this ASR. One of the new monitoring locations (Cobham 11) located on the A242 Portsmouth Road / A3 Esher Bypass junction, outside of any existing AQMAs, recorded an exceedance of the annual mean NO_2 objective in 2020, however no exceedance occurred at the nearest location of relevant exposure. Considering that measured concentrations in 2020 were far lower than previous years, this monitoring location will continue to be closely monitored in the coming years and further action taken if required, such as the declaration of a new AQMA, should exceedances be apparent at relevant exposure.

The areas prioritised for action in 2021/2022 are:



- **Priority 1 – reducing NO_2 levels within the Borough's AQMAs to below the objective in the shortest time practicable.**
- **Priority 2 - targeting $PM_{2.5}$ through a range of interventions with the aim of reaching the World Health Organisations recommended level of 10ug/m^3 by 2030 within the Borough.**
- **Priority 3 – modal shift to more sustainable transport.**
- **Priority 4 – ensuring air quality is a priority within the Council's policies and those of SCC and assist in delivering the projects and actions.**
- **Priority 5 – partnership working as part of the SAA to improve Surrey's air quality.**

Local Engagement and How to get Involved

As part of the approach of local engagement we will use messages such as 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.
- 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. More information can be found at: 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 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.

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1 Local Air Quality Management

This report provides an overview of air quality in Elmbridge 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 Elmbridge Borough Council ('the 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

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 the Council can be found in Table 2.1. The table presents a description of the six AQMAs that are currently designated within Elmbridge. Appendix D: Maps of Monitoring Locations and AQMAs, provides maps of the AQMAs and also the air quality monitoring locations in relation to the AQMAs. The AQMAs have all been declared due to exceedances of the annual mean NO_2 objective.

In 2020, the revocation of the Cobham High Street AQMA was approved by the Department of Environment, Food and Rural Affairs (DEFRA) as it has been demonstrated by robust monitoring evidence that there are no longer any breaches of the air quality objectives in the AQMA. Furthermore, future vehicle emissions in the AQMA are estimated to decline, which is anticipated to result in a continued improvement in air quality within the former AQMA.

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
Walton-on-Thames High Street	01/11/2013	NO_2 Annual Mean	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	28.3	Draft Air Quality Action Plan for Elmbridge Borough 2021 - 2026	https://www.elmbridge.gov.uk/pollution/local-air-quality/
Weybridge High Street	17/11/2008	NO_2 Annual Mean	An area encompassing Balfour Road, Church Street, High Street and Monument Hill, Weybridge.	YES	62	33.1	Draft Air Quality Action Plan for Elmbridge Borough 2021 - 2026	https://www.elmbridge.gov.uk/pollution/local-air-quality/
Hampton Court	17/11/2008	NO_2 Annual Mean	An area encompassing parts of Hampton Court Way and Riverbank.	NO	50.7	26.2	Draft Air Quality Action Plan for Elmbridge Borough 2021 - 2026	https://www.elmbridge.gov.uk/pollution/local-air-quality/
Hinchley Wood	17/11/2008	NO_2 Annual Mean	An area encompassing part of the A309 Kingston Bypass between Littleworth Road and Manor Road North.	YES	57.7	34.7	Draft Air Quality Action Plan for Elmbridge Borough 2021 - 2026	https://www.elmbridge.gov.uk/pollution/local-air-quality/
Esher High Street	17/06/2005	NO_2 Annual Mean	An area extending along the High Street, Church Street and	YES	62.1	31.1	Draft Air Quality Action Plan for Elmbridge Borough 2021 - 2026	https://www.elmbridge.gov.uk/pollution/local-air-quality/

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
			including parts of Esher Green and Lammas Lane.					
Walton Road, Molesey	17/06/2005	NO_2 Annual Mean	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	27.6	Draft Air Quality Action Plan for Elmbridge Borough 2021 - 2026	https://www.elmbridge.gov.uk/pollution/local-air-quality/

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

☒ **Elmbridge Borough Council confirm that all current AQAPs have been submitted to DEFRA.**

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

DEFRA's appraisal of last year's ASR concluded that the report was well structured, detailed, and provides the information specified in the Guidance. The following comments were provided by DEFRA to help inform future reports:

- Robust and accurate QA/QC procedures were applied. Calculations for bias adjustment, annualisation and distance-correction factors were outlined in detail.
- The Council has included discussion and review of both its AQMAs and monitoring strategy, informed in large part by the analysis of CERC modelling data. This demonstrates the Councils proactive and dedicated approach to improving air quality across Elmbridge.
- Comments from last year's ASR have been mentioned and addressed. This is welcomed, and we encourage this to continue in future ASRs.
- However, the need for an updated AQAP was mentioned in last years' ASR appraisal, and this has not yet been adopted. The Council is encouraged to adopt a revised AQAP in the next reporting year.
- The Council has an extensive NO_2 monitoring strategy. Monitoring of other pollutants, while not compulsory, could be considered to better inform how to tackle $PM_{2.5}$ pollution.
- The Public Health Outcomes Frameworks was mentioned, and this is encouraged. The Council could consider referring specifically to indicator D01. Fraction of mortality attributable to particulate air pollution.

The 2021 ASR has addressed these comments in the following ways:

- The AQAP has been progressed in 2020 despite resourcing constraints due to COVID-19. The draft AQAP 2021-2026 was submitted to DEFRA for a first appraisal review in March 2021.
- The Council has applied for Community Infrastructure Levy (CIL) funding for an automatic particulate monitoring station to be installed in Elmbridge.
- The Public Health Outcomes Framework has been referred to, including indicator D01 Fraction of Mortality Attributable to Particulate Pollution.

The Council has taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 34 measures are included within Table 2.2, with the type of measure and the progress the Council have made during the reporting year of 2020 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

Key completed measures are:

- Preparation of the draft AQAP 2021-2026, due to be adopted in Summer 2021.
- Review the Council's existing diffusion tube monitoring network and deployment of additional monitoring locations.
- Upgrade to the Holly Hedge Car Park electric vehicle charging point which was replaced in 2021 with four fast charging points with infrastructure for a further two.
- Production of a 'wood burning stoves animation' for the Council website.
- Continued support of the successful engagement and behaviour change programme in Surrey schools.
- Continued funding and promotion of the AirAlert pollution warning service.
- New taxi and private hire licensing policy

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

- Adoption of the AQAP 2021-2026.
- Development of a Local Cycling and Walking Infrastructure Plan (LCWIP) for Elmbridge.
- Installation of electric vehicle charging points at Churchfield Car Park, Weybridge and Civic Centre Car Park, Esher.
- Installation of an automatic roadside particulate monitor within the Borough.
- Successful completion of the SAA Taxi project

The Council's priorities for the coming year are:

- Adoption of the AQAP 2021-2026.
- Installation of an automatic monitoring station to measure particulates.
- Responding to the 'Climate Emergency', included as a priority in the Council Plan 2020/20211, and implementing the Council Carbon Management and Reduction Plan.

- Installation of more electric vehicle charging points in the Borough.
- Supporting the development of the new Local Plan to ensure policies relating to air quality are considered.
- Working with the SAA to implement the electric vehicle taxi project.

The principal challenges and barriers to implementation that the Council anticipates facing in the next reporting year are those associated with COVID-19. In particular, monitoring results for 2021 are likely to be impacted due to the implementation of lockdown measures, and as result measurements may not be considered representative of usual conditions due to significantly decreased traffic.

Experiences and learning through this period may provide opportunities for improvements in local air quality, for example modal shift due to increased home working.

The Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in all of the Council's six AQMAs.

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
BW-1	Transport for South East	Transport Planning and Infrastructure	Other	2021		GLA, SCC and EBC	Developers & highway infrastructure funding	NO	Partially Funded	> £10 million	Planning	Reduced vehicle emissions		Transport Strategy adopted in Summer 2020.	Elmbridge is located within two of the five study areas (the inner orbital and South West radial). The outcome of these studies will form the basis of the Transport for South East Strategic Investment Plan for new transport schemes, initiatives, and policies. The Strategic Investment Plan is expected to be published in 2022.
BW-2	Implementation of the Low Emission Transport Strategy for Surrey	Transport Planning and Infrastructure	Other	2018	2026	SCC and EBC	Developers & highway infrastructure funding	NO	Partially Funded	£1 million - £10 million	Implementation	Reduced vehicle emissions	Suite of indicators associated with quantum and distribution of air pollution, travel behaviour and delivery of infrastructure for low emission transport options	Strategy in use	
BW-3	Support an electric vehicle strategy for Surrey	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2018	2026	SCC and EBC	Developers & highway infrastructure funding	NO	Partially Funded	£100k - £500k	Implementation	Reduced vehicle emissions		Electric Vehicle Strategy produced and adopted by EBC. Ongoing implementation of Strategy. As of June 2021, project in initial stages with plan to implement in Autumn/Winter 2021.	SCC electric vehicle charging infrastructure pilot underway. The pilot is trialling fast chargers in urban and residential streets in Guildford, Woking, Spelthorne and Waverley. The findings of the pilot will be used to develop an EV charging design and policy guidelines. A report on lessons learned which will inform the delivery of a county-wide roll-out of EV charging infrastructure. The SAA has also submitted a grant application to DEFRA for an electric taxi fleet trial including telemetric devices in vehicles. In March 2021 the project was awarded £256,868 from the DEFRA Air Quality Grant Fund.
BW-4	Implementation of the Climate Change Strategy for Surrey	Promoting Travel Alternatives	Other	2020	2025	SCC and EBC	Central Government, developers, highways and infrastructure funding.	YES	Partially Funded	£1 million - £10 million	Implementation	Reduced vehicle and building emissions	Implementation of Strategy	Strategy in use	Strategy has been considered by 11 Districts and Boroughs. Measures relating to air quality are detailed in Section 5 the AQAP.

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
BW-5	Use of, and exploration of possibilities for increasing use of, Council electric vehicles for journeys within the Borough and supporting electric vehicle use by Council contractors	Promoting Low Emission Transport	Public Vehicle Procurement -Prioritising uptake of low emission vehicles	2020	2030	EBC	EBC	NO	Partially Funded	£10k - 50k	Implementation	Reduced vehicle emissions	Usage of >1900 miles/month to be cost effective	Jan to Dec 2019 usage 16,497 miles (1,375 average miles per month).Parking enforcement contractor moved to green fleet	The Carbon Management and Reduction Plan includes actions that will assist in the implementation of this measure including: - Review of the Council's internal purchases, working towards the ambition of an ultra-low carbon fleet. - Replace and review existing electric vehicle fleet and increase number of electric pool cars.
BW-6	Increasing the number of electric vehicles charging points in Council car parks	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2020	2021	EBC	EBC	NO	Partially Funded	£10k - 50k	Implementation	Reduced vehicle emissions	No. of charging points installed	As part of an upgrade to council car parks the charger at Holly Hedge Car Park in Cobham was replaced with four fast charging points and Esher Civic Centre and Churchfield Weybridge car parks to be completed by end 2021	Rolling programme, 2 twin chargers to be installed in three Council Car Parks. Holly Hedge Car park Cobham completed. Churchfields Road Weybridge and Civic Centre Esher scheduled for completion by end 2021.
BW-7	Use of a tiered fee structure for taxi licensing to benefit operators with lower emission vehicles	Promoting Low Emission Transport	Taxi emission incentives	2020	2026	EBC	N/A	NO	Funded		Implementation	Reduced vehicle emissions	Possible inclusion in Hackney carriage and private hire licensing policy	New EBC Taxi and Private Hire Licensing Policy adopted in September 2020.	The EBC Taxi and Private Hire Licensing Policy 2020 – 2025 includes a commitment to phase out use of all diesel-fuelled vehicles and petrol-fuelled vehicles that do not meet the latest Euro standard. From September 2020, new licences will not be issued for diesel-fuelled vehicles or petrol-fuelled vehicles that do not meet the latest Euro standard. Furthermore, if a licence holder wishes to replace their vehicle, the replacement vehicle must meet a higher Euro emission standard that the existing vehicle.
BW-8	Reducing Council staff and fleet transport emissions as	Promoting Low Emission Transport	Public Vehicle Procurement -Prioritising uptake of	2020	2030	EBC	EBC	NO	Partially Funded	£10k - 50k	Implementation	Reduced vehicle emissions	Latest carbon reduction action plan updates	Initial assessment of emissions completed	

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
	part of the Councils Carbon Reduction Strategy		low emission vehicles												
BW-9	Development and implementation of a Local Walking and Cycling Infrastructure Plan (LWCIP) for Elmbridge Borough	Transport Planning and Infrastructure	Cycle network	2020	2021	SCC and EBC	Central Government, developers, highways and infrastructure funding.	NO	Partially Funded	£50k - £100k	Planning	Reduced vehicle emissions	Completion and adoption of the LWCIP	2022-2032 - implementation of the LWCIP would be ongoing over next 10 years. 2021 - Policy completed. 2021 -2022 - identify locations and corridors that need improvement. 2022-2023 - feasibility and business cases for projects. 2023-2024 - target for first projects to be delivered. 2025 - delivery programme continues	The LWCIP is a ten-year programme and would include the following: - Identification of where good walking and cycling facilities would be most beneficial. - Identify what improvements are required at these locations. Plan how these improvements can be delivered, and which prioritise first.
BW-10	Investigate options for a pilot cargo bike scheme for local businesses	Promoting Travel Alternatives	Promotion of cycling	2020	2022	EBC			Not Funded	< £10k	Planning	Reduced vehicle emissions		Ongoing	To be delivered through LTP4.
BW-11	Work towards fulfilling the Council's pledge to be carbon neutral by 2030	Promoting Low Emission Plant	Public Procurement of stationary combustion sources	2020	2030	EBC	EBC	NO	Partially Funded	£10k - 50k	Implementation	Reduced vehicle and building emissions		Key priority in the Council's Service and Delivery Plan for 2020/2021. Carbon Management and Reduction Plan adopted.	The Carbon Management and Reduction Plan contains actions aimed at fulfilling the Council's Carbon neutral pledge. Such actions that will also be beneficial to air quality include: - Seeking strategic direction on enabling remote working for Council staff. - Replacement of gas-fired boilers with electric or other state-of-the-art technologies at the Civic Centre. - Planning for future replacement of gas-fired boilers at community centres. The emerging Local Plan will also seek to encourage more sustainable development

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
															through the implementation of policies regarding energy usage etc.
BW-12	Embed air quality in the Local Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	2022	EBC	EBC	NO	Funded	< £10k	Planning	Reduced vehicle and building emissions	Adoption of an Air Quality within Design and a Renewables focused SPD.	Ongoing	The emerging Local Plan will seek to encourage more sustainable development through the implementation of policies regarding matters such as energy usage, sustainable transport modes and electric vehicle charging requirements, etc. Specific guidance relating to air quality is to be covered in two SPD's, focused on design and a renewables. Consideration will be given to a separate SPD on air quality if required to incorporate air quality positive principles.
BW-13	Indoor air quality to be considered as part of the planning process for new development in the AQMAs	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	2022	EBC	N/A	NO			Planning	N/A	Number of planning applications in AQMA with indoor air quality considered	Ongoing	Housing within existing high streets is on the increase. The six AQMA's are all high street locations. While indoor air quality is not the primary focus of an AQAP it is included as an action on the grounds of public health.
BW-14	Investigate including Air Quality Positive principles in a Design and Renewables SPD	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	2022	EBC	EBC	NO	Partially Funded	< £10k	Planning	Reduced vehicle and building emissions	Number of planning applications considered to be air quality positive	Ongoing	Details on how this can be achieved to be provided within SPD's covering design and renewables. Also a separate SPD on air quality if required. The Publication London Plan (December 2020), which is intended to be published in 2021, requires large-scale developments to consider how air quality can be improved across the area through an Air Quality Positive approach. The Air Quality Positive approach requires new development proposals to consider ways in which the development could maximise benefits to local air quality, as well as what measures and design features that will be put in place to reduce exposure to air pollution.
BW-15	Encouraging residents to refrain from garden bonfires	Public Information	Via the Internet			EBC	EBC	NO	Funded	< £10k	Implementation	Reduced stationary source emissions	Reduction in the number of complaints received	Ongoing	Use of the Councils website and social media to promote changes in behaviour to move away from burning.
BW-16	Promoting approved wood-burning	Public Information	Via the Internet	2020	2021	EBC	EBC	NO	Funded	< £10k	Implementation	Reduced building emissions		Animation video on wood burning	Wood burning stove animation video. SAA plan on update to

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
	stoves and burning of approved products and encouraging recycling of waste													stoves produced with the SAA. Video launched on Clean Air Day in Nov 2020. Promotion of video ongoing. Animation to be updated in 2021.	animation following new guidance
BW-17	Ensure appropriate and effective monitoring is undertaken across Elmbridge to meet statutory review and assessment duties	Other	Other	2019		EBC	EBC	NO	Funded	< £10k	Implementation	N/A	Production of Air Quality Annual Status Report	Annual reports produced.	The Council seeks to maintain and run and efficient monitoring network. Review of diffusion tube location undertaken in 2021
BW-18	Investigate options for the installation of a PM_{10}/$PM_{2.5}$ monitor in Elmbridge	Other	Other	2020	2022	EBC	Community Infrastructure Levy (CIL)	NO	Not Funded	£10k - 50k	Planning	N/A	Installation of a PM_{10}/$PM_{2.5}$ monitoring site	Application submitted for CIL funds.	A Community Infrastructure Levy (CIL) bid was submitted in March 2021 for a roadside particulate monitor. A decision on the bid will be made at the Councils Cabinet meeting on 7 July 2021. Completion date is subject to CIL funding.
BW-19	CERC Surrey-wide air quality modelling update	Other	Other	2021	2024	SAA	SAA	NO	Not Funded	£10k - 50k	Planning	N/A	Air quality modelling undertaken		To undertake updated borough modelling in 2024
BW-20	Review of diffusion tube locations across the Borough following CERC modelling update	Other	Other	2019	2025	EBC	EBC	NO	Not Funded	< £10k	Planning	N/A	Report on diffusion tube location review produced	Review of diffusion tube locations in accordance with CERC modelling undertake in 2019 and new locations added as a result. Result have been reported in this ASR.	Once updated modelling review undertaken a further review of diffusion tube locations will be undertaken
BW-21	Monitor impact of London Ultra Low Emission Zone in	Other	Other	2021		EBC	EBC	NO	Funded	< £10k	Planning	N/A	Results of traffic surveys and reported in air quality annual status reports	Ongoing. London ULEZ extended in October 2021. SAA to	Potential for negative impacts in Esher and Hampton Court with traffic rerouting around LEZ. Identification of an issue will allow further actions to be targeted in these areas.

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
	Elmbridge AQMAs													monitor the situation.	
BW-22	Continuation of the Schools Air Quality Programme	Public Information	Via other mechanisms			SAA	DEFRA, SAA	YES	Partially Funded	< £10k	Implementation	Reduced vehicle and building emissions	No. children reached by promotional / engagement activities	Ongoing	SCC and the SAA continue to support the role out of a Schools programme to include Golden and Green Boot Challenges. September 2021 – New online teaching package on air quality available to all schools in Surrey
BW-23	Use of the EBC website to promote public awareness of the Elmbridge AQMAs and air quality in general	Public Information	Via the Internet			EBC	EBC	NO	Funded	< £10k	Implementation	Reduced vehicle and building emissions	Latest ASR available on website	Ongoing	The Councils website publishes the ASR's back to 2017, provides a link to the CERC modelling map, plus links to both real time monitors along with a range of advice https://www.elmbridge.gov.uk/pollution/local-air-quality/
BW-24	Continue to promote the AirAlert service	Public Information	Via other mechanisms			EBC	EBC	NO	Funded	< £10k	Implementation	N/A	Number of residents subscribed in Elmbridge	Ongoing	As of May 2021, Elmbridge continues to have the highest number of subscriptions within Surrey at 283. Promoted via social media and website.
BW-25	Clean Air Day Activities	Public Information	Via other mechanisms			EBC	EBC	NO	Partially Funded	< £10k	Implementation	Reduced vehicle and building emissions		Wood burning stoves animation on EBC website in 2020.	On 2020 Clean Air Day, the SAA commissioned a wood burning stoves animation (see https://www.elmbridge.gov.uk/pollution/local-air-quality/) This was promoted throughout Surrey. Clean Air Day June 2021 focusing on promoting animation Air Quality Impacts All of Us – 5 practical steps you can take to improve air quality in Elmbridge. Also, an initiative with the Energy Saving Trust to "Help your staff go electric" 45-minute online presentation to Council staff and colleagues at SCC and Surrey Districts and Boroughs.
BW-26	Raise awareness of indoor air pollution through the EBC website and social media	Public Information	Via the Internet			EBC	EBC	NO	Partially Funded	< £10k	Implementation	N/A	Information available on website	Ongoing	Consideration is also given to planning applications for residential with AQMA's and the likely impacts on indoor air quality
BW-27	Remain an active member of the Surrey Air Alliance and contributors to Work Plan	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions	2016		EBC	EBC	NO	Funded	< £10k	Implementation	Reduced vehicle and building emissions	Adoption of Work Plan	Constitution adopted and workplan produced. Regular meetings held.	The SAA facilitates Surrey Authorities, and SCC working together to improve air quality in Surrey. Examples of large projects include CERC County wide modelling project, DEFRA grant for schools project and the recent DEFRA grant for Electric Taxi fleet trial.

