Reigate & Banstead
BOROUGH COUNCIL
Banstead | Horley | Redhill | Reigate

2022 Air Quality Annual Status Report (ASR)

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

October 2022

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Executive Summary: Air Quality in Our Area

Air Quality in Reigate and Banstead Borough Council

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

Reigate and Banstead Borough is located in South East England, within the county of Surrey. To the south lies Crawley Borough, to the east Tandridge District, to the west Mole Valley District and to the north Epsom and Ewell Borough and the London Boroughs of Croydon and Sutton. The M25 runs through the borough. The main air quality issues identified are in relation to road traffic, particularly within the towns of Reigate and Horley and close to major roads (the A23 Brighton Road, as it passes through the village of Hooley and Junction 8 of the M25).

There are currently nine AQMAs, of varying size, declared in the towns of Reigate, Horley, Redhill, Banstead, and in Merstham, Hooley, and along the M25 (see http://uk-air.defra.gov.uk/aqma/list for further information). A specific action plan is currently in place for the M25 and Horley, which includes emissions from Gatwick Airport, and is considered in this report. An action plan for road traffic across the borough is also being developed. The action plan is being informed by a Surrey wide air quality modelling project, which has provided an updated set of model results and

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

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

source apportionment, on which to base the measures within the plan. Table 2.2 outlines both local and borough wide measures which are currently being implemented, with further measures being developed once Gatwick Airport's current expansion plans are finalised (2023) given the forecast growth from 46.5 million passengers per annum in 2019 to 72.3 mppa by 2032 and the current concerns of West Sussex and Surrey traffic teams on how this growth will impact the M25 / M23 and the local road network (A217 / A23). Reigate and Banstead Borough Council is actively working to improve air quality in its area through the implementation of these measures, as well as implementation of their Local Transport Plan and through working in partnership with Planning and Public Health colleagues.

Previous ASR reports (2017 – 2019) concluded that, as a whole, there appears to be a downward trend in air pollution levels, i.e. improvement in air quality throughout Reigate and Banstead, particularly when evaluated over a number of years (graphs of 3-year rolling averages (included in section 3.3 of this report from 2004). It is difficult to continue to draw this conclusion for 2021, as it was with 2020, due to the effect of the COVID-19 pandemic. Nitrogen dioxide concentrations continue to be below the 1-hour mean at all real time sites. In 2021, there was one exceedance of the annual mean nitrogen dioxide objective, in AQMA 13 (Hooley). Once distance corrected for relevant exposure, the concentration did not exceed the objective.

All relevant objectives are met outside AQMAs. Measured concentrations of PM_{10} and benzene continue to be below the relevant air quality objectives at all locations.

Until the completion of work by Gatwick Airport, Reigate and Banstead Borough Councils plans to revoke the M25 AQMA are on hold.

Actions to Improve Air Quality

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

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

Reigate and Banstead Borough Council has taken forward a number of measures during the reporting year of 2021 in pursuit of improving local air quality. Since the last ASR a number of measures have been completed, and the Council has continued to progress other measures to both directly improve the borough's air quality through improved traffic management and promotion of lower emissions transport, promotion of lower emission energy plant and on-going air quality monitoring, as well as to provide evidence for further air quality work.

Recently completed measures include the council having run a training day for local taxi drivers in October 2021 in conjunction with the Energy Saving Trust (EST), to give a real world view of using an electric vehicle as a taxi / private hire vehicle. The virtual component of the training day was attended by 30 drivers, while the afternoon test drive event, which had four different vehicles on display and available for test drives, was attended by around 20 drivers and the heads of the local taxi associations. The council also completed a further piece of work with the EST looking at the roll out of electric vehicle charging infrastructure across council car parks and also on street charging. The purpose of the work was to identify the priority of the charge point roll out to council car parks based on existing charging availability and also proximity of residential premises with and without a drive within five- and ten-minutes walking distances of the carparks. The work has since informed the charge point prioritisation list for the council. Details of measures are included in Table 2.2.

[5] Defra. Clean Air Strategy, 2019

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

Conclusions and Priorities

Monitoring results for 2017 to 2019 show that air quality within Reigate and Banstead continued to exceed the annual mean nitrogen dioxide objective at locations within AQMA 3 and AQMA 13, the latter having a detailed network of diffusion tubes. Overall, there appears to be a downward trend in air quality throughout the borough since 2004. This downwards trend is also reflected in 2020 and 2021 concentrations throughout the borough, however, due to the impact of COVID-19 on travel behaviour, 2020 and 2021 concentrations should be treated with caution.

The borough wide air quality plan, which is currently in development, is already, to a large extent, being implemented through a number of measures outlined above.

Local Engagement and How to get Involved

Members of the public can help improve air quality in Reigate and Banstead by travelling using sustainable transport options, such as walking, cycling, and using public transport. Car sharing is also a relatively easy way to reduce private car use (https://surrey.liftshare.com/), and, if members of the public are considering buying a car, consider a hybrid or electric vehicle as an alternative to a pure petrol or diesel vehicle.

Local Responsibilities and Commitment

This ASR was prepared by Air Quality Consultants and the Environmental Health Department of Reigate and Banstead Council, and has the support and agreement of the following officers and departments:

Head of Environmental Health

Planning Policy Lead

Sustainability Projects officer

Surrey air alliance (partners from other local authorities in Surrey, including Surrey County Council Public Health, SCC Transport, and SCC Trading Standards.

This ASR has been approved by:

Head Of Environmental Health

This ASR has not been signed off by the Director of Public Health at SCC given the council actively works with Public Health Colleagues on actions to improve air quality via the Surrey Air Alliance.

If you have any comments on this ASR please send them to Environmental Health at:

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Email: environmental.protection@reigate-banstead.gov.uk

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1 Local Air Quality Management

This report provides an overview of air quality in Reigate and Banstead Borough 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 Reigate and Banstead 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 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

The AQMAs declared by Reigate and Banstead Borough Council are shown in Figure 2.2.1 to Figure 2.2.7 and found in Table 2.1. Also, see Appendix D: Maps of Monitoring Locations and AQMAs, which provides a map of air quality monitoring locations in relation to the AQMAs. The air quality objective pertinent to the current AQMA designations is the nitrogen dioxide annual mean objective.

To date, the authority is gathering further information before revoking AQMAs where current measurements are below the objective (see section 2.1).

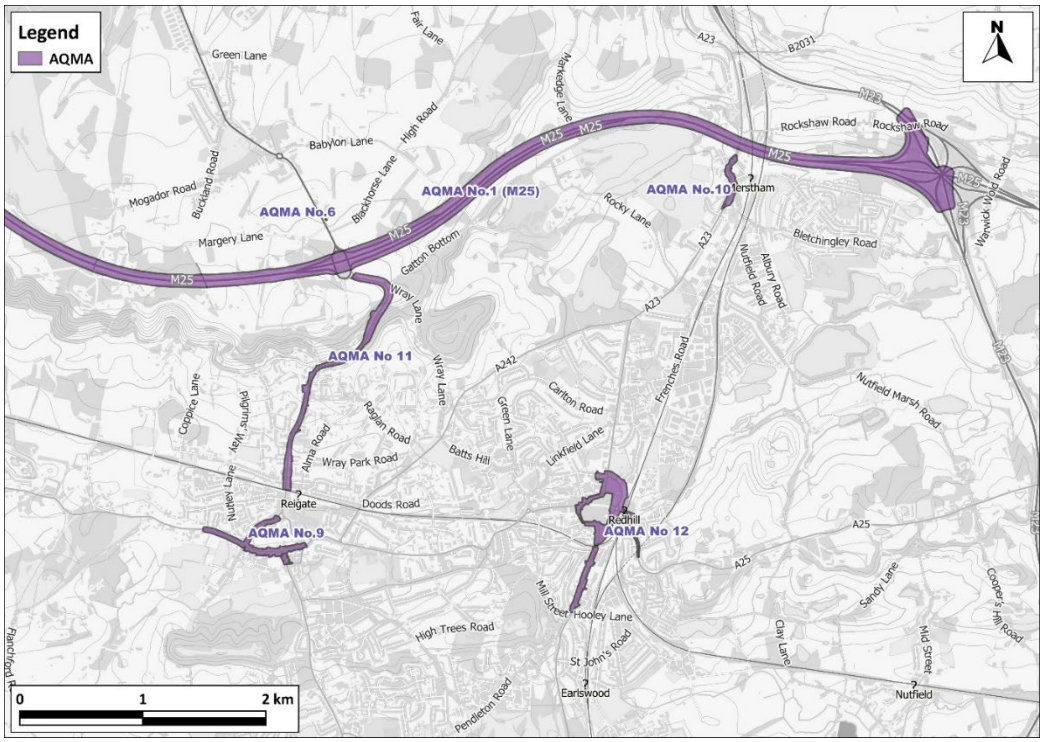

Figure 2.2.1: AQMAs No.1 (M25), No. 6 (Blackhorse Lane), No.9 (Reigate High St / West St / Bell St), No. 10 (Merstham), No. 11 (Reigate Hill) and No. 12 (Redhill)

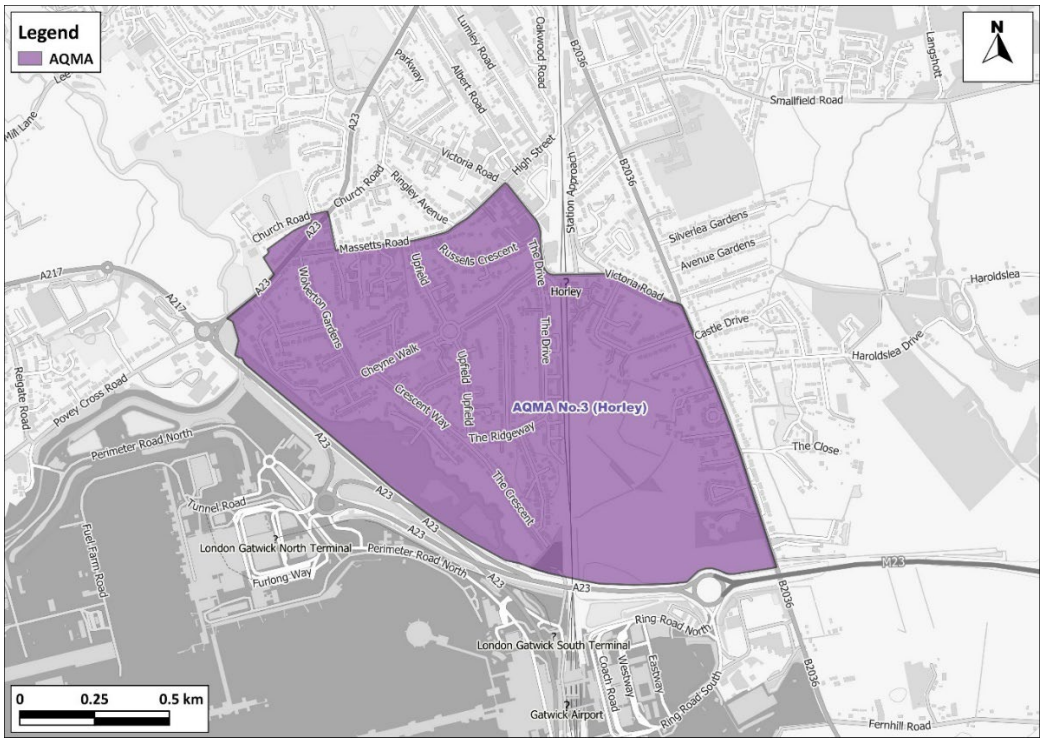

Figure 2.2.2: AQMA No.3 (Horley)

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Figure 2.2.3: AQMAs No.1 (M25) and No. 6 (A217 / Blackhorse Lane)

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Figure 2.2.4: AQMA No. 8 (Drift Bridge)

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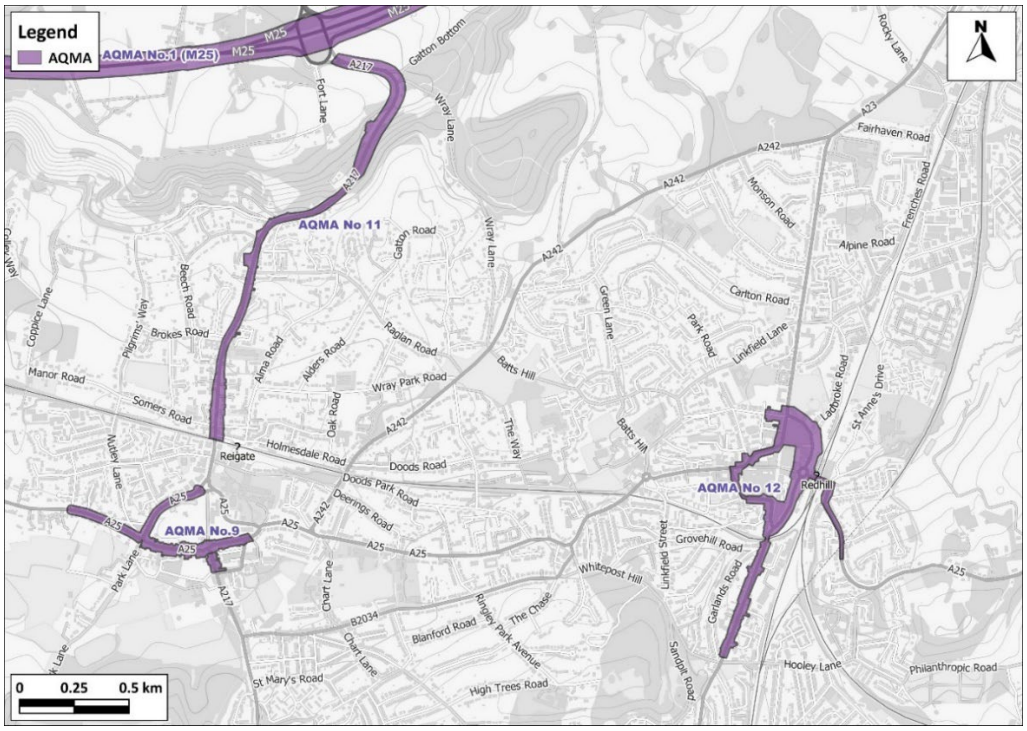

Figure 2.2.5: AQMAs No. 1 (M25), No. 9 (Reigate High St / West St / Bell St), No. 11 (Reigate Hill) and No. 12 (Redhill)

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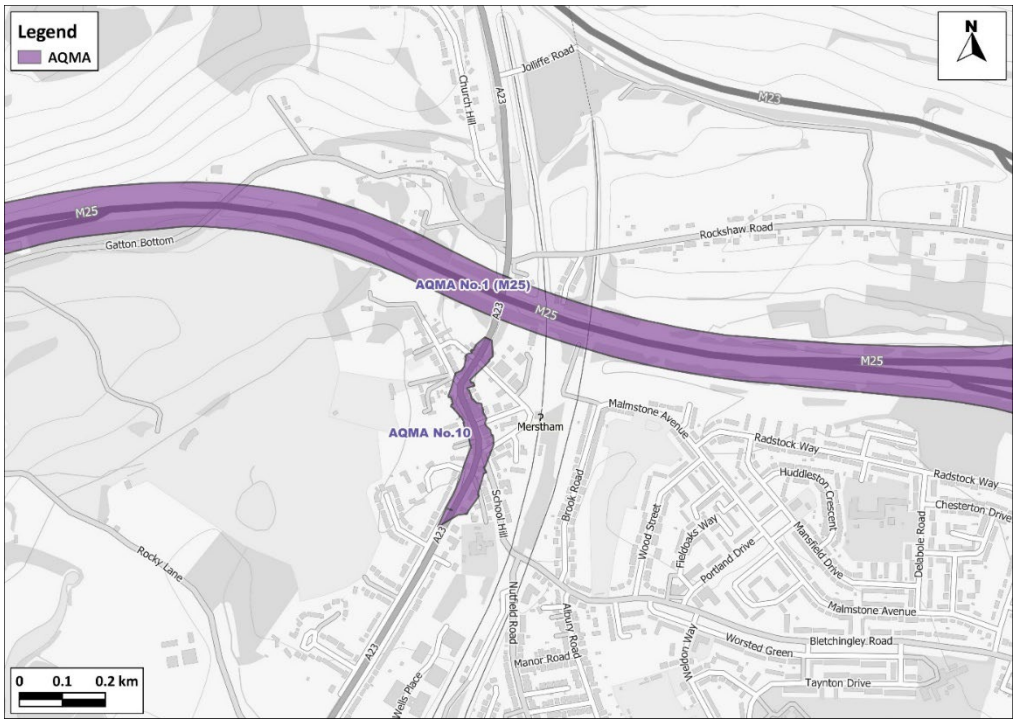

Figure 2.2.6: AQMAs No. 1 (M25) and No. 10 (Merstham)

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Figure 2.2.7: AQMA No. 13 (Hooley)

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Table 2.1 – Declared Air Quality Management Areas [a]

