



2018 Air Quality Annual Status Report (ASR)

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

December 2018

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Executive Summary: Air Quality in Our Area

Overview of Air Quality in Guildford Borough

This is a summary of the state of air quality in the Guildford Borough Council (GBC) area, it reports on the progress that the local authority and partners are taking to improve air quality. Predominantly, the report covers air quality monitoring and actions in 2017, the timing of the report dictates that there are updates regarding actions during 2018.

Air Quality in Guildford Borough

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

History and Background

The Borough of Guildford, centred on the town of Guildford, has a population of around 148,000, approximately half of which live within the urban area. The main source of emissions in Guildford Borough is from motor vehicles. Four major roads pass through the Borough. The M25 enters the Borough briefly at Junction 10 (Wisley), which links to the A3 London to Portsmouth trunk road. The A3 runs from north to south through the Borough, linking with the A31, which joins the A331 Blackwater Valley Road. Whilst the land use is predominantly residential, there are a number of light industrial sites; the authority has 32 permitted process under Environmental Protection Act 1990, to date there is no record of any significant air quality impact from these locations.

Guildford Borough established Smoke Control Areas in the 1960's covering approximately 12 square kilometres of the urban area. These areas are still operational and subject to statutory control.

In November 2017, Guildford Borough Council Executive approved the Air Quality Strategy 2017-2022. The document sets out the Council's approach and priorities on air quality, plus a

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

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

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

number of actions associated with statutory regimes and initiatives to bring about improvements.

The Annual Status Report (ASR) 2017 (Reference ASR17-115) considered the monitoring data over the calendar year 2016 and compared the levels measured with national objectives. Feedback received from Defra in September 2017 has been actioned in this report and is referenced as such.

The area at the northern end of The Street, B3000, in the village of Compton where the properties are in close proximity to the road was subject to additional passive diffusion tubes and automatic continuous monitoring for nitrogen dioxide; the process was completed in August 2017. Evidence from the further investigation confirmed that action was required and in November 2017 Guildford Borough Council Executive approved the declaration of an Air Quality Management Area. The Air Quality Management Area (AQMA) was formally declared on the 1 February 2018 and is a location consisting of three properties. The AQMA has been registered with Defra. The Council have consulted on an action plan and are currently in the process of preparing to present the action plan to the Guildford Joint Committee for approval in March 2019.

We recognise that in order to deal with air quality, the co-operation of Surrey County Council (SCC), Highways Agency (HA) and the Environment Agency is vital. The Surrey Air Alliance Group, which consists of the eleven borough and district councils and SCC, whilst having no statutory status has evolved into a partnership to enable air quality to be considered across the county and facilitate joint working where appropriate. One of the main targets in 2017 was to map levels of PM_{2.5} throughout the county of Surrey, investigate hotspots and quantify the links with health indicators this work commenced in April 2018 and the results will be reported in the ASR 2019. In August 2018 the group sent a coordinated response to the consultation on the Defra Clean Air Strategy 2018.

Finally, a number of transport related actions, which are aimed at tackling air quality issues can be found in the revised Guildford Borough Transport Plan produced in December 2017.

Actions to Improve Air Quality

The principal issues, findings and conclusions of the Annual Status report are:

- The detailed investigation of a specific area of the B3000 road in the village of Compton concluded with the declaration of an Air Quality Management Area (AQMA) in February 2018. A draft Action Plan was produced in November 2017 and consulted on in April 2018.

- GBC recognises the need to co-ordinate work with partners and the public in order to improve air quality. One of the targets for 2017 was to produce an Air Quality Strategy. The Guildford Borough Council Air Quality Strategy 2017-2022 was approved by the Council in November 2017. The strategy is subject to an annual review, full details of the actions classified as short, medium and long term are set out Section 2.1 of the main report.
- GBC recognises that the significant source of air pollution in the borough is from road traffic. GBC conducted an annual review of monitoring of Nitrogen Dioxide (NO₂) using passive diffusion tubes at the end of 2017 and the monitoring locations have been altered in accordance with Defra feedback provided in September 2017. The new sites are predominantly on the A road approaches within 0.5 miles of Guildford town centre.
- Further investigation using diffusion tubes in new areas on two A roads has highlighted potential exceedances of the annual objective levels for NO₂.
- Surrey County Council (SCC) and the Highways Agency (HA) are the highway authorities; in addition, GBC has updated its Guildford Borough Transport Strategy 2017, which includes a section on air quality.
- The A331, Blackwater Valley Relief Road, has been identified within the Government's Air Quality Plan for Nitrogen Dioxide as potentially exceeding the statutory annual mean limit value for Nitrogen Dioxide (NO₂). The Blackwater Valley Group of local authorities; Guildford, Rushmoor and Surrey Heath Borough Councils, are working collaboratively with the respective highway authorities of Hampshire and Surrey county councils and Highways England, on a Local Plan to identify a shortlist of measures that can be implemented to reduce roadside annual mean NO₂ concentrations within the shortest possible time. As this process is across three authorities and is reportable to Joint Air Quality Unit (JAQU), the detail is not contained within this report.
- GBC have worked with SCC on installing further rapid charge facilities in Guildford town centre and SCC have drafted an Electric Vehicle Charging Strategy, the consultation closed on the 26th August 2018.

Local priorities

1. Enhance our approach to air quality

- a. Implement the Guildford Borough Council Air Quality Strategy 2017-2022. This document has a number of short, medium and long-term actions which are linked to future actions and initiatives in Table 2.1.

2. Monitoring and reporting of air pollution levels

- a. Complete a detailed investigation of a potential AQMA on the A281, Shalford.
- b. Maintain and where necessary expand the nitrogen dioxide passive diffusion tube network, in response to observations on trends in recorded levels and areas of local concern.
- c. Explore the link between PM_{2.5}, NO₂ and public health by carrying out a modelling exercise across Surrey. Identified hotspots will be considered for further investigation.

3. Reducing vehicle emissions

- a. Reduce emissions in the GBC transport fleet by increasing the percentage of low emission vehicles.
- b. Produce the final Air Quality Action Plan for the AQMA in Compton.
- c. In conjunction with SCC provide facilities to ensure the efficient electric charging of vehicles is available to a wider part of the community and business.
- d. Explore opportunities to retrofit existing buses with the operators.
- e. Apply for government funding to facilitate improvements where appropriate.
- f. Explore future options within the taxi licensing regime.

4. Working with other agencies

- a. Reinforce public health work by continuing to work through the Surrey Air Alliance with SCC Public Health and other Surrey authorities to ensure that the profile of air quality improvements is elevated.
- b. Work with the two respective authorities; Highways England and SCC through the Guildford Transport Strategy.
- c. Work with SCC on local improvements as required in the ensuring that there is an effective AQAP in the AQMA in Compton.
- d. Work with the University of Surrey on the Iscape Project.

5. Planning Framework

- a. Ensure that the Local Plan process takes account of any relevant findings within air quality investigations or modelling.
- b. In conjunction with SCC and other Surrey authorities; provide guidance for developers to ensure that air quality is uniformly addressed at the pre application phase.
- c. Facilitate infrastructure improvements including; new railway stations and relief schemes for areas of localised congestion, for example a road bridge to replace a level crossing in Ash.

Challenges

The following challenges to achieving priorities have been identified:

- a. Provision of an effective process to link air quality with health outcomes in a reportable manner.
- b. Sufficient budget and resource allocation to achieve the priorities and strategy targets.
- c. Influencing behavioural change in the population of the Borough.
- d. Engagement with other organisations and commitment of their resource (human and financial) on actions.
- e. Nature of the road network in the Borough.
- f. Cost of infrastructure improvements and the provision of funding.

Local Engagement

GBC have engaged with the public as follows:

1. Participating in joint initiatives with University of Surrey Global Centre for Clean Air Research, Iscape project. <https://www.surrey.ac.uk/global-centre-clean-air-research>
2. Professor Kumar from University of Surrey Global Centre for Clean Air Research, has given presentations on engagement and education projects on air quality to the GBC Overview and Scrutiny Committee and Surrey Air Alliance.
3. Consulted on the Draft Air Quality Action Plan for the AQMA in the Street in Compton.
4. Consulted on Air Quality Strategy 2017-2022 in October 2017.
5. Dealing with local requests for nitrogen dioxide monitoring and displaying up to date monitoring data on the Council's website.

6. Executive Working Group on air quality receives reports on progress and developments associated with air quality.
7. Recommendations in line with guidance issued by Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) that air quality should be assessed on planning applications in close proximity to AQMA's and/or areas subject to Ministerial Direction, where there are over 10 dwellings and commercial developments.
<http://iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>

How to get involved

GBC has a number of ways that the public can get involved in air quality issues (relevant web links) including:

1. Reporting bonfires or air pollution incidents to our Customer Service Centre, to enable investigation under the Environmental Protection Act 1990 or other related legislation. <http://www.guildford.gov.uk/bonfires>
2. Use cleaner (ultra-low emission) vehicles. Advice is available from The Office for Low Emission Vehicles <https://www.gov.uk/government/organisations/office-for-low-emission-vehicles>
3. Reduce vehicle use, by participation in sustainable transport options; public transport, park and ride, walking, cycling, car clubs and car sharing.
<http://www.guildford.gov.uk/carclubs>; <https://www.surreycc.gov.uk/roads-and-transport/buses-and-trains/guildford-park-and-ride>
4. Ensure compliance with Smoke Control Orders, by only using authorised appliances and fuel. <http://www.guildford.gov.uk/article/1734/Smoke-control-area>
5. Participate in the activities of Guildford Environmental Forum.
<http://www.gefweb.org.uk/index.html>
6. Comment on the potential impact of proposed developments in the Borough via the planning process. <http://www.guildford.gov.uk/commentonaplanningapplication>

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1 Local Air Quality Management

This report provides an overview of air quality in Guildford Borough Council during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (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 Guildford Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Guildford Borough Council can be found in Table 2.1. Further information related to declared AQMAs, including a map of the AQMA boundaries are available online at <https://www.guildford.gov.uk/article/19807/Air-quality-monitoring>. Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides a map of the air quality monitoring locations in relation to the AQMA.

A public consultation on the draft Air Quality Action Plan was conducted and closed in April 2018. To date the details of the action plan are being discussed with Surrey County Council who are the local highway authority. Further work on queuing in the area is being carried out, in order to inform an assessment of potential improvements to the highway.

Following nitrogen dioxide diffusion tube data collected during 2017 indicating likely exceedances of the annual mean, GBC are proposing to carry out a detailed assessment of an area of the A281 in Shalford. The assessment which includes a revised traffic count in September 2018, is to determine whether there is sufficient evidence to declare a new AQMA in the area around SH1 and SH2 (see monitoring section).

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan		
						At Declaration	Now	Name	Date of Publication	Link
Guildford Borough Council AQMA Order (No. 1) 2018	01-Feb-18	NO ₂ Annual Mean	Compton	Section of B3000 to its northern end, encompassing 3 residential properties	Yes	43.8 µg/m ³	43.8 µg/m ³	Compton Draft AQAP	Draft published November 2017	https://www.guildford.gov.uk/article/21335/Air-Quality-Management-Area

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

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

Defra's appraisal of last year's ASR concluded that the Council should:

Number	Comment from Defra September 2017	Action
1	Submit the Detailed Assessment for the Street in Compton	The AQMA was approved by Guildford Borough Council Executive in November 2017 and officially declared on 1 February 2018.
2	Ensure that the distance correction is applied to all results where required and this must be placed in the relevant column in Table B.1	All distance corrections are included in Table B.1
3	Ensure that the distance corrections have been applied for sites C9 and C10 in The Street Compton., using guidance in LAQM TG (16) (para 7.77-7.79)	As above, distance corrections for C9 is not required as the monitoring location is relevant to the annual mean public exposure.
Update 4	Consider a strategy of monitoring relevant exposure on all of the major "A" roads as they enter Guildford town centre	New monitoring points have been installed on: A31 Farnham Road, Guildford A281 Horsham Road, Shalford A3100 Portsmouth Road, Guildford A25 Dorking Road, Abinger A322, Woodbridge Road, Guildford

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		A246, York Road, Guildford
5	Elaborate on the background to the decision to install an automatic monitor between March and August on the A331 at Tongham	The monitor was installed to gather evidence for a planning appeal. The findings are reported in section.
6	To report the findings of the county wide modelling in the ASR 2018	This action did not commenced until April 2018, but is due to be completed during 2018. To be reported in ASR 2019.
7	Show how the Council is working collaboratively with all local key stakeholders	GBC has engaged with SCC Public Health and Highway, University of Surrey and bus companies.
8	Pursue the wide range of measures detailed in the ASR to improve air quality across the local authority	See update in table 2.1
9	ASR 2018 to have clearer labelling of the monitoring locations particularly in map D6.	This has been completed.

Update on measures identified in ASR 2017

Guildford Borough Council has taken forward a number of direct measures during the reporting year of 2017 in pursuit of improving local air quality.