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
			and improve air quality												
BW-28	Investigate options for working with local businesses to reduce emissions from deliveries	Promoting Low Emission Transport	Company Vehicle Procurement -Prioritising uptake of low emission vehicles	2020	2022	EBC	EBC	NO	Not Funded	< £10k	Planning	Reduced vehicle emissions			Investigation completion expected in 2022 and further measures to be developed if suitable.
BW-29	Working with SCC to ensure that Air Quality is appropriately considered within the Local Transport Plan 4 (LTP4)	Transport Planning and Infrastructure	Other	2020	2022	SCC and EBC	N/A				Planning	Reduced vehicle emissions		Discussion ongoing with SCC Highways.	By the end of 2020 visions, objectives and core principles to be developed. LTP development to be started in 2021. Adoption anticipated by early 2022.
BW-30	Work with the Surrey Authorities to achieve WHO Guideline Values for PM_{10} and $PM_{2.5}$ in the Elmbridge Borough by 2030 and any further UK Government targets introduced.	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2020		SCC and EBC	N/A				Planning	Reduced $PM_{2.5}$ concentrations	Achievement of WHO Guideline Values across Elmbridge	Draft AQAP prepared with commitment to achieve WHO Guideline Values in Elmbridge by 2030.	Various measures within the AQAP will assist in quantifying particulate levels within the Borough and seek to reduce PM levels within a local authority sphere of control
AS-1	Alteration of existing signalised pedestrian crossings on the High Street, Weybridge to reduce congestion	Traffic Management	UTC, Congestion management, traffic reduction	2020		SCC and EBC	Developers & highway infrastructure funding	NO	Partially Funded	£10k - 50k	Planning	Reduced vehicle emissions		Study ongoing to determine feasibility	
AS-2	Improvements to the Hampton Court Roundabout/ junction to reduce congestion	Traffic Management	UTC, Congestion management, traffic reduction	2020		SCC and EBC	Developers & highway infrastructure funding	NO	Partially Funded	£50k - £100k	Planning	Reduced vehicle emissions		Planning application decision due in Summer 2021.	An agreed scheme as part of a development proposal. Could be implemented either as part of development or a standalone scheme
AS-3	Installation of additional pedestrian facilities on	Promoting Travel Alternatives	Promotion of walking	2020		SCC and EBC	Developers & highway infrastru	NO	Partially Funded	£10k - 50k	Planning	Reduced vehicle emissions		Study to understand traffic movements	

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
	Esher High Street						cture funding							through Esher currently ongoing. The outcome of this will allow identification of where pedestrian facilities could be installed	
AS-4	Electric vehicle charging point upgrades in Council car parks in Esher	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2020	2021	EBC	Developers & highway infrastructure funding	NO	Funded	£10k - 50k	Implementation	Reduced vehicle emissions	Upgrades completed	Due to be installed in 2021.	Rolling programme, 2 twin chargers to be installed in three Council Car Parks. Holly Hedge Car park Cobham completed. Churchfields Road Weybridge and Civic Centre Esher scheduled for completion by end 2021.

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.

The Public Health Outcomes Framework data tool compiled by Public Health England quantifies the mortality burden of $PM_{2.5}$ 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 2019 shows that the percentage of mortality attributable to $PM_{2.5}$ pollution (indicator D01) across England is 5.1%. The percentage within Surrey is 5.4% and within Elmbridge is 5.7%. Elmbridge has a higher percentage of mortality attributable to $PM_{2.5}$ pollution when compared to England and Surrey as a whole.

The modelling exercise undertaken by CERC also quantifies the mortality burden of $PM_{2.5}$, in terms of fraction of deaths attributable to $PM_{2.5}$ pollution, associated total life years lost and economic cost within Elmbridge, and the wider-Surrey area. The estimated total number of deaths attributable to $PM_{2.5}$ pollution in Surrey in 2017 was between 173 – 468, which equated to an estimated economic cost between £87,235,665 – £235,790,2568[12]. In Elmbridge, the estimated total number of deaths attributable to $PM_{2.5}$ pollution in 2017 was between 19 - 51, which equated to an estimated economic cost between £9,828,813 – £29,869,995.

The CERC modelling contour maps of predicted pollutant concentrations across Surrey and Elmbridge are available in an interactive format at the following website:

[12] CERC. Detailed Air Quality Modelling and Source Apportionment. Final Report. August 2019.

https://surreycc.maps.arcgis.com/apps/webappviewer/index.html?id=43910ffb100248ed972115b7a9b49d20

The contour map for predicted annual mean $PM_{2.5}$ concentrations in 2017 shows no exceedances of the annual mean $PM_{2.5}$ objective (25 µg/m^3) in Elmbridge.

However, given the implementation of the Technical Guidance LAQM.TG16[1] and Policy Guidance LAQM.PG16, the Council is working towards defining a strategy to reduce emissions or concentrations of $PM_{2.5}$. Existing actions to gain a better understanding of the current situation and measures to improve air quality already in place which can help reduce levels of $PM_{2.5}$ include:

- Planned installation of an automatic monitoring station measuring $PM_{2.5}$ in the Borough;
- $PM_{2.5}$ dispersion modelling, funded by the Council, has been carried out;
- Discouraging wood-burning and promoting the use of only approved wood-burning stoves and burning of approved products if wood-burning is necessary;
- encouraging residents to refrain from garden bonfires;
- promoting travel alternatives;
- Implementing the SAA Taxi project
- Implementing the new taxi and private hire licensing policy that came into force 1 September 2020
- promoting low emission transport;
- implementing Surrey's Climate Change Strategy (April 2020)[13] which includes measures targeted at reducing vehicle emissions; and
- implementing Surrey County Council's Low Emissions Transport Strategy (2018)[14].

[13] Surrey County Council. Surrey's Climate Change Strategy. 2020.

[14] Surrey County Council. Surrey Low Emission Transport Strategy. 2018.

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

This section sets out the monitoring undertaken in 2020 by Elmbridge Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

The Council undertook automatic (continuous) monitoring at two sites during 2020, Weybridge High Street 2, and Hampton Court Parade. Table A.1 in Appendix A shows the details of the automatic monitoring sites.

The Weybridge High Street 2 site was deployed in September 2019 and replaces the Weybridge High Street 1 site which was decommissioned in January 2020. The Weybridge High Street 2 site is a completely new monitoring station installed following a move as part of a High Street redevelopment.

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

3.1.2 Non-Automatic Monitoring Sites

The Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 49 sites during 2020. 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.

Following a review of the suitability of existing diffusion tube locations (Appendix H), and CERC modelling (Appendix G), several new non-automatic monitoring sites were deployed in 2020 including:

- Esher 14, Esher 15;
- Hinchley Wood 3;
- Walton 12;
- Weybridge 6A, Weybridge 17; and
- Cobham 8, Cobham 9, Cobham 10, Cobham 11, Cobham 12 and Cobham 13.

A number of sites were also decommissioned in 2020, either due to concentrations in previous years being well below the objective, or because the site has been replaced with a more suitable monitoring site following the diffusion tube review. The following sites were decommissioned during 2020:

- Esher 4, Esher 5, Esher 10;
- Hinchley Wood 2;
- Walton 3A, Walton 5
- Weybridge 1, Weybridge 6, Weybridge 9; and
- Downside 3.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is less than 9 months and greater than two months), and distance correction. 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 2020 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.

Automatic Monitoring

During 2020, the Council undertook automatic monitoring of NO_2 concentrations at Weybridge High Street 2 and Hampton Court Parade, within the Weybridge High Street and Hampton Court AQMAs. Annual mean NO_2 concentrations at both automatic monitoring sites were well below the objective, with annual mean NO_2 concentration of 24 µg/m^3 measured at Weybridge High Street 2 and 26 µg/m^3 measured at Hampton Court Parade. NO_2 concentrations at the two automatic monitoring sites reduced significantly in 2020 from previous years, with a 7 µg/m^3 reduction recorded at Weybridge High Street 2 between 2019 and 2020, and a 15 µg/m^3 reduction recorded at Hampton Court Parade. Data capture during 2020 was good (>90%) at both automatic monitoring sites.

There were no measured exceedances of the hourly mean NO_2 objective of 200 µg/m^3 at the Weybridge High Street 2 or Hampton Court Parade monitoring sites.

Non-Automatic Monitoring

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Table B.1, in Appendix B. The diffusion tube data have been processed using the DEFRA Diffusion Tube Processing Tool (v1.1).

In 2020, the only monitoring site which recorded an exceedance of the annual mean NO_2 objective was Cobham 11 where a concentration of 40.9 µg/m^3 was measured. Cobham 11 is a new monitoring site deployed in 2020 to capture concentrations in an area which required further investigation due to modelled exceedances of annual mean NO_2 objective being identified in the CERC modelling review. The monitoring site is located adjacent to the A242 Portsmouth Road / A3 Esher Bypass junction, outside of any existing AQMAs.

Distance correction has been carried out in order to estimate concentrations at the nearest location of relevant exposure in the vicinity of Cobham 11. Once distance corrected, the

annual mean NO_2 concentration in 2020 was below the objective (32.6 µg/m^3) at the nearest location of relevant exposure to Cobham 11. As no exceedance is predicted at the nearest location of relevant exposure, it is considered that further action (i.e. declaration of an AQMA) is not required at this time. However, concentrations at Cobham 11 will continue to be closely monitored and further action taken in the future, if required.

During 2020, there were no measured annual mean NO_2 concentrations greater than 60 µg/m^3, and therefore it is considered unlikely that the hourly mean NO_2 objective is exceeded at monitoring locations within the Borough.

In 2020, NO_2 concentrations improved at all sites in Elmbridge when compared with 2019 concentrations. These reductions are considered to be heavily influenced by COVID-19 restrictions during 2020 which resulted in significantly reduced traffic flows and subsequent road traffic emissions. Data trends for all current sites for the past five years are provided in Appendix A, Figures A.1 – A.7. Overall, between 2016 and 2020, concentrations have fluctuated, however a general decrease in concentrations is evident across the majority of sites since 2016.

Concentrations have remained below the objective at monitoring sites in the Hinchley Wood, Walton-on-Thames High Street and Walton Road, Molesey AQMAs since 2016. Measured annual mean NO_2 concentrations in the Molesey AQMA were more than 10% below the objective in 2016, 2017, 2018 and 2020. In the Hinchley Wood and Walton-on-Thames High Street AQMAs, measured annual mean NO_2 concentrations were more than 10% below the objective in 2017, 2018 and 2020. However, due to elevated concentrations in 2019, the Hinchley Wood, Walton-on-Thames High Street and Walton Road, Molesey AQMAs have not been considered for revocation at this time as a minimum of three consecutive years of concentrations more that 10% below the annual mean NO_2 objective is required. Monitoring will continue in the AQMAs until it can be demonstrated that concentrations have been more than 10% below the annual mean NO_2 objective for a minimum of three consecutive years.

3.2.2 Particulate Matter (PM_{10})

PM_{10} monitoring is not required and therefore is not currently carried out by Elmbridge Borough Council. However, the Council has applied for funding for a PM_{10} automatic monitoring station to be installed in the Borough.

PM_{10} has been included within the modelling exercise undertaken by CERC. The CERC modelling report for Elmbridge is provided in Appendix G and interactive contour maps of predicted pollutant concentrations can be accessed via the following link:

https://surreycc.maps.arcgis.com/apps/webappviewer/index.html?id=43910ffb100248ed972115b7a9b49d20

The contour map for the predicted annual mean PM_{10} concentrations in 2017 shows no exceedances of the annual mean PM_{10} objective (40 µg/m^3) in Elmbridge. The contour map for the 90.41st percentile of 24-hour mean PM_{10} concentrations shows exceedances of the 24-hour mean concentration (50 µg/m^3) along the A3 Portsmouth Road and the M25. However, these exceedances occur within the road and are therefore not representative of relevant exposure.

3.2.3 Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ monitoring is not required and therefore is not currently carried out by Elmbridge Borough Council. However, the draft AQAP sets out a commitment for Elmbridge to work towards reducing annual mean $PM_{2.5}$ concentrations in the Borough to below the WHO Guideline Value of 10 µg/m^3. In addition, the Council has applied for funding for a $PM_{2.5}$ automatic monitoring station to be installed in the Borough.

$PM_{2.5}$ has been included within the modelling exercise undertaken by CERC. The CERC modelling report for Elmbridge is provided in Appendix G and interactive contour maps of predicted pollutant concentrations can be accessed via the following link:

https://surreycc.maps.arcgis.com/apps/webappviewer/index.html?id=43910ffb100248ed972115b7a9b49d20

The contour map for the predicted annual mean $PM_{2.5}$ concentrations in 2017 shows no exceedances of the annual mean $PM_{2.5}$ objective (25 µg/m^3) in Elmbridge.

3.2.4 Sulphur Dioxide (SO_2)

Monitoring of SO_2 is not required and is therefore not currently carried out 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 (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
Weybridge High Street 2	Weybridge High Street 2	Kerbside	507459	164909	NO_2	YES	Chemiluminescence	6.5	0.7	1.8
Hampton Court Parade	Hampton Court Parade	Roadside	515338	168292	NO_2	YES	Chemiluminescence	10	1.9	1.6

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)
ESHER1	Church Street, Esher outside Cuvee	Roadside	513840	164693	NO_2	Yes - Esher	0.4	1.5	No	2.6
ESHER4	1 Portsmouth Road, Esher Bus Bay/toilet	Roadside	514058	164855	NO_2	Yes - Esher	41.3	4.7	No	2.4
ESHER5	Roundabout, Copsem Lane/A3	Roadside	514150	162470	NO_2	No	124.0	1.4	No	2.4
ESHER7	Outside Blink, 35-37 High Street, Esher	Roadside	513982	164750	NO_2	Yes - Esher	2.3	0.6	No	2.3

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)
ESHER8	Outside 9 Church St	Roadside	513832	164684	NO_2	Yes - Esher	0.1	3.2	No	2.4
ESHER9	Lamp post next to Churchyard, Church St	Kerbside	513821	164712	NO_2	Yes - Esher	12.5	0.6	No	2.6
ESHER10	Traffic Sign, outside 15 Esher Green	Roadside	513886	164767	NO_2	Yes - Esher	4.3	2.1	No	2.4
ESHER11	The Bear, 71 High St, Esher	Roadside	518395	164599	NO_2	Yes - Esher	1.6	5.1	No	2.6
ESHER13	Lampost outside Panahar Tandoori, 124-126 High Street	Kerbside	513736	164489	NO_2	Yes - Esher	2.7	0.9	No	2.4
ESHER 14	Lampost in Car Park, Sunrise Living off A3 Roundabout Esher	Roadside	514034	162282	NO_2	No	6.2	1.0	No	1.6
ESHER 15	Lampost o/s Helix House, Esher Green/High St, Esher KT10 8AB	Roadside	513901	164779	NO_2	Yes - Esher	1.1	3.8	No	1.9
HAMPTON COURT 1	Lampost outside Yew Tree Croft, Hampton Ct Wa, North of Summer Road, (Bus Layby)	Kerbside	515379	167946	NO_2	Yes - Hampton Court	20.9	0.9	No	2.2
HINCHLEY WOOD 1	2 Portsmouth Road, Kingston Bypass opp. Fire Station	Roadside	515248	165535	NO_2	Yes - Hinchley Wood	20.8	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)
HINCHLEY WOOD 2	Lamp post outside front gate, Brooklands, Westmont Road, KT10 9BE	Roadside	515218	165578	NO_2	Yes - Hinchley Wood	3.5	9.8	No	1.9
HINCHLEY WOOD 3	Lampost corner Kingston By Pass/Manor Rd Nth, Esher KT10 0AT	Roadside	515728	165191	NO_2	No	17.3	2.6	No	1.9
MOLESEY1	Outside 113 Walton Rd.	Kerbside	514450	168134	NO_2	Yes - Walton Road, Molesey	3.5	1.1	No	2.5
HAMPTON COURT5	Traffic Sign, 1 Creek Road	Roadside	515329	168390	NO_2	Yes - Hampton Court	13.7	0.4	No	2.4
MOLESEY8	44-46 Walton Rd	Roadside	514716	167960	NO_2	Yes - Walton Road, Molesey	0.1	2.6	No	2.4
MOLESEY9	Outside Tesco,114-118 Walton Road	Roadside	514507	168086	NO_2	Yes - Walton Road, Molesey	4.2	2.6	No	2.4
MOLESEY10	Molesey Mart 264 Walton Road	Roadside	514169	168152	NO_2	Yes - Walton Road, Molesey	0.1	4.9	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)
HAMPTON COURT 2, HAMPTON COURT 3, HAMPTON COURT 4	Air Quality Station, opposite Hampton Court Station, Hampton Court Way	Roadside	515338	168292	NO_2	Yes - Hampton Court	10.0	1.9	Yes	1.7
OX 1	Parking Sign outside Birdshill Farmhouse, Warren lane Oxshott	Roadside	514558	160621	NO_2	No	20.0	1.8	No	2.0
OX 2	Lamp Post o/s Flats1/2, Braeside House, High Street, Oxshott	Roadside	514574	160493	NO_2	No	5.0	3.0	No	2.2
WALTON 3A	Outside Walton Village Pub, High Street, Walton	Kerbside	510140	166328	NO_2	Yes - Walton-on-Thames High Street	2.7	0.4	No	2.6
WALTON 5	Hersham Road, Walton J/O Adelaide Road, opp 67	Kerbside	510702	165471	NO_2	No	17.1	0.9	No	2.3
WALTON 8	Leaders, 46 High St	Roadside	510154	166281	NO_2	Yes - Walton-on-Thames High Street	2.0	2.9	No	2.6
WALTON 9	Traffic Sign, Café Nero, 18 High St	Roadside	510082	166379	NO_2	Yes - Walton-on-Thames	2.2	2.6	No	2.5

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)
						High Street				
WALTON 10	Outside 34 Church Street, Walton	Roadside	510140	166522	NO_2	Yes - Walton-on-Thames High Street	2.0	3.3	No	2.6
WALTON 11	Lampost opposite Flour Cafe, The Heart, Hepworth Way	Roadside	510000	166401	NO_2	Yes - Walton-on-Thames High Street	21.0	2.3	No	2.4
WALTON 12	Lampost o/s 60 High Street, Walton on Thames, KT12 1FL	Roadside	510185	166225	NO_2	Yes - Walton-on-Thames High Street	5.7	3.2	No	2.0
WEYBRIDGE 1	Café Nero, 40a High St.	Kerbside	507448	164900	NO_2	Yes - Weybridge High Street	3.8	1.0	No	2.5
WEYBRIDGE 4	Right of 6 Monument Hill	Roadside	507705	164907	NO_2	Yes - Weybridge High Street	5.0	2.0	No	2.4
WEYBRIDGE 5	Pizza Express, 1 Monument Hill	Roadside	507609	164966	NO_2	Yes - Weybridge High Street	0.4	1.6	No	2.3
WEYBRIDGE 6	Outside Bradford & Bingley, 41 High St	Kerbside	507511	164936	NO_2	Yes - Weybridge	5.5	0.5	No	2.3

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)
						High Street				
WEYBRIDGE 6A	Lampost o/s 47 High St, Weybridge	Kerbside	507536	164952	NO_2	Yes - Weybridge High Street	3.0	0.7	No	3.3
WEYBRIDGE 7	Prezzo, 44 Church St	Roadside	507199	164804	NO_2	Yes - Weybridge High Street	0.1	1.5	No	2.4
WEYBRIDGE 8	Lloyd Roberts Opticians, 60A Church St	Roadside	507150	164761	NO_2	Yes - Weybridge High Street	0.1	4.6	No	2.4
WEYBRIDGE 9	Norfolk House, 39 Portmore Park Rd	Roadside	507065	164815	NO_2	Yes - Weybridge High Street	0.8	13.1	No	1.6
WEYBRIDGE 13, WEYBRIDGE 14, WEYBRIDGE 15	Air Quality Station, outside 40a High Street, Weybridge	Kerbside	507459	164909	NO_2	Yes - Weybridge High Street	6.5	0.7	Yes	1.8
WEYBRIDGE 16	Lampost Junction Parvis Road /Brookland Road, Byfleet	Roadside	507190	161340	NO_2	No	10.4	1.6	No	1.9
WEYBRIDGE 17	CCTV Column o/s Lloyds Bank	Kerbside	507365	164831	NO_2	Yes - Weybridge	2.6	0.6	No	3.2

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)
						High Street				
COBHAM 1	o/s The Lemon Tree	Roadside	510813	160048	NO_2	No	3.5	0.6	No	2.4
COBHAM 6	Harlequin Dry Cleaners, 2 Anyards Road	Roadside	510814	160099	NO_2	No	2.2	6.0	No	2.4
COBHAM 7	Exclusively Surrey, 38A High Street	Roadside	510861	159906	NO_2	No	4.2	3.1	No	2.4
COBHAM 8	'No Loading Sign' outside Fieldgate Court, Between Streets, Cobham	Kerbside	510300	160375	NO_2	No	1.3	1.0	No	1.9
COBHAM 9	Sign outside 71 Portsmouth Road, Cobham	Kerbside	510348	160417	NO_2	No	2.3	1.0	No	2.0
COBHAM 10	Lampost o/s 41 Portsmouth Road	Kerbside	510262	160454	NO_2	No	6.4	1.0	No	2.1
COBHAM 11	Lampost outside West Lodge, Portsmouth Road, Cobham	Roadside	509623	160616	NO_2	No	7.1	1.5	No	2.2
COBHAM 12	'No Entry Sign', A3 East Bound off slip road, Portsmouth Road, Cobham	Roadside	509532	106068	NO_2	No	14.3	1.5	No	2.0
COBHAM 13	Railings on Footpath, adjacent to A3 East Bound Slip Rd Cobham	Roadside	509465	160640	NO_2	No	5.5	2.0	No	1.1

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)
DOWNSIDE 3	Downside Village Hall	Suburban	510925	158061	NO_2	No	15.0	1.1	No	2.3

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)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
Weybridge High Street 2	507459	164909	Kerbside	99.5	99.5	-	-	-	31	24
Hampton Court Parade	515338	168292	Roadside	99.4	99.4	**44**	**41**	38	**41**	26

☒ **Reported concentrations are those at the location of the monitoring site (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**.