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) At declaration / now	Action Plan Name / date of publication / link
No. 1: M25	30/04/2002	Nitrogen dioxide – annual mean	Merstham, South Merstham, Margery, Mogador, Walton on the Hill	The length of the M25 to a distance 30m either side of the carriageway between Junction 7 and the point to the west of Junction 8 where the motorway meets the borough boundary.	Yes: M25	At declaration: 43 µg/m^3 Now: No measured exceedances	As no current exceedances, under long term monitoring with a view to revocation. Action Plan (link to Reigate & Banstead Borough Council website)
No. 3: Horley	30/04/2002	Nitrogen dioxide – annual mean	Horley	An area of the south-west quadrant of Horley near to Gatwick airport.	Yes: Airport Way (A23)	At declaration: 43 µg/m^3 [b] Now: 33 at RB149 in 2021. (With a previous Exceedance in 2019) µg/m^3	Air Quality Action Plan for the Non Airport sources of nitrogen dioxide within the Horley Air Quality Management Area 2007 2007 Action Plan (link to Reigate & Banstead Borough Council website)
No. 6: A217 / Blackhorse Lane	24/05/2006	Nitrogen dioxide – annual mean	Margery	An area encompassing the house "Highlands" near the junction of the A217 Brighton Road with Margery Lane and Blackhorse Lane	No	At declaration: 63 µg/m^3 Now: No measured exceedances	As no current exceedances, under long term monitoring with a view to revocation. Revised borough wide measures in

							development – see measures 1 to 21
No. 8: Drift Bridge	05/11/2007	Nitrogen dioxide – annual mean	Banstead	An area encompassing a couple of residential properties immediately to the north of the junction of the A240 (Reigate Road) and A2022 (Fir Tree Road).	No	At declaration: 48 µg/m^3 Now: No measured exceedances	As no current exceedances, under long term monitoring with a view to revocation. Revised borough wide measures in development – see measures 1 to 21
No. 9: Reigate High St / West St / Bell St	05/11/2007	Nitrogen dioxide – annual mean	Reigate	An area encompassing Reigate High Street, the section of Church Street between the High Street and Bancroft Road, properties with a frontage to Bell Street (between the High Street and the southern end of Bancroft Road) and land and properties within 15m of either side of West Street (between High St and Evesham Rd) and along London Road (between West St and Castlefield Rd).	No	At declaration: 47 µg/m^3 Now: No measured exceedances	As no current exceedances, under long term monitoring with a view to revocation. Revised borough wide measures in development – see measures 1 to 21
No. 10: Merstham	30/04/2008	Nitrogen dioxide – annual mean	Merstham	An area encompassing all properties facing on to part of the A23 in Merstham. The area commences on London Road South (south of the junction with School Hill) and extends north along Merstham High Street and then just to the north of the junction with Station Road North.	No	At declaration: 52 µg/m^3 Now: No measured exceedances	As no current exceedances, under long term monitoring with a view to revocation. Revised borough wide measures in development – see measures 1 to 21
No. 11: Reigate Hill	24/06/2011	Nitrogen dioxide – annual mean	Reigate	Properties within the area of Reigate Hill covering either partially or entirely properties between the	No	At declaration: 43 µg/m^3 Now:	As no current exceedances, under long term monitoring with a view to

				level crossing in Reigate Town and J8 of the M25.		No measured exceedances	revocation. Revised borough wide measures in development – see measures 1 to 21
No. 12: Redhill	24/06/2011	Nitrogen dioxide – annual mean	Redhill	Properties within the Redhill area covering either partially or entirely Cromwell Road, Queensway, A25 Redstone Hill between the junction with the A23 and the junction with Hillfield Road, A23 between the junction of Hooley Lane and Mill St and the A23 junction with Gloucester Road.	No	At declaration: 48 µg/m^3 Now: No measured exceedances	As no current exceedances, under long term monitoring with a view to revocation. Revised borough wide measures in development – see measures 1 to 21
No. 13: Hooley	04/09/2013	Nitrogen dioxide – annual mean	Hooley	Properties within the Hooley area covering either partially or entirely properties of the following roads, A23 Brighton Road, Star Lane and Church Lane	Yes: Brighton Road (A23)	At declaration: 77 µg/m^3 Now: 42.5 at RB148 in 2021 µg/m^3	Revised borough wide measures in development – see measures 1 to 21. Highways England announced plans to widen the A23 in Hooley from one to two lanes in both directions with a narrowing to one lane within the village southbound. Consultation on the scheme ran into 2019, but no dispersion modelling was undertaken as part of the plans by Highway England. Work is ongoing in trying to fully engage with Highways England at this location

[a] **Does not include revoked AQMAs**

☒ **Reigate and Banstead Borough Council confirm the information on UK-Air regarding their AQMAs is up to date**

2.1 Progress and Impact of Measures to address Air Quality in Reigate and Banstead Borough Council

Defra's appraisal of the 2017 - 2019 ASRs confirmed that the conclusions were acceptable for all sources and pollutants. No exceedances of the annual mean nitrogen dioxide objective were observed in areas outside of the AQMAs, as well as for concentrations of particulate matter (PM_{10}) and benzene. Defra noted that there have been no attempts from the Council to review the status of AQMAs where no exceedances have been observed for an extended period.

To date, the authority has held back from revoking its AQMAs as based on past experience, if an AQMA is revoked too early, it may need to be redeclared. In this case, it has been held off to avoid accusations that this was only possible because of the influence of the COVID-19 pandemic on travel behaviours. Furthermore, until the completion of work by Gatwick Airport, Reigate and Banstead Borough Council's plans to revoke the M25 AQMA are on hold.

Before considering the revocation of an AQMA the authority is looking for the following:

i) Clear evidence of a long-term downward trend in pollutant concentrations.

ii) Ideally concentrations of nitrogen dioxide below 32 µg/m^3 (20% below the standard) for a period of five years – to allow for any modelling / measurement uncertainties.

iii) No potential future plans for further development that may impact on air quality within the AQMA, e.g. increasing the number of road lanes, runways, or other developments that would lead to an increase in emissions of the pollutant of concern.

The council is also mindful of the fact that the health impacts of air pollution do not stop just because a legal limit / objective level has been met, and that there are health risks

associated with a consistent low level of exposure[7] as recognised by the WHO[8] in setting an annual average air quality standard for nitrogen dioxide of 10 µg m^{-3}, and no more than 3 days per annum over 25 µg m^{-3}.

In the event that an AQMA is revoked, monitoring will remain in place, though at some sites with a number of diffusion tubes, the number of monitoring locations may be reduced. This is to ensure ongoing compliance with current and any future air quality standards, to enable ongoing trend analysis, i.e. to ensure no deterioration in air quality, and to provide scientifically robust data for concerned local residents.

Once revoked, the authority expects to see continuing improvements in nitrogen dioxide concentrations, and the headroom created is not to be used by a specific industry sector to increase its pollution output.

Other issues identified within Defra's appraisal have been addressed in this report, including detailed work on $PM_{2.5}$, an in-depth and comprehensive discussion of trends in NO_2 concentrations and that good QA of monitoring data has continued.

In relation to updating its Air Quality Action Plans, as there are no current exceedances in the majority of the AQMAs, Reigate and Banstead Borough Council is keeping long term monitoring under review with a view to revocation. In the AQMA which has had recent exceedances (Hooley), traffic levels and resulting pollutant concentrations will be reviewed annually to identify post-Covid levels to ascertain whether further specific local measures will be required. In the meantime, actions in Table 2.2 represent the current status of the emerging action plan.

Reigate and Banstead Borough Council has taken forward a number of direct measures during the reporting year of 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

Since the last ASR a number of measures have been completed, and the Council has continued to progress other measures to both directly improve the borough's air quality through improved traffic management and promotion of lower emissions

[7] Chief Medical Officers Report 2017. Recommendations 5 and 7.

[8] WHO (2021) Global air quality guidelines: particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. ISBN 978-92-4-003421-1.https://apps.who.int/iris/handle/10665/345329.

transport, promotion of lower emission energy plant and on-going air quality monitoring, as well as to provide evidence for further air quality work.

Recently completed measures include the council run training day for the local taxi drivers in October 2021 in conjunction with the Energy Saving Trust (EST), to give a 'warts and all' view of using an electric vehicle as a taxi / private hire vehicle. The virtual component of the training day was attended by 30 drivers, while the afternoon test drive event which had four different vehicles on display and available for test drives was attended by around 20 drivers and the heads of the taxi associations.

The council also completed a further piece of work with the EST looking at the roll out of electric vehicle charging infrastructure across council car parks and also on street charging. The purpose of the work was to identify the priority of the charge point roll out to council car parks based on existing charger availability and also proximity of residential premises with and without a drive within 5 and 10 min walking distances of the carparks. The work has since informed the charge point prioritisation list for the council.

A second part of this project also looked at the prioritisation of on street charge point provision. The work here took into account the absence of off street parking, presence of existing or planned provision, and also social deprivation so that potentially profitable and more marginal areas could be 'packaged' together to obtain a suitable overall return on investment rather than just focusing on the potentially high profit areas alone. This work will feed into county wide plans for on street electric vehicle charging.

The principal challenges and barriers to implementation that Reigate and Banstead Borough Council anticipates facing relate in part to funding, and in relation to AQMA 13 (Hooley) certain partners not recognising the air quality issue associated with road traffic. However following the introduction of 'Relevant Public Authorities' in the 2021 Environment Act this issue will hopefully be resolved.

Progress on finalising the borough-wide Action Plan has been slower than expected due to delays (now resolved) to the Surrey wide modelling project and latterly in order to understand the long term impact of the COVID-19 pandemic on travel behaviours and the transition to hybrid working and the forecast growth at Gatwick from 46.5 mppa in 2019 to 72.3 mppa by 2032 as part of their Development Consent Order which is

currently a concern for the county traffic modellers in terms of on how this growth will impact traffic volumes on the M25 / M23 and the local road network (A217 / A23). The modelling work (completed in April 2020) will be used to inform the borough-wide plan given the inclusion of health costs and more importantly updated source apportionment data that more accurately reflect the real-world performance of diesel vehicles. This will assist in better targeting measures to achieve the air quality objectives at the remaining locations of exceedance. Reigate and Banstead Borough Council has also been focussing on implementing measures, as described above, as well as working collaboratively with local public health practitioners, Surrey County Council and others, including Gatwick Airport.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Reigate and Banstead Borough Council anticipates that further additional measures, not yet prescribed, may be required in subsequent years to achieve compliance and enable the revocation of the remaining AQMAs.

Within the Hooley AQMA, the London mayor's plan to extend the Ultra-Low Emission Zone to the boundary of greater London in 2023 is likely to have a significant impact, as the AQMA is only 600 m from the Greater London boundary. As this AQMA is on a road managed by National Highways as part of the strategic road network, this move by TfL is likely to have a far bigger impact than anything possible at a local level. In addition, this is likely to lead to a shift to newer and cleaner vehicles in the lead up to the scheme being implemented as people bring forward purchases of newer vehicles in anticipation of the change.

Within the Horley AQMA (near Gatwick) the airport is planning on significant expansion of the airport with aircraft movements up by 32% from 285,000 (2019) to 381,000 by 2032, with the number of passengers increasing from 46.5 mppa in 2019 to 72.3 mppa in 2032, representing a 55% increase. Consequently, until the airport undertakes its final modelling work on the air quality impact of this expansion it is difficult to produce a revised action plan for this area, and the majority of any air quality measures would be best addressed via the DCO process rather than LAQM.

Table 2.2 – Progress on Measures to Improve Air Quality Summary of Interim Actions for Borough wide road traffic action plan.

Measure No.	Measure	Cost(a)	Air Quality Improvement (b)	Person / organisation responsible	Indicator	Start Date	Completion Date	Actual Completion Date / or Progress	Outcome	Comments
1	Trial of Rapid Charging point (50 kWh) for electric vehicles.	Low to medium (1 to 2)	Variable, depending on uptake of electric vehicles.	RBBC – Env. Health	Steady growth in number of charges and kWh of electricity supplied.	Oct 2015	Oct 2018 Extended to Oct 2025 (using new kit installed below)	On going. Jan – Jun '16 total charges 37 (396.9 kWh) Jan – June '17 total charges 217 (3366.2 kWh) Jan – June '20 total charges 287 (5,269 kWh) Jan – June 21 total charges 28 (404.7 kwh) Jan – June 22 total charges 731 (14,942 kwh)	Equipment installed and running. Data collection in progress.	Trial project to look at - demand for rapid electric vehicle charging in the borough, and how this changes with time. - to understand the practicalities and costs of running such equipment. Ultimately aim is to see if one or more rapid chargers are needed in the borough. Note between 2017 and 2020 three new rapids opened in the vicinity of the current unit. Low usage for 2021 due to site works. In period July to Sept 21 (3 months) 189 charges 3,171 kWh. Significant growth in 2022 reflects increase in EVs in the road fleet and larger batteries in the vehicles
2	Replacement of existing rapid charger with a permanent installation	Low (1)	1+ µg m^{-3} (1) and much higher as fleet goes electric.	RBBC – Env. Health	Steady growth in number of charges and kWh of electricity supplied.	Nov 2019	Jan 2021 (installation) Then on going.	Funding secured and initial prep work completed March 2020. Final commissioning July 2021.	Installed and operational from July 2021.	Charger capable of delivering power at up to 920v (at 43kW) for the newer battery packs on the market. Unit has contactless payment rather than the need for apps. Kit now in use – see information above.
3	Trial of destination charging of electric vehicles using fast (7 -22 kWh) chargers.	Low (1)	Variable, depending on uptake of electric vehicles.	RBBC – Env. Health	Installation of charge points. Steady growth in number of charges and kWh of electricity supplied.	2017 (Subject to funding)	End 2021	Victoria Road car park (22kW) installed April 2018. Reigate Town Hall installed Aug 2018. Victoria Road Extension March 2020. Banstead High Street due to go live end 2022 / Q1 2023	On going. At all sites seeing increasing demand.	Complementary project to rapid charging project, to look at demand and usage pattern of destination chargers and gain practical experience of running such equipment including costs. Demand at Victoria Road was such that additional two sockets installed March 2020. Usage Victoria Road: July to Dec 2020: 10,073kWh (431 sessions) July to Dec 2021: 8,740 kWh (406 sessions) Note in '21 one of posts was down)
4	Evaluation of fast charger installation costs (22kW) at the main council car parks - Bell St / Bancroft Rd, Reigate - High St Banstead Gloucester Rd, Redhill	Low (1) to Medium (2)	1+ µg m^{-3} (1) and much higher as fleet goes electric.	RBBC – Env. Health	Completion of costings	Jan 2021	Nov 2021	On going – potential funding sources identified.	High St Banstead complete. Initial work on other car parks also complete.	Desktop exercise so that have costings in place as funding becomes available. Funding now agreed for installation of points in High St. Banstead car park in 2021/22.
5	Gridserve EV charging hub at Gatwick. (Horley)	Low (1) to RBBC.	1+ µg m^{-3} (1)	RBBC – Env. Health	Completion of works and operational.	From 2020	Late 2022	On going	On going	Assist the airport with introductions to contacts / landowners associated with the mains grid connection. Site will accommodate 36 chargers up to 350 kW. Important for both the Horley AQMA, and encouraging EV uptake amongst the local taxi fleet who operate on the airport run as lack of charging has been an issue.
6	On street charge point provision - evaluation project.	Low (1) to RBBC.	1+ µg m^{-3} (1)	RBBC – Env. Health / Sustainability	Project completion	March 2021	Late 2021	Completed Nov 2021	Complete – report produced	Work is to draw up a priority list of areas where charging is needed on street as there is no off road parking, and feasible to go on street. Work also to take account of socio economic factors so