Following an Overview and Scrutiny Committee recommendation, GBC has established an Executive Air Quality Monitoring Group, where councillors worked together with officers to examine our duties and commitments under the Local Air Quality Management (LAQM) regime. Subsequently the working group was dissolved and there is now a six monthly reporting process to the Overview and Scrutiny Committee. The details are on the relevant minutes on the GBC website

<http://hamilton.guildford.gov.uk:9070/mgCommitteeDetails.aspx?ID=262>

In the ASR 2017 we set out a number of priorities, an outline of the key areas progressed are set out below :

Key completed measures are:

Priority 1 – Clarify our approach to air quality

The most significant document has been the Guildford Borough Council Air Quality Strategy 2017-2022 this was approved by the Council in November 2017.

Priority 2 - Actions to improve air quality and monitor progress (See Table 2.1)

We have worked through the Surrey Health and Wellbeing Board, Guildford Health and Wellbeing Board to encourage individual and organisational awareness of the need improve air quality by changing to cleaner transport and reducing motor vehicle emissions.

We recognised the need to monitor the progress of actions, Table 2.1 provides details of the relevant actions.

Priority 3 - Monitoring and reporting of air pollution levels:

As described above after recommendations from Defra, GBC reviewed the monitoring of nitrogen dioxide (NO₂) using passive diffusion tubes and the network has been altered with a number of new monitoring locations in areas where road traffic may have an influence on sensitive receptors. This has been achieved with 7 new locations running for one year.

GBC has carried out further diffusion tube monitoring and commissioned modelling of nitrogen dioxide (NO₂) in the village of Compton.

Two automatic monitoring stations have been set up in Compton and Tongham to run from March to August 2017. This was completed.

The air quality page on the GBC website contains the most up to date results and reports. This was completed and is updated monthly.

All Surrey local authorities and SCC Public Health have jointly commissioned a countywide modelling of Pm₁₀, Pm_{2.5} NO_x, NO₂ and health indicators. The results will help identify hotspots and determine future monitoring and/or action plans. This is due to complete in April 2019.

Priority 4 - Reducing vehicle emissions: (see Table 2.1)

During 2016 and into 2017 GBC and our partner authorities have taken a number of steps to try to reduce vehicle emissions and traffic congestion by linking car use with the promotion of public and alternative means of transport. This remains central to reducing pollution from vehicle exhaust emissions in Guildford. Park and ride schemes, car share schemes, car clubs, green scheme for parking electric vehicles, bus lanes, cycling and walking strategies and integrated transport plans, all form part of the overall approach.

GBC has taken actions to reduce vehicle emissions within existing duties and responsibilities:

- Emissions are a prominent factor in procurement of The Council's vehicle fleet.
- GBC encourage internal lease car users to consider low emission vehicles by highlighting the tax benefits and setting a limit on the carbon dioxide (CO₂) emissions.
- Guildford town centre car clubs have expanded and utilise more vehicles that are electric.
- GBC have carried out a scoping exercise; with the intention to provide additional charging points in town centre public car parks during 2017.
- Use of the two electric pool cars by staff has increased, the installation of the associated rapid charging points is planned for early 2019.
- Provision of more guidance on Smoke Control Orders, Travel Plans and other legislative requirements via the GBC website. This has not been progressed but has been included in future work plans for 2018/19.
- Where practicable, procurement of ultra-low emission fleet vehicles is encouraged. This has been partially progressed.
- In 2017 GBC will report on the environmental benefits accrued from reduced car journeys, as we continue to encourage home working by staff. This has partially progressed and is included in future work plans.

Priority 5 – Planning controls on development

The requirement for additional housing and associated infrastructure across GBC and the south east of England, represents significant challenge of maintaining and improving air quality. The Local Plan for Guildford Borough is a key document. The Air Quality Review of Guildford Local Plan was published in June 2017 and updated. This has been achieved.

- Planning applications - An air quality assessment is required; where a proposed development over 10 residential units is proposed, in order to assess the suitability of the site and impact local air quality. This has been achieved.
- The Guildford Borough Transport Strategy 2017 has an indicative programme which includes measures set out as far as 2034, actions anticipated within the current year are:
 - Guildford Town Centre Transport Package -improvements for buses and active modes have been planned
 - Increase train service frequency on the North Downs line to two fast trains per hour between Reading and Gatwick, via Guildford

This is a long- term strategy and therefore progress cannot be reported on an annual basis.

Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in the;

- Guildford Borough Council, Air Strategy 2017-2022- November 2017
- Guildford Borough Transport Strategy 2017- Revised December 2017
- Surrey Transport Plan: Air Quality Strategy (SCC 2016)
- Guildford Borough Cycling Plan 2015
 - GBC has a green scheme for car parking, which heavily discounts parking of electric vehicles. <http://www.guildford.gov.uk/carparks>

Local priorities for 2018

Guildford Borough Council's priorities for the coming year are in line with those set out in 2017, GBC has set out the following priorities:

1. Enhance our approach to air quality

- a. Implement the Guildford Borough Council Air Quality Strategy 2017-2022. This document has a number of short, medium and long term actions which are linked to future actions and initiatives in Table 2.1.

2. Monitoring and reporting of air pollution levels

- a. Complete a detailed investigation of a potential AQMA on the A281, Shalford.
- b. Maintain and where necessary expand the nitrogen dioxide passive diffusion tube network, in response to observations on trends in recorded levels and areas of local concern.
- c. Explore the link between PM_{2.5}, NO₂ and public health by carrying out a modelling exercise across Surrey. Identified hotspots will be considered for further investigation.

3. Reducing vehicle emissions

- a. Reduce emissions in the GBC transport fleet by increasing the percentage of low emission vehicles.
- b. Produce the final Air Quality Action Plan for the AQMA in Compton.
- c. In conjunction with SCC provide facilities to ensure the efficient electric charging of vehicles is available to a wider part of the community and business.
- d. Explore opportunities to retrofit existing buses with the operators.
- e. Apply for government funding to facilitate improvements where appropriate.
- f. Explore future options within the taxi licensing regime.

4. Working with other agencies

- a. Reinforce the public health to work by continuing to work through the Surrey Air Alliance with SCC Public Health and other Surrey authorities to ensure that the profile of air quality improvements is elevated.
- b. Work with the two respective authorities; Highways England and SCC through the Guildford Transport Strategy.
- c. Work with SCC on local improvements as required in the ensuring that there is an effective AQAP in the AQMA in Compton.
- d. Work with the University of Surrey on the Iscape Project.

5. Planning Framework

- a. Ensure that the Local Plan process takes account of any relevant findings within air quality investigations or modelling.
- b. In conjunction with SCC and other Surrey authorities; provide guidance for developers to ensure that air quality is uniformly addressed at the pre application phase.
- c. Facilitate infrastructure improvements including; new railway stations and relief schemes for areas of localised congestion for example a road bridge to replace a level crossing in Ash.

6. Challenges

The principal challenges and barriers to implementation that Guildford Borough Council anticipates facing are:

- a. Provision of an effective process to link air quality with health outcomes in a reportable manner.
- b. Sufficient budget and resource allocation to achieve the priorities and strategy targets.
- c. Influencing behavioural change in the population of the Borough.
- d. Engagement with other organisations and commitment of their resource (human and financial) on actions.
- e. Nature of the road network in the Borough.
- f. Cost of infrastructure improvements and the provision of funding.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Guildford Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Guildford Borough Council AQMA Order (No1) 2018.

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Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
Short term 2017-19											
1	Air quality is consideration at pre-application and application stage to allow effective use of planning conditions.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Planning Services and Environmental Health	2017	2018	Number of developments where air quality has been assessed and actioned	Encourages EV charging in all new developments above 10 dwelling threshold	Service Level Agreement between Planning Development and Environmental Health from March 2017 with quarterly monitoring meetings.	ongoing	Developers need to be made aware
2	Work with other authorities, land managers, and highway authorities to develop a framework to monitor forecast improvements in roadside air quality around the Thames Basin Heaths Special Protection Area to confirm that forecast improvements are being delivered and, if required, to identify and deliver supplementary measures.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Environmental Health and Planning Services and	Ongoing	2019	Establishment of a framework for monitoring forecast improvements in roadside air quality	Not measurable	None	2019	Relies on modelling rather than monitoring.
3	Green scheme parking fees for electric vehicles in GBC car parks	Traffic Management	Emission based parking or permit charges	Parking Services	2016	2018	Evidence of greater take up from car parking records.	Number of ELVs	Owners of electric vehicles can apply for a parking permit to obtain reduced fees.	ongoing	Additional charging points to be installed in GBC car parks. https://www.guildford.gov.uk/carparks

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Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
4	Parking App to direct users to closest and cheapest spaces	Traffic Management	Other	Parking Services	2016	2018	Use of App	Not measurable	App is available to download and aims to reduce congestion and queuing	ongoing	https://www.guildford.gov.uk/parkingapp
5	Education in communities to change behaviours	Promoting Travel Alternatives	Promotion of cycling, Promotion of walking, Workplace Travel Planning	Community Development and Environmental Health	Ongoing	2018	Feedback as part of the project	Not measurable	Project Aspire initiatives to reduce dependency on cars and educational programmes in schools	ongoing	Participation of the residents.
6	Bringing services to the communities to reduce car journeys	Promoting Travel Alternatives	Other	Community Development and Community services	Ongoing	2018		Not measurable	Project Aspire encouraging partners to increase use of local facilities within communities to reduce journeys	ongoing	
7	GBC Air Quality Strategy	Policy Guidance and Development Control	Other policy	Environmental Health	2017	Strategy adopted by Executive November 2017	Within current resources	Strategy produced in consultation with all Council Services and relevant partners	2017	2022	Implementation of action plan to be monitored by Overview and Scrutiny Committee
8	Declaration of Air Quality Management Area in Compton	Traffic Management	Other – defined in action plan	Environmental Health	2017	AQMA and Action Plan approved at Executive November 2017	Compliance with Action Plan		AQMA declared February 2018 and consultation on Action Plan carried out in April 2018.	February 2018	Action Plan implementation to be confirmed after consultation and monitored by Overview and Scrutiny Committee
9	Facilitate and promote home, mobile, remote and flexible working within the Council	Promoting Travel Alternatives	Encourage / Facilitate home-working	HR & IT	2018	Adopt and implement 'Home, Mobile, Remote and Flexible Working Policy' Reduction in mileage claims, increase public transport	Number of hours recorded working from home.	Can be calculated by using the mileage saved and car type.	Policy adopted to promote and facilitate: - home working - flexible working times - compressed hours to reduce days in the office - utilisation building facilities for mobile working - Virtual meetings	2019/20	ICT provision to facilitate working methods.

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Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
10	Promote alternative travel to work at the Council	Promoting Travel Alternatives	Workplace Travel Planning	HR & Facilities management	2018	Adopt and implement a 'Staff Travel Plan'	Take up by staff	Reduction in car use to be monitored and emissions can be matched with type and usage.	Initial discussions with services and providers commenced.	2019/20	Promote alternative transport to work : - car sharing - Bike to work scheme - Provision of facilities to support cyclists, runner, walkers - promote and incentivise park and ride scheme - Incentivise non car use
11	Car clubs in Guildford Town Centre	Alternatives to private vehicle use	Car Clubs	SCC/GBC; funding from Department for Transport	2016	2016	Restrain or reduce traffic	Assuming all vehicles are as described. Mileage can be obtained and benefits calculated.	GBC working in partnership with SCC and Enterprise Car Club to develop the scheme, Currently there are 8 car clubs in Guildford Town Centre; all either low or ultra-low emissions with at least 3 electric vehicles	ongoing	
12	Air quality modelling of Surrey for PM10, PM2.5, NO2	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	All Surrey Local Authorities	2017	Model delivered by December 2018	Completion of model and	None modelling exercise to show hot spots	In May 2017, all Surrey Local Authorities agreed to procure Surrey wide modelling study.	Dec 2018	Results of model will give identify potential hotspots for PM2.5, PM10 and will allow further local investigation and action.
13	Participate in the University of Surrey iSCAPE project..	Public Information	Via other mechanisms	Environmental Health	2017	2018 Initial scoping meeting with University	Aims to raise citizen awareness about air quality and the impact	Note take up of project by residents.	Exercise has commenced and groups engaged. https://www.iscapeproject.eu/	2020	Next steps developing the interactive displays and participating in the public engagement activities and events.