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%).

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 (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
ESHER1	513840	164693	Roadside	72.8	72.8	**44.9**	37.1	**43.2**	39.7	25.8
ESHER4	514058	164855	Roadside	100	30.5	39.8	33.4	35.6	35.7	24.2
ESHER5	514150	162470	Roadside	100	30.5	**44.4**	**42.6**	**46.1**	**48.1**	31.0
ESHER7	513982	164750	Roadside	100	100.0	**40.5**	39.2	**41.9**	**46.0**	31.1
ESHER8	513832	164684	Roadside	100	100.0	**42.0**	38.6	**41.9**	**42.4**	30.1
ESHER9	513821	164712	Kerbside	72.8	72.8	32.7	28.7	33.4	31.9	20.2
ESHER10	513886	164767	Roadside	100	30.5	30.2	28.5	28.2	32.3	16.8
ESHER11	518395	164599	Roadside	100	100.0	32.9	32.7	33.7	35.0	23.1
ESHER13	513736	164489	Kerbside	100	100.0	35.7	31.5	31.5	35.7	24.8
ESHER 14	514034	162282	Roadside	100	100.0	-	-	-	-	16.8
ESHER 15	513901	164779	Roadside	100	69.5	-	-	-	-	25.5
HAMPTON COURT 1	515379	167946	Kerbside	100	100.0	36.9	35.4	32.1	34.4	23.7
HINCHLEY WOOD 1	515248	165535	Roadside	100	100.0	38.3	35.4	34.4	37.4	27.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
HINCHLEY WOOD 2	515218	165578	Roadside	100	30.5	31.2	30.8	31.0	31.4	19.2
HINCHLEY WOOD 3	515728	165191	Roadside	100	69.5	-	-	-	-	34.7
MOLESEY1	514450	168134	Kerbside	72.8	72.8	32.1	28.2	32.9	34.7	22.8
HAMPTON COURT5	515329	168390	Roadside	100	100.0	28.7	25.3	28.9	27.7	20.9
MOLESEY8	514716	167960	Roadside	100	100.0	35.6	31.2	35.7	39.2	27.6
MOLESEY9	514507	168086	Roadside	100	100.0	34.1	32.3	32.5	34.3	24.0
MOLESEY10	514169	168152	Roadside	100	100.0	26.6	27.5	28.5	28.1	19.8
HAMPTON COURT 2, HAMPTON COURT 3, HAMPTON COURT 4	515338	168292	Roadside	100	100.0	38.5	34.8	36.9	38.9	26.2
OX 1	514558	160621	Roadside	100	100.0	-	-	-	-	19.7
OX 2	514574	160493	Roadside	82.4	82.4	-	-	-	-	20.4
WALTON 3A	510140	166328	Kerbside	100	30.5	-	-	-	34.4	18.6
WALTON 5	510702	165471	Kerbside	100	30.5	29.8	27.5	34.4	32.4	19.1
WALTON 8	510154	166281	Roadside	90.4	90.4	32.3	30.5	33.2	36.2	25.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
WALTON 9	510082	166379	Roadside	90.1	90.1	31.5	30.2	32.4	33.6	23.1
WALTON 10	510140	166522	Roadside	100	100.0	36.8	33.2	34.9	37.0	28.3
WALTON 11	510000	166401	Roadside	90.1	90.1	33.7	30.5	35.9	39.4	24.2
WALTON 12	510185	166225	Roadside	100	69.5	-	-	-	-	24.5
WEYBRIDGE 1	507448	164900	Kerbside	100	15.4	31.9	30.1	28.4	36.3	-
WEYBRIDGE 4	507705	164907	Roadside	82.7	82.7	32.4	30.2	32.1	35.5	29.9
WEYBRIDGE 5	507609	164966	Roadside	84.9	84.9	36.4	34.0	34.0	36.2	28.4
WEYBRIDGE 6	507511	164936	Kerbside	100	15.4	30.9	28.1	27.7	32.9	-
WEYBRIDGE 6A	507536	164952	Kerbside	100	69.5	-	-	-	-	23.5
WEYBRIDGE 7	507199	164804	Roadside	90.1	90.1	**45.0**	**40.6**	39.6	**45.6**	33.1
WEYBRIDGE 8	507150	164761	Roadside	100	100.0	37.4	35.5	31.9	35.2	23.8
WEYBRIDGE 9	507065	164815	Roadside	100	30.5	25.8	22.7	25.4	24.6	13.4
WEYBRIDGE 13, WEYBRIDGE 14, WEYBRIDGE15	507459	164909	Kerbside	100	100.0	-	-	-	31.5	24.3

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
WEYBRIDGE16	507190	161340	Roadside	100	100.0	-	-	-	-	23.1
WEYBRIDGE 17	507365	164831	Kerbside	100	69.5	-	-	-	-	25.4
COBHAM 1	510813	160048	Roadside	82.4	82.4	33.1	30.1	33.3	32.2	18.3
COBHAM 6	510814	160099	Roadside	92.6	92.6	28.6	24.6	27.0	28.1	18.9
COBHAM 7	510861	159906	Roadside	100	100.0	34.1	32.2	31.6	33.6	22.7
COBHAM 8	510300	160375	Kerbside	100	84.6	-	-	-	-	22.4
COBHAM 9	510348	160417	Kerbside	100	84.6	-	-	-	-	21.3
COBHAM 10	510262	160454	Kerbside	100	84.6	-	-	-	-	23.5
COBHAM 11	509623	160616	Roadside	100	84.6	-	-	-	-	**40.9**
COBHAM 12	509532	1060689	Roadside	100	84.6	-	-	-	-	26.2
COBHAM 13	509465	160640	Roadside	100	84.6	-	-	-	-	24.0
DOWNSIDE 3	510925	158061	Suburban	100	30.5	21.3	19.1	20.3	21.1	12.1

☒ **Annualisation has been conducted where data capture is between 3 and 8 months 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:

Diffusion tube monitoring data has been processed using the DEFRA Diffusion Tube Data Processing Tool (v1.1).

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 between 3 and 8 months. 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 in Esher