										areas are not left behind, and to examine council car parks that might be prioritised for overnight charging by local residents with no off road or no charging point.
7	Study to examine the practicalities of linking UTC (traffic lights) to pollution monitor enabling gating of traffic outside of street canyon when pollution levels are rising.	Low (1)	Up to 1 µg m^{-3} (1), and potentially higher.	RBBC – Env. Health / SCC (Tim Brown)	i) Data collection ii) Data analysis to determine if workable option. iii) Scheme implementation	Jan 2018	Jan 2020	Complete Jan 2020.	Complete	Trial project centred on Reigate High Street now complete. Work not taken forward as AQ objectives on High St now met.
8	Changes in Physical Road Layouts to improve air quality (Redhill).	High (3)	Up to 1 µg m^{-3} (1), and potentially higher.	RBBC – Env. Health / Planning Policy	Road Layout changes and building development complete.	April 2013	Final Phase starts 2020	On track – changes in road layout complete. Marketfield carpark redevelopment began in 2020 as part of the final phase of works and is on track (2022).	On going.	Aim of work is to ensure that residential housing built as part of redevelopment of Redhill town centre is set back from the road to minimise pollution, while existing housing benefits from moving traffic away from building facades via pavement widening schemes. Nitrogen dioxide concentrations in Redhill AQMA now meeting relevant objectives.
9	Changes in Physical Road Layouts to improve air quality (Hooley).	Low (1) to Medium (2)	Up to 1 µg m^{-3} (1), and potentially higher.	RBBC – Env. Health, HA.	i) Micro-simulation scoping study. ii) implementation of scheme (if appropriate)	Jan 2018 subject to funding, and availability of suitable emissions data set.	Jan 2024	Funding sources being sought. Lack of up to date instantaneous emissions database identified as possible problem in 2017. However following discussion with Leeds Uni. and others (Dec 2019) workable data set now exists. 2018 and 2019 HE looking to make layout changes without AQ modelling.	On going	Work is to focus on the A23 Hooley AQMA. Aim of the microsimulation study is to look at changes in the physical road layout especially in the vicinity of the Star Lane Junction, with a view to reducing pollution levels by moving the road away from residential properties, along with the impact of speed changes following on from similar work at Drift Bridge Banstead. Lack of funding to date (Apr 2022) remains an issue, plus unwillingness of HE / National Highways to consider a microsimulation approach.
10	'High Quality Bus Corridors' (Bus priority routes) within borough.	Medium (2) to High (3)	Variable, depending on scheme, and buses operating on that route.	SCC / RBBC – Planning Policy (Peter Boarder, SCC Alison Houghton / David Ligertwood)	Completion of Redhill to Salfords route	April 2015	April 2018	April 2018	Work focused on Redhill area now complete.	New sites will be introduced as funding becomes available and include: - A217 north of M25 (Sutton / Epsom) - A23 Merstham / Hooley (Croydon) - A25 Reigate / Redhill (Dorking / Oxted). To date (2022) no new funding has been secured for these projects. A review of the Reigate / Redhill bus priority strategy has been commissioned was due April 2021, but had not been delivered July 2021. However Surrey Enhanced partnership plan for buses due August 2022.
11	Introduction of Hydrogen Fuel Cell busses on Fastway 20 route.	High (3)	<0.1 µg m^{-3} (3) at borough level. But potentially 0.1 to 1 µg m^{-3} (2) at RB149.	Metrobus	Introduction of retrofitted buses.	April 2018	April 2020	Company supplying fuel cells went into administration but now back. Thus project delayed from April 2020 to April 2022 - otherwise on track.	On going. Buses are due for delivery June 2022.	Once complete 50 % of all bus movements past the RB149 site in the Horley AQMA will be via a hydrogen fuel cell bus. Project is a demonstrator for Metrobus - if operational savings as forecast remaining high frequency bus service past RB149 is likely to also be converted to H_2 fuel cell.
12	Electrification of the council's vehicle fleet.	High (3)	<0.1 µg m^{-3} (3) at borough level.	RBBC – Fleet Anthony Hathaway / RBBC - Env Health Leon Hibbs	Change in fleet from Diesel / Petrol to Electric	April 2018	Late 2028 – but will be a staged approach.	In Progress. Pool cars replaced Oct 2019. On site charging installed Sept 2020. Van fleet replaced Mar 2021.	On going.	Fleets does around 450,000 miles annually - all on local road network. Depot charging infrastructure phase I Sept 20. Initial phase of van fleet due to be replaced 2020/21. Larger vans/ specialist fleet from 2022. Initial bin lorry trials 2022 and looking to repeat in 2023.

										Heavy EV charging infrastructure design 2022 (provisional). Project for AQ and CO_2 savings.
13	Maintain current taxi licensing regime.	Low (1)	<0.1 µg m^{-3} (3)	RBBC Licensing.	Taxi standards maintained	On going	On going	On going	On going	Current scheme means that entire taxi fleet is replaced every 9 years, with majority replaced within 7 years. Important in wider AQ context as fleet has grown two fold since 2005 from c.500 to 907 (2020).
14	Encourage EV uptake via taxi licensing regime.	Low (1)	Variable depending on uptake.	RBBC Licensing.	No. of pure EVs in the taxi fleet.	Apr 2019	On going	First phase of the work complete June 2020. Event with Energy Saving trust to run though EV Taxi ownership and test drives 7th Oct 2021.	On going	First phase of the work complete with agreement for 5 dedicated pure electric taxi licences. Aim is to get EVs into the local fleet so drivers can assess the practical benefits and issues with EV taxi ownership and share with other drivers. Initial work with energy saving in Oct 21 saw 30 drivers take part, with a further 12 test driving vehicles. EST said that was very good turnout for this type of event.
15	EV Taxi trial project.	Low (1) (to RBBC)	<0.1 µg m^{-3} (3) at borough level	SAA / SCC / RBBC for local aspect	No. of vehicles taken up by drivers	Apr 2023	April 2024	Funding in place (July 21)	On going	Final form of the project is still in discussion with DEFRA, but will essentially enable taxi drivers to lease an EV for private hire or Hackney carriage work at a discounted rate. Seven boroughs in Surrey (including RBBC) involved. Project intended to help the 'early adopter' drivers so that they are able to feedback to other drivers the good and bad aspects of EV taxi ownership.
16	Continued Promotion of Surrey Car Share.	Low (1) (to RBBC)	<0.1 µg m^{-3} (3)	Contact at SCC – Heidi Auld.	Steady Growth in number of participants. (1300 users at start of 2006).	On going	On going	On going. Currently 4809 (2020) active members. 4979 (2017) 3500 (2011)	On going.	Measurable improvements in air quality unlikely in the short medium term unless significant increase in users. Surrey scaled back promotion after closure of travelSMART (June 2017), thus possible explanation for limited growth to 2020. Unable to get data for 2021 at current time.
17	Promotion of cycling within schools.	Low (1) (to RBBC)	<0.1 µg m^{-3} (3)	Sustrans SE - Lalage Chatfield. RBBC - Health & Wellbeing. Patrick Alexander.	Continuation of existing promotional work and training.	Sept 2015	Subject to funding will be on going.	On going.	On going.	Existing programme is well established. Main need is to keep programme running as new children start and others leave. Promotional work also done on cycling under the R&Be active scheme. 31 schools involved in the program in 2019 with between 2 and 6 days per school per term. No work in 2020 due to COVID which has continued in 2021.
18	Promotion of low NOx boilers, ground and air source heat pumps.	Low (1)	0.1 to 1 µgm^{-3} (2)	RBBC Leon Hibbs	Measure adopted by developers.	On going since June 2005	On going.	On going.	On going.	Aim is to minimise growth in background pollution / reduce if possible. Increasingly seeing equipment specified in commercial sector, less so in small scale residential developments.
19	Discourage use of biomass / wood burning stoves.	Low (1)	<0.1 µg m^{-3} (3) at borough level.	RBBC Leon Hibbs	No specific measure – impact conveyed via talks, planning, and calls regarding smoke control areas.	On going	On going.	On going.	On going.	Use of biomass in a commercial setting considered on merits i.e. setting / nearby receptors. Surrey Air Alliance undertook a promotional campaign as part of clean air day in Oct 2020 on this topic. Surrey air alliance considering DEFRA bid in 2022 on public information campaign.
20	Continue to Work with Surrey Air Alliance (SAA) on	Low (1)	Variable depending on project.	RBBC Leon Hibbs	Projects in progress	On going	On going.	On going.	On going.	Successful application under the DEFRA AQ grant programme 2020/21 for £256K for EV taxi project, which will be implemented from mid 2023 (delayed from mid 2022).

	Surrey wide Projects.									
21	Air Pollution Warning Service for vulnerable groups.	Low (1)	<0.1 µg m^{-3} (3)	RBBC – Env. Health	Steady Growth in number of participants (up to a total of 1000 users).	Oct 2013	Oct 2023 – though looking at continuing subject to funding.	On going. Currently 1020 active users (April 2022) 1010 users (Apr'21) 978 users (April '20) 809 users (April '17)	On going.	Service for pollutants either compliant with LAQM standards (PM_{10}) or outside the regime (O_3), but which reach levels capable of having an acute health impact. Founding East Surrey boroughs joined by Woking and Spelthorne in April 2015, and Runnymede in Dec 2019. Planned work with NHS in Surrey on revamped 'ask about asthma' due in Sept 2022.
22	Production of borough wide mapping of $PM_{2.5}$ and NO_2 including health impact assessment.	Low (1)	N/A	RBBC – Env. Health	Production of map and health calculations	April 2017	April 2018	Complete. Final draft Nov 2019. Published April 2020.	Complete.	Mapping is to be used as a policy tool to quantify changes in health impact of pollution on residents with time, and inform county health funding priorities. Also used to inform action planning, if appropriate, at a local level. Modelling and mapping work will be refreshed in 2024.
23	Monitoring.	Low (1) to Medium (2) depending on time scale	N/A	RBBC Leon Hibbs	Data capture > 90 %.	On going	On going	On going.	Data capture consistently in excess of 90 %.	Sites are important for examining trends in measured pollutant concentrations, compliance monitoring, and also model validation. Ultrafine particulate monitoring campaign from June 2018 to Sept 2019 indicates significant impact from aviation on residents' exposure to ultrafine particles. Replacement station for RG1 due to be installed in May 2022 (was April) and on track.
24	Ultrafine Particle monitoring within the vicinity of Gatwick Airport.	Medium (2)	N/A	RBBC Leon Hibbs	Equipment installed and then data capture > 90 %.	Subject to funding.	Equipment would be installed within 12 months of funding.	Have approached DfT, DEFRA, and Gatwick for funding (Aug 2019). But all have been unable to fund the work, even for a specified period. Discussions currently underway with academic partner on further ultrafines work. If agreed work likely to commence June 2022.		Recent work (report in 2020 ASR) indicates residential exposure to ultrafine particles in the vicinity of Gatwick is significantly higher than that seen in a comparable residential setting. When winds are off airport concentrations are higher than those seen 1m from the roadside in central London despite the residential monitor being over 600 m from the airport. As discussed in 2022 ASR (this report) residential exposure to hourly levels classed as 'High' by WHO are double that seen roadside in Central London. Aim is to install equipment to monitor this emerging pollutant to characterise residential exposure (number and size distribution) and examine long term trends in exposure.

Summary of Actions to date for the Non Airport Sources of Pollution within the Horley AQMA.

Measure No.	Measure	Cost(a)	Air Quality Improvement (b)	Person / organisation responsible	Indicator	Start Date	Completion Date	Actual Completion Date / or Progress	Outcome	Comments
25	Limit Road Transport Growth to 5.5 % by 2011 from 2004/5 levels. (Annex 9 LTP2).	High (3)	c.0.1 µg m^{-3} (2) at RB59[(c)]	SCC (via LTP 6).	For current traffic flows see note 'd' at end of table.	April 2006	Original: April 2011 Revised: On going as monitoring measure	April 2011 Now on going.	Target met given growth to end of 2008, and recession. Note without recession projections suggest target would still have been met.	No current target on traffic growth in new Local transport plan (LTP3). New transport plan (LTP4) out for consultation (July to Oct 21) and will be implemented 2022. However growth on roads monitored varies from -1.8 % A23 (2005-19), +8.6% M23 (2006 to 18), to +18% A217 (2004 to 19), although on the A217 2004 to 18 the increase was 6.4 %. Figures for 2020 /21 only reflect COVID and not long term trends e.g. A217 traffic down by c.26% on 2019.

26	Fastway Route (Horley to Crawley via Gatwick).	High (3)	<0.1 µg m^{-3} (3)	SCC / RBBC/ HTC/ GAL. RBBC Carrie Burton	Reduction in peak hour traffic flow.	Jan 2006	April 2011 (Phase 1) April 2021 (Final NW sector)	Fastway 20 running in NE sector. Link road to NW sector due 2020 – but finally completed 2021.	Completed - April 2021.	Now complete.
27	Fastway Interchange at Horley Station.	High (3)	<0.1 µg m^{-3} (3) at RB59	SCC / RBBC for information contact Emily Mottram Policy & Regeneration (RBBC).	Project Completion	April 2006	April 2011	Completed (as of Sept 2008)	Interchange complete	Impact on air quality of this individual project is negligible. However this is one part of a wider project that should help minimise any growth in NO_2 concentrations from the new housing developments in Horley.
28	Bus Priority Lanes on A23 (p105 5.43 in LTP2).	Medium (2)	<0.1 µg m^{-3} (3) at RB59	SCC / RBBC contact Peter Boarder Policy & Regeneration (RBBC). David Ligertwood (SCC).	Project Completion	April 2015	April 2018	Funding secured for scheme centred on greater Redhill area reaching as far as Salfords, including improved foot and cycle path provision. (Now Complete - April 2018).	Works Complete.	LTP2 now superceded, this is variation on original scheme. Minimal benefit to air quality within Horley AQMA, but potential benefit for current breach on A23 on edge of AQMA.
29	Extension of Fastway to Redhill and Reigate. (LTP2 aspiration).	High (3)	<0.1 µg m^{-3} (3) at RB59	SCC / RBBC contact Peter Boarder Policy & Regeneration.	Project Completion	Unknown	April 2015 (if implemented)	Extension to Redhill completed in 2008	Route extended to Redhill only.	Extension of route to Reigate was still under consideration (2011), but subsequently dropped. Work now focused primarily on cycling improvements (2020).
30	Maintain current taxi licensing regime.	Low (1)	<0.1 µg m^{-3} (3) at RB59	RBBC Licensing.	Taxi standards maintained	On going	On going	On going	On going	Current scheme means that entire taxi fleet is replaced every 9 years. Minimal impact on Horley AQMA. However important in wider AQ context as fleet has grown two fold since 2005 from c.500 to 907 in 2020. Plans also implemented to help drivers considering a switch to Electric vehicles (Oct 2021) see main air AQ measures document.
31	Public Service Agreement to reduce Congestion on the A217 and A23 (Horley Road).	Low (1) (to RBBC)	<0.1 µg m^{-3} (3) at RB59	SCC / RBBC/ ODPM. Contact Linden Mendes SCC.	5 % reduction in average vehicle delay by March 2008.	March 2005	March 2008	March 2008	The 5% reduction target was met, but due to traffic signal changes alone, and not signal changes and greater car sharing combined as originally intended.	Project had no bearing on Horley AQMA. Intention was to note reasons for success / failure of project, and bear these in mind – if appropriate – for future reference if congestion becomes a problem within the Horley AQMA. The results suggest that there is still scope for improvements in traffic flows based on the timings of traffic signals.
32	Travel Plans (Work). (LTP / STP indicator TP2).	Low to medium (1 to 2)	<0.1 µg m^{-3} (3) at RB59	RBBC / Local employers Contact Lynne Howard (SCC).	4 to 5 plans to be completed per annum.	On going	On going	Scheme to closed in 2017 due to closure of TravelSMART at Surrey County council.	Scheme closed in 2017. Travel planning now addressed solely through planning.	Most major employers in Horley had a travel plan in place so impact on AQMA itself was limited. Horley NW sector housing development have completed travel plan for the development (2016), money for actions in plan will be phased over next 10 years.
33	Travel Plans (Schools) (LTP / STP indicator TP1).	Low to medium (1 to 2)	<0.1 µg m^{-3} (3) at RB59	SCC - (Lynne Howard / Rebecca Harrison).	All Horley schools have, and have implemented, a travel plan.	On going	On going	On going. Concern at number of schools that appear not to have a current plan.	Note impact from scheme on concentrations within AQMA is very limited.	SCC now have an updated system that requires the online submission of travel plans. Horley Infants plan shows a reduction in pupil car use over the past 3 years (2020). However 8 of the 11 schools at present (August 2021) do not have an up to date plan. This is up on 2020 (5) with further plans expiring.
34	Continued Promotion of Surrey Car Share.	Low (1) (to RBBC)	<0.1 µg m^{-3} (3) at RB59	Contact at SCC – Heidi Auld	Steady Growth in number of participants. (1300 users at start of 2006).	On going	On going	On going. Currently (2020) 4,807 active members, (2017) 4979 compared to 3500 (2011).	Surrey scaled back promotion after closure of travelSMART (June 2017), thus possible explanation for limited growth to 2020.	Measurable improvements in air quality unlikely in the short term, minimal if any impact on air quality within the AQMA, but possible wider AQ benefits. Trial of electric vehicles as part of the car share scheme in Guildford is still ongoing. No data for 2021.