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Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
14	Smoke Control Order Compliance	Promoting Low Emission Plant	Regulations for fuel quality for low emission fuels for stationary and mobile sources	GBC	Originally implemented in the 1970s	2018	Compliance with Statute	Not likely to significantly change as areas are generally compliant	Guildford has smoke control areas setup in the 1960's; Increase awareness and obligations for residents	2019	A webpage dedicated to Smoke Control Area (SMA); with interactive map to search properties within the SMA
15	Anti vehicle idling, for example at level crossings, taxi ranks, the station, bus stops and outside schools.	Traffic Management	Other	GBC and SCC	2018	2019-20	Implementation of signs or other measures.	Potentially less emissions on reducing idling	Scoping discussion with SCC Three level crossings in the Borough (Ash and Chilworth X 2) have been identified for the potential scheme.	2020	Feasibility study for a new road bridge at Ash Railway Station.
16	Potential declaration and implementation of Air Quality Management Area	Traffic Management	UTC, Congestion management, traffic reduction	GBC/SCC	2017-2018	2018/19	To not exceed the annual objective level for nitrogen dioxide	Reduction in nitrogen dioxide exposure at receptors.	A281, Shalford is subject to a detailed investigation. SCC have been consulted on the traffic counts	2019	Subject to further consultation. Defra approval during 2018.
17	Great Western Railway increased service frequency on North Downs Line with introduction of a second fast service in each hour via Guildford rail station between Reading and Gatwick Airport	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	Great Western Railway	2015	2016	Alternative means of transport	Less emissions based on replacement form of transport	Implementation phase commenced during 2016.	2018	No updates
18	Guildford Town Centre Transport Package improvements for buses and active modes	Transport Planning and Infrastructure	Bus route improvements	SCC	2015	2016	Restrain or reduce traffic	Less congestion to reduce pollutants at receptors.	Implementation phases are staggered; current bus targeted schemes are the A25/A320 Stoke crossroads improvement including bus priority	2018-19	No updates

Guildford Borough Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
Medium and Long Term (2019-34)											
19	Service delivery review to reduce public journeys to Council properties where appropriate	Promoting Travel Alternatives	Personalised travel planning	GBC	2019	Policy adopted and implemented	Council's record of vehicle use	Less journeys will reduce emissions	There are examples of good practice around the Council but no consistency or formal policy	2020	Identify reasons for members of the public journeys to council offices and if the journey is necessary. e.g. dropping off documents, making a booking, attending a meeting and consider a different way to deliver the service e.g. online booking, officers travelling to venue.
20	Adopt GBC Policy lease car and fleet vehicles procurement	Promoting Low Emission Transport and Vehicle Fleet Efficiency	Company Vehicle Procurement -Prioritising uptake of low emission vehicles	GBC	2018	GBC adopt Policy on procuring lease case and fleet vehicles	Council's record of vehicle use	Less pollutants from low emission vehicles.	Two electric pool cars (Nissan Leaf) have been purchased and charging points are due to be installed at GBC Millmead offices. 2 electric vehicles in fleet at Woking Road Depot Charging point has been installed at the Woking Road Depot.	2020	Policy to include: - Review of lease car scheme to require reduced emissions/ electric vehicles -Review essential car user scheme -criteria for purchasing fleet vehicles -regular fleet replacement to ensure using lowest emission vehicles on the market.
21	Review/Create GBC policy for travelling to meetings, seminars and training courses	Promoting Travel Alternatives	Workplace Travel Planning	GBC	2019	Revised policy implemented in 2019	Council's record of vehicle use	Less emissions from individual journeys.	2019 There are examples of good practice around the Council but no consistency or formal policy.	2020	Implement Travel Policy for training courses, seminars and meeting – to include increase e-learning, in house provision, use of public transport when travelling. Incentivise non-car use.

Guildford Borough Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
22	Improve sustainable transport opportunities in line with the Guildford Borough Transport Strategy	Policy Guidance and Development Control	Other policy	GBC and SCC	Present – 2035+	1. Increased rail patronage / 2. Increased rail modal share / 3. Increased bus modal share / 4. Increased walking and cycling modal share	Existing and future bids	More sustainable transport	Progress with respect to schemes: Delivered in 2016/17: • Improvement of River Wey towpath around Parsonage Watermeadows (linking A25 to A320)	2035	Newly committed in 2017/18: •SRN7: A3 northbound off-slip lane widening at University Interchange improvement scheme • SRN8: A3 southbound off-slip lane widening to A320 Stoke Interchange improvement scheme – £2.5m committed funding
23	Adopt GBC Electric Vehicle Charging Strategy	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	GBC and SCC	2019	Assessment of infrastructure	Number and use of charging points	Electric charging points on Council property: -2 Woking Road Depot -2 car parks	SCC have consulted on an EV Charging Strategy that can be mirrored. Date of consultation close 26-08-18	ongoing	Actions could include: -Increase in: GBC sites, GBC car parks, GBC assets, GBC major projects -require as part of the planning process Encourage businesses and residents to provide charging points
24	To encourage existing employers to introduce travel plans.	Promoting Travel Alternatives	Workplace Travel Planning	GBC	2019	Target for number of companies with travel plans	Number of new travel plans	None – new initiative	None	2020	There is an opportunity to consider site users, such as patients, customers, visitors.
25	Electric charging points in public areas and residential streets	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	GBC and SCC	2019	2017-2020	Reduce emissions at source	Less pollutants from low emission vehicles pollutants.	Feasibility study for the provision of additional charging points in the residential streets in Guildford Town Centre, 27 publically accessible electric vehicle charging points in Borough	2020	Suitable locations are required, types of charging points, demand, funding and maintenance, impact on electricity demand

Guildford Borough Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
26	Taxi and Private Hire Licensing Policy	Promoting Low Emission Transport	Taxi Licensing conditions	GBC Licensing	2022	2023-2032	Low emission taxi fleet	Can be calculated from uptake	None – new initiative	.2032	Scope change to taxi and private hire licensing policy to require taxi and private hire vehicles to be low emission/electric
27	Revise Green Scheme Parking to introduce differential charging according to emissions Extend policy to on-street parking permits	Traffic Management	Emission based parking or permit charges	GBC Parking Services	2020	2021	Uptake in reduced rate permits	Can be calculated from uptake	ongoing	2022	Opportunity to extend differential charging scheme to on-street residential parking.
28	To encourage freight and delivery companies to introduce travel plans	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGVs/Delivery and Service plans	GBC Environmental Health and SCC	2020	2021	Number of companies taking up scheme	Can be calculated from uptake	None – new initiative	2022	No update
29	Research road configuration best practice to achieve improvements in air quality	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, inc Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	GBC Environmental Health and SCC	2020	2020-2024	Restrain or reduce traffic	Less congestion to reduce emissions.	None – new initiative	2024	Learn from best practice and up to date research when proposing new schemes.

Guildford Borough Council

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
30	Road Strategy schemes to tackle congestion on Strategic Road Network	Traffic Management	UTC, Congestion management, traffic reduction	GBC/SCC	2016	Ongoing	Restrain or reduce traffic	Not defined	Planning phase as part of the Guildford Borough Transport Strategy; includes a number of actions on the A3 junctions	2034	Long term objectives over the next 20 years
31	Improve sustainable transport opportunities in line with the Guildford Borough Transport Strategy	Policy Guidance and Development Control	Other policy	Planning and Regeneration	Present – 2035+	1. Increased rail patronage / 2. Increased rail modal share / 3. Increased bus modal share / 4. Increased walking and cycling modal share	Existing and future bids	Not defined	Progress with respect to schemes: Delivered in 2016/17: • Improvement of River Wey towpath around Parsonage Watermeadows (linking A25 to A320)	2035	Newly committed in 2016/17: •SRN7: A3 northbound off-slip lane widening at University Interchange improvement scheme •SRN8: A3 southbound off-slip lane widening to A320 Stoke Interchange improvement scheme – £2.5m committed funding



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.

Guildford Borough Council is taking the following measures to address PM_{2.5}:

There are no plans to monitor PM_{2.5},

GBC along with all Surrey authorities, commissioned a county wide modelling exercise in April 2018. The modelling will consist of detailed mapping of the County of Surrey, it will also include source apportionment in at least 20 specific hotspots per authority the project is due to complete in April 2019.

The findings will be used to gain a clearer indication of where to target future monitoring and mitigation. GBC will report on modelling as part of the AQSAP and it will be included in the 2019 ASR.

The Borough's five Smoke Control Areas have been in operation for over 45 years, they are centred around the north west of the town centre, Residents in those areas can obtain advice on the type of fuel and relevant appliances by following the links on our web page. In the absence of any complaints about operations in these areas

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Guildford Borough Council undertook automatic (continuous) monitoring at two roadside sites to continuously monitor NO_x, NO and NO₂ are due to run from March to August 2017 at the following locations.

1. The Street, Compton – for the purpose of investigating the potential declaration of an AQMA. Grid ref: 495444, 147259
2. Junction of A331 and A31- for the purpose of ascertaining the ambient levels adjacent to a major trunk road and a potential housing development. Grid ref: 487970, 148462

A summary of hourly mean NO₂ results is presented in the table A.4. The full reports are included in Appendix F.

Conclusions from automatic monitoring exercises 2017

1. **The Street, Compton.** The monitoring was carried out from March to August 2017 at the front of a residential property. The readings after verification and calibration indicate that the annual objective level for NO₂ would be exceeded. The figures were used to support the declaration of the AQMA.
2. **Junction of A331 and A31.** The monitoring was carried out from March to August 2017 at a kerbside location some 200 metres from the nearest residential property. The levels of NO₂ recorded indicated that the annual objective would not be exceeded and this was used as evidence in determining the planning decision on the use of land for residential purposes within 10 metres of the location.

Table A.1 in Appendix A shows the details of the sites. 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

Guildford Borough Council undertook non-automatic (passive) monitoring of NO₂ at 33 sites during 2017, 27 were for the full year and 6 were partial periods. The partial sites were either sites where monitoring was requested by a resident, interested party or for a particular reason.

Table A.2 in Appendix A shows the details of the sites. The individual locations are discussed in 3.2.1.

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.

Please note that any nitrogen dioxide diffusion tubes used as part of the Ministerial Direction on the A331 are reported separately to JAQU.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

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

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

In January 2017, GBC reviewed all of its diffusion tube locations

- Appendix A shows the details of the sites.
- Table A.2 and Graph A1 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.
- Appendix B contains the full 2017 dataset of monthly mean values.

- Appendix C contains further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in.
- Appendix D contains the maps showing the location of the monitoring sites.

Details of monitoring sites

For all the following locations please refer to Table A1 in Appendix A for the site location and distance to relevant exposure.

Please refer to the DEFRA calculator for calculation of NO₂ levels near receptor which has been used for distance correction. The calculator is available at the following link: <https://lagm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>

Guildford background locations (GD6, GD3, GD10)

Guildford has three long standing background sites.

GD6 is the rural background site located at the Chancies. GD3 is the urban background location near towncentre and major roads and GD10, the Garth is in Ash. The location GD10, was monitored using triplicate diffusion tubes from July 2017. The monthly NO₂ data reported is the highest value of the three results.

Guildford town centre locations (GD1 and GD13)

GD1 This location does not exceeded the annual mean NO₂ national objective. The annual mean NO₂ was measured 29µg/m³ in 2017. The site was discontinued in January 2018.

Near GD13, the YMCA with first floor residential accomodation is identified as potential site of public exposure with regard to long term objective value. GD13 is approximately 2.5m from the kerb and receptor approximately 6.0m and annual mean measured at this location is 31µg/m³. The NO₂ level at the receptor after distance correction is 26.3 ug/m³. This location has never exceeded the annual mean objective value. However, it is located on busy Guildford gyratory and therefore is potentially an important location to study the trend in NO₂ levels.

Junction of Stoke Road/York Road, Guildford (GD2, GD14)

GD2 and GD14 are located at York Road/Stoke Road junction, they are 12 and 5 metres respectively to the nearest receptors. The NO₂ levels at both the locations

remained below the air quality objectives. The annual mean distance corrected to relevant receptor is 26 $\mu\text{g}/\text{m}^3$ at GD2 and 28 $\mu\text{g}/\text{m}^3$ at GD14. From January 2018, GD2 was discontinued and relocated approximately 10 metres west of the original site as the vegetation in the vicinity was preventing air movement. The new location is on the facade of a school building(GD16).

Stoke Road (Lido, GD15),

GD15 was introduced in August 2016. The tube was located on the façade of two cottages adjacent to the Stoke Cross roads, which is heavily trafficked throughout the day. The annual mean was 28 $\mu\text{g}/\text{m}^3$. The site was discontinued at the end of 2017.

Stoughton Road (STN1), Worplesdon Road (WP1),

These locations were added for monitoring in 2017 calendar year, no exceedances were observed and therefore the monitoring discontinued in 2018.

Farnham Road (FRH1)

The monitoring at this location started in January 2017. The results are available for 11months and monthly NO_2 value exceeded 40 $\mu\text{g}/\text{m}^3$ for 6 monitoring months. The annual average obtained after bias correction and distance correction is 28 $\mu\text{g}/\text{m}^3$.

The diffusion tube has been relocated to a residential façade for monitoring in 2018.

Beckingham Road (GD11)

This is a longstanding monitoring location at a residential façade near major road, A3 and has never exceeded the annual mean objective level. It is used as a reference site and will continue to operate as such.

Elm Corner, Wisley (WS1) in July 2016

The location is near to residential properties approximately 250m from the A3 and approximately 1.3km to the southwest of M25, Junction 10. It is representative of semi-rural background and there are currently no exceedances of the objective levels. The monitoring has been discontinued after one full year of monitoring.

A247 Send (Send1 and Send 2)

Send 1 and Send 2 were the two locations which monitored the impact of traffic on A247. The location Send1 was near Send Marsh Road/Send Hill Junction to monitor the impact of traffic buildup near the junction. The annual mean NO₂ at both the locations remain well below the national objective level. The monitoring at both the locations discontinued from January 2018 as no air quality issues were identified.

Compton Village B3000: (C4, 7, 9 and 10)

As was outlined in 2017, annual objective levels were being exceeded at C4, which was on the façade of a residential property, although this has continued to be high the annual mean in 2017 was 40µg/m³. However C9 which is in close vicinity showed slightly higher annual levels 42µg/m³ and therefore showed an exceedance. C7 and 10 are below the annual objective level.

An automatic continuous monitor was set from March to August 2017 adjacent to one of the tube locations in the potentially affected area this is reported in section 3.1.1.