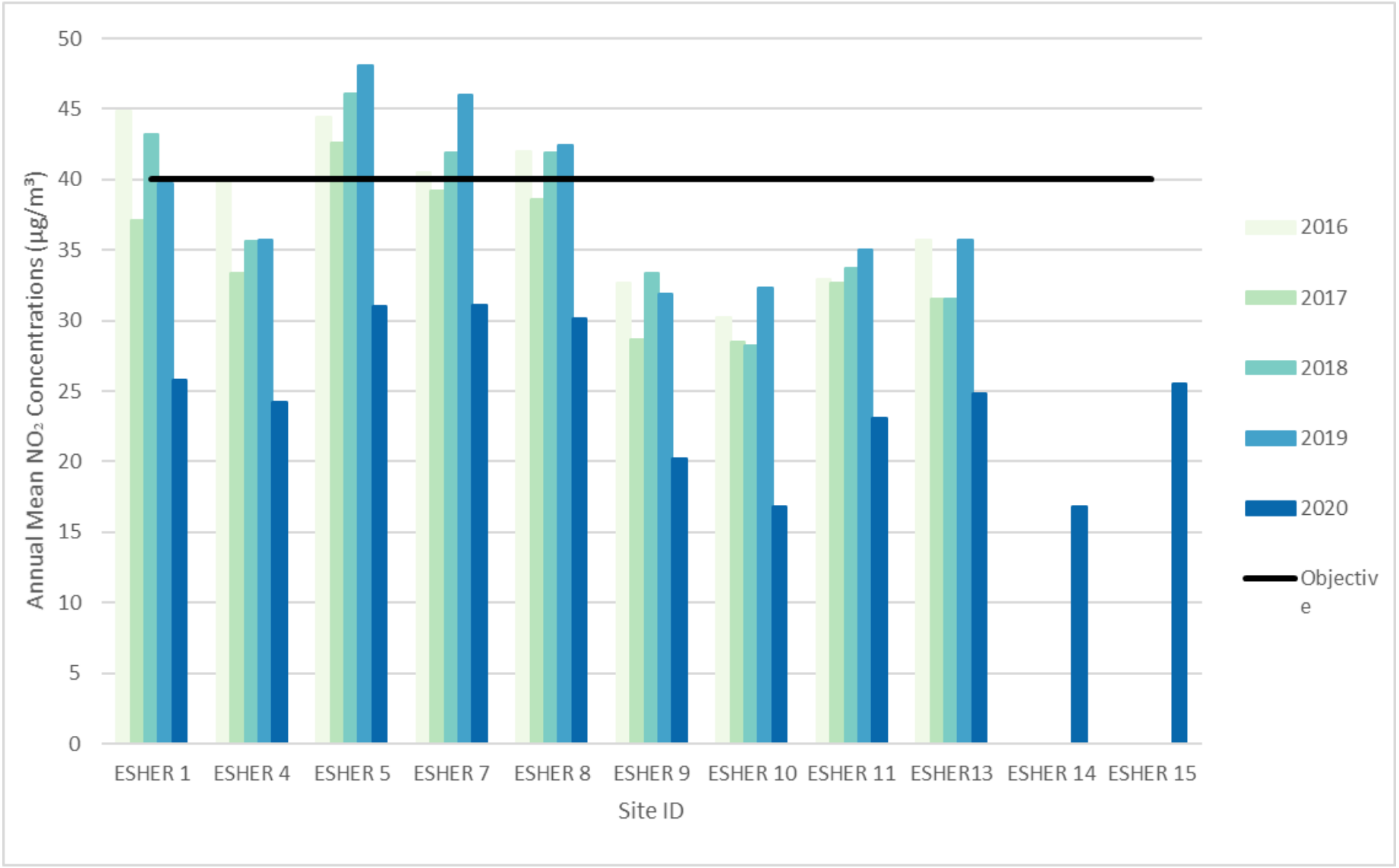


Figure A.2 – Trends in Annual Mean NO_2 Concentrations in Hinchley Wood

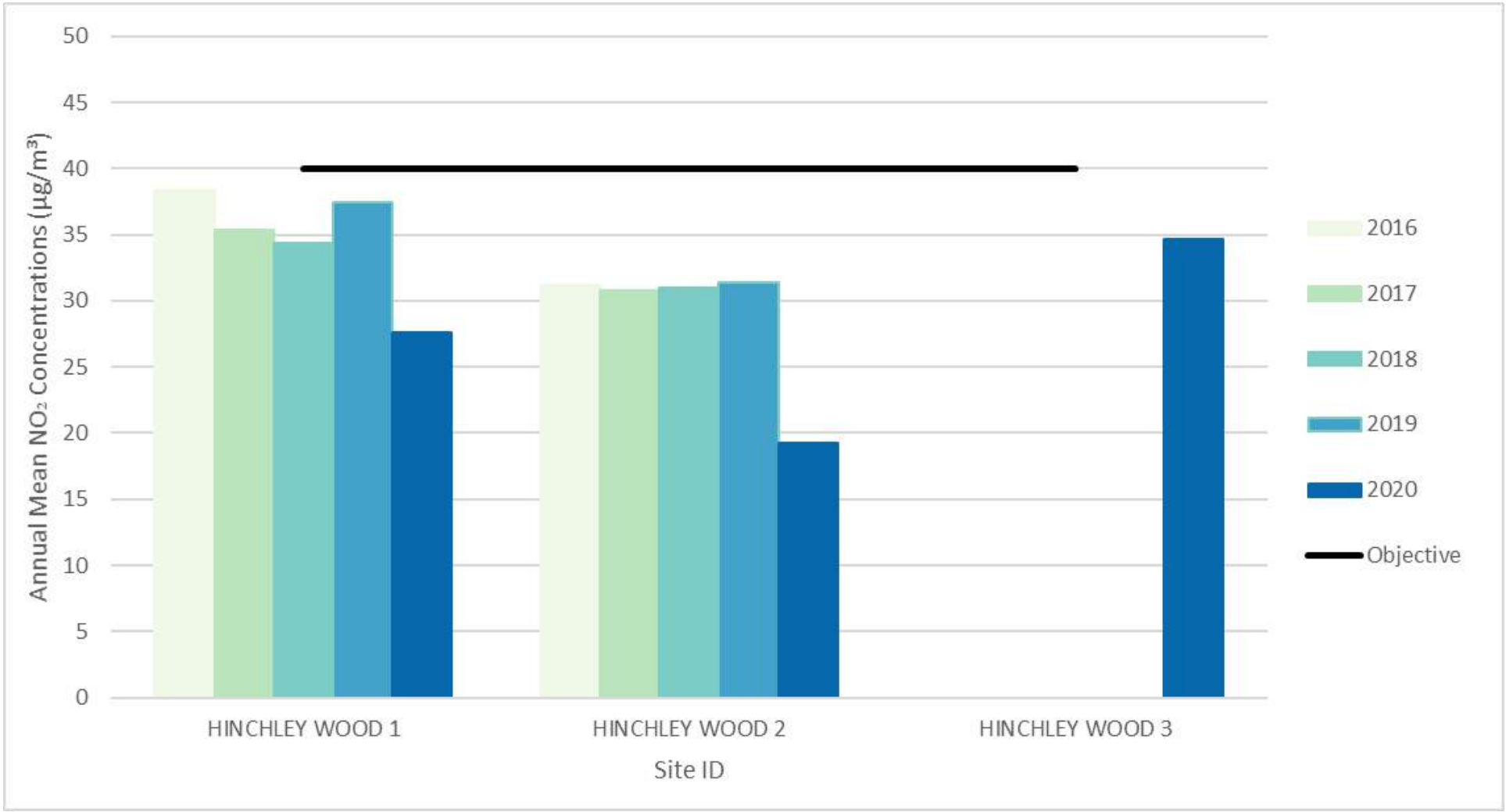


Figure A.3 – Trends in Annual Mean NO_2 Concentrations in Molesey

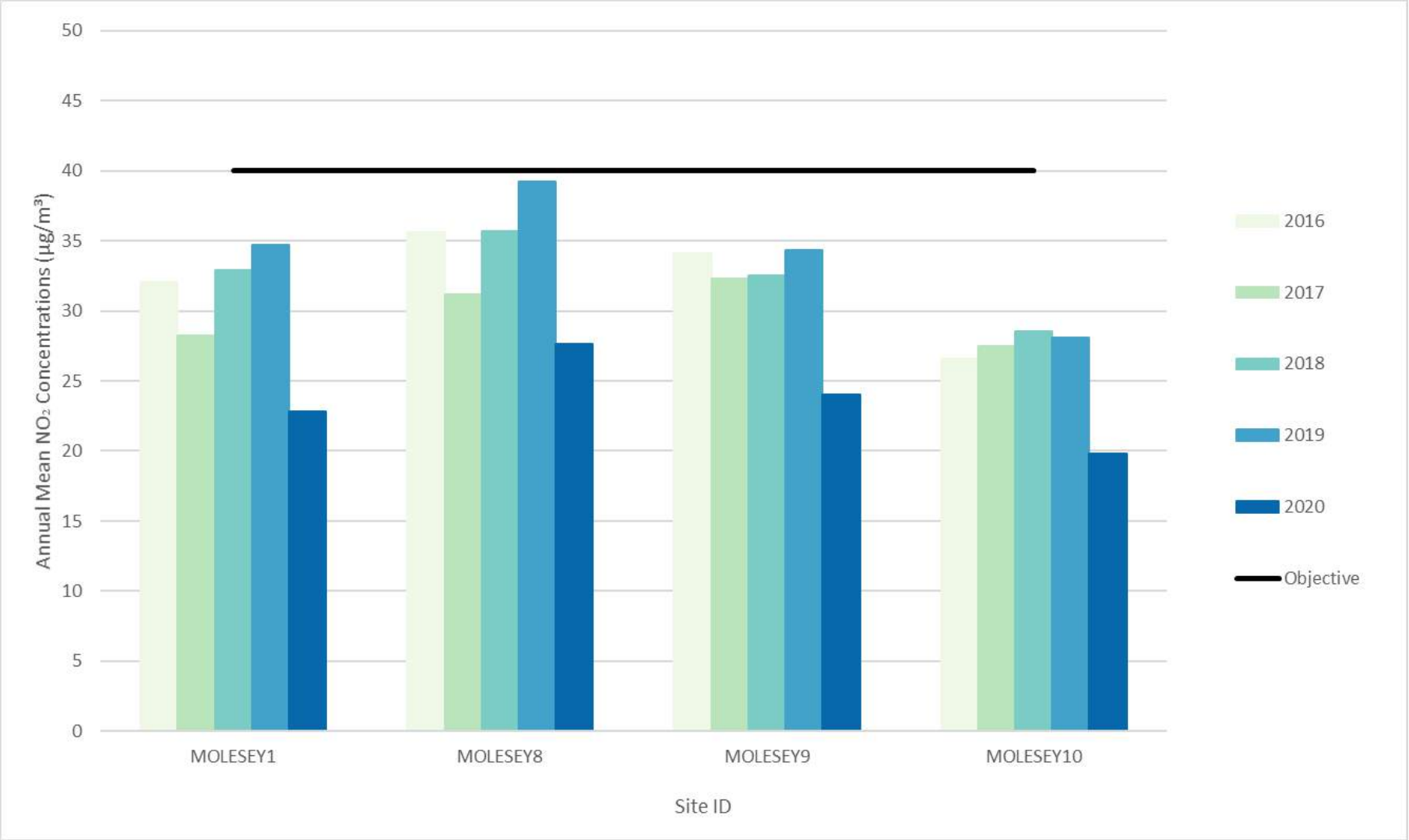


Figure A.4 – Trends in Annual Mean NO_2 Concentrations in Hampton Court

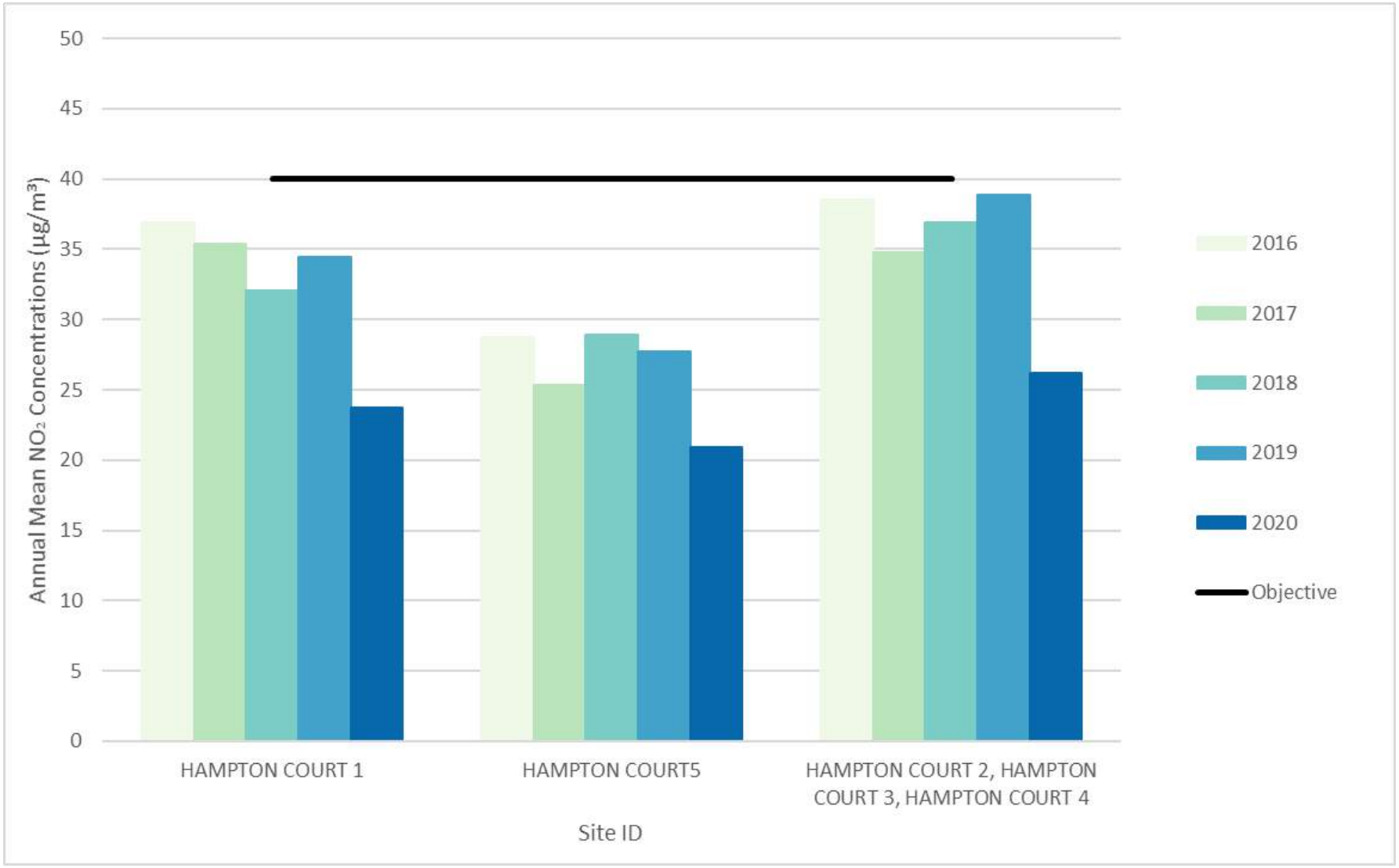


Figure A.5 – Trends in Annual Mean NO_2 Concentrations in Walton-on-Thames

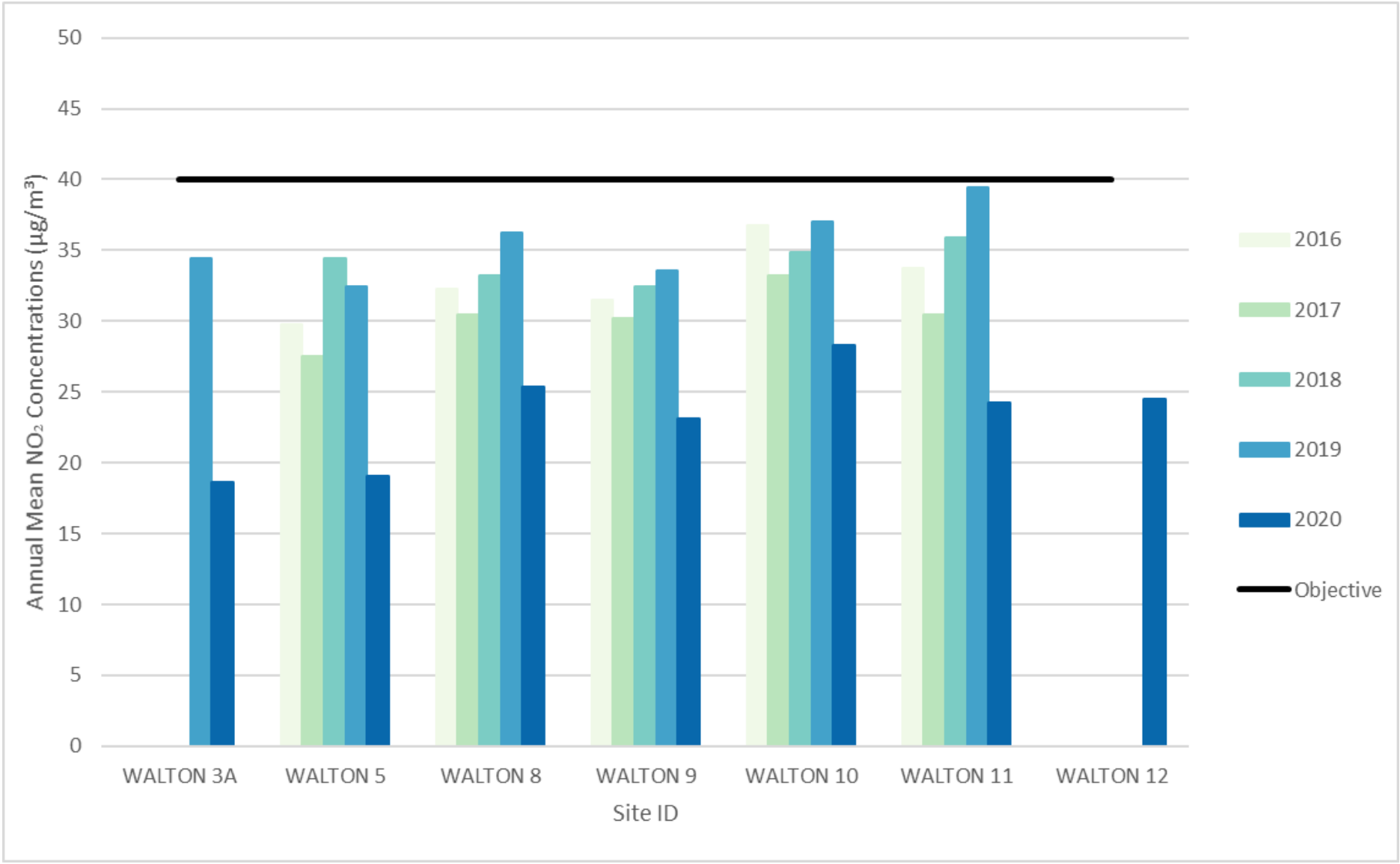


Figure A.6 – Trends in Annual Mean NO_2 Concentrations in Weybridge

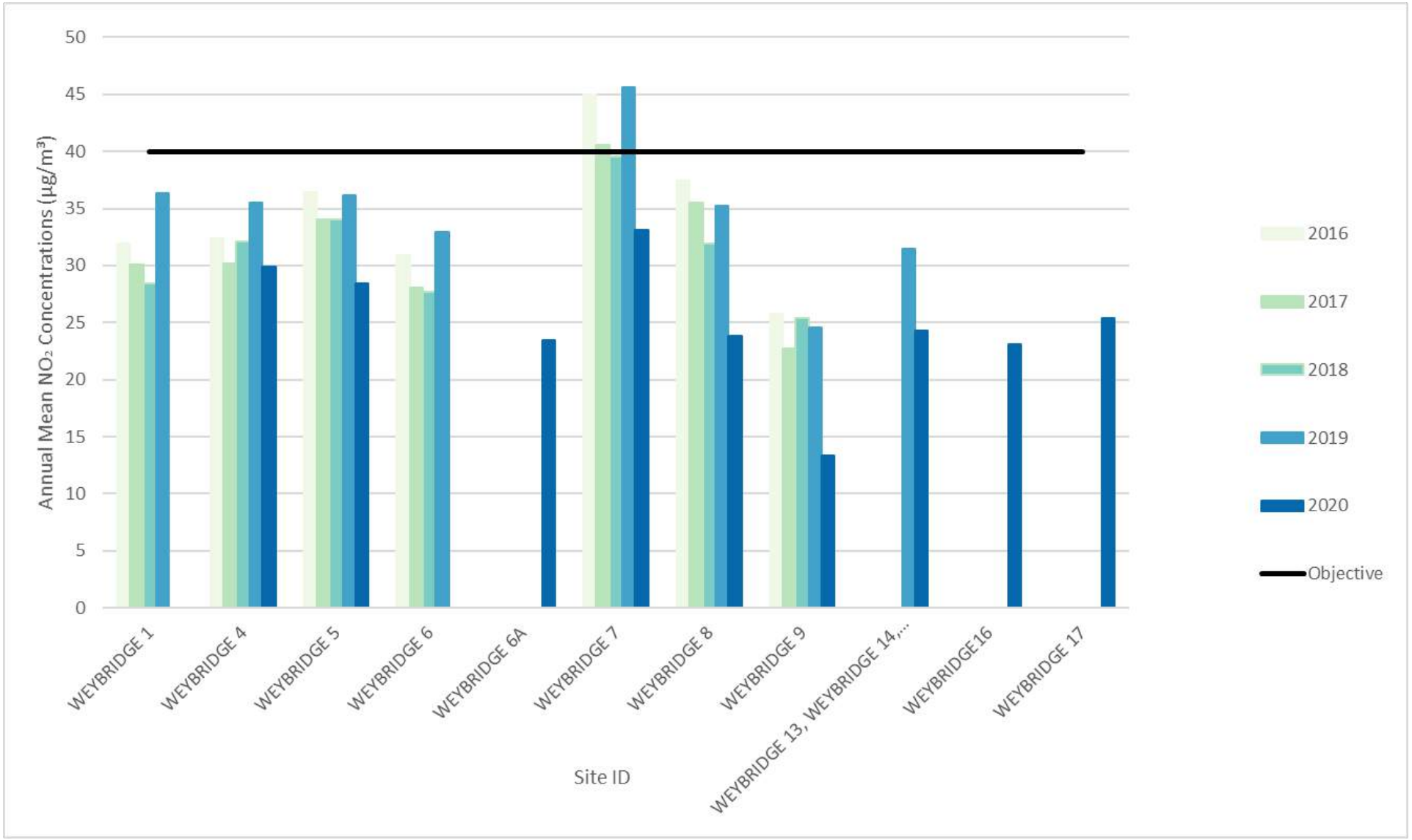


Figure A.7 – Trends in Annual Mean NO_2 Concentrations in Cobham, Oxshott and Downside

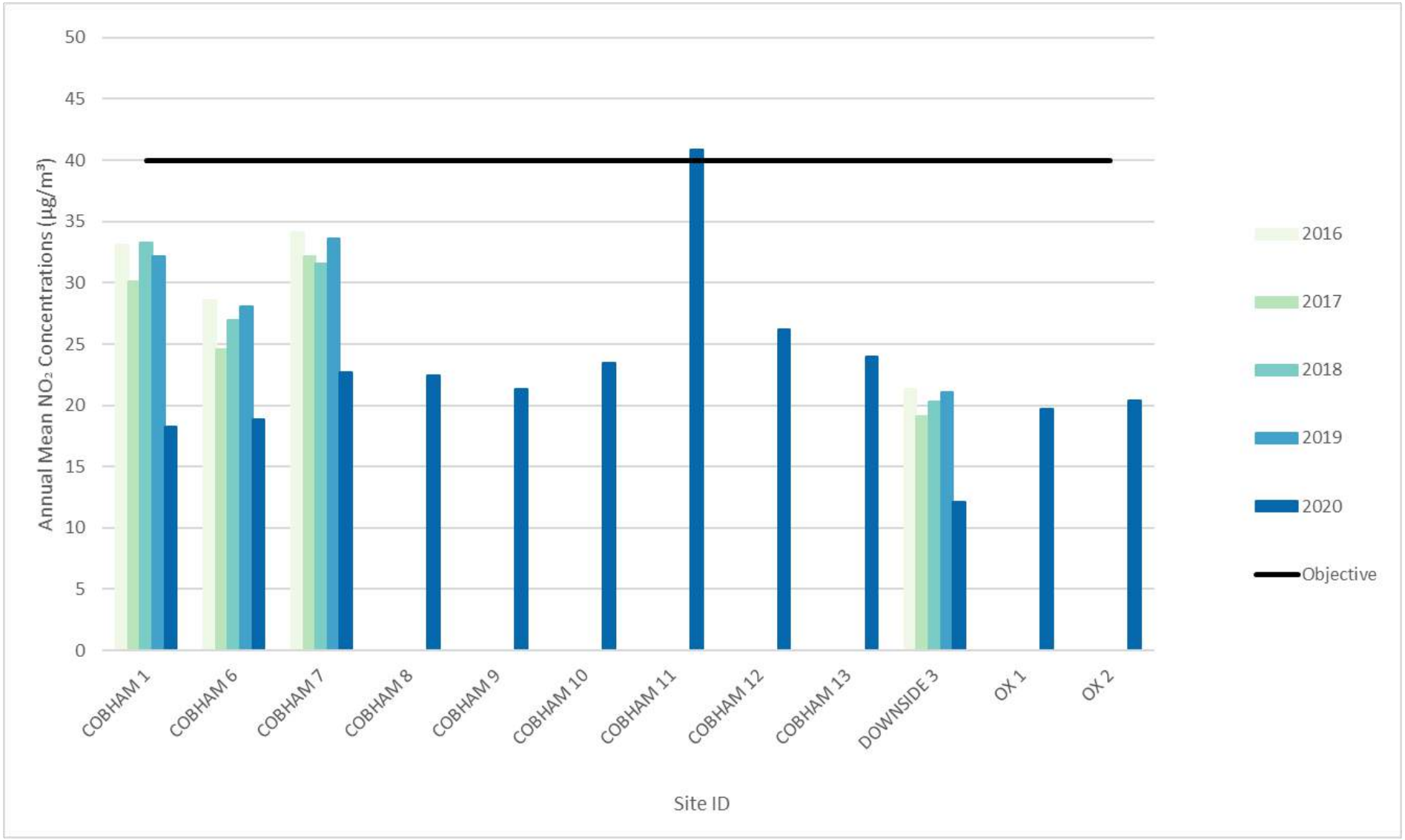


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
Weybridge High Street 2	507459	164909	Kerbside	99.5	99.5	-	-	-	**0 (103)**	0
Hampton Court Parade	515338	168292	Roadside	99.4	99.4	2	0	0	0	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.

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

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(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%).

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (1.01)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
ESHER1	513840	164693	34.0	37.0	22.0	21.0	17.0	25.0	20.0				28.0	26.0	25.6	25.8	-	
ESHER4	514058	164855	35.0	35.0	24.0	17.0									27.8	24.2	-	
ESHER5	514150	162470	50.0	45.0	28.0	19.0									35.5	31.0	-	
ESHER7	513982	164750	39.0	38.0	25.0	19.0	17.0	31.0	22.0	36.0	36.0	36.0	40.0	30.0	30.8	31.1	-	
ESHER8	513832	164684	41.0	36.0	30.0	17.0	17.0	29.0	26.0	36.0	36.0	31.0	36.0	22.0	29.8	30.1	-	
ESHER9	513821	164712	30.0	27.0	18.0	18.0	10.0	19.0	16.0				29.0	13.0	20.0	20.2	-	
ESHER10	513886	164767	27.0	20.0	14.0	16.0									19.3	16.8	-	
ESHER11	518395	164599	27.0	27.0	21.0	16.0	12.0	21.0	18.0	26.0	32.0	24.0	25.0	25.0	22.8	23.1	-	
ESHER13	513736	164489	37.0	29.0	20.0	16.0	12.0	20.0	16.0	25.0	27.0	36.0	29.0	28.0	24.6	24.8	-	
ESHER 14	514034	162282	20.0	15.0	14.0	14.0	11.0	14.0	14.0	20.0	22.0	16.0	21.0	18.0	16.6	16.8	-	
ESHER 15	513901	164779					11.0	19.0	15.0	25.0	23.0	32.0	36.0	27.0	23.5	25.5	-	
HAMPTON COURT 1	515379	167946	35.0	27.0	20.0	15.0	13.0	23.0	16.0	29.0	24.0	26.0	31.0	23.0	23.5	23.7	-	
HINCHLEY WOOD 1	515248	165535	36.0	33.0	21.0	13.0	15.0	25.0	23.0	33.0	34.0	30.0	34.0	31.0	27.3	27.6	-	
HINCHLEY WOOD 2	515218	165578	23.0	33.0	20.0	12.0									22.0	19.2	-	
HINCHLEY WOOD 3	515728	165191					15.0	33.0	22.0	37.0	40.0	40.0	36.0	33.0	32.0	34.7	-	
MOLESEY1	514450	168134	33.0	25.0	22.0	16.0	12.0	19.0	13.0				31.0	32.0	22.6	22.8	-	
HAMPTON COURT5	515329	168390	39.0	21.0	13.0	16.0	9.0	17.0	13.0	22.0	23.0	18.0	26.0	31.0	20.7	20.9	-	
MOLESEY8	514716	167960	37.0	36.0	25.0	15.0	13.0	23.0	19.0	28.0	31.0	28.0	35.0	38.0	27.3	27.6	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (1.01)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
MOLESEY9	514507	168086	35.0	29.0	16.0	14.0	12.0	19.0	16.0	25.0	30.0	27.0	40.0	22.0	23.8	24.0	-	
MOLESEY10	514169	168152	27.0	23.0	17.0	16.0	10.0	18.0	14.0	20.0	23.0	20.0	27.0	20.0	19.6	19.8	-	
HAMPTON COURT 2	515338	168292	33.0	30.0	21.0	15.0	12.0	23.0	17.0	31.0	29.0	28.0	33.0	28.0	-	-	-	Triplicate Site with HAMPTON COURT 2, HAMPTON COURT 3 and HAMPTON COURT 4 - Annual data provided for HAMPTON COURT 4 only
HAMPTON COURT 3	515338	168292	38.0	28.0	23.0	16.0	13.0	21.0	17.0	32.0	32.0	28.0	31.0	29.0	-	-	-	Triplicate Site with HAMPTON COURT 2, HAMPTON COURT 3 and HAMPTON COURT 4 - Annual data provided for HAMPTON COURT 4 only
HAMPTON COURT 4	515338	168292	40.0	28.0	21.0	17.0	11.0	22.0	17.0	31.0	26.0	33.0	35.0	45.0	25.9	26.2	-	Triplicate Site with HAMPTON COURT 2, HAMPTON COURT 3 and HAMPTON COURT 4 - Annual data provided for HAMPTON COURT 4 only
OX 1	514558	160621	23.0	19.0	15.0	13.0	14.0	17.0	14.0	22.0	21.0	21.0	29.0	26.0	19.5	19.7	-	
OX 2	514574	160493	25.0	23.0	20.0	14.0	12.0	19.0	18.0			25.0	28.0	18.0	20.2	20.4	-	
WALTON 3A	510140	166328	27.0	23.0	17.0	18.0									21.3	18.6	-	
WALTON 5	510702	165471	29.0	24.0	19.0	15.0									21.8	19.1	-	
WALTON 8	510154	166281	37.0	28.0	19.0	15.0		20.0	19.0	26.0	31.0	26.0	30.0	26.0	25.2	25.4	-	
WALTON 9	510082	166379	37.0	29.0	18.0	16.0	10.0	17.0	18.0		25.0	29.0	31.0	22.0	22.9	23.1	-	
WALTON 10	510140	166522	36.0	30.0	18.0	26.0	17.0	27.0	20.0	35.0	33.0	34.0	33.0	27.0	28.0	28.3	-	
WALTON 11	510000	166401	39.0	28.0	22.0	17.0	12.0	22.0	13.0		26.0	24.0	34.0	26.0	23.9	24.2	-	
WALTON 12	510185	166225					12.0	16.0	17.0	25.0	31.0	24.0	31.0	25.0	22.6	24.5	-	
WEYBRIDGE 1	507448	164900	34.0	36.0											-	-	-	
WEYBRIDGE 4	507705	164907	32.0	29.0		28.0		24.0	19.0	27.0	28.0	45.0	32.0	32.0	29.6	29.9	-	
WEYBRIDGE 5	507609	164966	32.0	35.0			12.0	23.0	16.0	31.0	31.0	31.0	34.0	36.0	28.1	28.4	-	
WEYBRIDGE 6	507511	164936	35.0	30.0											-	-	-	
WEYBRIDGE 6A	507536	164952					12.0	20.0	17.0	26.0	24.0	25.0	29.0	21.0	21.8	23.5	-	
WEYBRIDGE 7	507199	164804	40.0	37.0	26.0	22.0	20.0	31.0	29.0		45.0	37.0	37.0	36.0	32.7	33.1	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (1.01)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
WEYBRIDGE 8	507150	164761	26.0	29.0	22.0	20.0	13.0	18.0	20.0	27.0	31.0	24.0	29.0	24.0	23.6	23.8	-	
WEYBRIDGE 9	507065	164815	20.0	15.0	14.0	12.0									15.3	13.4	-	
WEYBRIDGE 13	507459	164909	30.0	34.0	24.0	18.0	13.0	19.0	20.0	28.0	28.0	25.0	30.0	26.0	-	-	-	Triplicate Site with WEYBRIDGE 13, WEYBRIDGE 14 and WEYBRIDGE15 - Annual data provided for WEYBRIDGE15 only
WEYBRIDGE 14	507459	164909	31.0	27.0	24.0	15.0	13.0	19.0	22.0	27.0	31.0	28.0	29.0	25.0	-	-	-	Triplicate Site with WEYBRIDGE 13, WEYBRIDGE 14 and WEYBRIDGE15 - Annual data provided for WEYBRIDGE15 only
WEYBRIDGE15	507459	164909	27.0	30.0	22.0	20.0	13.0	19.0	19.0	25.0	31.0	27.0	30.0	17.0	24.1	24.3	-	Triplicate Site with WEYBRIDGE 13, WEYBRIDGE 14 and WEYBRIDGE15 - Annual data provided for WEYBRIDGE15 only
WEYBRIDGE16	507190	161340	27.0	25.0	18.0	19.0	16.0	21.0	17.0	27.0	29.0	28.0	26.0	22.0	22.9	23.1	-	
WEYBRIDGE 17	507365	164831					11.0	22.0	18.0	30.0	31.0	29.0	24.0	23.0	23.5	25.4	-	
COBHAM 1	510813	160048	25.0	20.0	15.0	11.0	10.0	17.0	15.0			23.0	25.0	20.0	18.1	18.3	-	
COBHAM 6	510814	160099	22.0	20.0	16.0		10.0	14.0	13.0	21.0	25.0	21.0	23.0	21.0	18.7	18.9	-	
COBHAM 7	510861	159906	26.0	29.0	18.0	12.0	13.0	19.0	17.0	26.0	32.0	27.0	25.0	26.0	22.5	22.7	-	
COBHAM 8	510300	160375			19.0	15.0	11.0	26.0	19.0	28.0	29.0	25.0	29.0	21.0	22.2	22.4	-	
COBHAM 9	510348	160417			16.0	17.0	13.0	17.0	17.0	26.0	32.0	24.0	26.0	23.0	21.1	21.3	-	
COBHAM 10	510262	160454			18.0	15.0	12.0	21.0	20.0	29.0	29.0	27.0	35.0	27.0	23.3	23.5	-	
COBHAM 11	509623	160616			35.0	28.0	25.0	41.0	36.0	51.0	50.0	53.0	43.0	43.0	40.5	**40.9**	32.6	
COBHAM 12	509532	106068			20.0	22.0	20.0	32.0	20.0	33.0	32.0	27.0	30.0	23.0	25.9	26.2	-	
COBHAM 13	509465	160640			19.0	16.0	14.0	23.0	18.0	33.0	32.0	29.0	36.0	18.0	23.8	24.0	-	
DOWNSIDE 3	510925	158061	17.0	18.0	11.0	9.0									13.8	12.1	-	

☒ **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 between 3 and 8 months in line with LAQM.TG16**

☒ **Local bias adjustment factor used.**

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

☒ **Elmbridge Borough Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

Notes:

Diffusion tube monitoring data has been processed using the DEFRA Diffusion Tube Processing Tool (v1.1).