35	Implementation of Council Travel Plan.	Low to medium (1 to 2)	<0.1 µg m^{-3} (3) at RB59	RBBC Raymond Dill Policy & Regeneration.	Implementation of plan.	Jan 2006	Implemented end 2008	Complete (Q3, 2009).	Workplace parking charges introduced for all. Pool cars introduced, plus other incentives to use public transport or cycle.	Implementation allows council to encourage other employers to implement their own plans, with possible benefits for Horley, especially with airport travel plan.
36	Incorporation of Sustainable energy policy into local development framework document.	Low (1) to RBBC, possibly Medium (2) to High (3) to developers.	Variable, depending on scheme.	RBBC Policy & Regeneration Raymond Dill.	Incorporation of policy	Current	Jan 2007	Complete.	Document now included.	Benefit to Horley AQMA marginal in short term. However, may help reduce growth in background NO_2 concentrations from new developments in area, which would be of benefit.
37	Horley Design Guide: - Low NO_x boilers.	Low (1)	<0.1 µg m^{-3} (3) at RB59	RBBC Leon Hibbs	Measure adopted by developers.	June 2005	Jan 2007 (1st phase) Jan 2025 (Final)	Initial stage complete Jan 2007. 1st phase of NW sector started 2015 and on going 2022.	Measure is now in the design guide.	Aim is to minimise growth in background, but will not reduce existing pollution.
38	Horley Design Guide: - Minimum of 10 % of energy from renewable sources.	Medium (2)	<0.1 µg m^{-3} (3) at RB59, but potential increase for local 'hot spots' depending on source.	RBBC Policy & Regeneration Raymond Dill.	Scheme up and running.	On going	Jan 2007 for local development framework policy	Initial stage complete Jan 2007.	Measure now in design guide.	Measure adopted by developers (2010/11). Aim is to use a mix of solar heating and air source heat pumps, so no risk of NOx 'hot spots'. Build out to date (2022) indicates solar water heating / solar electricity has and is going in.
39	Horley Design Guide: - Home Zone.	Medium (2)	<0.1 µg m^{-3} (3) at RB59	RBBC Planning	New developments completed as home zones.	On going	Jan 2007	Jan 2007.	Policy in design guide.	Impact on air quality potentially low. However, may encourage walking over short distances and avoid car use.
40	Monitoring.	Low (1) to Medium (2) depending on time scale	N/A	RBBC Leon Hibbs	Data capture > 90 %.	On going	On going	On going.	Data capture consistently in excess of 90 %.	Sites are important for examining trends in measured pollutant concentrations, compliance monitoring, and also model validation. Significant reduction in NO_2 seen across Horley AQMA (2005 to 2019) driven by non airport sources, which masks an underlying upward trend from airport sources 2012 – 2016. Current breaches limited to A23 on edge of AQMA (2019) but as might be expected significant falls in 2020 with levels typically 40 % lower where aviation is a significant contribution. And further falls in 2021. Replacement station for RG1 due to be installed during 2022, with $PM_{2.5}$ monitoring.
41	Local Forums / Policy: - AQ Working Group with GAL.	Low (1) to RBBC	1 µg m^{-3} (1) at RB59	RBBC Pollution Team	No specific measure, but will include Gatwick AQ plan implemented, on going predictive modelling work.	On going	On going	Meetings are on going.	On going	AQ work on use of the emergency runway / DCO process resumed in Sept 2021. With extra runway 381,000 movements by 2032 compared to 284,987 in 2019. (c.33 % increase). Progress on the airport's action plan is subject to quarterly monitoring - all measures of note are currently on track (April 2022). However monitoring suggests airport NO_2 contribution is back to where it was 15 years ago (2019), and up considerably on 2012.
42	Local Forums / Policy: - New section 106 agreement and sustainable development strategy.	Low (1) to RBBC	1 µg m^{-3} (1) at RB59	RBBC Planning and Env. Health. Others: GAJA, GOG, GATCOM.	Agreement and Implementation of new agreement and strategy.	On going	End 2018	S106 agreement rolled forward to 2024. (provisional currently in discussion with GAL).	On going	Only if the measures in the agreement are completed, and the outcome of any studies in the agreement acted upon, will any improvement in air quality occur. Have seen improvements in AQ over past 10 years, but none due to airport itself by 2016. There were improvements to 2019 that bring the airport contribution back to levels seen 15 years ago.

43	National / EU measures: - Tighter vehicle emissions standards.	Low (1) to RBBC, but very high (3+) to industry.	Up to 1 µg m^{-3} (1) at RB59	UK Government via EU.	Higher standards in place.	?	?	Euro 6 real world emissions significant improvement on Euro 5.	-	Current breach on A23 heavily dependent on emissions improvement, but are seeing improvements in practice (April 2020). During 2020 NO_2 levels fell by c.28 % due to COVID. Levels in general have risen slightly since 2020 by 5 % in 2021 but remain below levels seen in 2019.
44	National / EU measures: - Tighter aircraft engine emissions standards.	Low (1) to RBBC, but very high (3+) to industry.	Aim is to reduce the rate of growth of aircraft emissions.	UK Government via EU.	Higher standards in place.	?	?	Discussed informally with DfT representative on 16/10/07, especially the need initially for better and publicly available data on APU emissions.	-	APU emissions are also a source of concern, and the lack of manufacturers' data on emissions makes assessing the scale of the impact difficult. Thus in the first instance emissions testing of APUs needs to be introduced. Still limited work in this area that is in public domain (April 2021). However APU running times at Gatwick have reduced significantly since 2010. Current DCO work (Sept 2021) indicates that out to 2038 the only growing source of NOx emissions are aircraft / APUs, all other sources show declines despite significant planned growth at the airport.

Notes:
Greyed rows are completed actions.
[a] (1) Low £<100K, (2) Medium £100K to £1 million, (3) High £1 million to £10 million.
[b] (1) improvement of 1 µg m^{-3}, (2) 0.1 to 1 µg m^{-3}, (3) <0.1 µg m^{-3}.
[c] as used mid line forecast in original TEMPRO model equivalent to a 10 % increase in traffic 2005 to 2010.
[d] The current traffic flows as measured on roads in the area are as follows:

	Site ID	AADT 2004	AM weekday peak flow 2004	PM Weekday peak flow 2004
A217 (Mill Lane / Nursery Lane)	A0217 (04063A)	18,061	2036 (8 to 9am)	1703 (17 to 18:00)
A23 (just before Massetts Rd / Woodroyd Av.)	A0023 (04082C)	29,392	2217 (8 to 9am)	2493 (17 to 18:00)
M23 Gatwick Spur* (contact Margaret King at: area4@interroutejv.co.uk)	6009 & 6010 (TRADS 2 Ref) (529427, 141683) and 529498, 141694)	65,964 (2% HGV)	1702 (9 to 10am) to M23 3172 (9 to 10am) to Gatwick	2691 (18 to 19:00) 1665 (14 to 15:00)

***Note these are the revised figures (2008) for 2004.**
Sites 6009 and 6010 were subsequently closed at the end of 2008. Two new counters were installed mid 2006.
In 2006 (the first year for which data is available) the figures for this site were:

	5980/1 east bound alt ref 4/30015253 (529950, 141730)	32,851	1746 (9 to 10am) to M23	2480 (18 to 19:00)
	5981/1 west bound alt ref 4/30015254 (530240, 141693)	31,553	2917 (9 to 10am) to Gatwick	1509 (13 to 14:00)

2020 Figures:

A217 (Mill Lane / Nursery Lane)	A0217 (04063A)	13,707	(2019 figure 21,446 which was up 18 % on 2004. Note 2018 up 6.4 % on 2004). 2021 post COVID.
A23 (just before Massetts Rd / Woodroyd Av.)	A0023 (04082C)	19,136 (2020 data)	Loop damage 2018 and 2019, no data 2020. 2017: 30,270. Equivalent DfT site 78232 shows 1.8 % traffic fall 2005 to 2019).
M23 Gatwick Spur (2018 Data) Website not returning data for 2019, 2020 or 2021.	6009 & 6010 (TRADS 2 Ref)	Site closed end 2008	
	5980/1 alt ref 4/30015253	35,602 (4.1% HGV) (up 8.4% on '06)	N/A (9 to 10am) to M23 N/A (18 to 19:00) Peak hour traffic data no longer available following website redesign
	5981/1 west bound 4/30015254	34,355 (4.0% HGV) (Up 8.9% on '06)	N/A (8 to 9am) to Gatwick N/A (18 to 19:00) Peak hour traffic data no longer available following website redesign

Data for the M23 spur sites is lacking following road widening scheme in 2019.
DfT estimated data (46035) for 2018 as per automatic count data above was 69,559, 2021 data is 53,540 – a 23 % fall in traffic on 2018.

RB59 is the worst case receptor within the Horley Air Quality Management Area (AQMA).
GAJA: Gatwick Airport Joint Local Authorities. GAL: Gatwick Airport Limited GATCOM: Gatwick Consultative Committee. GOG: Gatwick Officers Group.
HTC: Horley Town Council. ODPM: Office of the Deputy Prime Minister. RBBC: Reigate and Banstead Borough Council. SCC: Surrey County Council.

2.2 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), 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 Council has not previously monitored $PM_{2.5}$ directly. However, given the new focus on levels of $PM_{2.5}$ the council will begin monitoring $PM_{2.5}$ from September 2022.

The council's borough wide modelling work examining residents' exposure to $PM_{2.5}$ (and other pollutants) was reported on in the 2020 ASR. This work clearly showed that unlike with nitrogen dioxide, local road traffic is responsible for a relatively small component of residents' exposure to $PM_{2.5}$ – up to 14% but typically under 10%, and that in the local traffic derived fraction the bulk of the exposure is from a combination of brake, tyre and road wear rather than exhaust emissions.

While the focus of the council's current work in relation to air quality is around vehicle electrification given the significant benefits in NOx reduction, the removal of combustion derived particulates, and the potential reduction in brake wear via regenerative braking, the council is mindful of the potential increase in emissions from increased tyre and road wear given at present on average electric vehicles are heavier than the petrol / diesel equivalent.

The Council undertook borough wide modelling of $PM_{2.5}$ concentrations (Figure 2.2.8 shows the 2017 base year) including source apportionment at selected sites (Table 2.3) as part of a county wide modelling exercise led by Reigate and Banstead Borough Council, in conjunction with Elmbridge and Spelthorne Borough Councils.

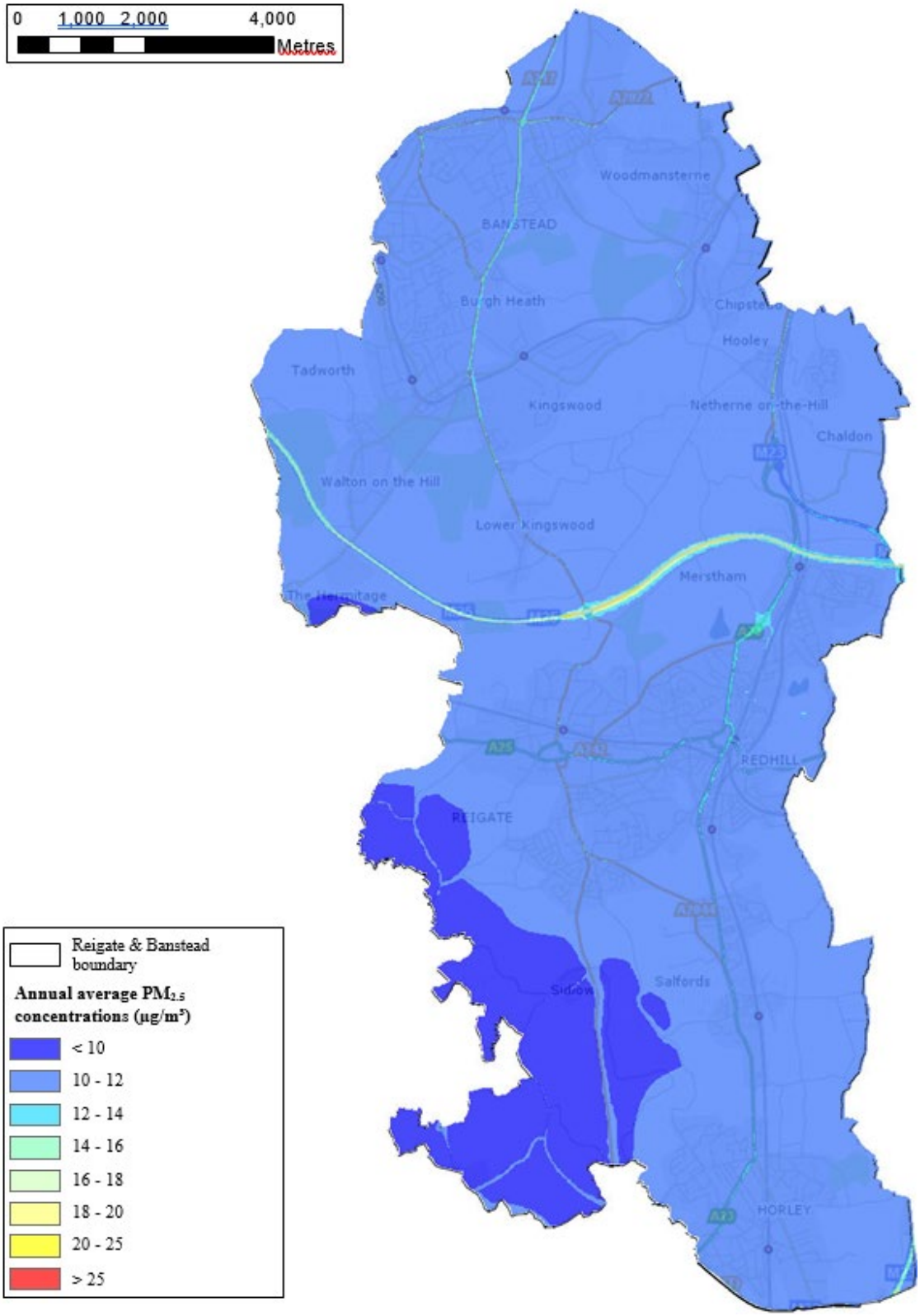


Figure 2.2.8 Annual Average $PM_{2.5}$ Concnetrations in Reigate and Banstead in 2017 ($\mu g/m^3$)

Table 2.3 – Summary of $PM_{2.5}$ concentration source apportionment in Reigate and Banstead ($\mu g/m^3$)

	Type of source apportionment												
PM2.5	Source type				Road transport - exhaust by vehicle type						Road transport - non-exhaust		
Receptor	Road sources	Other sources	Background	Large industrial sources	Petrol Cars & Motorcycles	Diesel Cars	LGVs	Buses & Coaches	Rigid HGVs	Artic HGVs	PM2.5 Brake wear	PM2.5 Tyre wear	PM2.5 Road wear
RB009	0.3	1.9	8.8	<0.1	<0.0	0.02	0.02	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1
RB023	0.4	2.0	8.8	<0.1	<0.0	0.03	0.03	<0.01	<0.01	<0.01	<0.1	0.1	<0.1
RB034	1.0	1.0	8.8	<0.1	0.01	0.08	0.09	<0.01	0.02	0.03	0.3	0.3	0.2
RB039	1.9	1.4	8.8	<0.1	0.02	0.15	0.15	<0.01	0.03	0.05	0.5	0.6	0.4
RB050	1.2	1.1	8.8	<0.1	0.02	0.10	0.08	<0.01	0.02	0.01	0.3	0.4	0.2
RB059	0.4	1.9	8.8	<0.1	<0.0	0.03	0.03	<0.01	0.01	<0.01	<0.1	0.1	<0.1
RB102	0.7	1.1	8.8	<0.1	<0.0	0.07	0.06	<0.01	0.01	<0.01	0.2	0.2	0.1
RB104	0.9	1.6	8.8	<0.1	0.02	0.11	0.06	0.01	0.03	<0.01	0.2	0.3	0.2
RB106	1.2	1.9	8.8	<0.1	0.02	0.13	0.07	<0.01	0.02	<0.01	0.3	0.4	0.2
RB109	0.5	1.7	8.8	<0.1	<0.0	0.06	0.03	<0.01	0.01	<0.01	0.1	0.2	0.1
RB110	1.7	1.5	8.8	<0.1	0.03	0.17	0.11	0.02	0.03	0.02	0.4	0.5	0.3
RB116	1.2	1.6	8.8	<0.1	0.02	0.13	0.07	<0.01	0.03	<0.01	0.3	0.4	0.3
RB117	0.8	1.6	8.8	<0.1	0.01	0.09	0.05	<0.01	0.02	<0.01	0.2	0.3	0.2
RB120	0.9	1.9	8.8	<0.1	0.01	0.09	0.05	0.01	0.02	<0.01	0.2	0.3	0.2
RB124	1.2	1.6	8.8	<0.1	0.02	0.13	0.08	0.02	0.02	0.01	0.3	0.4	0.3
RB125	1.0	1.4	8.8	<0.1	0.02	0.10	0.07	<0.01	0.03	0.01	0.2	0.3	0.2
RB126	0.6	2.0	8.8	<0.1	<0.0	0.04	0.04	0.04	0.01	<0.01	0.1	0.2	0.1
RB136	1.9	1.3	8.8	<0.1	0.03	0.16	0.11	0.01	0.04	0.02	0.5	0.6	0.4
RB137	1.2	1.3	8.8	<0.1	0.02	0.10	0.07	<0.01	0.03	0.01	0.3	0.4	0.3
RB140	0.8	2.1	8.8	<0.1	0.01	0.09	0.05	0.02	0.02	<0.01	0.2	0.3	0.2
RB145	1.5	2.1	8.8	<0.1	0.03	0.15	0.08	0.02	0.03	<0.01	0.4	0.5	0.3
RB146	1.8	1.3	8.8	<0.1	0.03	0.15	0.10	0.01	0.04	0.02	0.5	0.6	0.4
RB147	0.4	1.3	8.8	<0.1	<0.0	0.03	0.03	<0.01	0.01	<0.01	<0.1	0.1	<0.1
RB148	0.8	1.7	8.8	<0.1	0.01	0.08	0.04	<0.01	0.01	<0.01	0.2	0.3	0.2
RB149	0.8	1.7	8.8	<0.1	0.01	0.08	0.04	<0.01	0.01	<0.01	0.2	0.3	0.2
RB150	0.7	1.6	8.8	<0.1	0.01	0.07	0.04	<0.01	0.02	<0.01	0.2	0.2	0.2
RB151	0.3	2.1	8.8	<0.1	<0.0	0.03	0.03	0.01	<0.01	<0.01	<0.1	0.1	<0.1

2.2.1 Ultrafine Particles in the Vicinity of Gatwick

Globally, airports have been identified as a significant source of ultrafine particulate pollution[9,10], i.e. particles that are under 0.1 µm in aerodynamic diameter, and that a large proportion of these particles are generated during take-off with the resulting 'spike' in ultrafine particles detected at least 600 m from the airport based on studies at Los Angeles Airport (LAX).