Following the continuous monitoring area centred around 3 cottages in the upper part of the Street, Compton was declared an AQMA in February 2018.

High Street, Ripley (RP1 , RP2 and RP3)

The two locations were added in July 2016. RP1 is located on street furniture in Ripley High Street and RP2 is in Newark Lane. After 18 months of monitoring it was noted that neither of the locations have exceeded the objective level.

Following observations at other locations, the “canyon effect” on properties, a new monitoring location was added to the downpipe of a residential property on Newark Lane from September 2017. The table B.1 includes the 4 months results for this location without any further analysis and interpretation.

In the monitoring year 2018, RP1 and RP2 were closed, RP3 is continued alongwith additional location (RP4) on Newark Lane.

Ripley (RP1, RP2 and RP3)

In Ripley, monitoring was carried out at two locations (RP1 and RP2) for the full calendar year in 2017. RP1 was located on Ripley High Street and RP2 was at Newark Lane. None of these two locations exceeded the national annual mean objective level. Due to considerable local interest and concerns that the monitoring locations were not located near the relevant receptors, this department added a new monitoring location from September 2017. An annual average for this location is provided in the results (Table B.1) however the result is not annualised as the data capture is very low (33%).

In 2018, RP1 and RP2 were discontinued. The monitoring at RP3 will continue for a full calendar year.

A281, Horsham Road, Shalford (SH1)

This kerbside location has shown consistently high readings, which although not exceeding the annual mean objective level at relevant receptor, lead officers to examine the locality. In January 2018 another location was set up on the façade of a property (SH2), early indications show that the levels are likely to be above the objective levels. It is the intention of the authority to carry out a detailed investigation in the area in and around the junction with East Shalford Lane.

Ash and Tongham

The Garth (GD10), The Street Tongham (T1) Oxenden Road, Tongham(T2)

A331 slips - Northbound(GD9) and Southbound (ASH2), The Street Tongham (T1), A331/A31 junction (T2)

GD10 is an urban background site with no objective level exceedances. It has been used for precision monitoring using triplicate tubes from June 2017.

GD9 was a longstanding monitoring location, which was discontinued in May 2016 as there were no exceedances of the objective levels. However, following the publishing of the DEFRA's draft Air Quality Action Plan in 2017, the location was reinstated in April 2017.

Additional sites established at T1, T2 and Ash 2 were set up in 2017. The location T2 was monitored for only 6 months between March – August 2017 (50% data capture). The annualisation has been carried out as per Technical Guidance LAQMTG16 (<https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf>) and using the continuous monitoring results from London Hillingdon and Reading New Town of the Automatic Urban and Rural Network (<https://uk-air.defra.gov.uk/networks/network-info?view=aur>)

None of these locations exceed the annual mean objective.

Short term monitoring

From time to time residents express concern that they may have a localised problem due and following a review of the request we sometimes undertake a short term period of monitor to identify if the area is likely to exceed annual limit values. .

Guildford Park Road (GPR) and Byrefield Road

At the above locations, air quality concerns were received from members of public relating to emissions from buses. On Guildford Park Road, the property adjacent to a bus stop on a busy town centre road was monitored for three months in early 2017. Monitoring indicated levels considerably below the annual mean and was discontinued after 3 months.

At Byrefield Road, this department had no air quality concerns, however monitoring was carried out for three months between November 2017 – January 2018 on request from a local resident the results for both studies are shown in Appendix B.

3.2.1 Future Nitrogen Dioxide (NO₂) monitoring

Proposed new sites all commenced in 2018 are:

1. A3100 Portsmouth Road, Guildford
2. A25, Dorking Road, Abinger
3. London Road, Burpham
4. A31, Farnham Road, Guildford

5. Walnut Tree Close, Guildford
6. Stoke Road, Guildford
7. A246, York Road, Guildford
8. A322, Woodbridge Road, Guildford

Validation

Triplicate tubes were installed at GD13 and GD10 from the month of July 2017. Where triplicate results were available, the highest of the three values was used to calculate the annual average.

In future years, if practical, we will locate a diffusion tube near to the continuous monitoring station operated to test correlation of the annual mean measurement with that from a continuous automatic monitoring device.

In the absence of any long-term continuous real time monitoring in GBC, the proposed location will be at a unit in Camberley, Surrey subject to permission from Surrey Heath Borough Council who are the operators.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
C-AMS	Compton	Roadside	495446	147259	NO2	YES	Chemiluminescent	2	2	1.5
A331-AMS	A331/A31	Kerbside	487970	148462	NO2	NO	Chemiluminescent	NA	1	1.5

Notes:

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

(2) N/A if not applicable.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
GD1	Bridge Street/Walnut Tree Cl	Roadside	499269	149522	NO2	NO	N/A	5	NO	3
GD2	York Road	Roadside	499799	149934	NO2	NO	12	4	NO	3
GD3	Josephs Road	Urban Background	499659	150739	NO2	NO	0	NA	NO	2
GD6	The Chantry	Rural Background	500385	148342	NO2	NO	0	NA	NO	2
GD9	A331 slip, Ash	Kerbside	488275	149859	NO2	NO	16	1	NO	2
GD10	The Garth, Ash	Urban Background	488629	150032	NO2	NO	0	NA	NO	2
GD11	Beckingham Road	Other	498133	150648	NO2	NO	0	8	NO	2
GD13	YMCA	Kerbside	499305	149512	NO2	NO	6	1	NO	3
GD14	Sandfield School	Kerbside	499800	149913	NO2	NO	5	1	NO	3
GD15	Stoke Road, Lido	Roadside	499807	150792	NO2	NO	0	8	NO	2
C4	Little Cottage	Kerbside	495437	147288	NO2	YES	0	1	NO	3
C9	Moors Cottage	Kerbside	495442	147270	NO2	YES	4	1	NO	2.5
C10	Opp. Little Cott	Kerbside	495444	147292	NO2	YES	12	1	NO	3
SH1	A281	Kerbside	500046	147604	NO2	NO	4	1	NO	3
RP1	Ripley High St	Kerbside	505243	156819	NO2	NO	5	1	NO	3

RP2	Newark Lane	Kerbside	505090	156777	NO2	NO	6	1	NO	3
RP3	Newark Lane	Kerbside			NO2	NO	0	1	NO	3
WS1	Elm Corner	Rural	507346	158005	NO2	NO	7	NA	NO	3
WP1	Worplesdon Road	Kerbside	497972	152575	NO2	NO	5	1	NO	3
ASH1	Britten Cl	Other	489883	150771	NO2	NO	4.5	10	NO	2.5
ASH2	Courier House	Kerbside	488350	150078	NO2	NO	NA	1	NO	2
Send1	Box and Holly Court	Other	502861	155421	NO2	NO	0	5	NO	3
Send2	Lancaster Hall	Kerbside	502172	155843	NO2	NO	12	1	NO	3
WCL	West Clandon	Kerbside	504477	151404	NO2	NO	3	1	NO	2.5
T1	Tongham	Kerbside	488636	148845	NO2	NO	2.5	1	NO	2
T2	A31/A331 junction	Kerbside	487970	148462	NO2	NO	NA	1	NO	2
STN	Stoughton Road	Kerbside	498831	151472	NO2	NO	3	1	NO	2
FRH1	Farnham Road	Kerbside	499024	149402	NO2	NO	4	1	NO	2
GPR	Guildford Park Road	Roadside	499027	149601	NO2	NO	0	4	NO	2
WKR1	Woking Road	Kerbside	499813	151204	NO2	NO	0	6	NO	1.5
PR1	Portsmouth Road	Kerbside	499355	149292	NO2	NO	0	1	NO	2
WP2	Byrefield Road	Kerbside	498114	151769	NO2	NO	5	1	NO	2

Notes:

- (1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).
- (2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
GD1	Roadside	Diffusion Tube	100	100	35	31	33	36	29
GD2	Roadside	Diffusion Tube	100	100	39	25	33 ⁽³⁾	35	31
GD3	Urban background	Diffusion Tube	100	100	22	16	20 ⁽³⁾	24	17
GD5	Kerbside	Diffusion Tube			45	40	46	43 ⁽³⁾	
GD6	Rural background	Diffusion Tube	100	100	14	14	13	14	10
GD8	Roadside	Diffusion Tube			23	19	25	27 ⁽³⁾	
GD9	Kerbside	Diffusion Tube	100	83	27	31	30	21 ⁽³⁾	17
GD10	Urban background	Diffusion Tube	100	100	18	16	17	20	15
GD11	Other	Diffusion Tube	100	100	29	29	28	29	24
GD13	Kerbside	Diffusion Tube	100	100	35	31	38	35	31
GD14	Roadside	Diffusion Tube	100	100	37	30	42	36	32
GD15	Other	Diffusion Tube	83	83				32	28
C1	Kerbside	Diffusion Tube				22	28	29 ⁽³⁾	
C2	Kerbside	Diffusion Tube				32	28	28 ⁽³⁾	
C3	Other	Diffusion Tube					21 ⁽³⁾	22 ⁽³⁾	
C4	Roadside	Diffusion Tube	100	100		67 ⁽³⁾	53	50	40
C5	Roadside	Diffusion Tube					27 ⁽³⁾	28 ⁽³⁾	
C6	Other	Diffusion Tube					17 ⁽³⁾	19 ⁽³⁾	
C7	Roadside	Diffusion Tube	100	100				40 ⁽³⁾	34
C9	Kerbside	Diffusion Tube	92	92				50 ⁽³⁾	42
C10	Kerbside	Diffusion Tube	92	92				39 ⁽³⁾	31
SH1	Kerbside	Diffusion Tube	100	100				37 ⁽³⁾	35
RP1	Road Side	Diffusion Tube	100	100				34 ⁽³⁾	27
RP2	Kerbside	Diffusion Tube	100	100				29 ⁽³⁾	24
WS1	Rural	Diffusion Tube	100	100				14 ⁽³⁾	14
WP1	Kerbside	Diffusion Tube	100	100				31 ⁽³⁾	25
ASH1	Near-road	Diffusion Tube	100	100				19 ⁽³⁾	17

Send1	Near-road	Diffusion Tube	100	100				28 ⁽³⁾	22
Send2	Kerbside	Diffusion Tube	92	92				26 ⁽³⁾	21
WCL	Roadside	Diffusion Tube	100	100				27 ⁽³⁾	20
T1	Kerbside	Diffusion Tube	100	100					23
T2	Kerbside	Diffusion Tube	100	50					32 ⁽³⁾
STN	Kerbside	Diffusion Tube	90	75					24
FRH1	Kerbside	Diffusion Tube	92	92					34
GPR	Roadside	Diffusion Tube	100	33					
WKR1	Other	Diffusion Tube	100	25					
PR1	Kerbside	Diffusion Tube	100	25					
WP2	Roadside	Diffusion Tube	100	17					
RP3	Kerbside	Diffusion Tube	100	33					
AHS2	Kerbside	Diffusion Tube	90	75					22

- Diffusion tube data has been bias corrected
- Annualisation has been conducted where data capture is <75%

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

- (1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
- (2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).
- (3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.1 – Trends in Annual Mean NO₂ Concentrations (2013 – 2017)