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 Elmbridge During 2020

There were no new or changed sources identified within Elmbridge during 2020.

The London Ultra Low Emission zone extension is planned for October 2021. Whilst the ULEZ is not considered to be a new source of air pollution, it has the potential to displace traffic onto roads within Elmbridge through existing AQMAs. Any increase in traffic flows and resulting NO_2 concentrations will be closely monitored in these areas.

Additional Air Quality Works Undertaken by Elmbridge Borough Council During 2020

Air Quality Action Plan 2021-2026

During 2020, the Council progressed with the development of the AQAP 2021-2026. The Steering Group was established with the purpose of overseeing the formulation of the AQAP by identifying new policies or actions that could positively effect air quality. Two Steering Group workshops were held in August 2020 and a separate meeting was held with SCC Public Health to accommodate COVID-19 response demands. Following these meetings, the AQAP was drafted and was consulted upon between 10th March – 5th May 2021. The AQAP is planned to go to the Councils Cabinet on 7th July 2021. A link to the Draft AQAP is provided below:

https://www.elmbridge.gov.uk/pollution/local-air-quality/

Diffusion Tube Review

In April 2020, Stantec were commissioned by Elmbridge Borough Council to undertake a review of the Council's NO_2 diffusion tube monitoring sites to advise on any sites no longer required or where existing sites should be amended/relocated. The following factors were considered in the review:

- measured annual mean NO_2 concentrations;
- representativeness of relevant human exposure;
- whether the tubes are in a worst-case location; and
- the suitability of the monitoring site (e.g. air circulation, surrounding vegetation, etc).

The review took into account guidance produced by the Working Group commissioned by DEFRA and Devolved Administrations[15] and DEFRA's LAQM TG.16[1].

The full diffusion tube review is provided in Appendix H.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes in 2020 were prepared and analysed by Lambeth Scientific Services using a preparation method of 50% TEA in acetone. In 2020, there was some divergence from the 2020 LAQM Diffusion Tube Monitoring Calendar, however this did not exceed more than 2 days for any month. Therefore, these divergences are with the ±2 days allowed either side of the calendar dates.

Lambeth Scientific Service take part in the analytical proficiency testing scheme (AIR-PT), formerly known as the WASP operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). During 2020, 100% of samples were determined to have been satisfactory in the 1st and 4th quarter, and no results were recorded in the 2nd and 4th quarter.

Diffusion Tube Annualisation

Where data capture is between 3 and 8 months for a full calendar year, the diffusion tube results have been annualised following the methodology outlined in LAQM TG (16)[1]. Annualisation was carried out for 13 sites detailed in Table C.2.

Continuous monitoring data from the London Hillingdon, London North Kensington, London Westminster and Reading New Town urban background sites, part of the Automatic Urban and Rural Network (AURN) were used. Details of site requiring a

[15] AEA Energy and Environment (2008). 'Diffusion Tubes for Ambient Monitoring: Practical Guidance for Laboratories and Users'. Issue 1A.

summary of annualisation calculations are provided in Table C.2. Annualisation has been carried out in the DEFRA Diffusion Tube Data Processing Tool.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 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[1]. 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.

Elmbridge Borough Council has applied a local bias adjustment factor of 1.01 to the 2020 monitoring data. A summary of bias adjustment factors used by the Council over the past five years is presented in 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 1.04 has been derived for the Hampton Court Parade site. The measurements obtained from the automatic monitor and diffusion tubes at this site have good data capture and overall data precision.

A local bias adjustment factor of 0.98 has been derived for the Weybridge High Street 2 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 2 and Hampton Court Parade sites, an averaged local bias adjustment factor of 1.01 obtained from these two sites has been used to bias adjust the diffusion tube data for 2020.

Table C.1. The local bias adjustment factor has been calculated in the DEFRA Diffusion Tube Data Processing Tool.

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 1.04 has been derived for the Hampton Court Parade site. The measurements obtained from the automatic monitor and diffusion tubes at this site have good data capture and overall data precision.

A local bias adjustment factor of 0.98 has been derived for the Weybridge High Street 2 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 2 and Hampton Court Parade sites, an averaged local bias adjustment factor of 1.01 obtained from these two sites has been used to bias adjust the diffusion tube data for 2020.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	Local	-	1.01
2019	Local	-	0.995
2018	Local	-	1.11
2017	National	03/18	0.90
2016	National	03/17	0.94

NO_2 Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be 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_2 fall-off distance from road has been calculated for monitoring sites which exceeded 36 µg/m^3 in 2020. The only site which exceeded 36 µg/m^3 in 2020 was Cobham 11 and therefore NO_2 fall-off with distance has been calculated for this site. Table C.4 presents the inputs in the Diffusion Tube Processing Tool used to calculate NO_2 fall-off with

distance for Cobham 11. The annual mean NO_2 background concentration at Cobham 11 has been obtained from the latest 2018-based DEFRA background maps.

QA/QC of Automatic Monitoring

Air Quality Data Management (AQDM) provide the data management services and carry out Local Site Operator duties for the Weybridge High Street 2 and Hampton Court automatic monitors. All data has been validated and ratified to the standards outlined in LAQM TG.16. The data presented in the ASR for 2020 is fully ratified.

Automatic Monitoring Annualisation

All automatic monitoring locations within Elmbridge recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data.

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Elmbridge required distance correction during 2020.

Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor London Hillingdon	Annualisation Factor London North Kensington	Annualisation Factor London Westminster	Annualisation Factor Reading New Town	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
ESHER4	0.8399	0.8890	0.9017	0.8299	0.8651	27.8	24.0
ESHER5	0.8399	0.8890	0.9017	0.8299	0.8651	35.5	30.7
ESHER10	0.8399	0.8890	0.9017	0.8299	0.8651	19.3	16.7
ESHER 15	1.0891	1.0580	1.0501	1.0999	1.0743	23.5	25.2
HINCHLEY WOOD 2	0.8399	0.8890	0.9017	0.8299	0.8651	22.0	19.0
HINCHLEY WOOD 3	1.0891	1.0580	1.0501	1.0999	1.0743	32.0	34.4
WALTON 3A	0.8433	0.8926	0.9060	0.8328	0.8687	21.3	18.5
WALTON 5	0.8433	0.8926	0.9060	0.8328	0.8687	21.8	18.9
WALTON 12	1.0867	1.0558	1.0475	1.0977	1.0719	22.6	24.3
WEYBRIDGE 6A	1.0867	1.0558	1.0475	1.0977	1.0719	21.8	23.3
WEYBRIDGE 9	0.8433	0.8926	0.9060	0.8328	0.8687	15.3	13.2
WEYBRIDGE 17	1.0867	1.0558	1.0475	1.0977	1.0719	23.5	25.2
DOWNSIDE 3	0.8433	0.8926	0.9060	0.8328	0.8687	13.8	11.9

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1 (Hampton Court Parade)	Local Bias Adjustment Input 2 (Weybridge High Street 2)
Periods used to calculate bias	11	11
Bias Factor A	1.04 (0.93 - 1.18)	0.98 (0.87 - 1.12)
Bias Factor B	-4% (-15% - 7%)	2% (-11% - 16%)
Diffusion Tube Mean (µg/m^3)	25.2	24.2
Mean CV (Precision)	6.0%	5.9%
Automatic Mean (µg/m^3)	26.3	23.6
Data Capture	99%	99%
Adjusted Tube Mean (µg/m^3)	26 (23 - 30)	24 (21 - 27)

Notes:

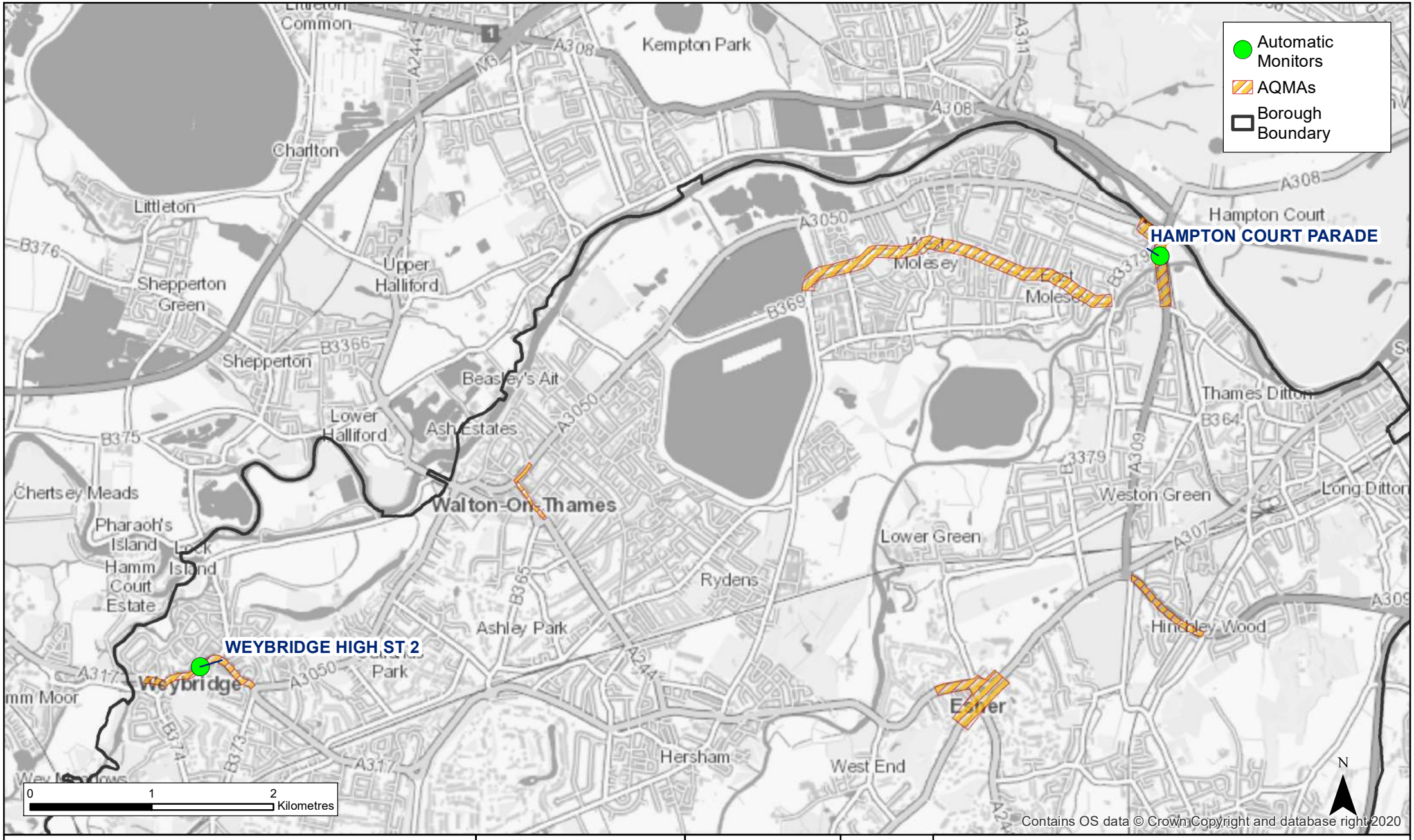
A combined local bias adjustment factor of 1.01 has been used to bias adjust the 2020 diffusion tube results.

Table C.4 – NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted)	Background Concentration	Concentration Predicted at Receptor
COBHAM 11	1.5	8.6	40.9	19.2	32.6

Appendix D: Maps of Monitoring Locations and AQMAs

Document Path: C:\Projects\Elmbridge ASR 2021\ArcGIS\Figure D.1(Automatic Monitoring).mxd



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Contains Ordnance Survey Data © Crown Copyright and Database Right 2020.

1:40,000 @ A4	
27/05/2021	
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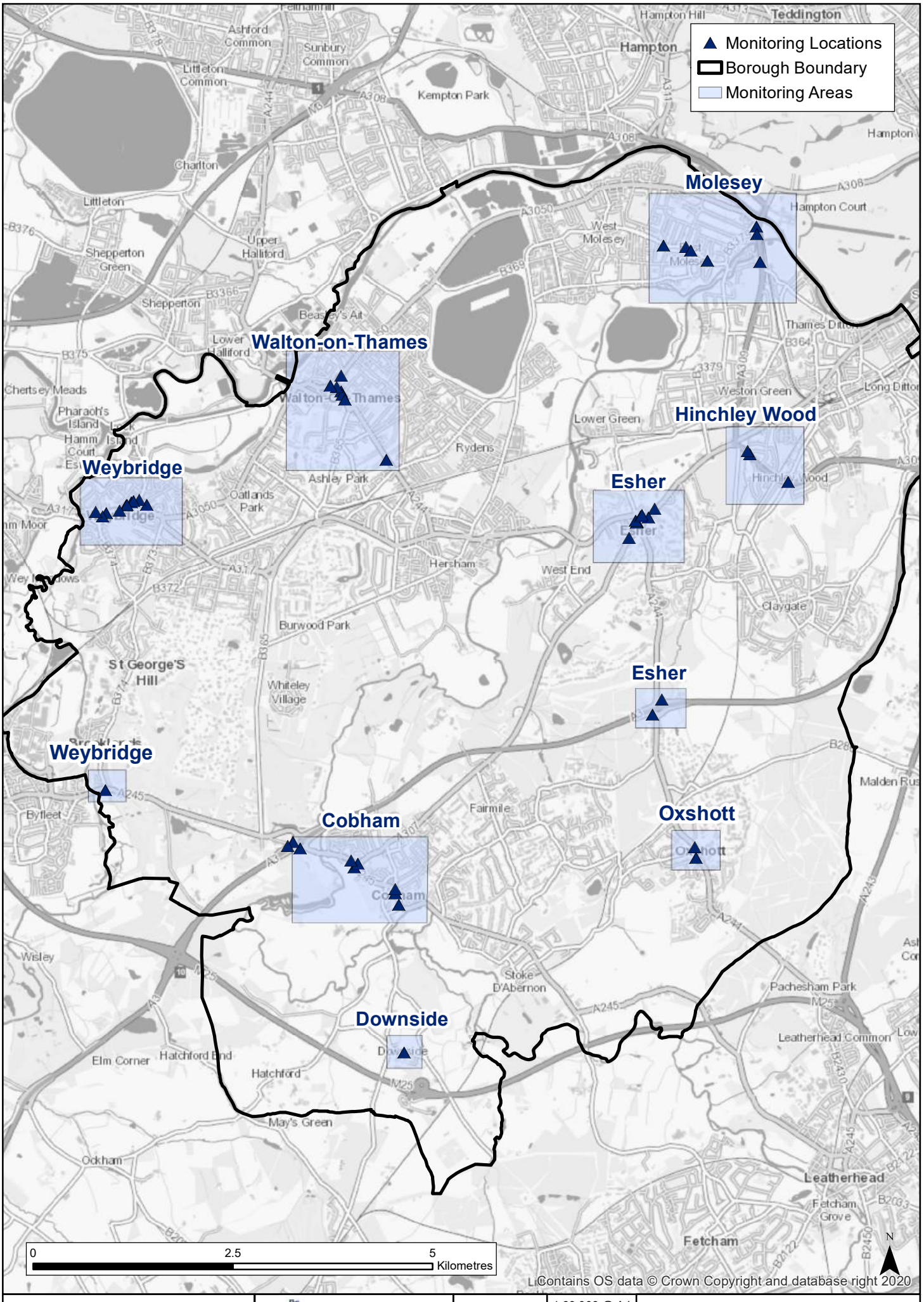
Automatic Monitoring Locations in Elmbridge

Figure D.1 | Rev A



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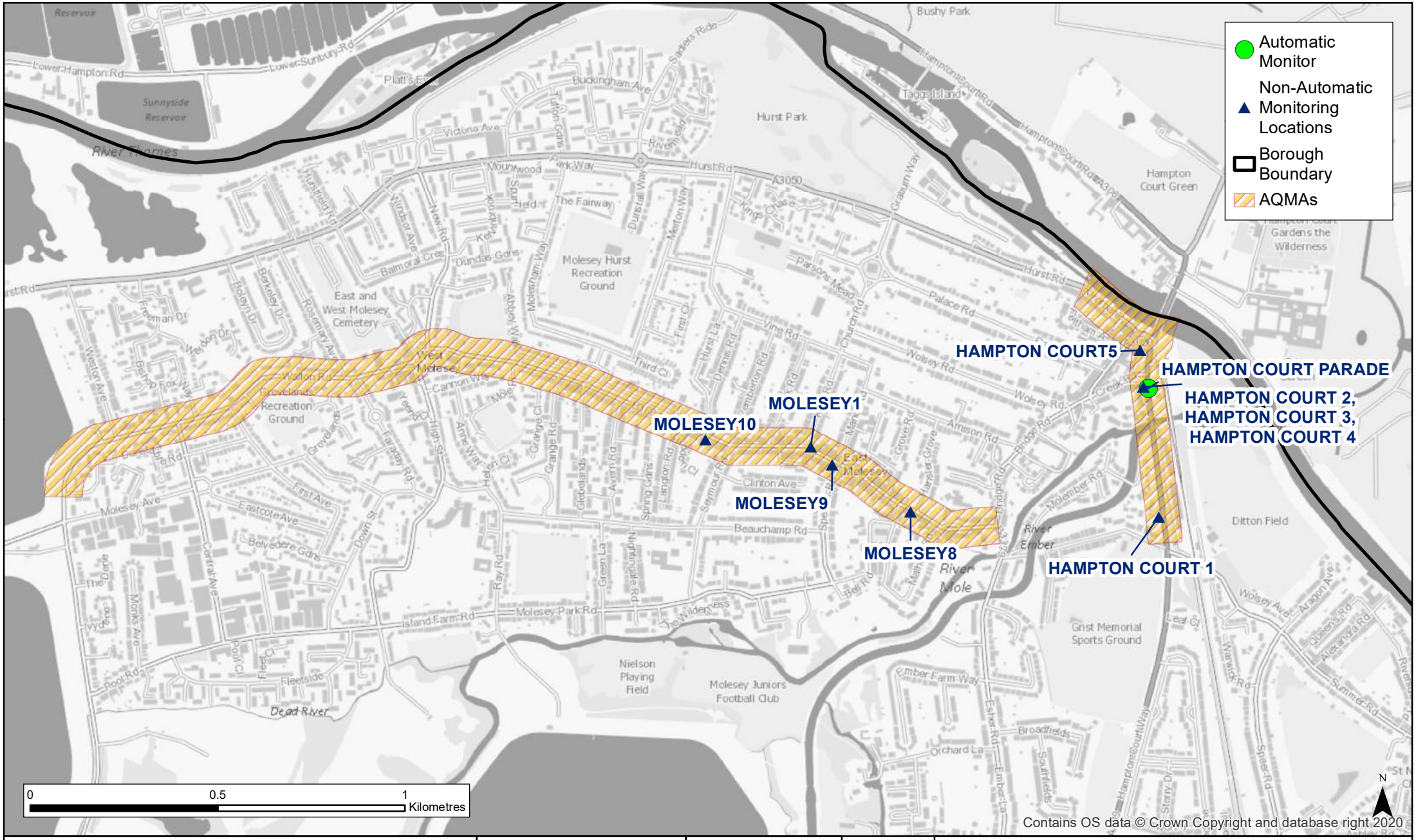
Monitoring Locations in Elmbridge

Figure D.2 | Rev A

Document Path: C:\Projects\Elmbridge ASR 2021\ArcGIS\Figure D.3(Molesey Monitoring).mxd