As research over the past 10 to 15 years has continually indicated that the finer combustion derived particle fractions, including particles under 0.1 µm in (aerodynamic) diameter, tend to have the greatest biological effects, and as an initial 'look / see' study by the Council in late 2011 indicated a significant source of ultrafine particles in the vicinity of Gatwick, the Council has sought academic partners to look at ultrafine particle concentrations in the vicinity of Gatwick in greater detail.

Work with King's College, Imperial College, and Leicester University during 2018 and 2019 to better characterise the impact of ultrafines on local residents was reported on in the 2020 ASR. The key findings from this work were:

- when winds were off airport residential exposure (350 m from A23 / 610 m from the airport) was far higher than that measured 1.5 m from the six lane road in central London, but the average exposure was lower than the roadside site;
- the average exposure at the RG1 site was around double the average exposure at the London background site; and
- there was preliminary evidence that residents closer to the airport than the RG1 site e.g. RG6 site were exposed on average (not just when winds were off airport) to levels seen at Marylebone Road in London.

In 2021 the WHO released updated guidelines[11] in relation to ultrafine particles. While they have been unable to give a numerical standard due in part to the lack

[9] Atmospheric Environment 45 (2011) pp.6526 - 6533

[10] Atmospheric Environment 50 (2012) pp.328 - 337

[11] WHO (2021) Global air quality guidelines: particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. ISBN 978-92-4-003421-1.https://apps.who.int/iris/handle/10665/345329.

of monitoring for researchers to use, they have defined what can be considered high and low values:

- High concentrations - more than 10,000 particles/cm^3 (24-hour mean) or more than 20,000 particles/cm^3 (1-hour); and
- Low concentrations - less than 1,000 particles/cm^3 (24-hour mean).

Applying the new WHO guidelines to the 2018 and 2019 data gives the following results (Table 2.4):

Table 2.4 – RG1 Ultrafine Particle counts measured in 2018 and 2019 – comparison to WHO guidelines.

	2018 Data	2019 Data
No. of days in period	84	205
No. of days with daily average over 10,000 counts / cm^3 (days HIGH)	46	73
% of days over 10,000 counts/cm^3	54.8%	35.6%
No. of days with minimum of 1 hour over 20,000 counts/cm^3	53	110
% of days with minimum of 1 hour over 20,000 counts/cm^3	63.1%	53.6%
No. of days over 10,000 counts/cm^3 or minimum 1 hr greater than 20,000 counts/cm^3	57	114
% of days over 10,000 counts/cm^3 or minimum 1 hr greater than 20,000 counts/cm^3	67.8%	55.6%
No. of days with daily average under 1,000 counts/cm^3 (days LOW)	0	0

While the data in Table 2.4 does not cover a full calendar year it does suggest that for around 50% of the time residents in the vicinity of RG1 are exposed to ultrafine particle concentrations that are classed as high either on a daily or hourly basis by the WHO.

If the data for the 2019 period is broken down by daily average wind direction (Table 2.5) then it is clear that the high pollution days are occurring when winds are coming from the general direction of the airport, with the 21 days on westerly winds all occurring when winds are from the SW to WSW (effectively off airport).

Table 2.5 – Distribution of High ultrafine particle concentrations at RG1 by Wind direction in 2019 data.

Daily average Wind Direction	Days	No. Days with Daily Average over 10,000 particles/cm^3	No. Days with min. of 1 hour over 20,000 particles/cm^3
North	13	0	1
East	43	1	5
South (from the airport)	66	51	56
West	83	21	48

To put the Horley figures into a wider context the RG1 site can be compared to both the London background site (Honor Oak) and the roadside site at Marylebone Road. As daily and hourly values are being examined the comparison is based only on days in 2019 when data from all three sites was available (Table 2.6).

Table 2.6 – Comparison of London Background and Roadside monitoring to Residential Monitoring in Horley using WHO guidelines.

Site	Distance from Source	Data Capture (%)	Mean Particle Count (Particles / cm^3)	Days 'High' (daily mean)	No. of hours 'High' in period	No. Days with min. of 1 hour 'High'
London – Background (Honor Oak)	n/a	89	4,261	4	0	0
RG1 Horley	350 m A23 / 610 m Airport	89	8,846	29	216	46
London – Marylebone Road	1.5 m	89	9,686	39	111	36

Table 2.6 indicates that residential exposure at RG1 to 'High' days of ultrafine pollution is significantly higher than the London background site, but lower than that seen 1.5 m from a road in central London.

However, it also shows that the hourly exposure to 'High' pollution at RG1 either as the total number of hours of exposure, or the number of days with a minimum of 1-hour of 'High' pollution exposure is significantly higher than that seen at Marylebone Road.

Given the RG1 site is located in a residential estate around 350 m from the nearest main road, and a significant number of houses are closer to the source of ultrafine pollution than the RG1 site, it suggests that ultrafine particles in the vicinity of Gatwick are far higher than could be considered ideal.

To date no additional work has been undertaken in this area as the airport feels unable to fund an ultrafines monitoring program, despite this being in line with measures proposed in the Government's draft aviation strategy[12], and the recommendations of the Government's air quality expert group (AQEG)[13].

However, the council is looking at other potential projects in this area with academic partners which will be reported on in due course.

2.2.2 Health Impact of Air Pollution in the Borough

Historically, the Council has focused much of its air quality work on local hot spots that have been declared AQMAs, although within the past five years the general approach has been to focus on measures that have air quality benefits across the borough e.g. electric vehicle charging infrastructure trials.

While it is important to focus on localised hot spots where a straightforward solution is possible e.g. realignment of a road in relation to houses so that in effect the houses are moved away from the road to meet the air quality standards, it is also important to realise that while the majority of the borough meets the relevant air quality standards there is still a health cost associated with the lower levels of pollution that exist across the borough.

As reported on in the 2021 ASR the most recent borough (and county) wide modelling[14] examined the current health costs of air pollution (nitrogen dioxide and PM) across the borough to inform future policy at the council around reducing residents' exposure air pollution

The work suggests that in 2017 air pollution across the borough had an economic cost of £37 to £45 million, with the number of life years lost in the region of 880 to 1,060 years.

As the health impact is a function of both the pollution levels and the number of people affected, while the borough had the third highest average nitrogen dioxide exposure in Surrey and the 6th highest $PM_{2.5}$ exposure, as a consequence of its

[12] Aviation 2050: The Future of UK Aviation. pp.82.

[13] AQEG Ultrafine Particles (UFP) in the UK. – July 2018. pp.11, and pp.94 Section 7.1 Paragraph 2.

[14] CERC 2018 Detailed air quality modelling and source apportionment for Surrey Local Authorities.

relatively large population compared to the other Surrey boroughs, Reigate and Banstead suffers from the largest health impact/cost in Surrey.

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

3.1 Summary of Monitoring Undertaken

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

3.1.1 Automatic Monitoring Sites

Reigate and Banstead Borough Council undertook automatic (continuous) monitoring at four sites in 2021 (RG1, RG3, RG6 and RG7). RG7 started monitoring in August 2018. Table A.1 in Appendix A shows the details of the sites.

National monitoring results for the AURN site RG1 (Horley) are available at https://uk-air.defra.gov.uk/networks/network-info?view=aurn. National monitoring results for the AURN site RG1 (Horley), and the other three sites which are not AURN but are operated to AURN standards by ERG at Imperial College (i.e. RG3 (Poles Lane, between Crawley and Gatwick Airport) and RG6 (Horley South East)) and RG7 (Hooley) are available at https://www.londonair.org.uk/london/asp/data-download.asp.

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

Reigate and Banstead Borough Council undertook non- automatic (passive) monitoring of NO_2 at 149 sites in 2021. Table A.2 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 Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias[15], "annualisation" (where the data capture falls below 75%), and distance correction[16]. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

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

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

Table A.4 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 results indicate that for both the annual mean and 1-hour mean objectives there were no breaches at any of the monitoring locations in 2021.

There was only one measured exceedance of the annual mean nitrogen dioxide objective at diffusion tube monitoring site RB148 in 2021, which required distance correcting and was well below the obejctive at a relevant location (31.2 µg/m^3). There were no other measured exceedences, meaning all relevant objectives were met within the Borough.

3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

[15] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html
[16] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

There have been no exceedances of either PM_{10} objective in any of the years monitored.

3.2.3 Particulate Matter ($PM_{2.5}$)

No $PM_{2.5}$ monitoring was undertaken by Reigate and Banstead Borough Council in 2021.

3.2.4 Sulphur Dioxide (SO_2)

No SO_2 monitoring was undertaken by Reigate and Banstead Borough Council in 2021.

3.2.5 Benzene

Table A.7 in Appendix A compares the ratified monitored benzene annual mean concentrations for the past five years with the annual mean air quality objective of 5µg/m^3. Measured concentrations are consistently below the objective at all sites from 2016 – 2021.

3.2.6 AQMA No. 1: M25

The M25 AQMA consists of the length of the M25 to a distance of 30 m either side of the carriageway between Junction 7 and the point of the west of Junction 8 where the motorway meets with the borough boundary.

There are two nitrogen dioxide diffusion tube monitoring sites located within the M25 AQMA, and seven nitrogen dioxide diffusion tube monitoring sites located in close proximity (i.e. within 50 m) to the AQMA. Measured pollutant concentrations at all monitoring sites both within and up to 50 m distance from the AQMA have generally been decreasing since 2004 and were below the relevant air quality objectives in this reporting period (Figure 3.1).

Figure 3.2 below shows traffic flows between Junction 7 and Junction 8, and between Junction 8 and Junction 9 of the M25 motorway within the M25 AQMA, from 2002 to 2021. The traffic volumes were relatively stable between 2002 and 2010 on both sections of the M25. On the Junction 7 – Junction 8 section, traffic

volumes decreased between 2011 and 2014, then kept increasing sharply until 2017 and has been very slowly decreasing since. The Junction 8 – Junction 9 section has followed a similar trend albeit a year later than the neighbouring M25 section. Overall, traffic volumes between Junction 7 and Junction 8 have decreased since the early 2000s and increased between Junction 8 and Junction 9.

There was a sharp decrease in traffic volumes on the M25 in 2020 as a result of changing travel patterns due to the COVID-19 pandemic. Traffic flows subsequently increased in 2021, but remained well below those in earlier years.. Concentrations at all monitoring sites decreased from 2019 to 2020, and have continued to decrease from 2020 to 2021.

In view of the air quality objectives being met, the relatively low concentrations measured at relevant receptors for a number of years, and the long term downward trend, the Council would ordinarily look to revoke the M25 AQMA. However, plans to revoke the M25 AQMA are currently on hold pending the completion of work by Gatwick Airport to examine the impact of its planned expansion from 46.5 million passengers per annum (mppa) in 2019 to 72.3 mppa in 2032 (a 55 % increase in passenger traffic). The airport currently envisages road traffic associated with this growth mainly accessing the airport via the M25 / M23, although the county councils' (Surrey and West Sussex) traffic modellers currently have concerns around capacity constraints on this section of the road network.

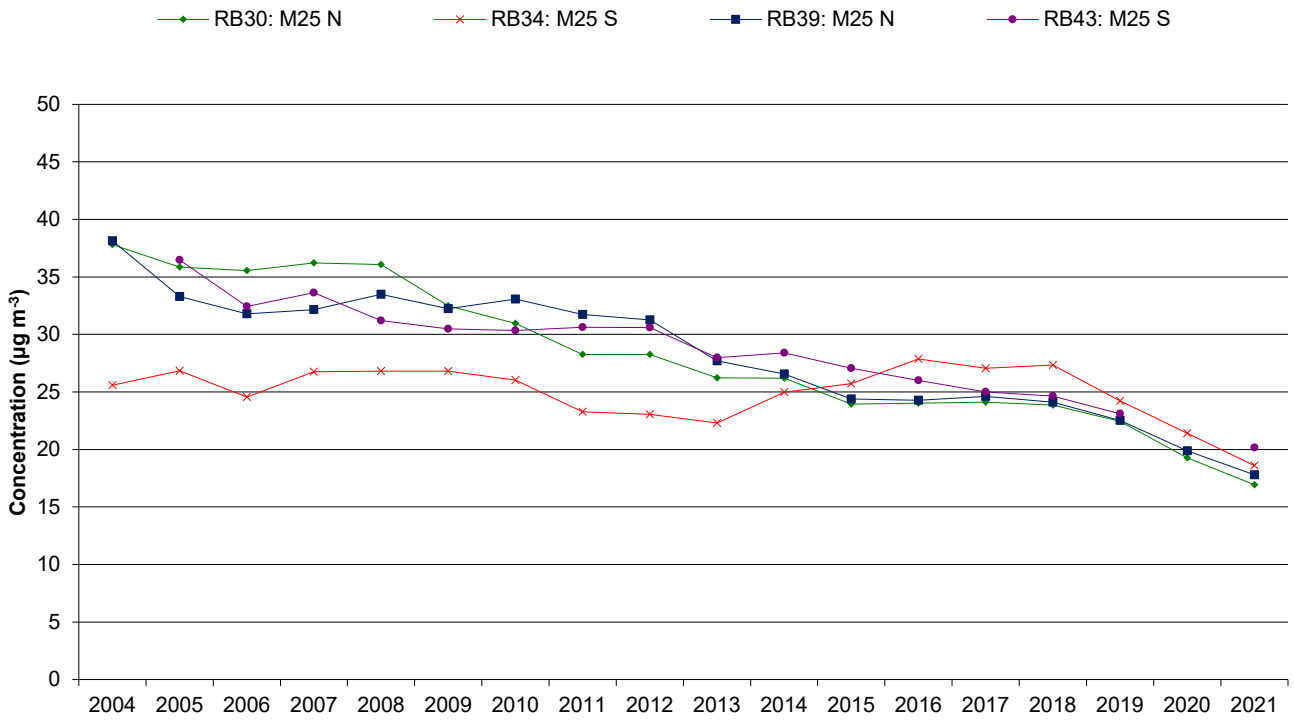


Figure 3.1 3 Year Rolling Annual Averages at Diffusion Tube Sites - M25 AQMA, 2004 – 2021

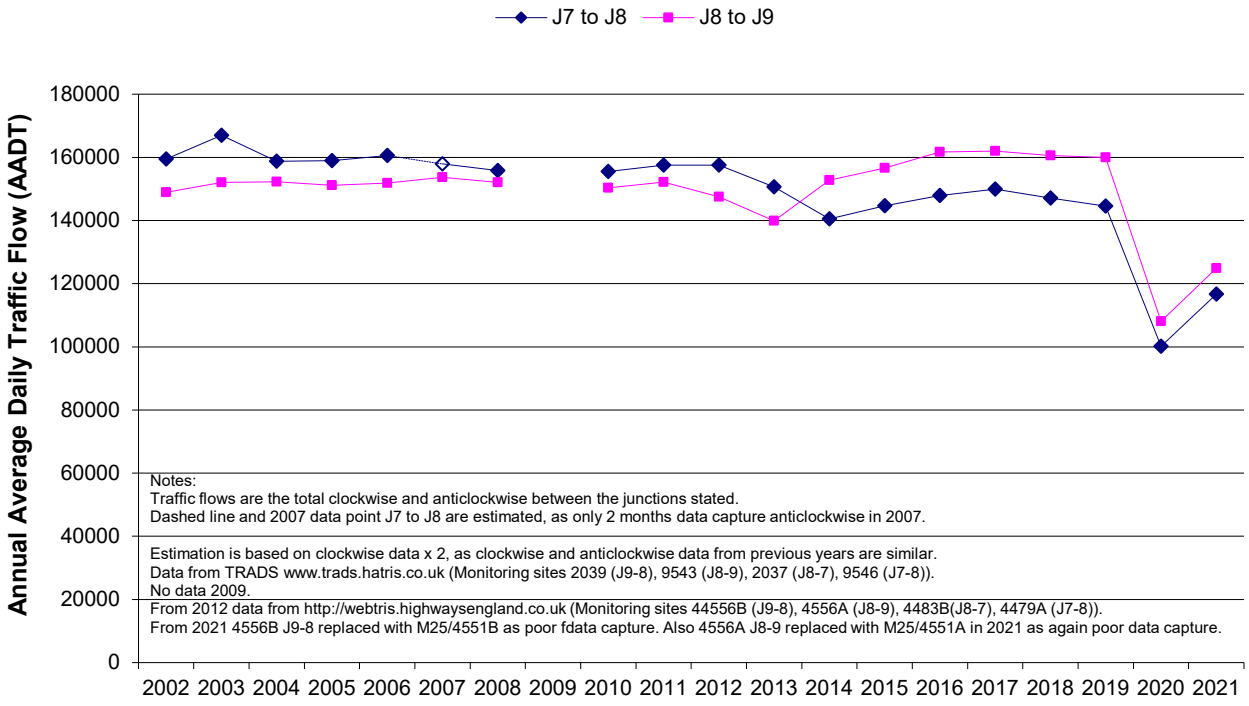


Figure 3.2 Annual Mean Daily Traffic Flows within the M25 AQMA, 2002 – 2021.