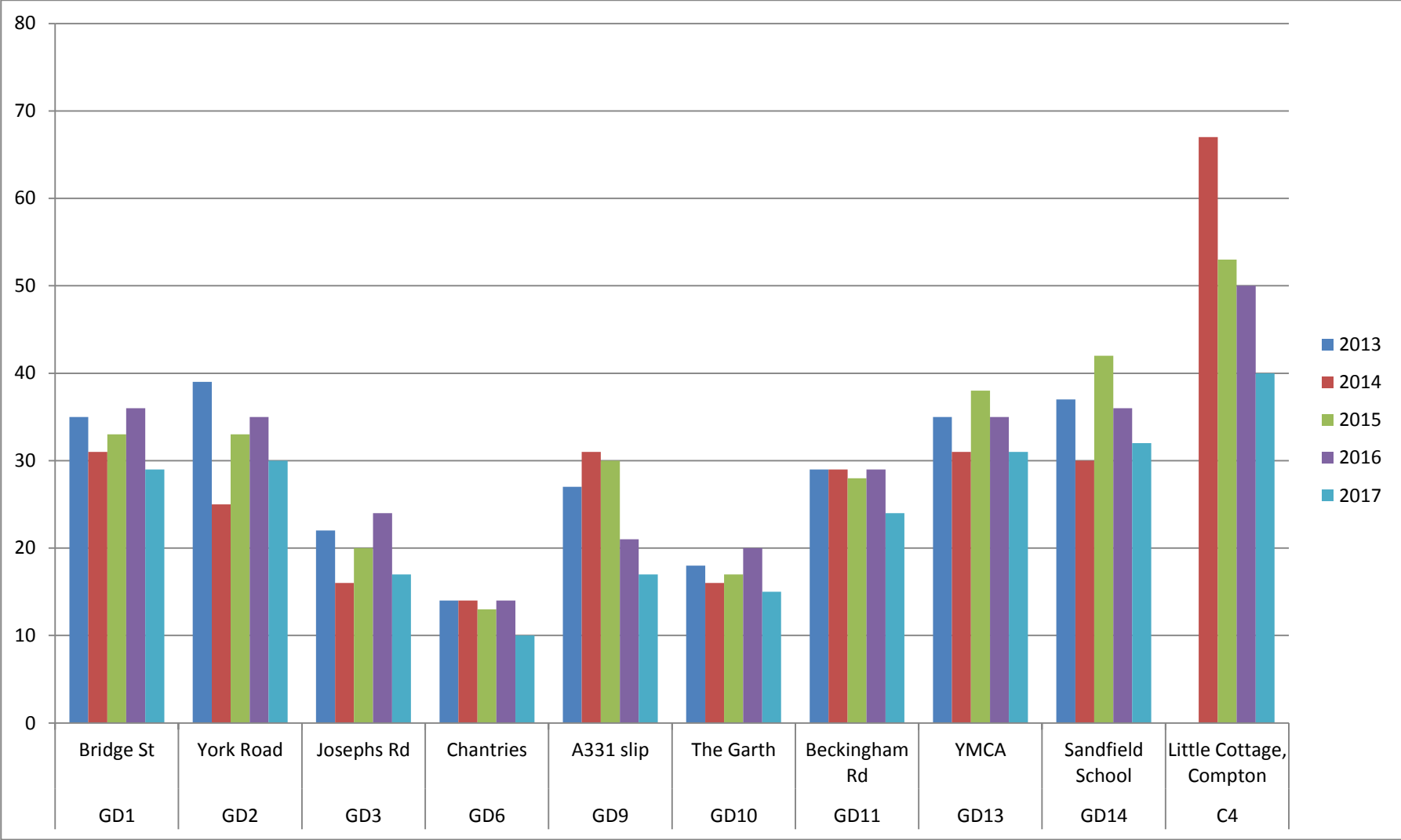


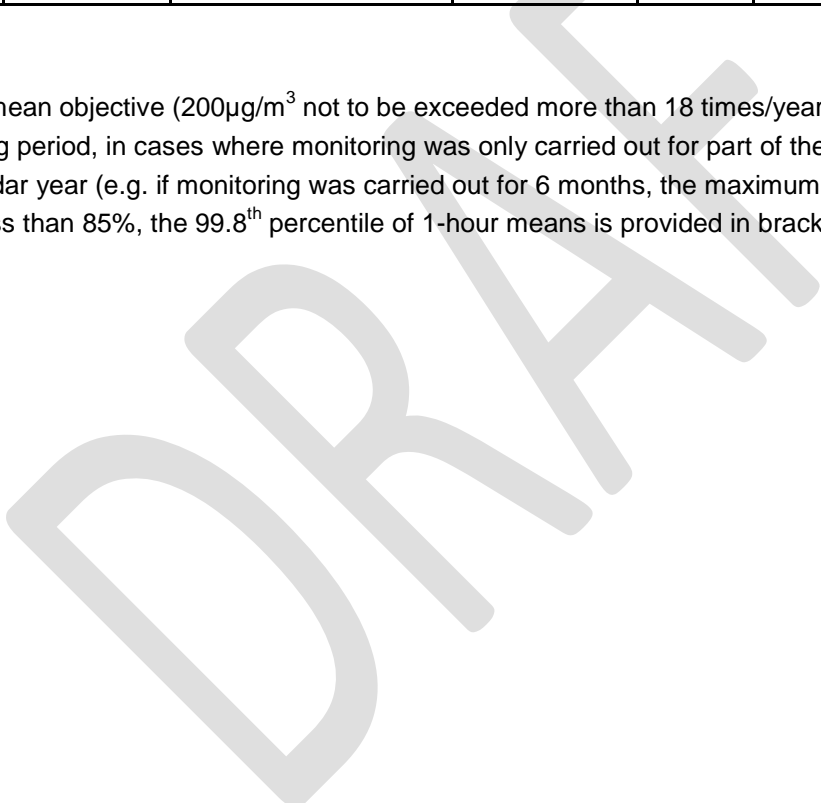
Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2013	2014	2015	2016	2017
C-AMS	Roadside	Continuous	97.8	41.6					0 (147)
A331 - AMS	Roadside	Continuous	91.3	45.6					2 (111)

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

- (1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
- (2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).
- (3) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.



Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2017

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.90) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
GD1	51.0	36.0	30.0	23.0	24.0	31.0	33.0	28.0	35.0	30.0	34.0	26.0	32.0	29	29
GD2	50.0	43.0	25.0	29.0	26.0	33.0	26.0	27.0	36.0	36.0	39.0	33.0	34.0	31.0	26.0
GD3	34	22	19	16	16	15	15	16	18	18	25	16	19.0	17.0	17.0
GD6	20	13	11	10.0	6	8	8	9	10	11	15	12	11.0	10.0	10.0
GD9			23	18.0	16	16	20	13	20	21	21	20	19.0	17.0	16.0
GD10	25	21	20	13.0	11	12	11	15	15	19	23	18	17.0	15.0	15.0
GD11	44	31	25	19.0	26	29	25	23	26	22	25	25	27.0	24.0	24.0
GD13	54	40	37	27.0	28	31	31	33	33	30	38	28	34.0	31.0	26.3
GD14	55	42	35	30.0	23	34	32	31	39	35	39	27	35.0	32.0	28.0
GD15	42	45	30	26.0	24	26	25	27	32	29	no sample	no sample	31.0	28.0	28.0
C4	68	43	42	42.0	36	32	43	30	51	46	54	39	44.0	40.0	40.0
C7	54	37	35	35.0	38	41	39	30	36	35	32	35	37.0	34.0	34.0
C9	68	48	39	41.0	23	44	49	48	50	51	50	no sample	46.5	42.0	33.0
C10	51	no sample	33	29.0	34	40	35	27	42	31	38	24	35.0	31.0	21.0

Guildford Borough Council

SH1	63	42	40	36.0	21	43	43	37	38	31	42	35	39.0	35.0	28.0
RP1	54	40	30	21.0	18	28	28	19	36	31	35	23	30.0	27.0	23.4
RP2	45	30	26	19.0	17	26	21	25	25	25	28	2 (invalid)	26.0	23.5	21.4
RP3									27	27	28	23	26.0	24.0	24.0
WS1	26	20	13	12	13	12	13	11	14	15	19	14	15.0	14.0	14.0
WP1	43	32	29	20	22	22	27	23	29	28	32	28	28.0	25.0	21.4
ASH1	33	24	23	15	12	16	14	16	18	18	26	16	19.0	17.0	18.2
ASH2			22	25	15	no sample	24	23	18	30	37	27	25.0	22.0	22.0
Send1	42	29	27	21	15	25	21	22	24	20	27	20	24.0	22.0	22.0
Send2	43	26	14	20	12	22	21	23	22	no sample	25	23	23.0	21.0	16.0
WCL	36	26	21	20	23	16	20	21	22	22	22	16	22.0	20.0	18.0
T1	55	29	26	19	13	20	22	23	15	23	36	21	25.0	23.0	21.2
T2			39	26	24	20	38	35					30.0	32(1)	32.0
STN			34	25	20	29	25	26	27	31	27	no sample	27.0	24.0	22.0
FRH1	51	45	42	28	28	41	39	28	40	33	42	no sample	38.0	34.0	28.0
GPR				22	21	31	26								
WKR1										27	30	22			
PR1										41	31	35			
Bryer Rd											24	19			

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

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

(2) Distance corrected to nearest relevant public exposure.

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

C.1 Continuous monitoring reports (Compton) and (Tongham).

See Appendix F

C.2 Diffusion Tubes

Lambeth Scientific Services supplied all the diffusion tubes for 2017 period, these were prepared using a 50% triethanolamine (TEA) method

C.2 Table of bias adjustment factors:

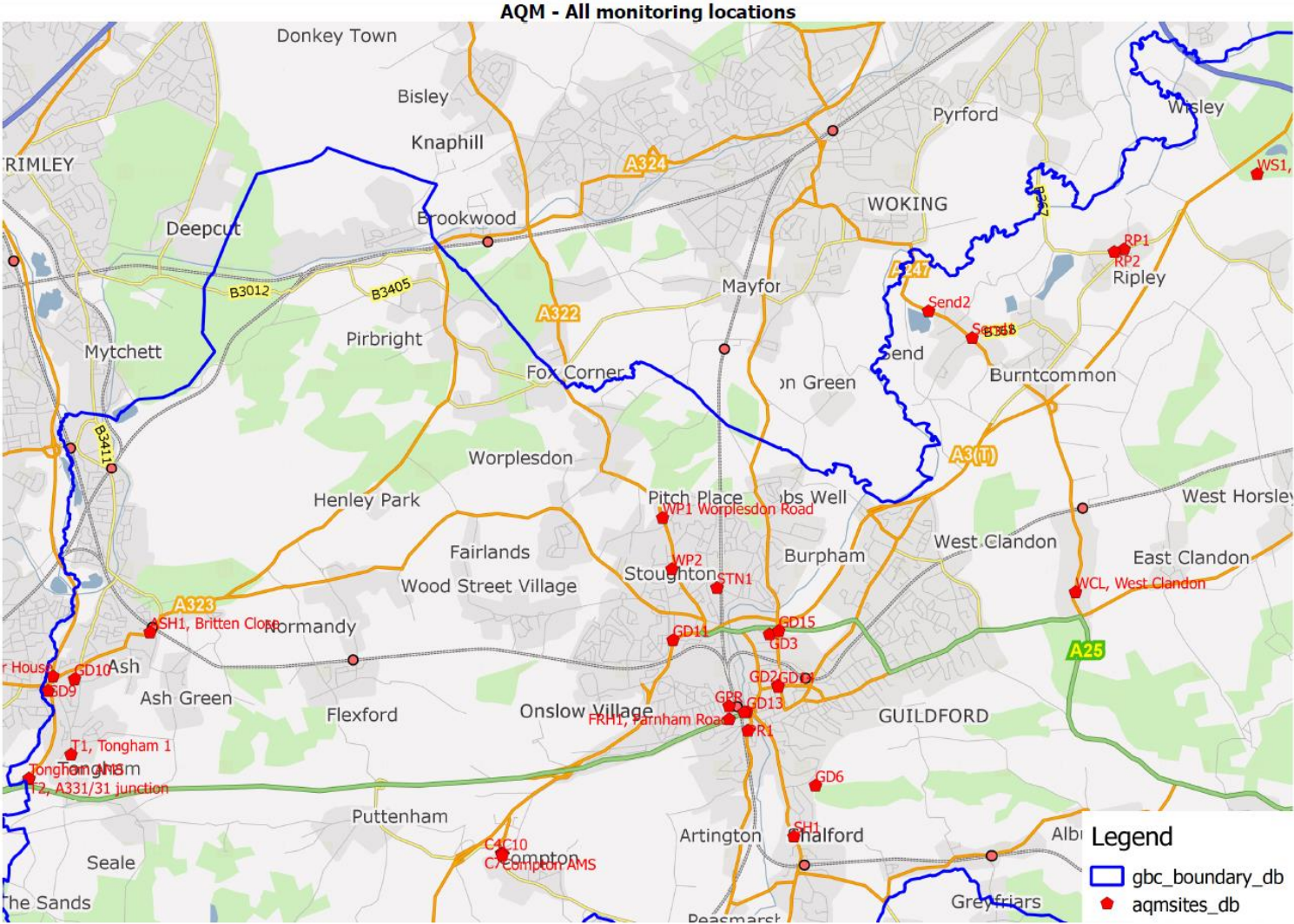
Year	National bias adjustment factor, Lambeth (50% TEA in acetone)	Reigate-Banstead BC bias adjustment factor based on triplicate tubes at three real time sites
2014	0.80	
2015	1.07	
2016	0.94	1.02 (used for bias correction)
2017	0.90	