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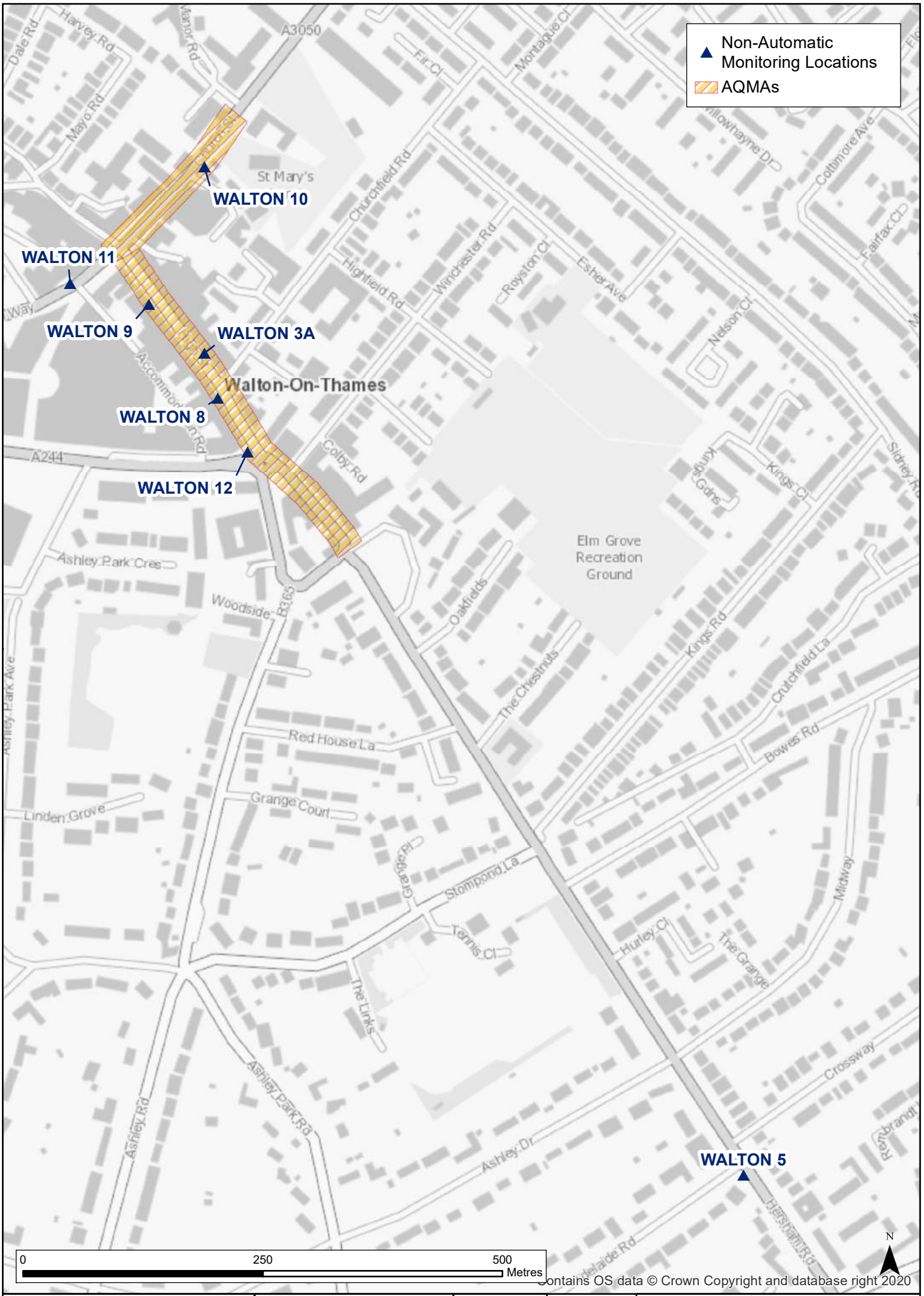
Monitoring Locations in Molesey

Figure D.3 | Rev A



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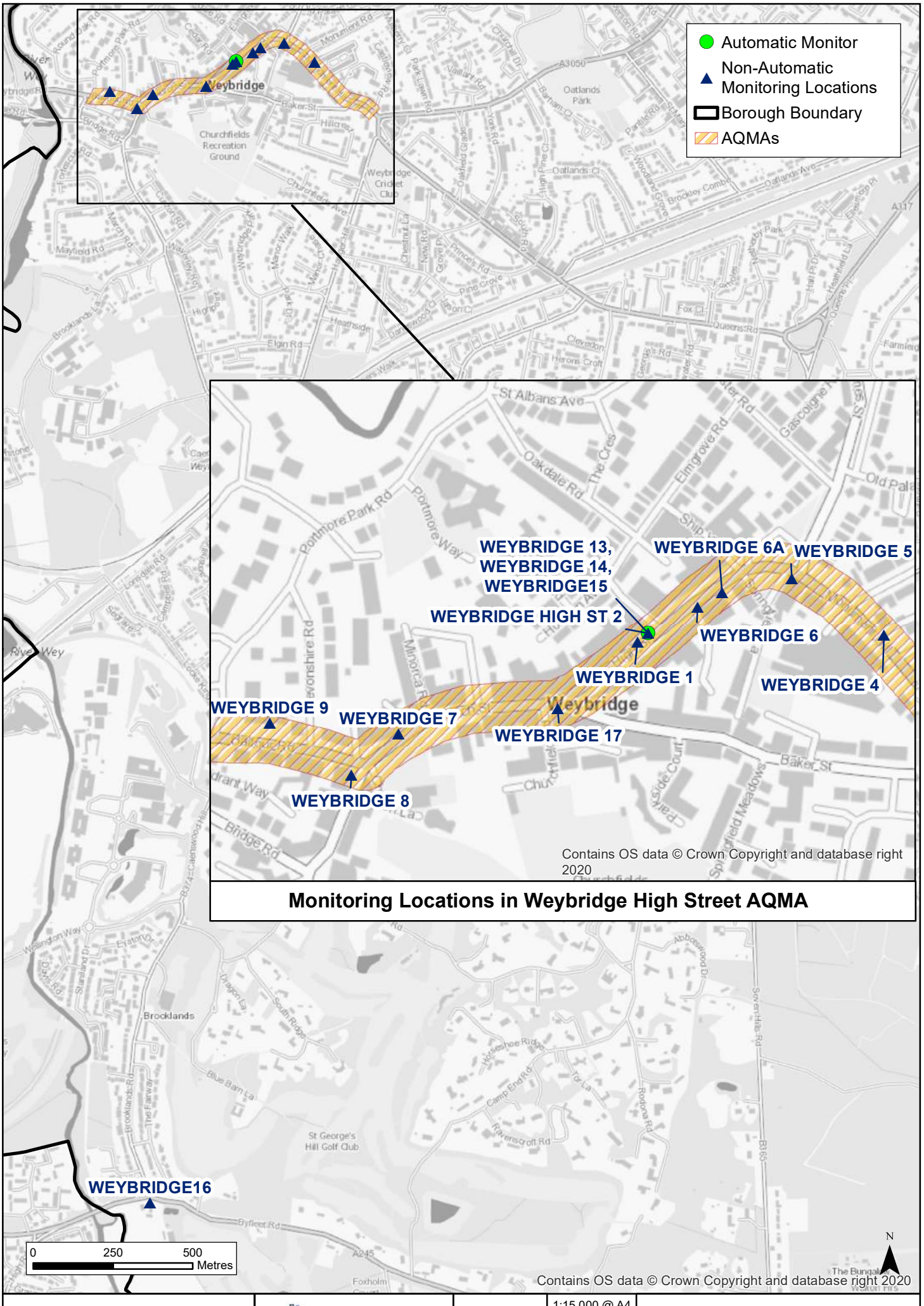
Monitoring Locations in Walton-on-Thames

Figure D.4 | Rev A



Monitoring Locations in Weybridge High Street AQMA

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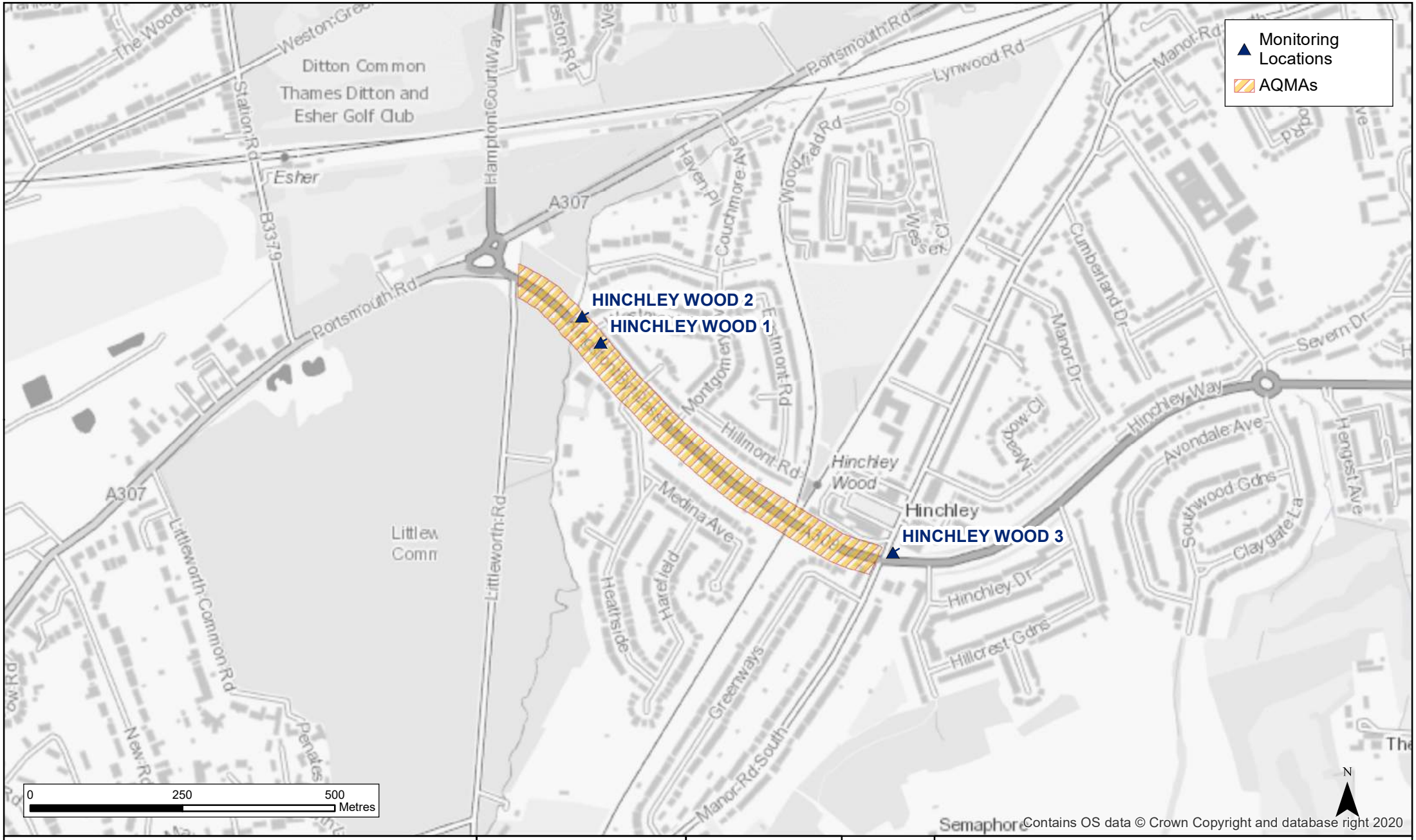
Monitoring Locations in Weybridge

Figure D.5 | Rev A

Document Path: C:\Projects\Elmbridge ASR 2021\ArcGIS\Figure D.6(Hinchley Wood Monitoring).mxd



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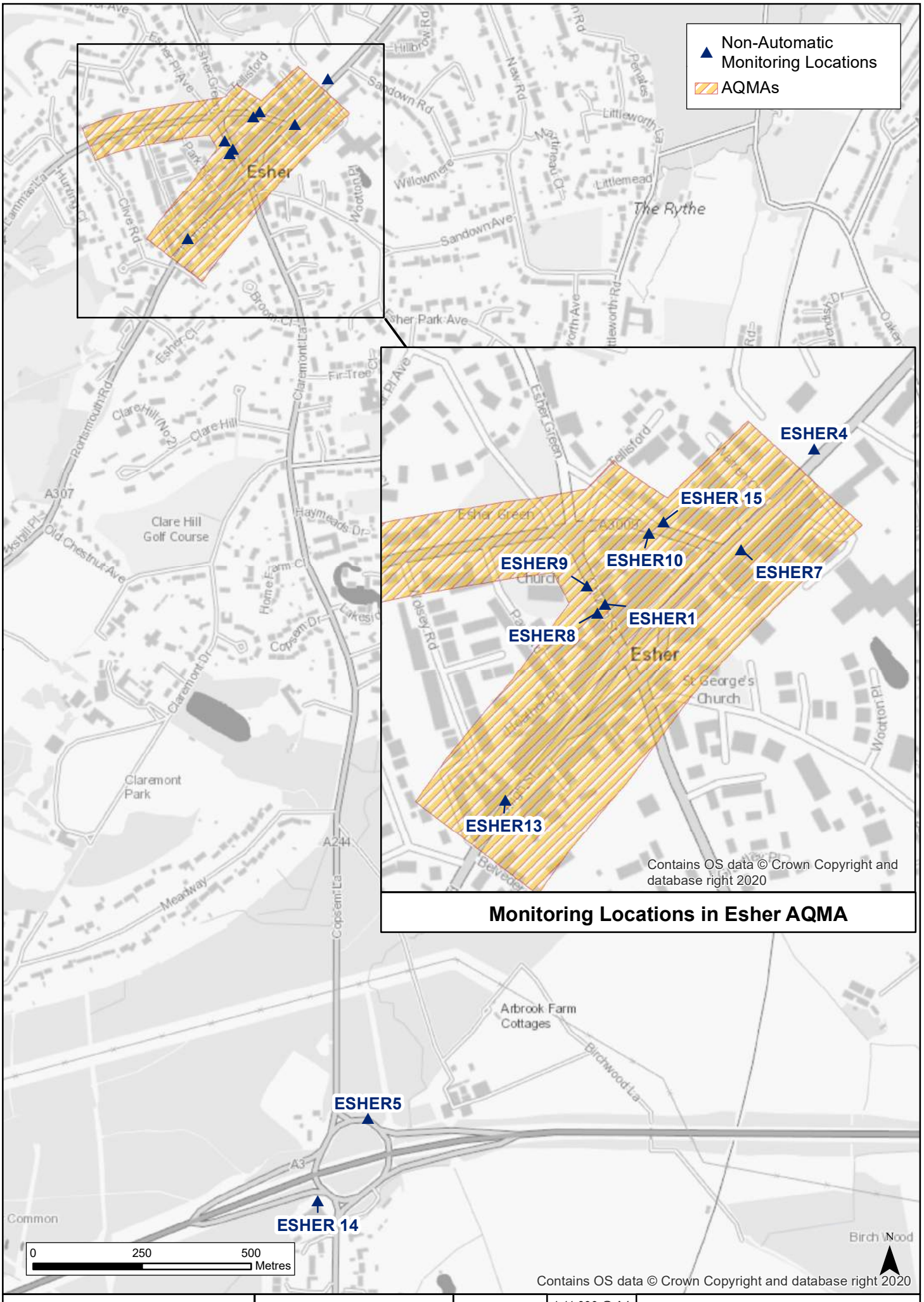
Monitoring Locations in Hinchley Wood

Figure D.6 | Rev A



Monitoring Locations in Esher AQMA

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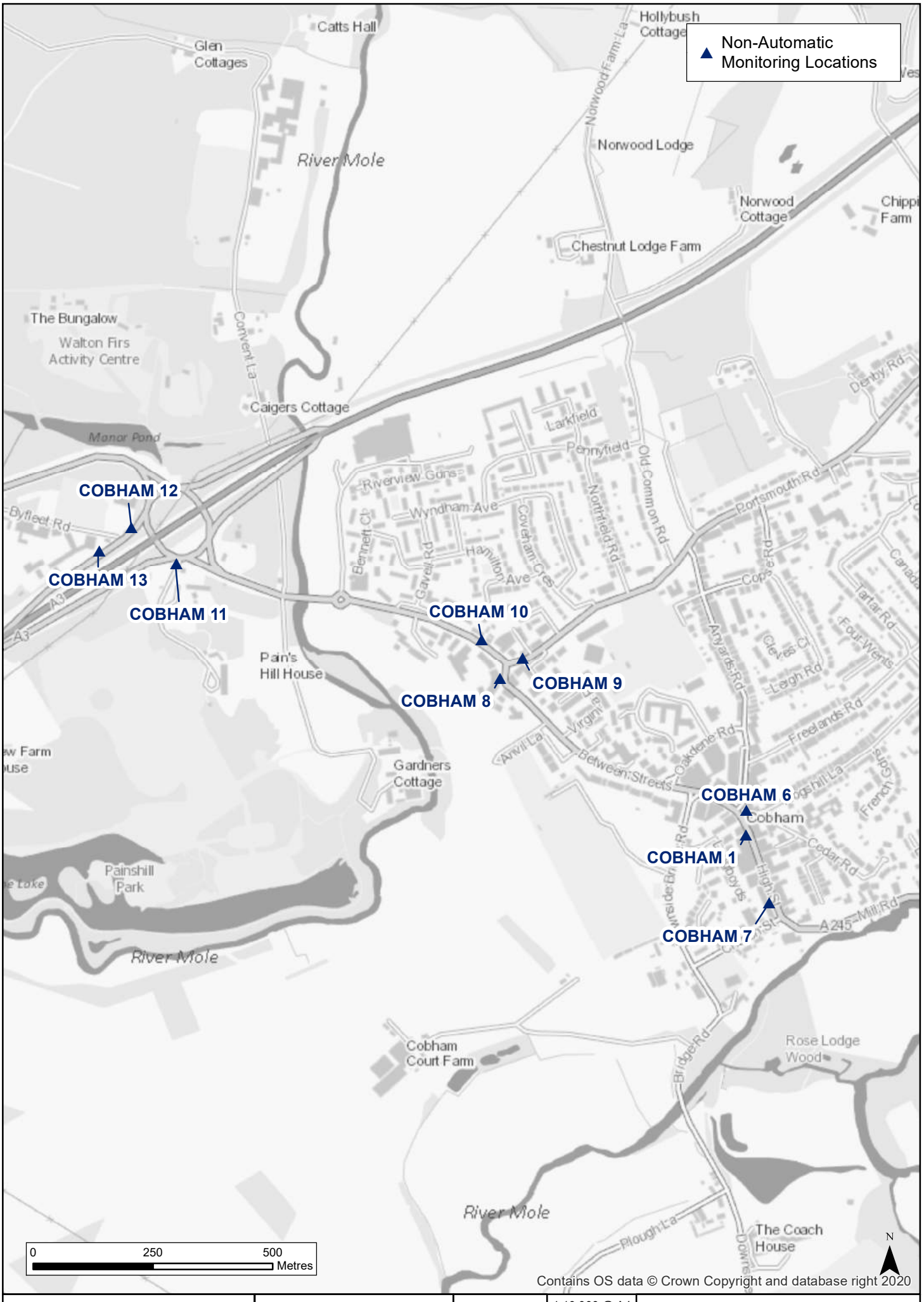
Monitoring Locations in Esher

Figure D.7 | Rev A



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Monitoring Locations in Cobham