3.2.7 AQMA No. 3: Horley

Horley AQMA covers an area of the southwest quadrant of Horley near to Gatwick Airport.

The following monitoring sites are located within the AQMA:

- 37 diffusion tubes which monitor nitrogen dioxide concentrations;
- one diffusion tube which monitors benzene concentrations;
- one automatic monitoring site (RG1) which monitors nitrogen dioxide and PM_{10} concentrations; and
- one automatic monitoring site (RG6) which monitors nitrogen dioxide concentrations.

Monitoring of nitrogen dioxide is also undertaken by the council at a further site (RG3), which is located to the southwest of Gatwick Airport in Crawley. One diffusion tube (RB149) located along Brighton Road, near to the boundary, but within the AQMA, measured exceedances of the nitrogen dioxide annual mean objective between 2017 and 2019, but when distance corrected fell below the objective in 2018. Site RB149 also measured exceedances from 2014 to 2015 (not distance corrected). There does, however appear to be a long-term downward trend at this location. Measured pollutant concentrations at all of the other monitoring sites were below the relevant air quality objectives in the reporting period (Figure 3.3). There were no measured exceedances in 2021.

While the overall trend in nitrogen dioxide concentrations is downwards in the vicinity of the airport, it is also possible to examine the trend in 'airport concentrations' using data selected based on wind direciton. These 'airport concentrations (Figure 3.4), which also include a road traffic component from the A23 Airport Way, have been calculated by subtracting pollutant concentrations measured upwind of the airport, from those on the other side when the winds are from the south West (i.e. RG2 / RG6 minus RG3). As can be seen from Figure 3.4, while the underlying trend in concentrations in Horley is down (Figure 3.3), there is a different pattern in these airport sources. While there has been a reduction in these airport sources since 2016, it is worth noting that this airport component is currently unchanged on 10 years ago. A sharp decrease was seen in 2020 and

continued in 2021, as a result of changing travel behaviour (including a significant decrease in number of flights), as a result of the COVID-19 pandemic.

Figure 3.5 below shows traffic flows along the A23 in Horley. The data suggest a slight trend of increasing annual mean daily traffic flows from 2014 to 2019; with a sharp decrease in 2020 as a result of the COVID-19 pandemic changing travel behaviour. Flows increased in 2021 but remained below those in previous years. Whereas previously discussed, nitrogen dioxde concentrations are generally decreasing.

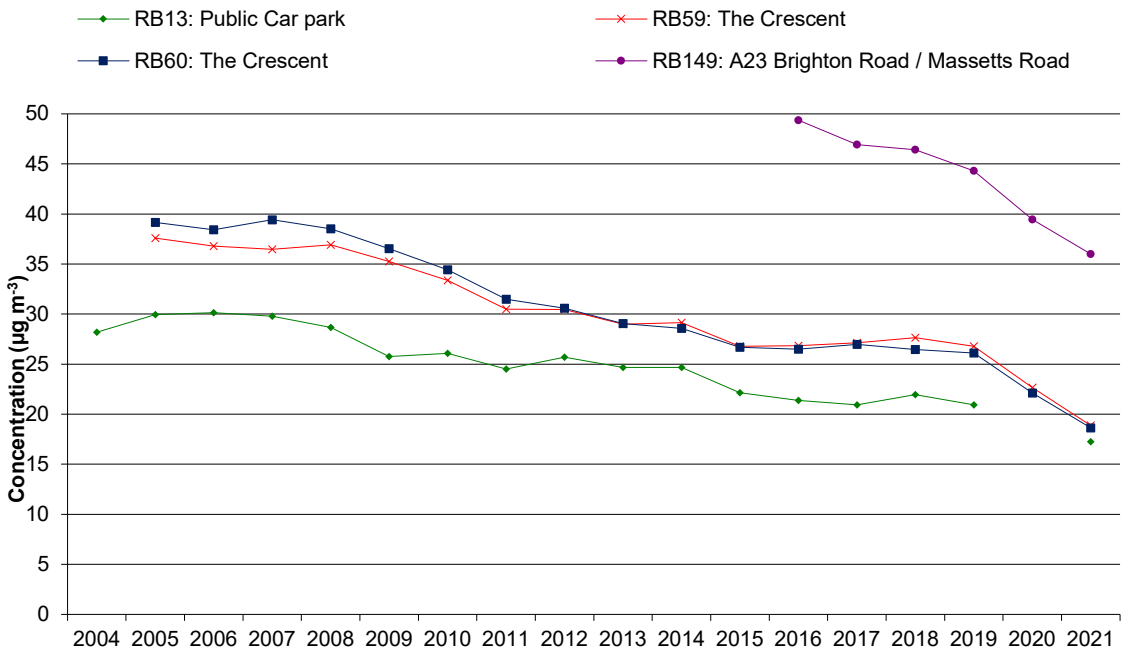


Figure 3.3 3-Year Rolling Annual Averages at Diffusion Tube Sites - Horley AQMA, 2004 – 2021.

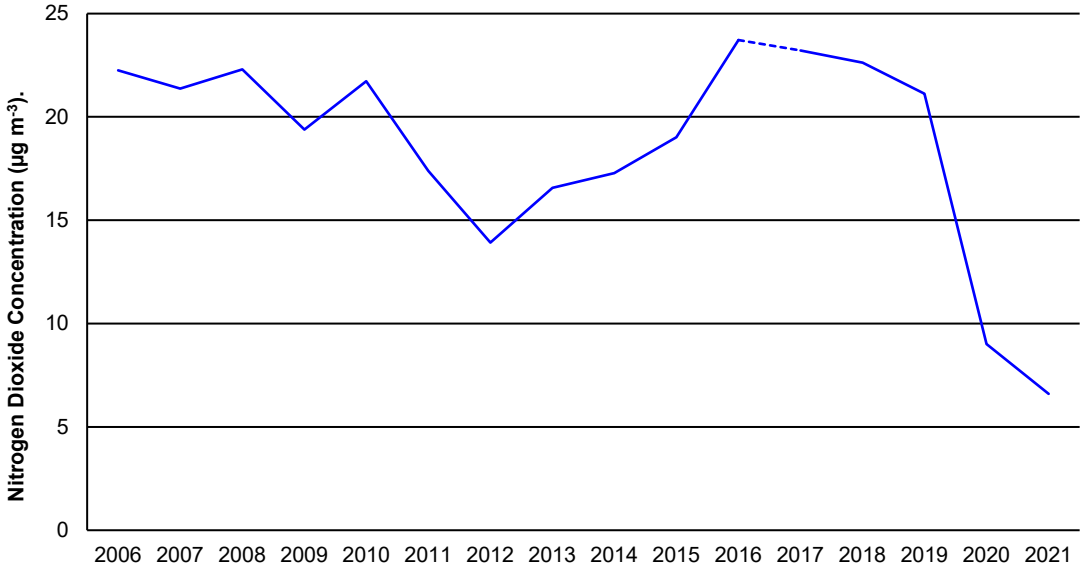


Figure 3.4: RG2 minus RG3 when wind on 202 to 248 degrees - Mean of hourly values 2006 – 2021.

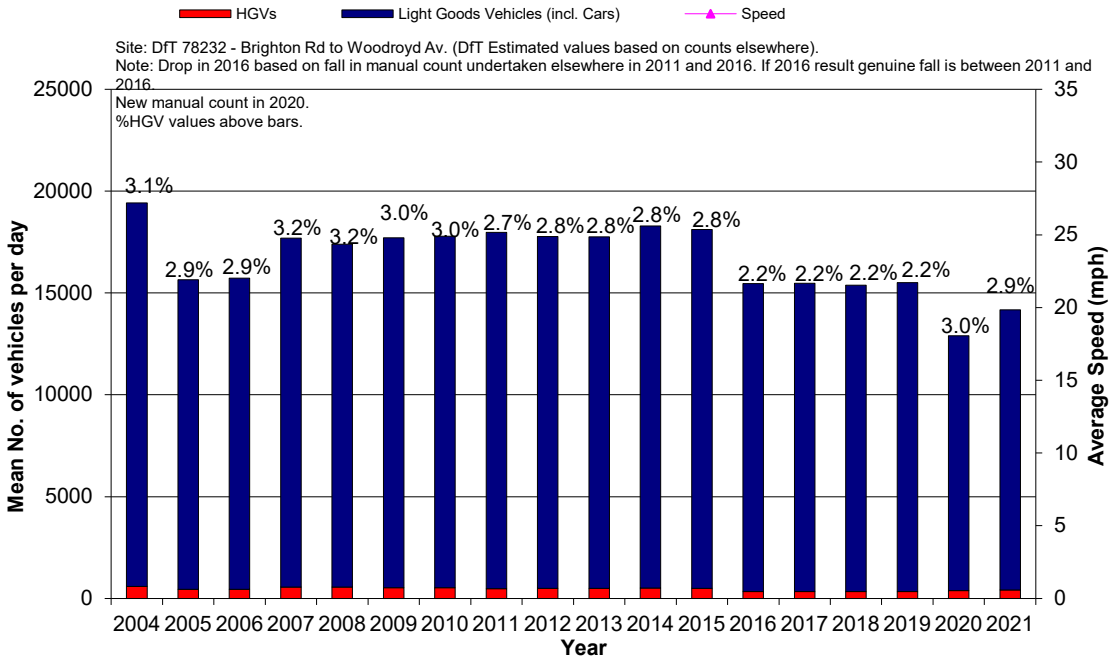


Figure 3.5 A23, Horley, Annual Mean Daily Traffic Flows 2004 - 2021

3.2.8 AQMA No. 6: A217 / Blackhorse Lane

The A217 / Blackhorse Lane AQMA covers an area encompassing one property near the junction of the A217 Brighton Road with Margery Lane and Blackhorse Lane.

Nitrogen dioxide monitoring takes place at one diffusion tube monitoring site, located within the AQMA (RB49) and one site located aproximately 15 m to the north of the AQMA (RB50). Measured concentrations at one of the monitoring sites (RB49) exceeded the annual mean nitrogen dioxide objective from 2015 – 2017, before falling below the objective during 2018 and 2019; monitoring site RB50 did not breach the objective in any of the years presented. Both monitoring sites show a small decreasing trend in concentrations which has almost levelled off in the case of site RB50 in recent years (Figure 3.6). There were no measured exceedances in 2020, with no data collected from RB50 in 2021 due to the nearby refurbishment of a house. The tube is back in place for 2022.

Figure 3.7 below shows traffic flows along the A217, near to Blackhorse Lane, in close proximity to Blackhorse Lane AQMA. Data for 2010 was unavailable. The data suggest a gradual overall decrease in annual mean daily traffic flows over the period monitored. As expected, there was a slight increase in traffic in 2021, due to removal of restrictions put in place during the COVID-19 pandemic. Traffic levels are still well below pre-pandemic levels.

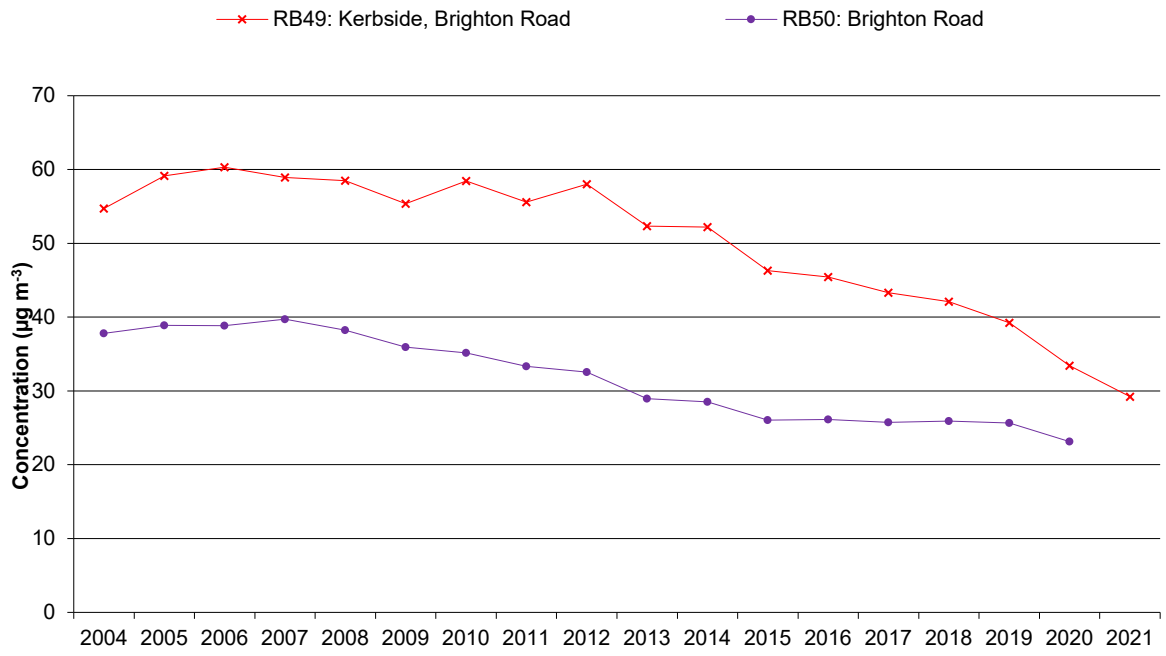


Figure 3.6: 3-Year Rolling Annual Averages at Diffusion Tube Sites – Blackhorse Lane AQMA, 2004 – 2021.

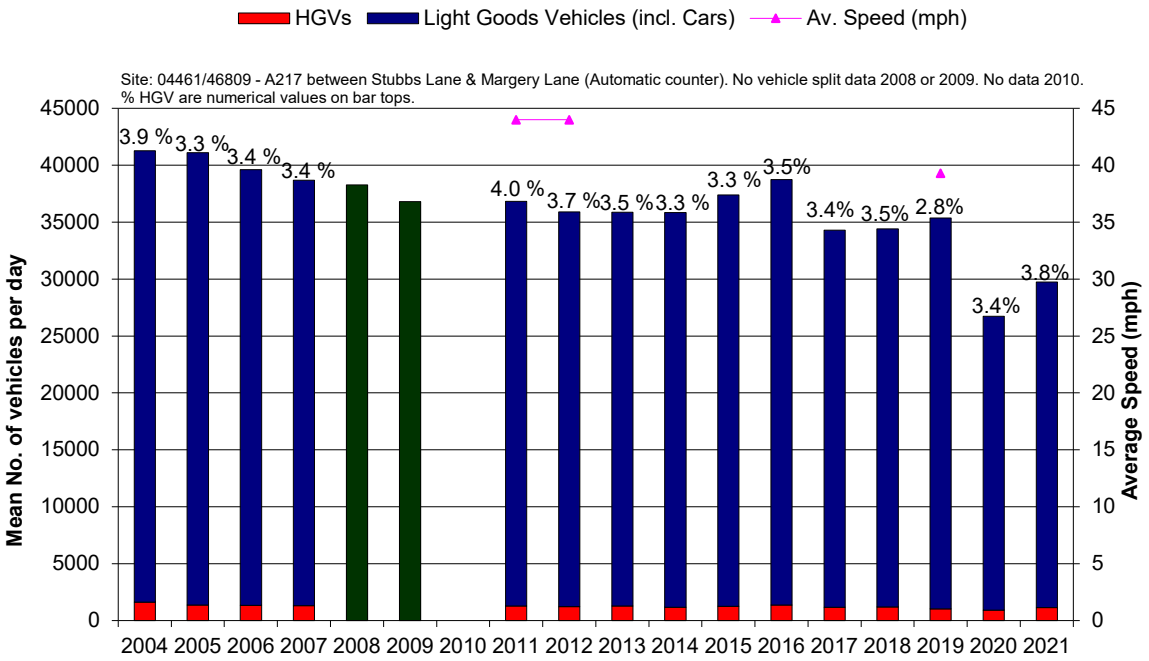


Figure 3.7: A217 (Near to Blackhorse Lane) Annual Mean Daily Traffic Flows, 2004 - 2021

3.2.1 AQMA No. 8: Drift Bridge

The Drift Bridge AQMA covers an area encompassing two residential properties immediately to the north of the junction of the A240 (Reigate Road) and A2022 (Fir Tree Road).