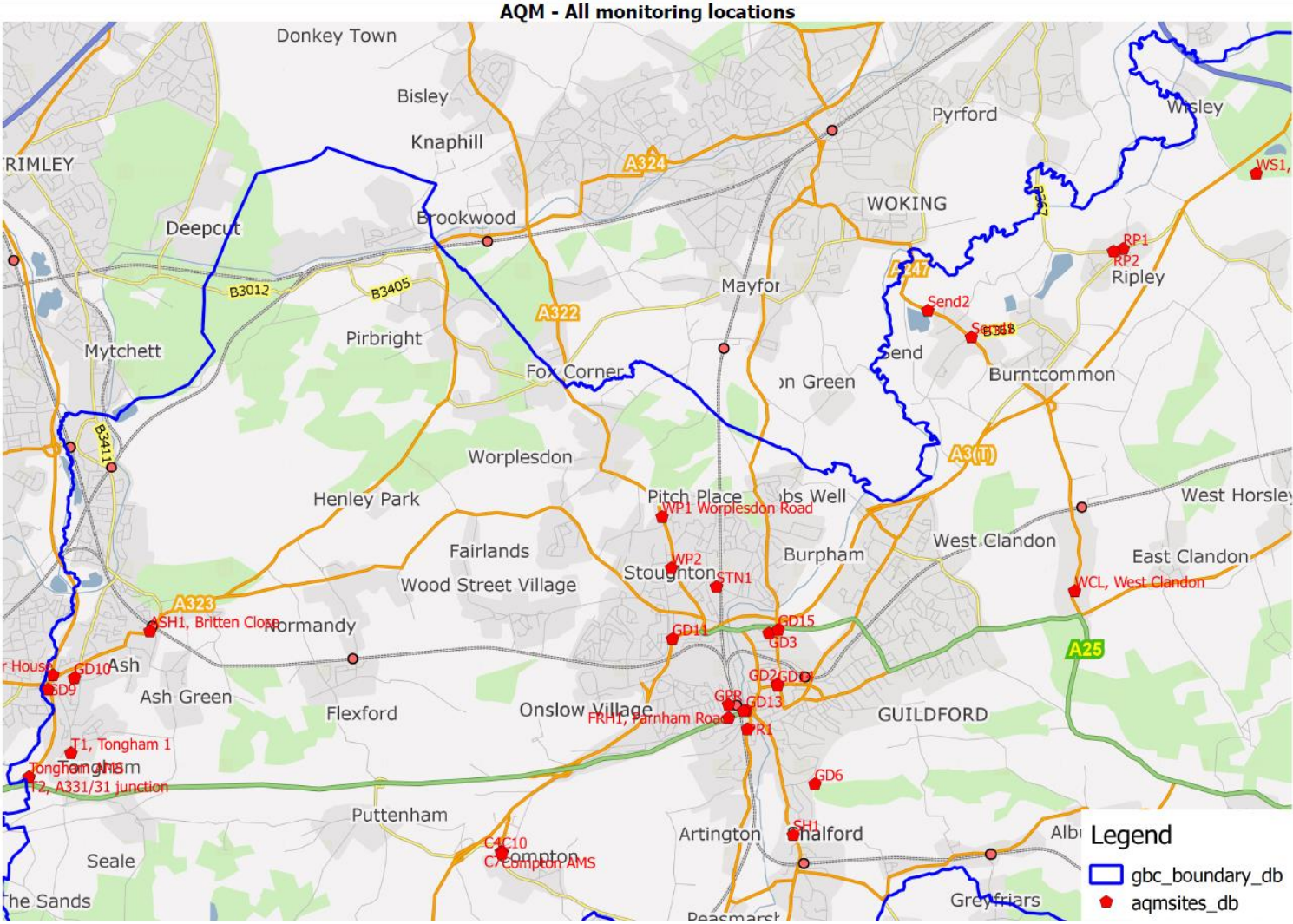
C.3 Annualisation of data:

A period adjustment (annualisation) calculation was carried out for the diffusion tube sites with valid data capture less than 75% (75% is the threshold for satisfactory data capture according to Box 3.2 in LAQM.TG(09)). The realtime monitoring data for Reading New Town and London Hillingdon, which is part of national network (https://uk-air.defra.gov.uk/data/flat_files?site_id=LON6) were used to obtain the annualisation factor. The calculations are shown below.

Reading New Town 2017			London Hillingdon		T2 A31/A331	B1 when T2 is available (PM1)	B2 when T2 is available (PM2)
Month	NO2 (B1)		Month	NO2 (B2)			
Jan	42		Jan	64			
Feb	28		Feb	73			
Mar	25		Mar	73	39	25	73
Apr	27		Apr	52	26	27	52
May	28		May	37	24	28	37
Jun	21		Jun	41	20	21	41
Jul	17		Jul	39	38	17	39
Aug	18		Aug	38	35	18	38
Sep	26		Sep	53			
Oct	29		Oct	79			
Nov	39		Nov	79			
Dec	26		Dec	46			
Average	27			56	30	23	47
Ratio R1	Avg B1/PM1	1.1739					
Ratio R2	Avg B2/PM2	1.1915					
Ra (Avg R1:R2)		1.18					
T2 (annualised average)	30x1.18	35.4					

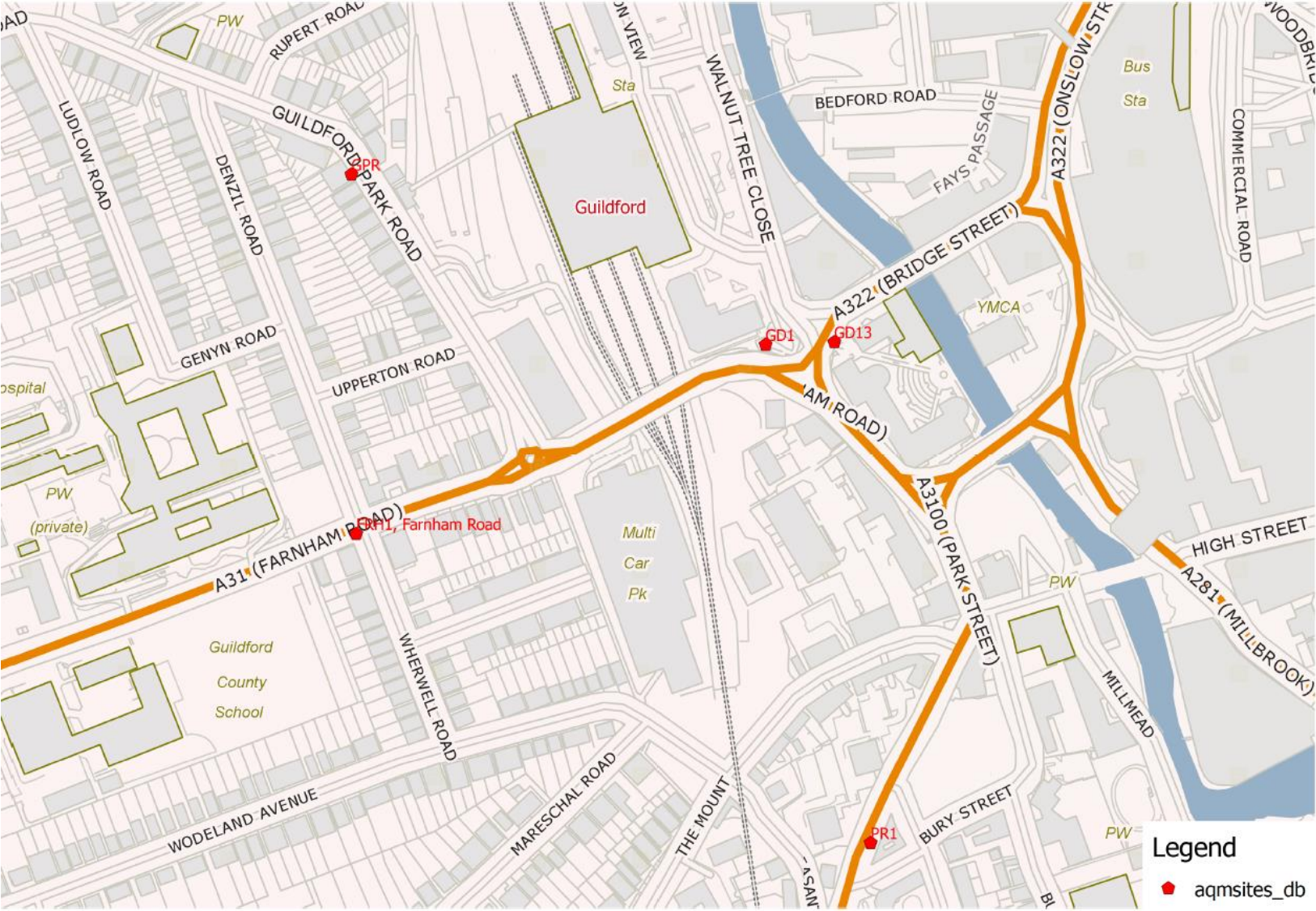
Appendix D: Map(s) of Monitoring Locations and AQMAs