Figure D.8 | Rev A

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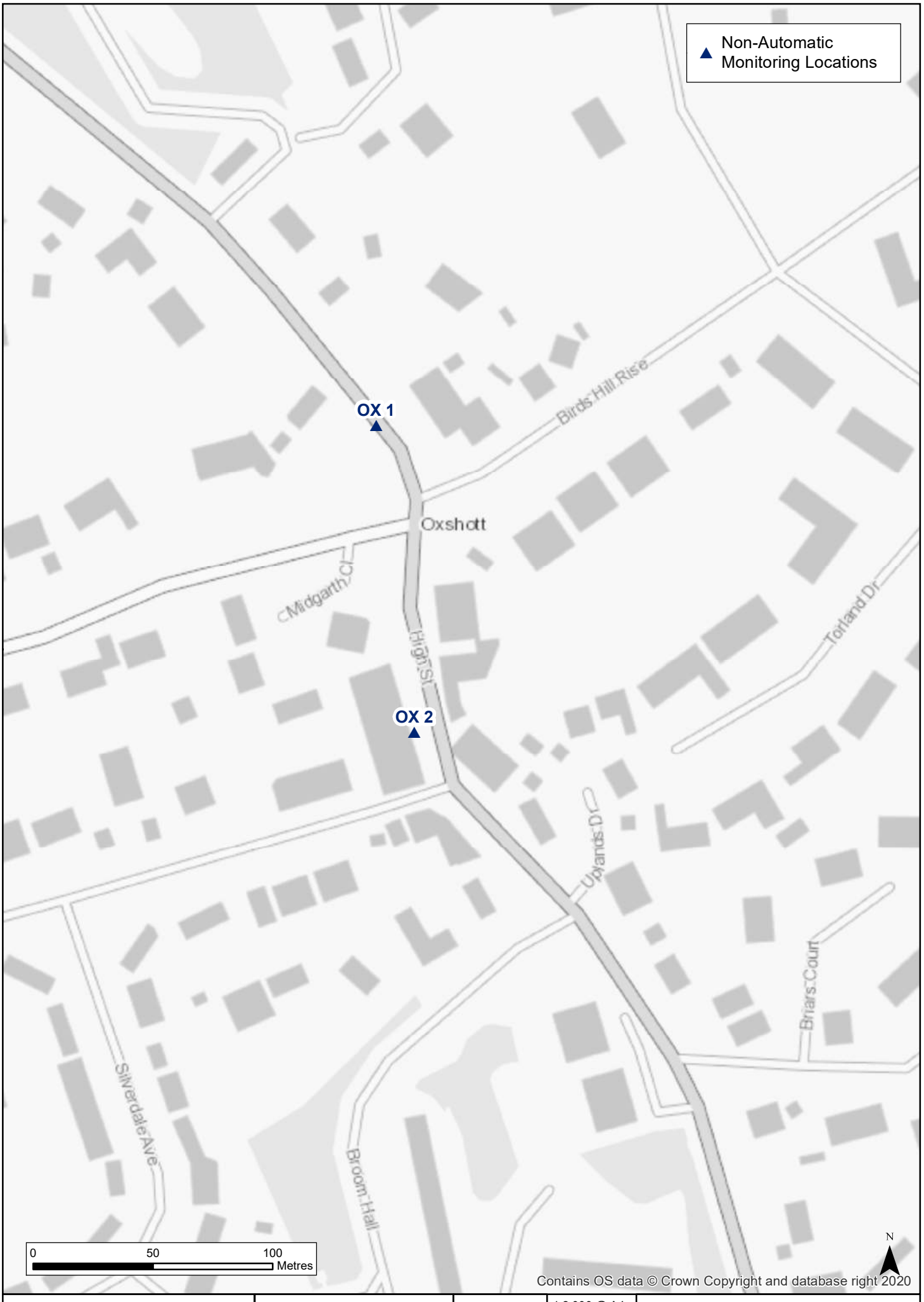

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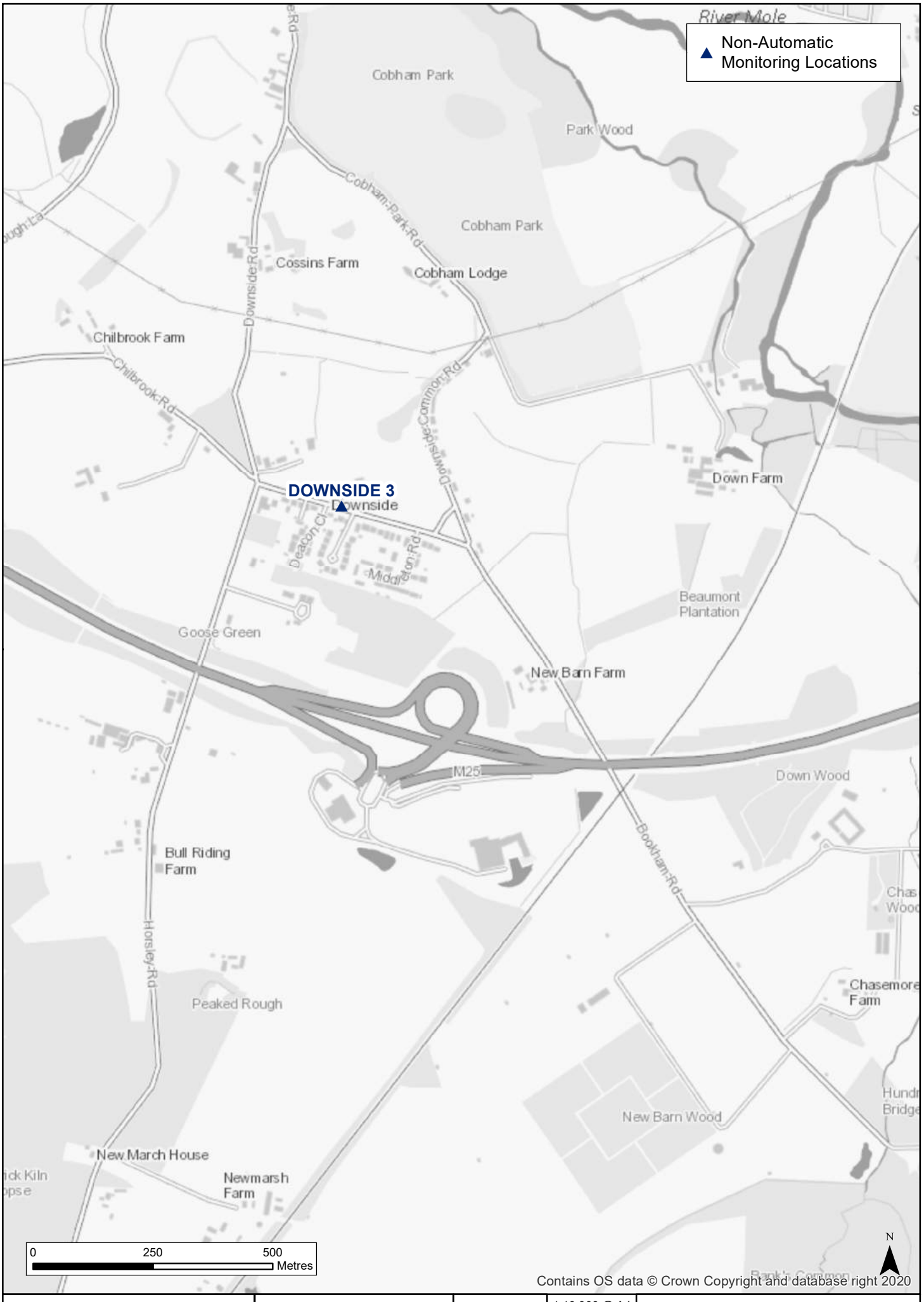
Monitoring Locations in Oxshott

Figure D.9 | Rev A



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Monitoring Locations in Downside

Figure D.10 | Rev A

Appendix E: Summary of Air Quality Strategy Objectives in England

Table E.1 – Air Quality Objectives in England[16]

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

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

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, DEFRA provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. DEFRA has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data[17] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. oxides of nitrogen (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)[18] has estimated that during the initial

[17] Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

[18] Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10 to 20µg/m^3 if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5µg/m^3 lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within Elmbridge

The Council's air quality contractors continued working throughout the pandemic, namely Lambeth Scientific Services, who supply and analyse the passive diffusion tubes, Horiba and Air Quality Data Management, who support the operation of the two air quality stations. This enabled the Council to undertake its full air quality monitoring programme through the pandemic and report a full year of data for the majority of monitoring sites.

A decrease in annual mean NO_2 concentrations was experienced at all monitoring sites across Elmbridge in 2020 when compared to 2019. There were no exceedances of the annual mean objective within any of Elmbridge's six AQMAs in 2020. The percentage reductions within each AQMA are shown in Table F.1. It should be noted that meteorological conditions can also contribute to reductions in concentrations apparent between years.

Table F.1 – Percentage Reduction in Annual Mean NO_2 (µg/m^3) between 2019 and 2020 in the AQMAs

AQMA	Maximum Reduction (%)	Minimum Reduction (%)
Esher High Street	48% - Esher 10	29% - Esher 8
Hampton Court	37% - Hampton Court Parade Automatic Station	25% - Hampton Court 5

AQMA	Maximum Reduction (%)	Minimum Reduction (%)
Walton Road, Molesey	34% - Molesey 1	30% - Molesey 8, Molesey 9 and Molesey 10
Walton-on-Thames High Street	46% - Walton 3A	24% - Walton 10
Weybridge High Street	46% - Weybridge 9	16% - Weybridge 4
Hinchley Wood	39% - Hinchley Wood 2	26% - Hinchley Wood 1

Opportunities Presented by COVID-19 upon LAQM within Elmbridge

The following changes have occurred in 2020 that can be attributed to the pandemic:

- Uptake of walking and cycling throughout the lockdowns has encouraged behaviour change with more people likely to use these modes of transport than before the pandemic.
- Support for local businesses was also evident during the pandemic and it is expected that behaviour change towards shopping locally will continue into the future. This has potential to reduce road transport emissions associated with deliveries, and also from car journeys to shopping centres located out of town.
- The majority of Council staff have successfully worked from home. This will likely lead to a hybrid way of working going forward.
- All air quality monitoring continued throughout the pandemic therefore sufficient data is available in 2020 for reporting and comparison to previous years.
- On Baker Street, Weybridge, a modal filter removing through traffic while allowing pedestrian and cycle movements was implemented. This is due to be made permanent in the financial year 2021/22.
- On the A244 Esher Road, Hersham, road-space was reallocated to enable construction of new pedestrian crossings and improvement of the cycle lanes. This remains temporary, and a public consultation will need to be undertaken before final decision to make permanent will be made.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Elmbridge

The following challenges and constraints have been identified as being attributable to the pandemic. Where relevant, an impact rating for each constraint has been stated in line with guidance presented within the LAQM Impact Matrix provided within Table F.2.

- A revised AQAP is being developed. However, owing to the reallocation of Council resources during 2020, the development and implementation of the AQAP has been delayed over six months. Current estimates are that the final AQAP will be published in Summer 2021. **Small Impact**
- Whilst sufficient monitoring data was obtained from the majority of monitoring sites in the 2020, the data should not be used alone to inform judgements, as it is not considered to be representative of a typical year. **Small Impact.**

The impacts as presented above are aligned with the criteria as defined in Table F.2, with professional judgement considered as part of their application.

Table F.2 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: High
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

Appendix G: CERC Modelling Data Review

TECHNICAL NOTE

Job Name: Elmbridge 2020 Local Air Quality Management

Job No: 47763

Note No: TN001

Date: December 2019

Prepared By: Laura Smart

Subject: **CERC Modelling Review**

1. Introduction

1.1. Peter Brett Associates, now part of Stantec, has been commissioned by Elmbridge Borough Council (EBC) to undertake a review of air quality modelling data in order to advise on any potential new Air Quality Management Areas (AQMAs) and monitoring locations that might be required within the Borough. EBC currently has seven declared AQMAs: Walton-on-Thames High Street, Weybridge High Street, Hampton Court, Cobham High Street, Hinchley Wood, Esher High Street and Walton Road, Molesey.

1.2. Surrey-wide detailed air quality modelling has been carried out by Cambridge Environmental Research Consultants (CERC) in order to determine predicted nitrogen dioxide (NO_2), and particulate matter (PM_{10} and $PM_{2.5}$) concentrations across Elmbridge and the wider Surrey area. Contour maps of predicted concentrations in 2017 across Elmbridge have been provided by CERC and have been used to inform this review.

1.3. This technical note provides a review of predicted concentrations across Elmbridge and compares these against the National Air Quality Objectives ('the objectives') in order to identify areas of potential exceedances. Locations where additional diffusion tube monitoring is required to further investigate potential exceedances have been identified and any new potential AQMAs have been highlighted.

2. Review of Predicted Concentrations

Nitrogen Dioxide (NO_2)

2.1. The contour maps for predicted annual mean NO_2 and the 99.79th percentile of hourly mean NO_2 concentrations show exceedances of the annual mean NO_2 objective (40 µg/m^3) and hourly mean NO_2 objective concentration (200 µg/m^3) on: the M25 in Downside; the A3 Portsmouth Road in Cobham; the A3 Esher Bypass in Esher; the A245 Byfleet Road in Byfleet; and the A245 Portsmouth Road/Between Streets in Cobham. These exceedances have been identified outside of any of the existing seven AQMAs in Elmbridge. Exceedances of the annual mean NO_2 objective were also identified in the existing Esher AQMA, along the A307 High Street. No exceedances of the annual or hourly mean NO_2 objectives were identified in the remaining six AQMAs in Elmbridge.

Particulate Matter (PM_{10})

2.2. The contour map for the predicted annual mean PM_{10} concentrations shows no exceedances of the annual mean PM_{10} objective (40 µg/m^3) in Elmbridge. The contour map for the 90.41st percentile of 24-hour mean PM_{10} concentrations shows exceedances of the 24-hour mean concentration (50 µg/m^3) along the A3 Portsmouth Road and the M25.

2.3. The contour map for the predicted annual mean $PM_{2.5}$ concentrations shows no exceedances of the annual mean $PM_{2.5}$ objective (25 µg/m^3) in Elmbridge.

3. Potential AQMAs

3.1. AQMAs are required where there are exceedances of the objectives in an area of relevant public exposure. Relevant exposure includes locations where members of the public are likely to be present over the averaging period of the objective.

3.2. Predicted exceedances of the 24-hour mean PM_{10} objective have been identified along the A3 and M25; however, these exceedances occur within the road and are therefore not representative of relevant exposure.

3.3. In relation to NO_2, the A3 at the A245 Portsmouth Road junction and the A245 Portsmouth Road/Between Streets roundabout in Cobham, and the A245 Byfleet Road/Brooklands Road roundabout in Byfleet, have been identified as areas where there are predicted exceedances of the objectives in the vicinity of relevant exposure. Furthermore, potential exceedances of the NO_2 objectives have also been identified at the A3 Esher Bypass at the A244 Copsem Lane junction in Esher.

3.4. Further monitoring is therefore required in order to determine whether or not the predicted exceedances of the annual and hourly mean NO_2 objectives actually occur at these locations.

4. Proposed Monitoring Locations

4.1. The following table provides the details of monitoring locations required to investigate potential exceedances of the NO_2 objectives, and therefore to determine whether further AQMA(s) should be designated. Proposed monitoring locations are shown in **Figure 1**.

Label	Location Description	X	Y
Byfleet A245	Lamp post next to 'Parvis Road' road sign, Brooklands Road/Byfleet Road roundabout	507158.2	161338.5
Cobham A245 1	Lamp post outside 41, A245 Portsmouth Road, Cobham	510262.1	160454.3
Cobham A245 2	'No Loading' road sign outside Fieldgate Court, A245 Between Streets	510300.8	160375.3
Cobham A245 3	69, A245 Portsmouth Road, Cobham	510325.6	160415.6
Cobham A3 1	Railings on footpath adjacent to A3 eastbound off-slip at A245 Portsmouth Road	509491.5	160659.8
Cobham A3 2	'No Entry' sign, A3 eastbound off-slip, at A245 Portsmouth Road	509532.7	160688.8
Cobham A3 3	Lamp post outside West Lodge, A245 Portsmouth Road	509623.0	160616.4
Esher A3	Lamp post at northern end of 'Sunrise of Esher' carpark, A245 Portsmouth Road/Esher Bypass junction	514034.0	162281.8

5. Conclusions

5.1. Contour maps of predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ across Elmbridge, provided by CERC, have been reviewed and compared against the relevant objectives.

5.2. The review has highlighted areas where potential exceedances of the annual and hourly mean NO_2 objective may occur in the vicinity of relevant exposure, outside of the existing AQMAs declared in Elmbridge Borough Council's administrative area. There are no exceedances of the PM_{10} and $PM_{2.5}$ objectives in the vicinity of relevant exposure.

5.3. Additional monitoring locations are proposed in order to further investigate potential exceedances of the NO_2 objectives and to inform the declaration of any new AQMAs in Elmbridge.

Appendix A Figure

DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
47763/3001/TN001	-	16/12/2019	LS	KH	KH	ER

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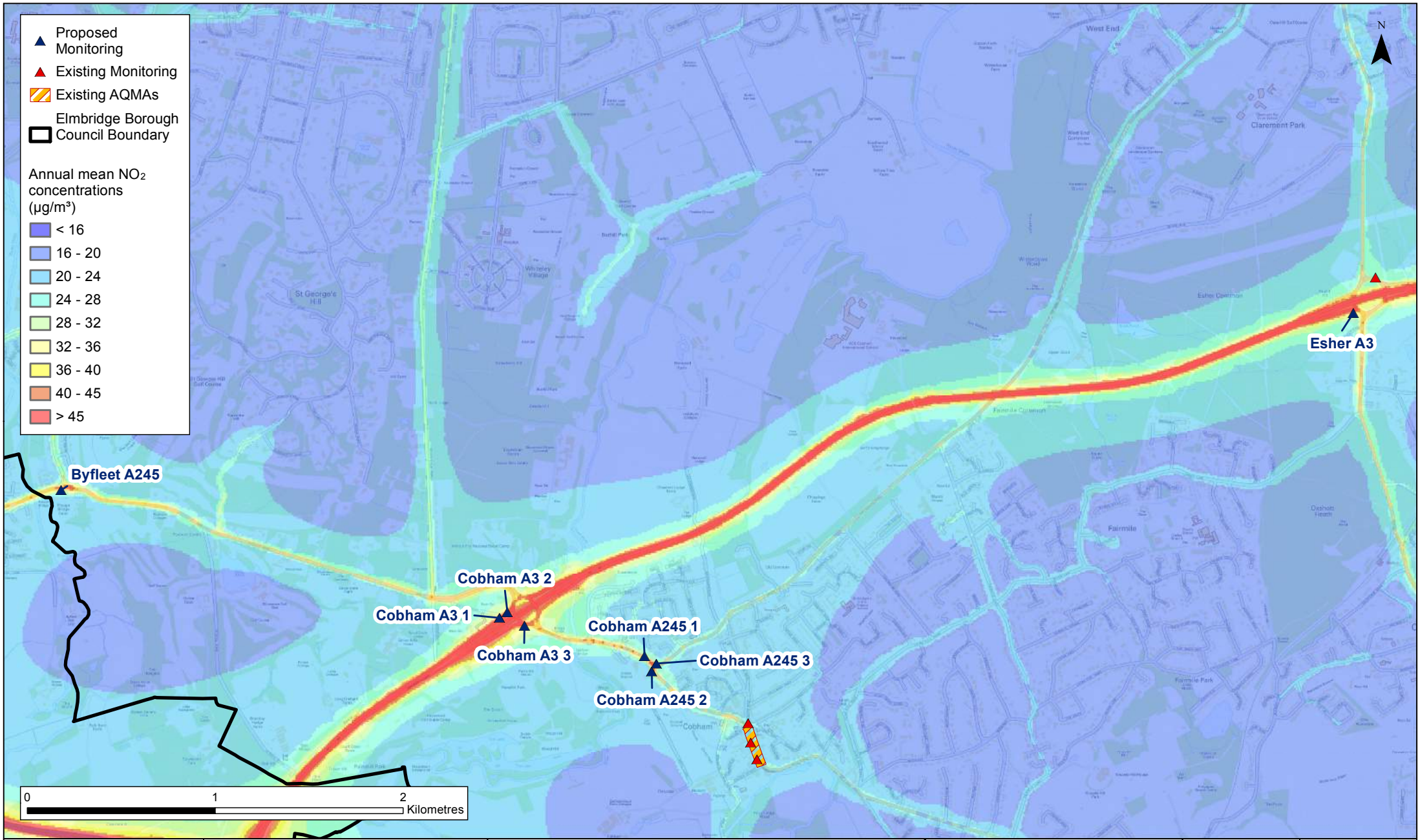

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Proposed Monitoring Locations

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Figure 01	Rev A

Appendix H: Diffusion Tube Review

TECHNICAL NOTE

Job Name: Elmbridge 2020 Local Air Quality Management

Job No: 47763

Note No: TN002

Date: March 2020

Prepared By: Laura Smart

Subject: **Diffusion Tube Review**

1. Introduction

1.1. Stantec has been commissioned by Elmbridge Borough Council (EBC) to undertake a review of the Council's nitrogen dioxide (NO_2) diffusion tube monitoring sites to advise on any sites no longer required or where existing sites should be amended/relocated. A total of fifty diffusion tubes are currently deployed across the Borough.

1.2. The following factors have been considered in the review of diffusion tube locations:

- measured annual mean NO_2 concentrations;
- representativeness of relevant human exposure;
- whether the tubes are in a worst-case location; and
- the suitability of the monitoring site (e.g. air circulation, surrounding vegetation, etc).

1.3. The review takes into account guidance produced by the Working Group commissioned by DEFRA and Devolved Administrations[1] and Local Air Quality Management Technical Guidance (LAQM TG.16) produced by DEFRA[2].

2. Review of Tube Locations in Air Quality Management Areas (AQMAs)

Esher High Street AQMA

2.1. Esher 10 is not considered to be in a worst-case location as congestion is apparent at the southern end of the A244 Esher Green where it meets the A307 High Street. As there is relevant exposure in close proximity to this junction, it is recommended that the Esher 10 monitoring site is relocated to a position closer to the junction (**Figure 1**) to ensure worst-case concentrations are measured in the AQMA. Where diffusion tubes are relocated, it is recommended that the site is given a new name to avoid confusion when interpreting the monitoring data.

2.2. Esher 1 and Esher 8 are located in close proximity to each other on building façades on the east and west side of Church Street. However, neither one of these locations measures consistently higher concentrations than the other; for example, concentrations at Esher 8 were higher than those at Esher 1 in 2019, and vice-versa in 2018. As a result, it is not clear which of these locations is worst-case, and as they are both representative of relevant exposure, they should therefore both be retained.