Nitrogen dioxide diffusion tube monitoring takes place at one diffusion tube adjacent to the southeast corner of the AQMA. There are further two diffusion tubes monitoring sites within 50 m of the AQMA and another one approximately 400 m to the east of the AQMA. Concentrations at all of the monitoring sites have been decreasing or at worst remained steady since 2012 and have been below the air quality objectives since 2015 (Figure 3.8). There was a sharp decrease in concentrations in 2020, rebounding slightly in 2021, as a result of changing travel patterns due to the COVID-19 pandemic. Concentrations are still below pre-pandemic levels.

Figure 3.9 below shows traffic flows at three sites near to the Drift Bridge AQMA. Two (Sites A and B) are located along the A240 and one (Site C) is located along the A2022. Data at Site A suggests a decrease in annual mean daily traffic flow from 2004 to 2012, followed by an increase in 2013 after which the flow stabilizes for four years before decreasing again in 2017-2018. Data available from Site B does not suggest a clear trend in annual mean daily traffic. Data at Site C suggests decreasing annual mean daily traffic flow between 2005 and 2011, after which the trend in flow is relatively stable. A sharp decrease is seen in 2020 as a result of changing travel behaviour as a result of the COVID-19 pandemic. Again, as expected, there was a slight increase in traffic in 2021, due to removal of restrictions put in place during the COVID-19 pandemic. Traffic levels are still well below pre-pandemic levels.

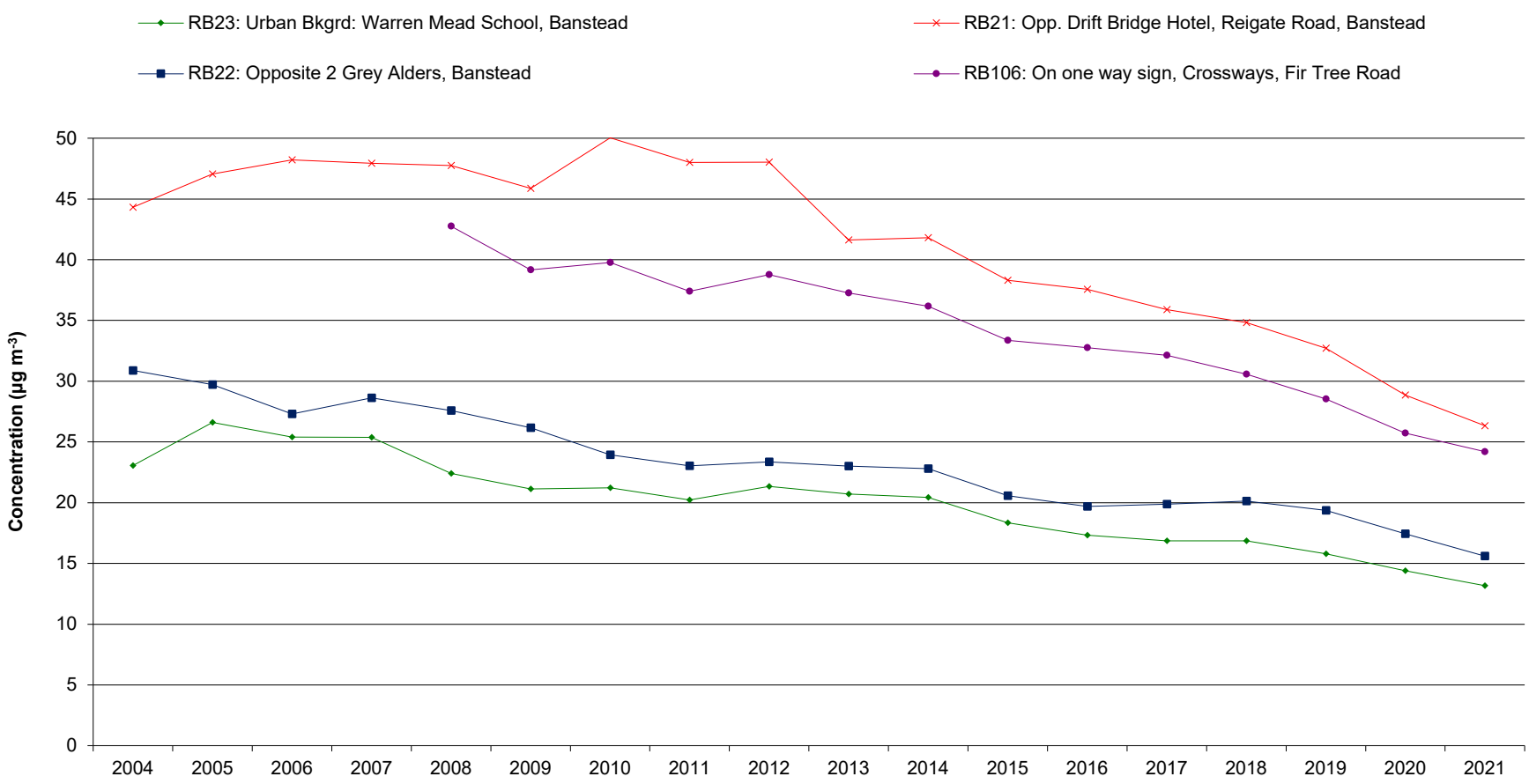


Figure 3.8 3-Year Rolling Annual Average Nitrogen Dioxide at Diffusion Tube Sites – Drift Bridge AQMA, 2004 – 2021.

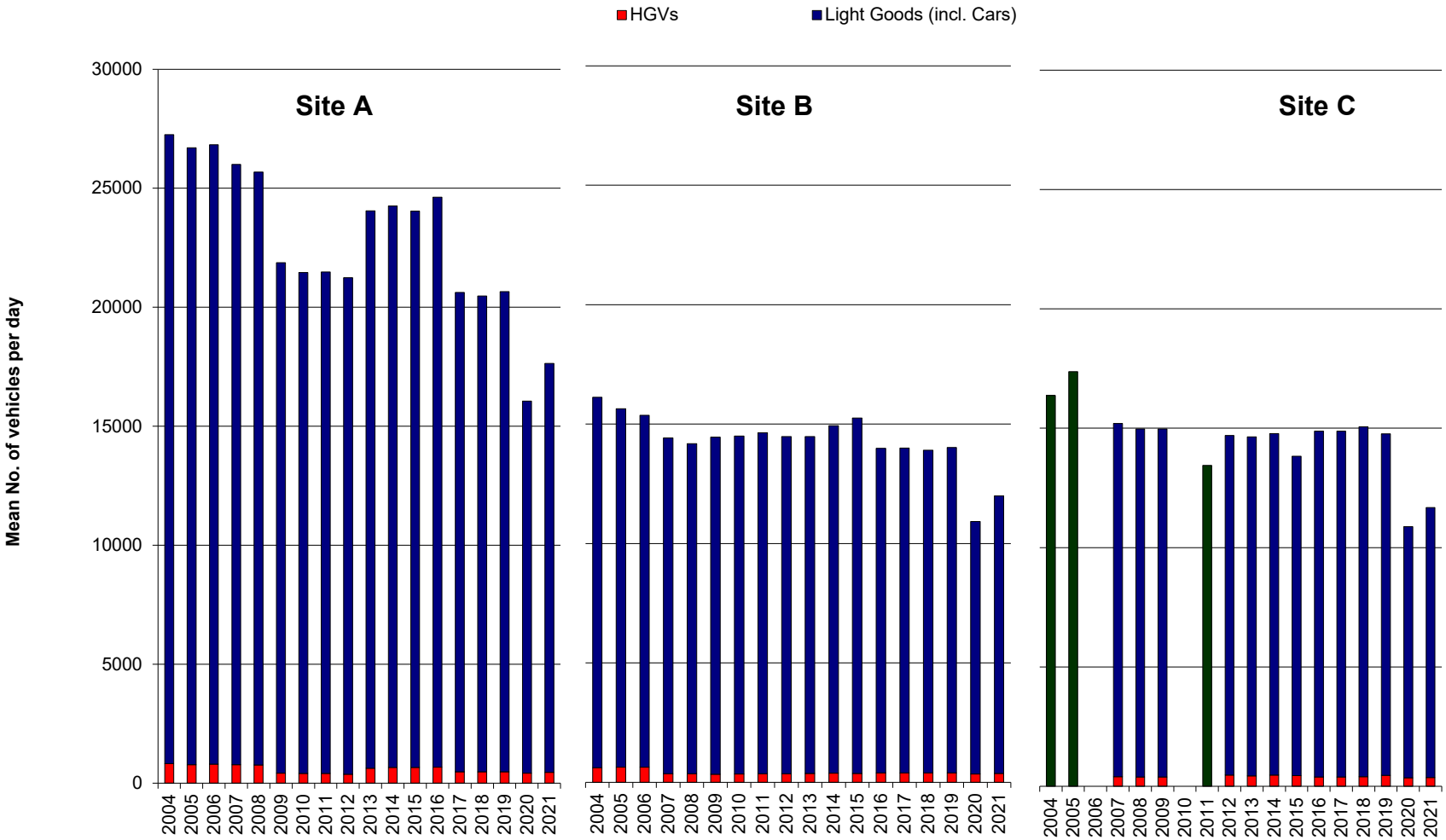


Figure 3.9 Drift Bridge Annual Mean Daily Traffic Flows, 2004 – 2021 (Sites A-C).

3.2.2 AQMA No. 9: Reigate High Street/ West Street/ Bell Street

The Reigate High Street / West Street / Bell Street AQMA covers an area encompassing Reigate High Street, the section of Church Street between the High Street and Bancroft Road, properties with a frontage to Bell Street (between the High Street and the southern end of Bancroft Road) and land and properties within 15m of either side of West Street (between High St and Evesham Rd) and along London Road (between West St and Castlefield Rd).

Nitrogen dioxide monitoring is undertaken by 15 diffusion tube monitoring sites within the AQMA. Benzene diffusion tube monitoring takes place at one location within the AQMA (note: the AQMA was declared for exceedances of the annual mean nitrogen dioxide objective). Measured concentrations of nitrogen dioxide at all monitoring sites have been steadily decreasing from their peak in 2008 and were below the relevant air quality objectives in 2019 (Figure 3.10). There were also no measured exceedances in 2021. Benzene concentrations were also below the objectives.

Figure 3.11 below shows traffic flows along Reigate High Street. Monitor 1 suggests a weak trend of reducing annual mean daily traffic flows from 2004 to 2013, and a weak trend of increasing annual mean daily traffic flows from 2013 to 2016. From 2016 traffic flows decreased again to around 2012-2013 levels. No data are available for 2019. Monitor 2 suggests a weak trend of reducing annual mean daily traffic flows from 2004 to 2010 and subsequent increasing between 2010 and 2012. Between 2012 and 2018 the traffic flows changed only marginally year on year, however in 2019 the observed traffic flows were the highest since the monitoring begun. A sharp decrease is seen in 2020, which continued into 2021, as a result of changing travel behaviour as a result of the COVID-19 pandemic.

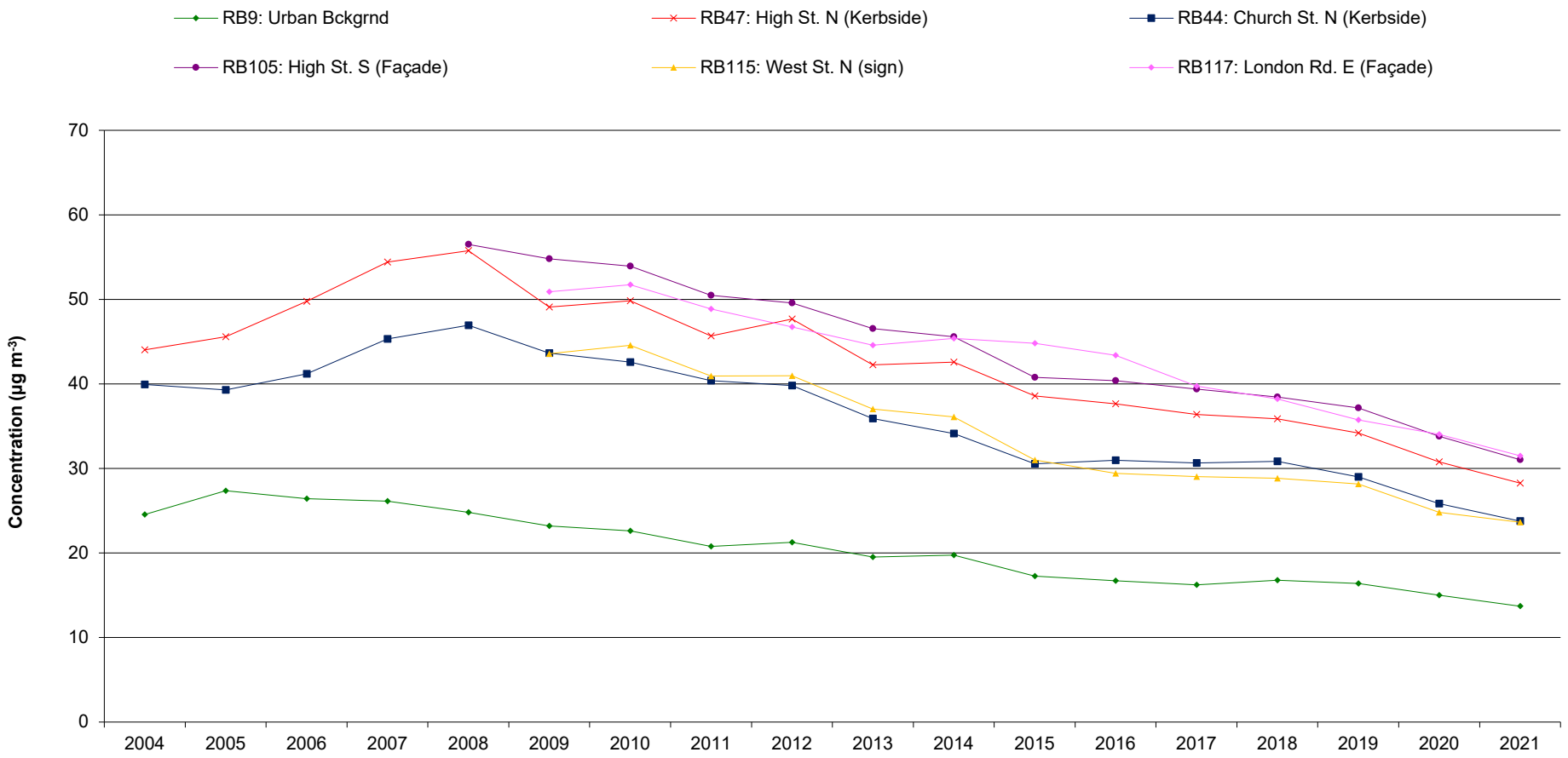


Figure 3.10 3 Year Rolling Annual Averages at Diffusion Tube Sites - Reigate High Street AQMA, 2004 – 2021.