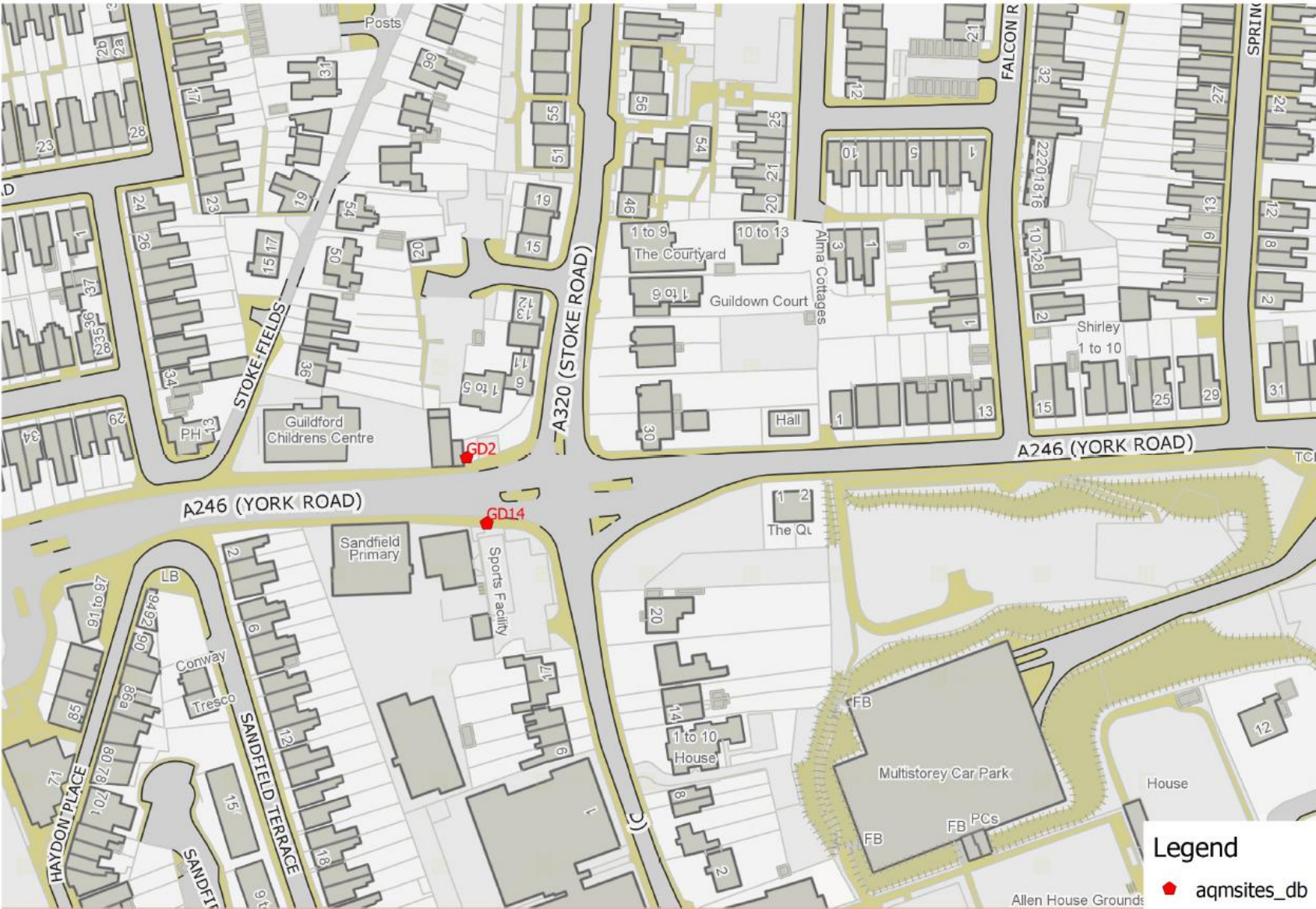


Map 1: All Sites

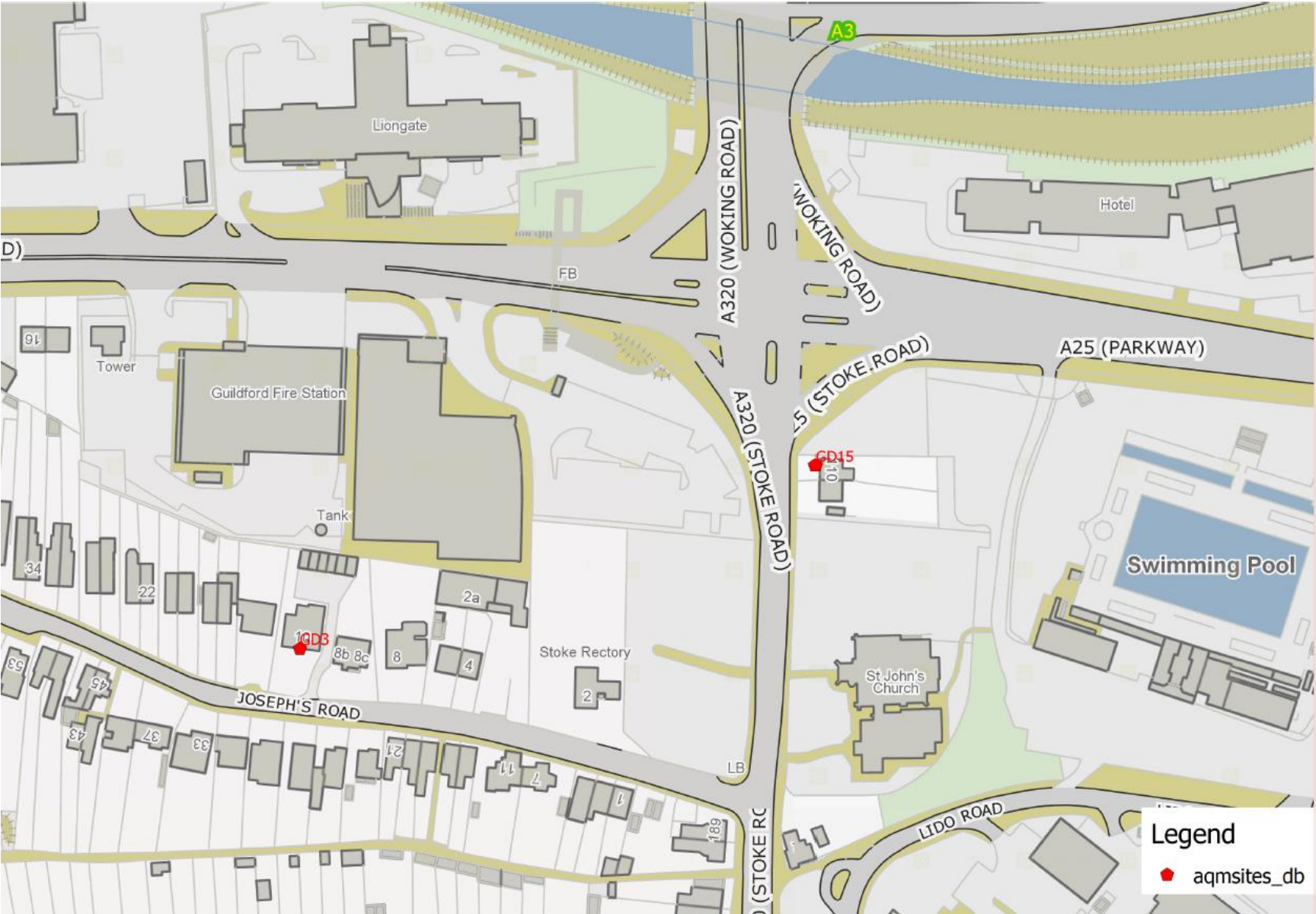
Guildford Central



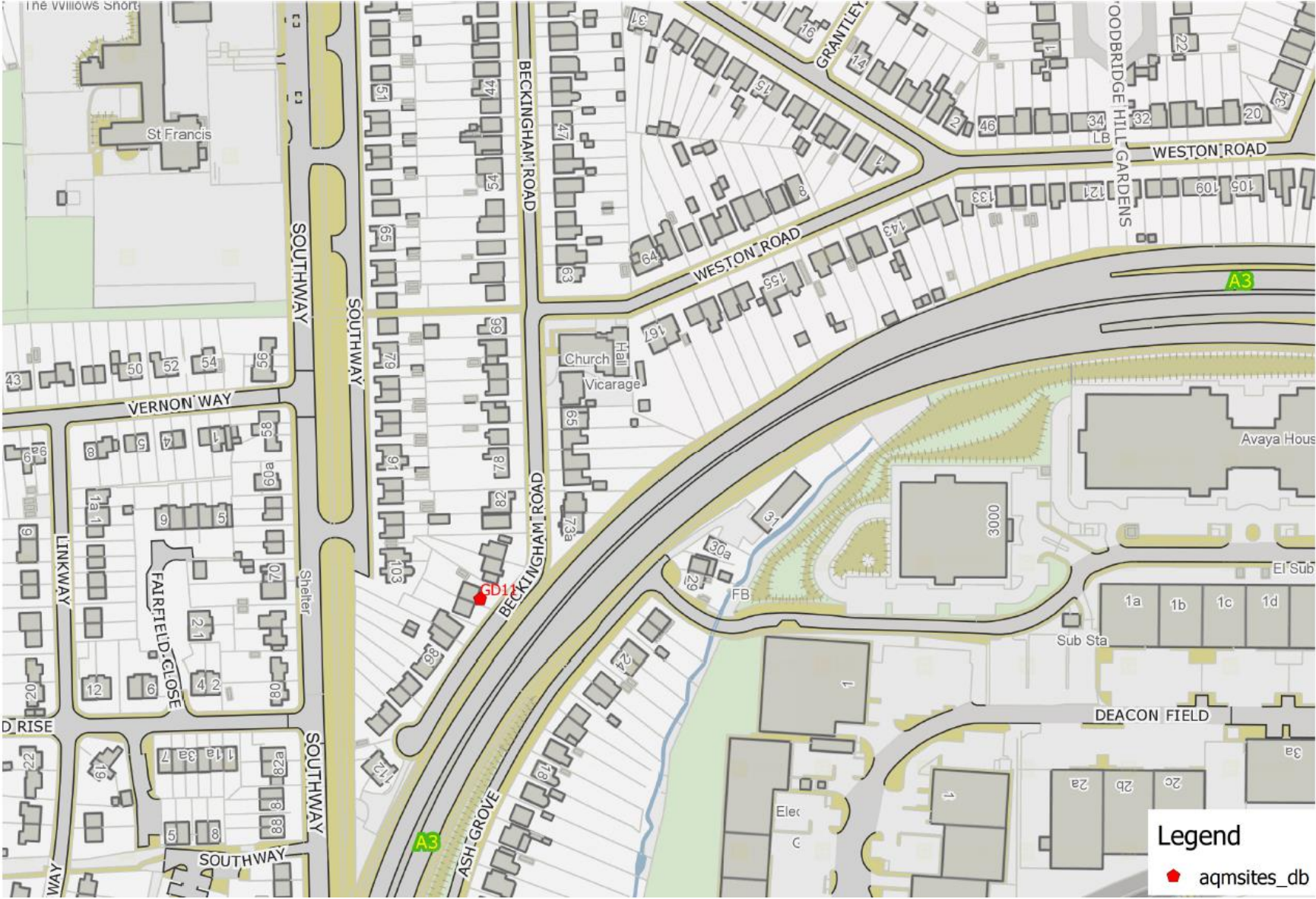
York Road Stoke Road Junction



Josephs Road (GD3) and Stoke Rd GD15



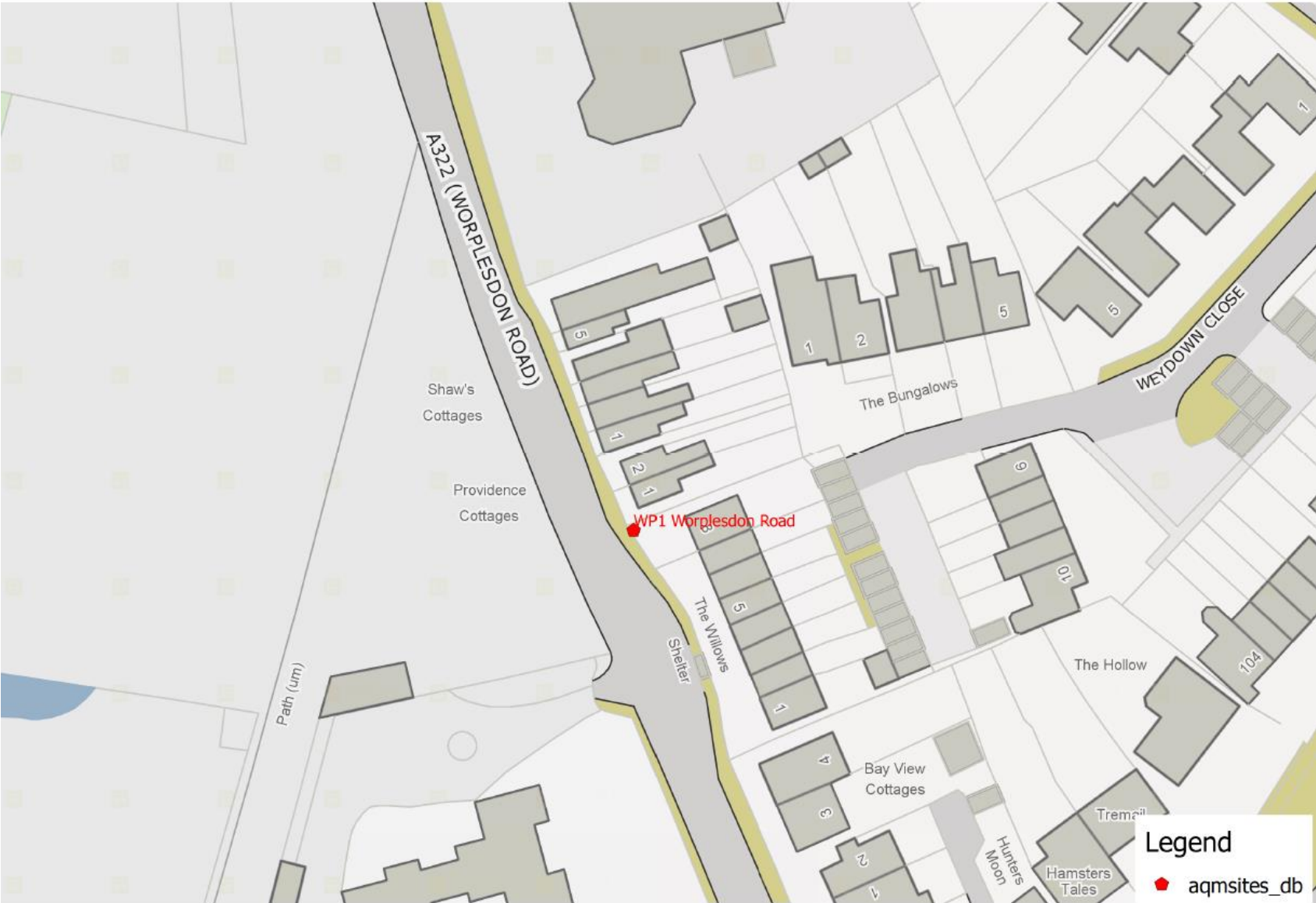
GD11 Beckingham Road



STN1 Stoughton Road



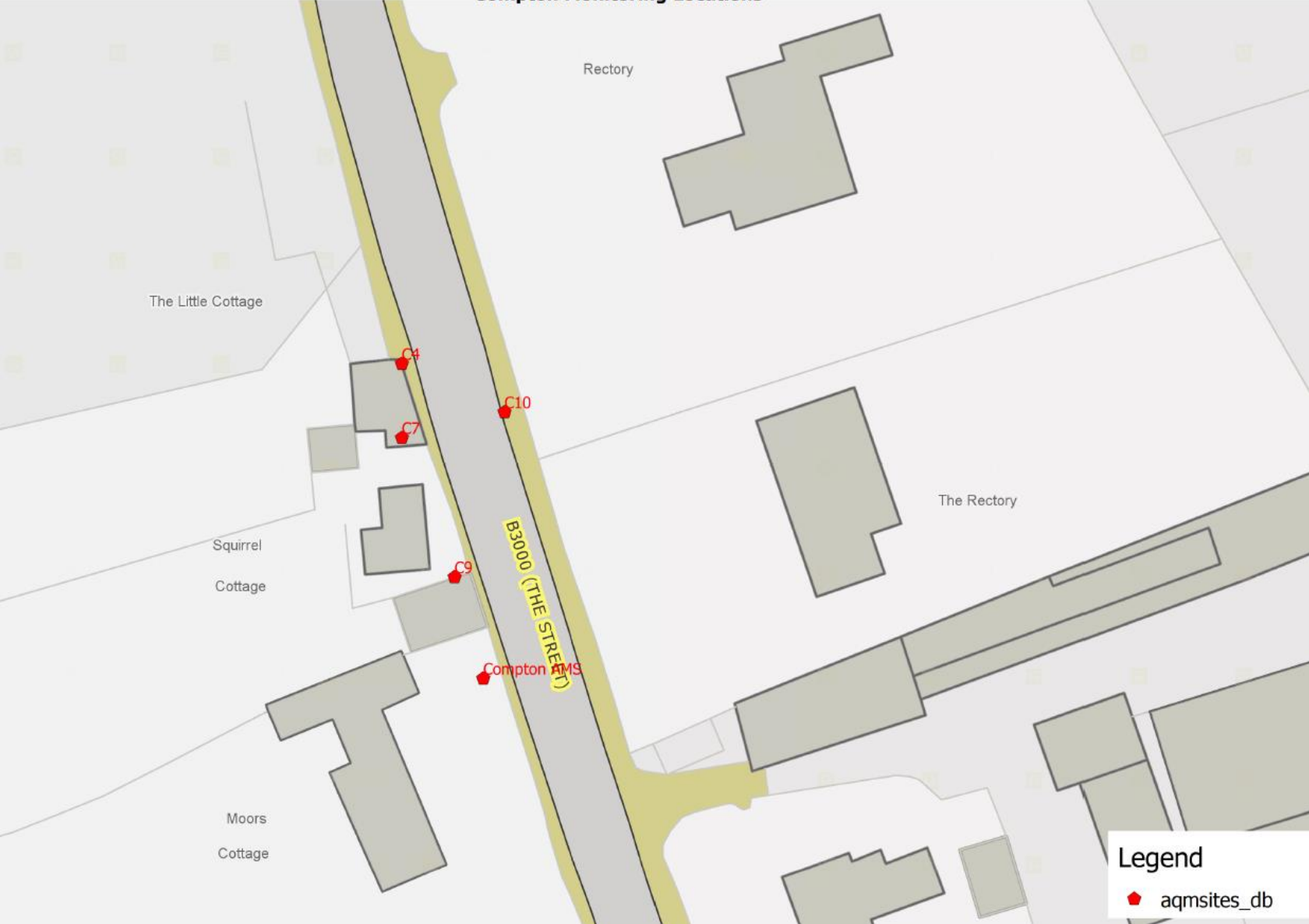
WP1 Worplesdon Road



Shalford



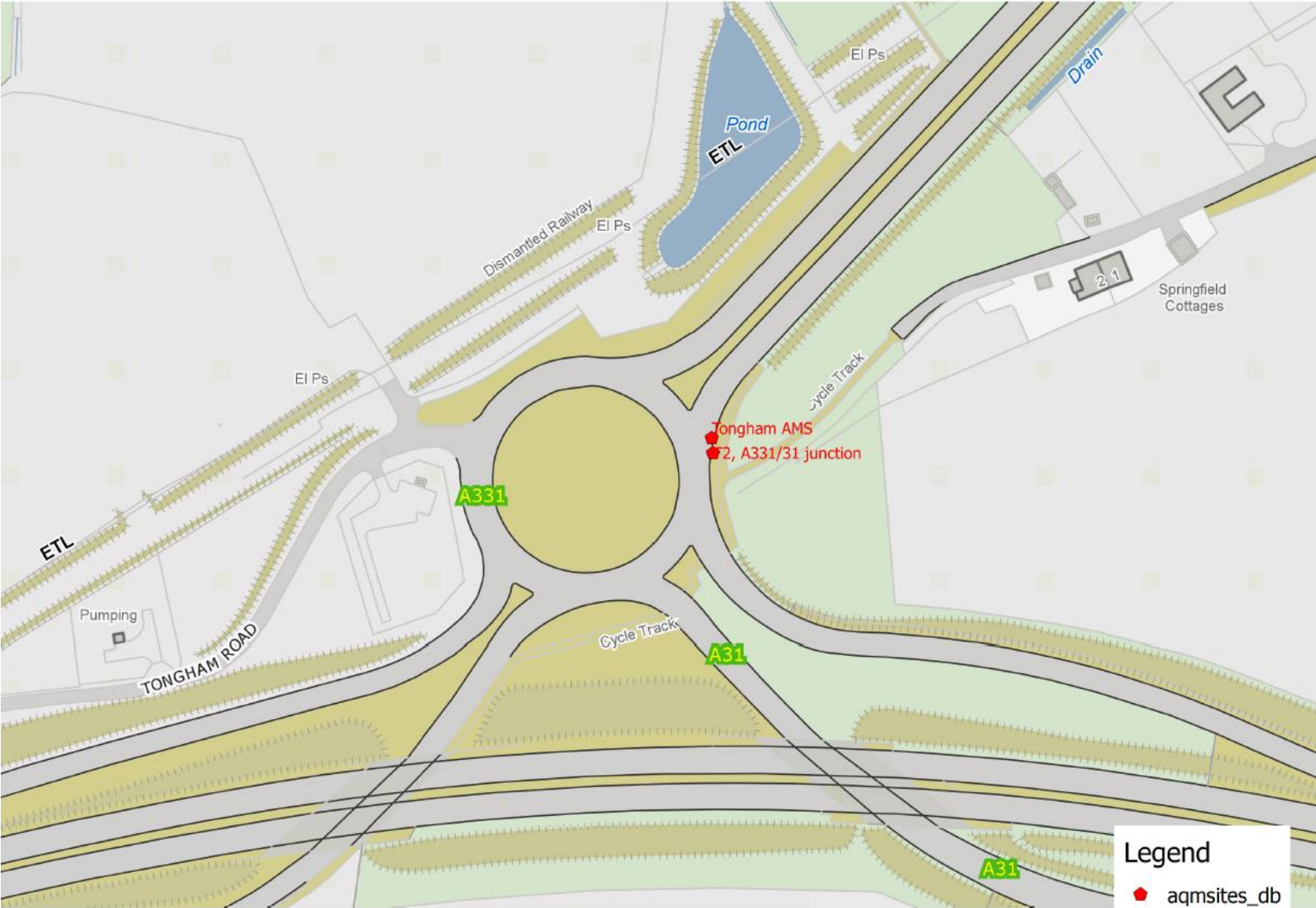
Compton Monitoring Locations



Tongham Monitoring Locations - 1



Tongham Monitoring Locations - 2



Ash monitoring locations



Ash monitoring locations - ASH1



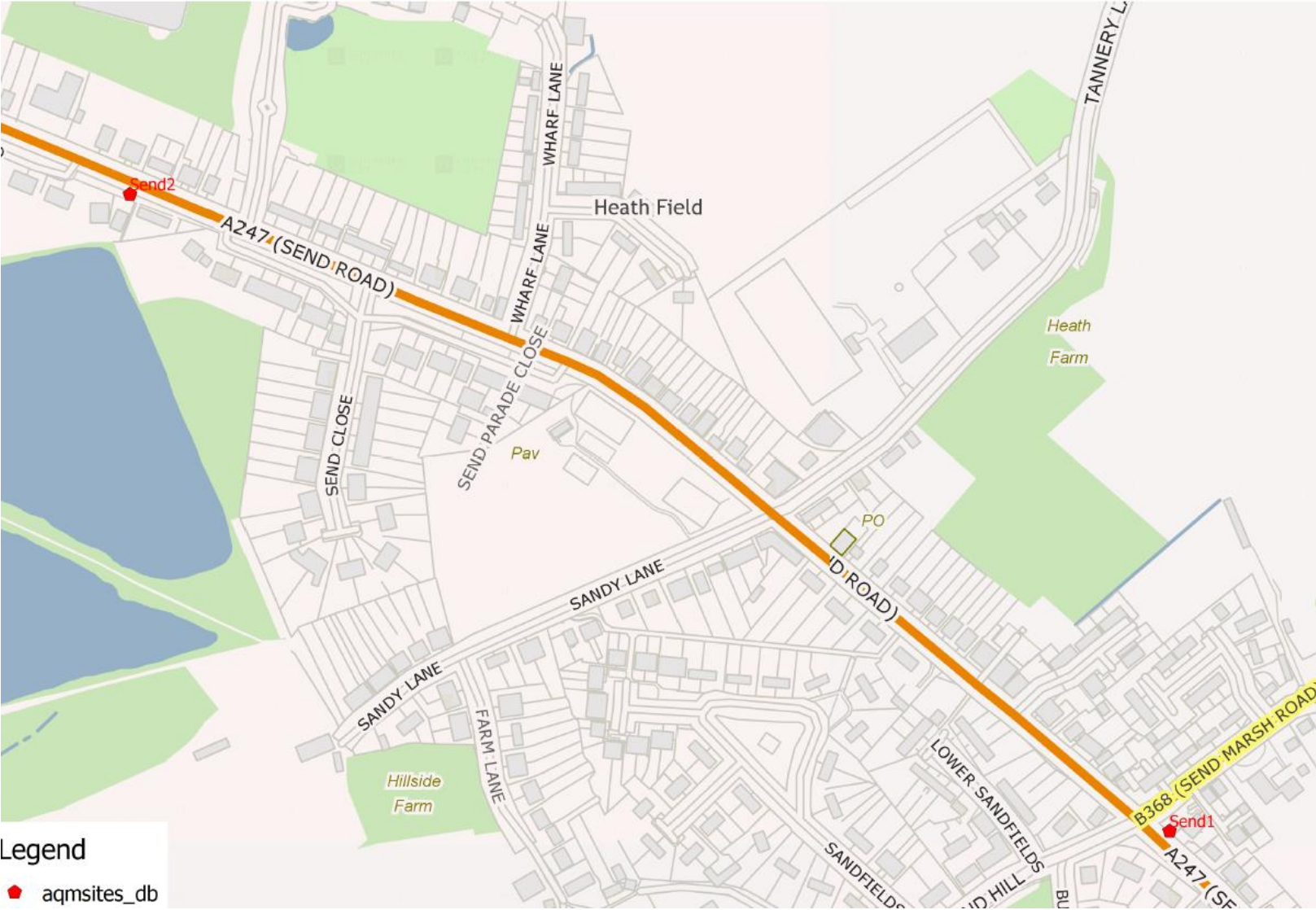
WCL West Clandon



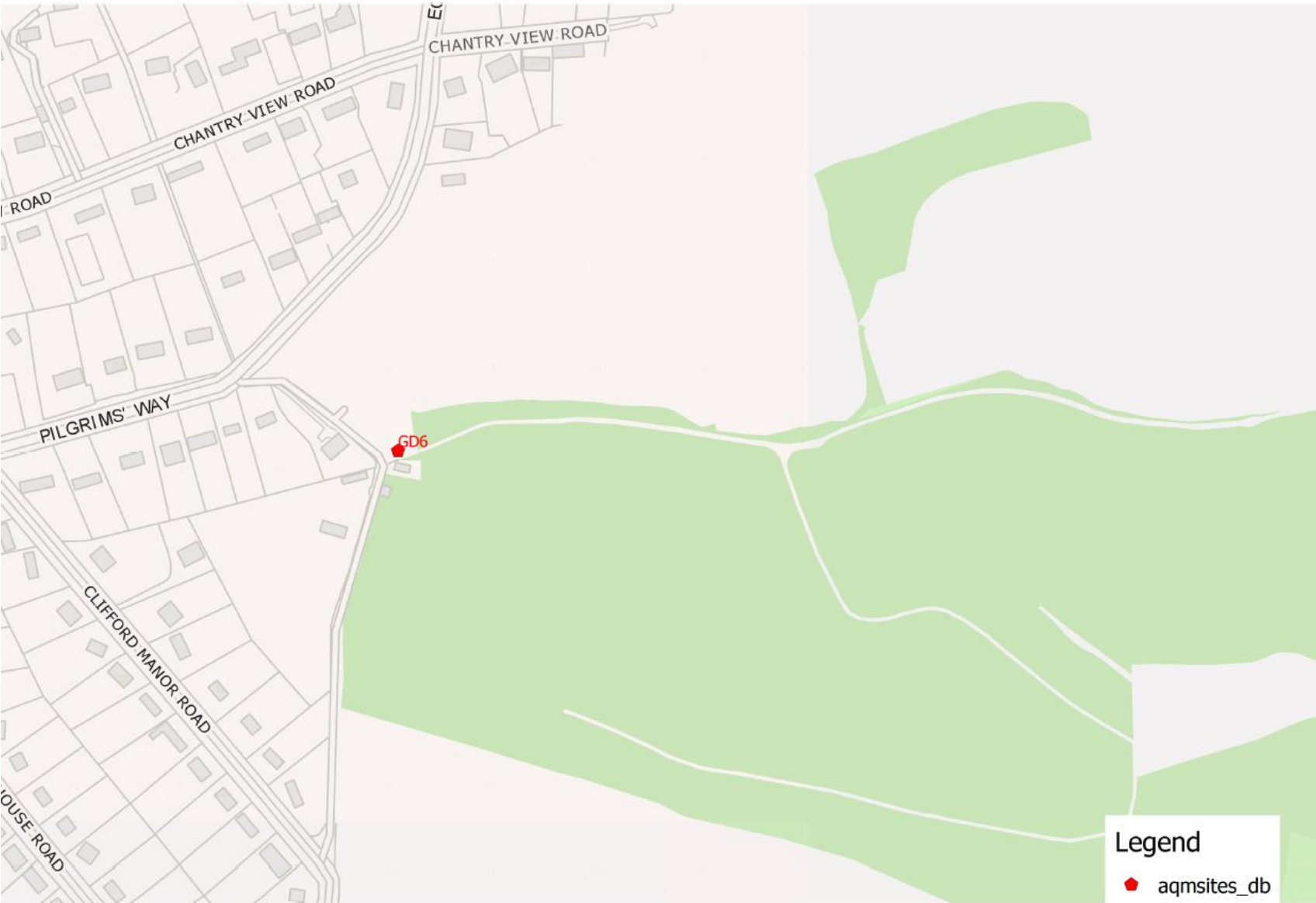
Ripley Monitoring Locations



Send Monitoring Locations



GD6 - Guildford Rural Background



WS1 Elm Corner



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Continuous Automated Monitoring reports for Compton and Tongham

See attached PDF Files

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Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EPUK	Environmental Protection UK
EU	European Union
FDMS	Filter Dynamics Measurement System
GBC	Guildford Borough Council
IAQM	Institute of Air Quality Management
JAQU	Joint Air Quality Unit

LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SCC	Surrey County Council

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References

1. Guildford Borough Council Air Quality Strategy 2017-2022
2. Air Quality Management Area The Street Compton
3. Draft AQAP The Street Compton
4. Local Air Quality Management (TG16) Defra April 2016
5. Guildford Air Quality Reviews and Assessments 2006-2016
6. LAQM Tools
7. Guildford Transport Strategy 2017: <http://www.guildford.gov.uk/newlocalplan/CHttpHandler.ashx?id=21339&p=0>
8. Surrey County Council (2011) Surrey Transport Plan: Air Quality Strategy
9. Guildford Borough Cycling Plan: <https://www.travelsmartsurrey.info/cycling/guildford-consult>
10. Nitrogen dioxide fall off with distance (Calculator to estimate annual average nitrogen dioxide at one distance from the road using measurements made at a different distance from the same road) <https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>
11. DEFRA's draft air quality action plan: https://consult.defra.gov.uk/airquality/air-quality-plan-for-tackling-nitrogen-dioxide/supporting_documents/Draft%20Revised%20AQ%20Plan.pdf