[1] AEA Energy and Environment (2008). 'Diffusion Tubes for Ambient Monitoring: Practical Guidance for Laboratories and Users'. Issue 1A.
[2] DEFRA (2018). 'Local Air Quality Management Technical Guidance (TG16)'. V1.

2.3. The remaining diffusion tube locations within the Esher High Street AQMA are considered suitable and should be retained.

Walton-on-Thames High Street AQMA

2.4. Since monitoring began in the Walton-on-Thames High Street AQMA, new residential exposure has been introduced on the High Street, adjacent to the A244 New Zealand Road/Ashley Road junction. This represents a worst-case location in the AQMA due to the influence of road traffic emissions from several combined roads at the junction, as well as reduced speeds. It is therefore recommended that a new diffusion tube monitoring site is deployed, or Walton 3 is relocated closer to the junction (**Figure 2**). If Walton 3 is relocated, it should be renamed to avoid confusion.

2.5. The remaining diffusion tube locations within the Walton-on-Thames High Street AQMA are considered suitable and should be retained.

Weybridge High Street AQMA

2.6. Weybridge 9 is not considered to be representative of worst-case exposure as it is located significantly further back from the road than other residential properties in the area and measured concentrations have been well below the National Air Quality Objective (NAQO) for several years. As worst-case exposure is already captured at other monitoring sites in the AQMA in close proximity to Weybridge 9, it is considered that this monitoring site can be removed.

2.7. Monitoring is currently not undertaken adjacent to the Baker Street junction on Weybridge High Street. This is considered to be a worst-case location in the AQMA due to congestion and the combined effect of road traffic emissions from Baker Street and the High Street. Measured concentrations at Weybridge 1 have been below the NAQO for a number of years and therefore it is considered that this location could be relocated (and renamed) further down the road, closer to the Baker Street junction (**Figure 3**).

2.8. The remaining diffusion tube locations within the Weybridge High Street AQMA are considered suitable and should be retained.

Hinchley Wood AQMA

2.9. Hinchley Wood 2 appears to be enclosed by vegetation and Working Group guidance states that vegetation over-hanging or surrounding diffusion tube monitoring sites must be avoided so that air can circulate freely around the tube[1]. As Hinchley Wood 1 is closer to the road and therefore worst-case, it is considered that Hinchley Wood 2 can be removed.

2.10. However, it is recommended that an additional monitoring location is deployed at (or Hinchley Wood 2 relocated to) the southern end of the AQMA, adjacent to the A309 Kingston Bypass/Manor Road junction (**Figure 4**). As a result of the combined effect of road traffic emissions at the junction, as well as congestion and reduced speeds, concentrations at this location are likely to be higher than those currently measured elsewhere in the AQMA. In addition, there is relevant exposure in close proximity to the junction.

Walton Road, Molesey AQMA

2.11. The diffusion tube sites in the Walton Road AQMA have been reviewed and are considered suitable. Monitoring at these sites should therefore continue.

2.12. The diffusion tube sites in the Cobham High Street AQMA have been reviewed and are considered suitable. Monitored concentrations at the monitoring sites in the AQMA support the revocation of the AQMA as they have been more than 10% below the annual mean NO_2 NAQO for four years. Monitoring on Cobham High Street should be continued following the revocation of the AQMA, to enable any deterioration in air to can be responded to quickly.

Hampton Court AQMA

2.13. The diffusion tube sites in the Hampton Court AQMA have been reviewed and are considered suitable. Monitoring at these sites should therefore continue.

3. Review of Tube Locations outside of an AQMA

3.1. Existing diffusion tube locations outside of the seven AQMAs have also been reviewed. It is considered that monitoring at the following sites can be discontinued:

- Walton 5 due to consistently low measured annual mean NO_2 concentrations which are well below the NAQO.
- Esher 5 as it is not representative of relevant exposure, and nearby monitoring has been introduced in 2020 (Esher 14) which is more representative and worst-case.
- Esher 4 is currently located approximately 25 m northeast of the Esher High Street AQMA boundary and annual mean NO_2 concentrations at this site have been more than 10% below the NAQO for several years.
- Downside 3 due to consistently low measured annual mean NO_2 concentrations which are well below the NAQO.

4. Summary and Conclusions

4.1. The current diffusion tube monitoring sites across the Council's administrative area have been reviewed.

4.2. A number of diffusion tube sites have been recommended for removal or amendment. A summary of these changes is provided in the table below. It is recommended that monitoring at the other sites is continued.

Site ID	Recommendation Summary
Esher 4	To be removed.
Esher 5	To be removed.
Esher 10	To be relocated closer to the A244 Esher Green/A307 High Street junction.
Walton 3	To be relocated closer to the High Street/A244 New Zealand Road junction.
Walton 5	To be removed.
Weybridge 9	To be removed.
Weybridge 1	To be relocated closer to the High Street/Baker Street junction.

Site ID	Recommendation Summary
Hinchley Wood 2	To be relocated closer to the A309 Kingston Bypass/Manor Road junction.
Downside 3	To be removed.

4.3. In relation to timescales, it is recommended that the above amendments are made as soon as reasonably practicable.

DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
47763/3002/TN002	Draft	March 2020	LS	KH	KH	SB

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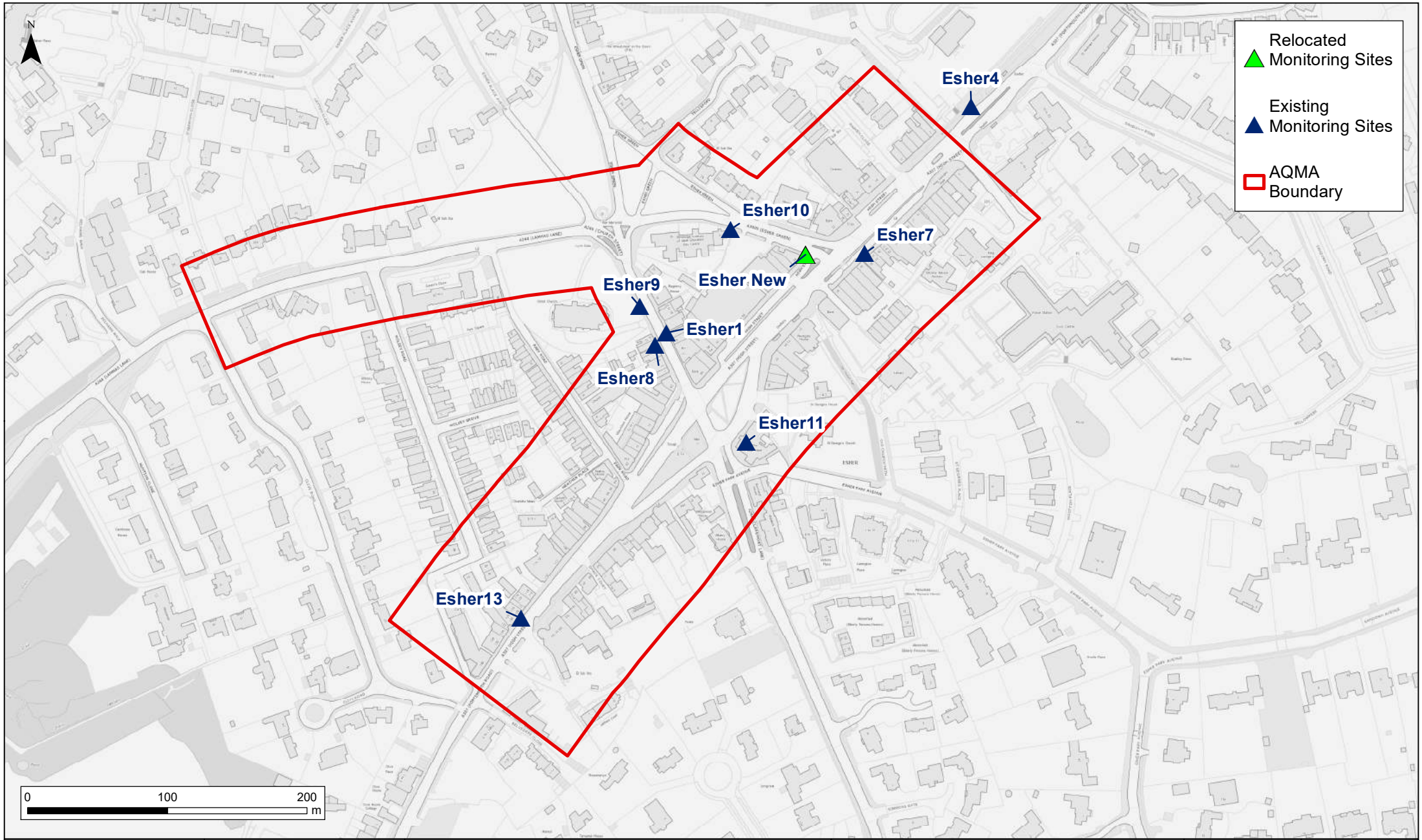

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Diffusion Tube Review - Esher High Street AQMA

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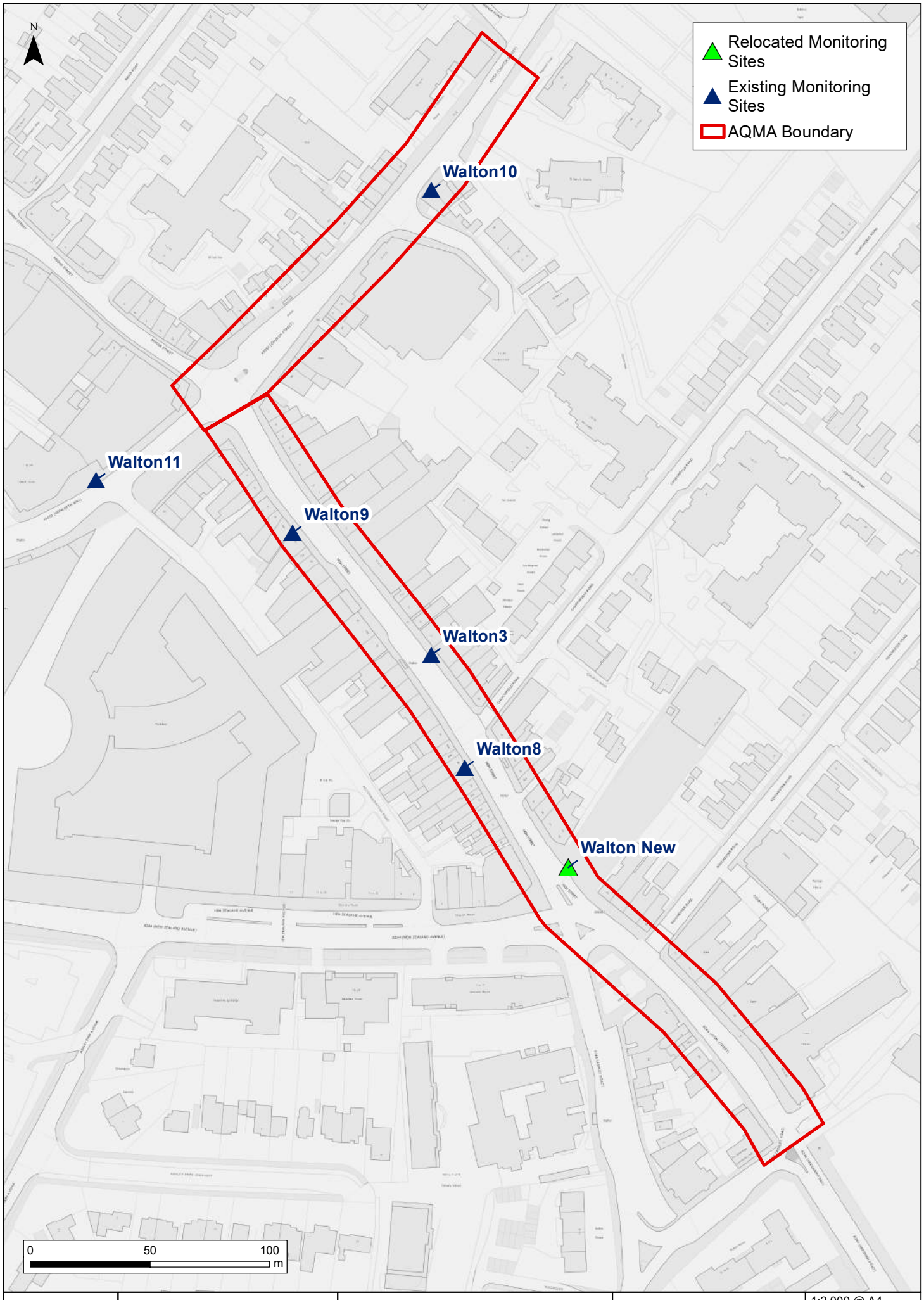
Figure 1	Rev A



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Diffusion Tube Review - Walton-on-Thames High Street AQMA

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Figure 2	Rev A

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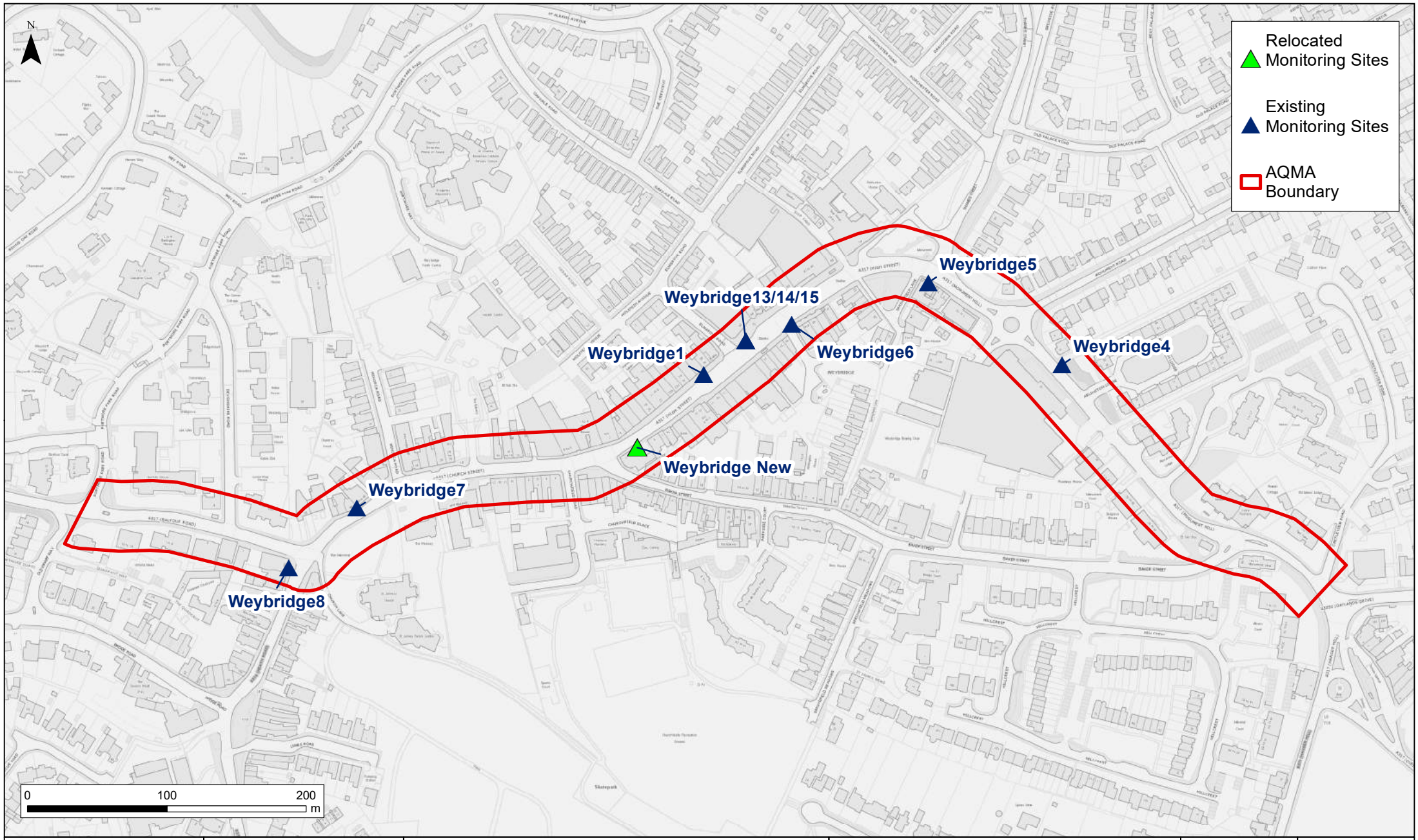

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Elmbridge 2020 LAQM

Diffusion Tube Review - Weybridge High Street AQMA

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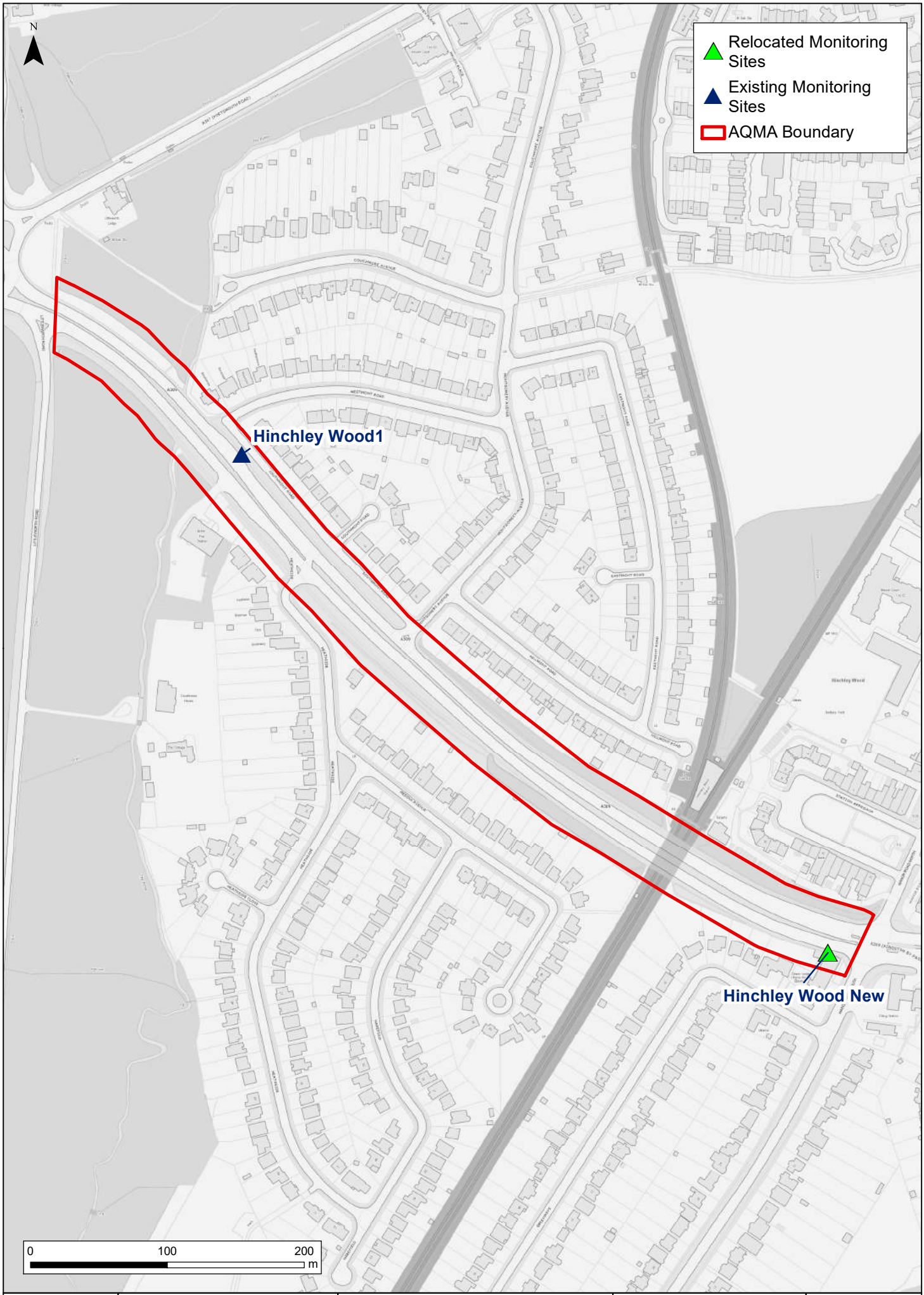
1:3,500 @ A4	Date: 31/03/2020
Drawn: LS	Checked: KH
Figure 3	Rev A



Stantec

Elmbridge Borough Council
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Elmbridge 2020 LAQM

Diffusion Tube Review - Hinchley Wood AQMA

Service Layer Credits:

1:3,500 @ A4	
Date: 31/03/2020	
Drawn: LS	
Checked: KH	
Figure 4	Rev A

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
EU	European Union
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
SAA	Surrey Air Quality Alliance
SCC	Surrey County Council
SO2	Sulphur Dioxide
The Council	Elmbridge Borough Council
TEA	Triethanolamine
SAA	Surrey Air Quality Alliance

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