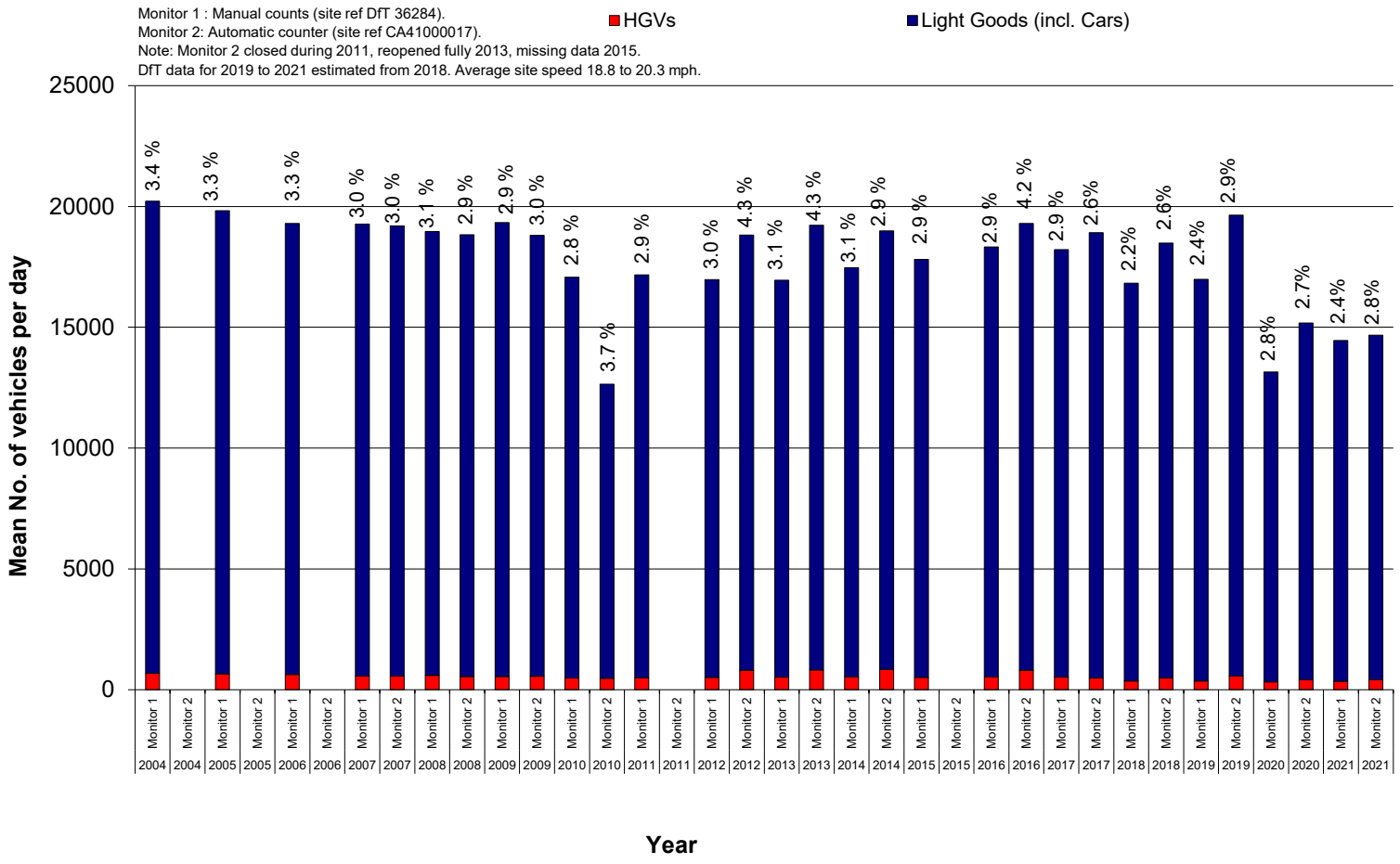


Figure 3.11 Reigate High Street Annual Mean Daily Traffic Flows, 2004 – 2021.

3.2.3 AQMA No. 10: Merstham

The Merstham AQMA covers an area encompassing all properties facing on to part of the A23 in Merstham. The AQMA runs from London Road South (south of the junction with School Hill) and extends north along Merstham High Street and then just to the north of the junction with Station Road North.

Nitrogen dioxide monitoring takes place at three diffusion tube sites located within the Merstham AQMA (RB20, 110 and 124), and at one further site just outside the AQMA. Benzene monitoring takes place at one diffusion tube site located within the AQMA (note: the AQMA was declared for exceedances of the annual mean nitrogen dioxide objective). Measured concentrations of all pollutants at all locations have been below the relevant air quality objectives since 2016 (Figure 3.12).

Figure 3.13 below shows traffic flows along the A23 as it passes through Merstham. The traffic flow was largely stable between 2005 and 2016 before a substantial drop in 2017. By 2019 the traffic flows increased to the previous levels, however. There is a weak decreasing trend in average traffic speed in recent years. A sharp decrease is seen in 2020 as a result of changing travel behaviour as a result of the COVID-19 pandemic, which is reflected in a decrease in concentrations in this year.

Traffic has rebounded to near pre-pandemic levels in 2021, with no increase in nitrogen dioxide concentrations witnessed.

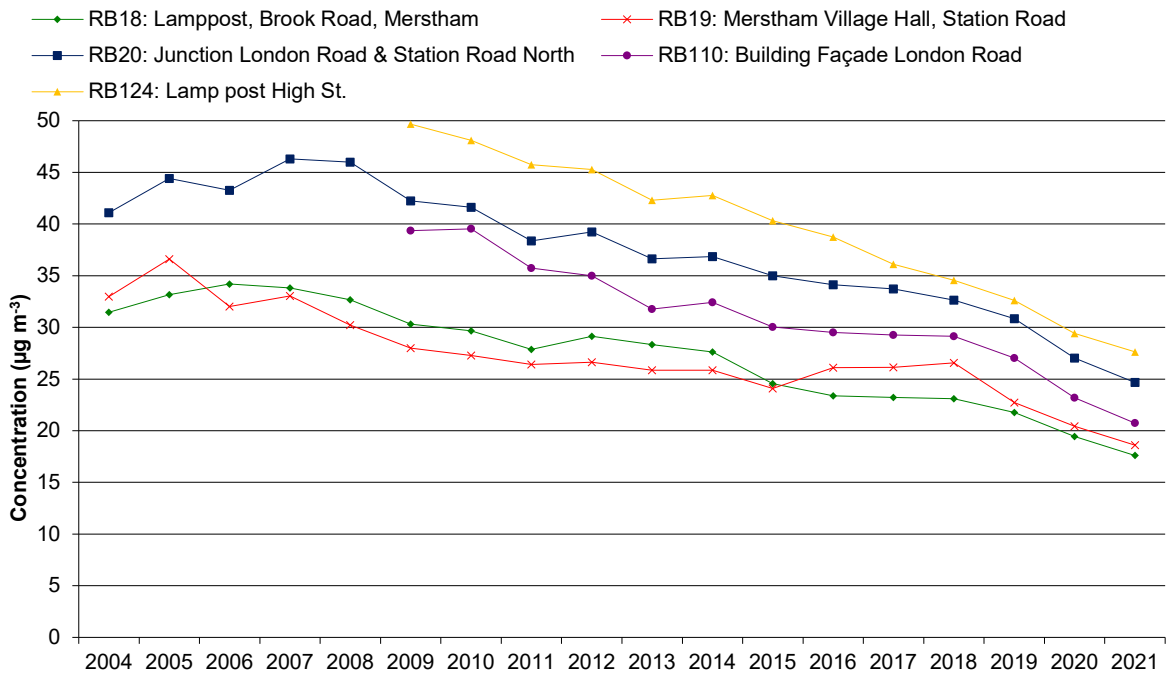


Figure 3.12 3-Year Rolling Annual Averages at Diffusion Tube Sites - Merstham AQMA, 2004 – 2021.

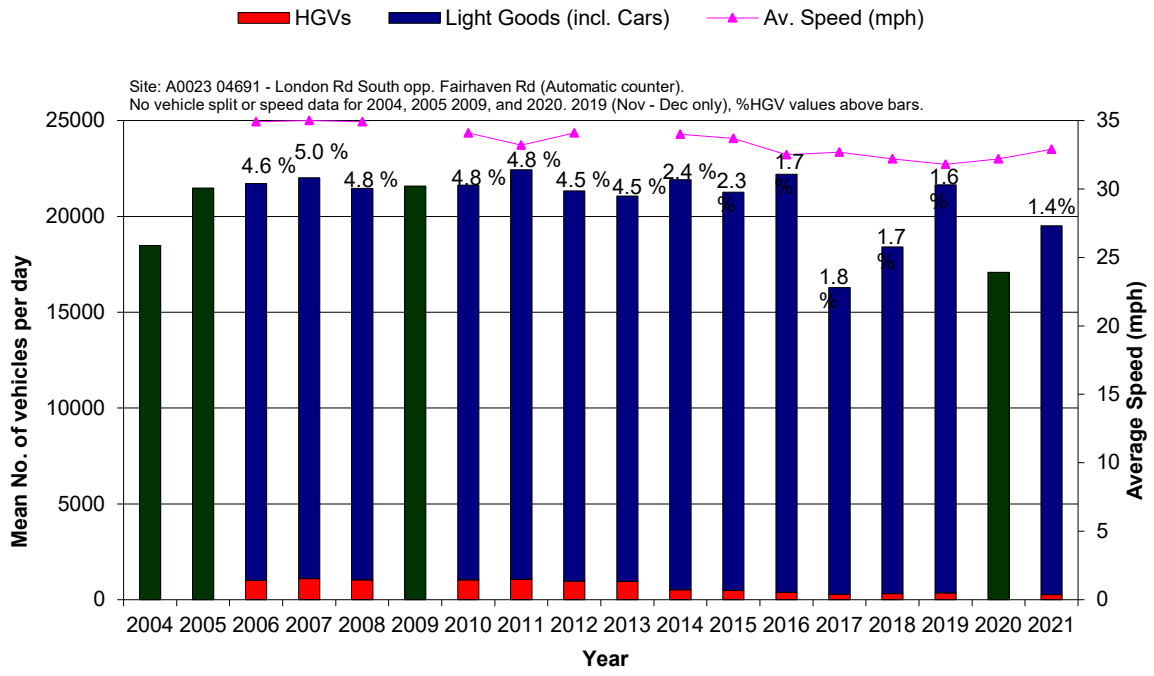


Figure 3.13 Merstham Annual Mean Daily Traffic Flows, 2004 – 2021.

3.2.4 AQMA No. 11: Reigate Hill

The Reigate Hill AQMA includes properties within the area of Reigate Hill between the level crossing in Reigate Town and J8 of the M25.

Nitrogen dioxide diffusion tube monitoring takes place at two locations within the AQMA, and one location outside of the AQMA. Concentrations at each of these monitoring sites were below the relevant air quality objectives throughout the 2017-2021 period (Figure 3.14).

Figures 3.15 shows the traffic flows along the A217 north of Ragland Road. The observed traffic flows in 2019 are the highest recorded to date, however due to large gaps in the data it is not possible to infer any trends in the recent years. A sharp decrease is seen in 2020 as a result of changing travel behaviour as a result of the COVID-19 pandemic, which is reflected in a decrease in concentrations in this year. No traffic data are available for 2021.

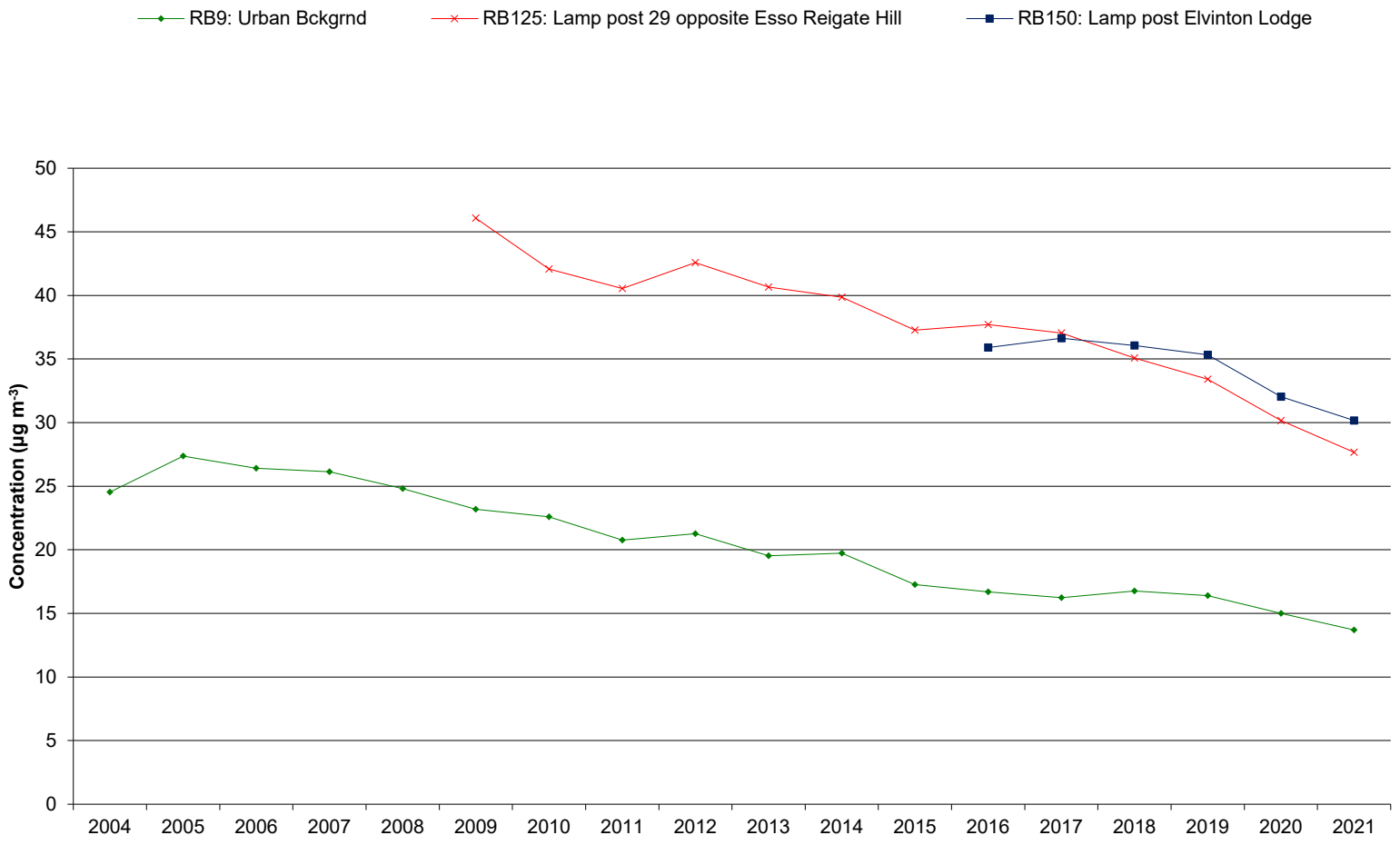


Figure 3.14 3 Year Rolling Annual Averages at Diffusion Tube Sites – Reigate Hill AQMA, 2004 – 2021

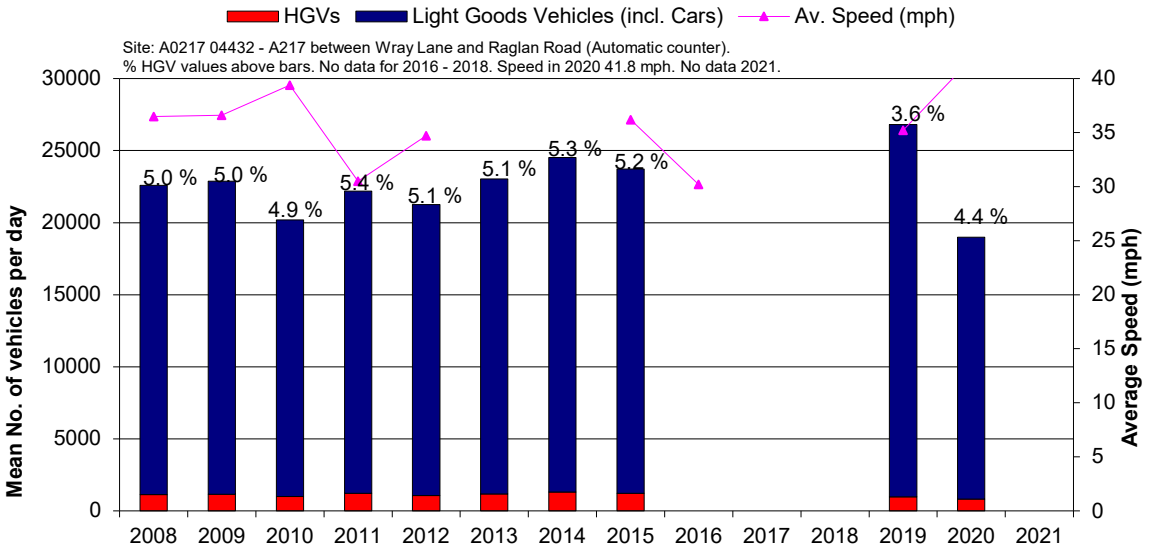


Figure 3.15 Reigate Hill, North of Raglan Road Annual Mean Daily Traffic Flows, 2008 – 2021.

3.2.5 AQMA No. 12: Redhill

The Redhill AQMA covers properties within the Redhill area covering either partially or entirely Cromwell Road, Queensway, the A25 Redstone Hill between the junction with the A23 and the junction with Hillfield Road, the A23 between the junction of Hooley Lane and Mill St, and the A23 junction with Gloucester Road.

Nitrogen dioxide diffusion tube monitoring takes place at seven sites located within the Redhill AQMA. Measured concentrations at each of these monitoring sites, where there is relevant exposure, was below the relevant air quality objective in the 2017-2021 period (Figure 3.16).

Figure 3.17 below shows traffic flows along the A23, south of Redhill. Data for 2018-2020 and 2021 at this site are unavailable. Data from the previous year's suggest that both traffic flows and average speeds remained relatively stable between 2006 and 2017.

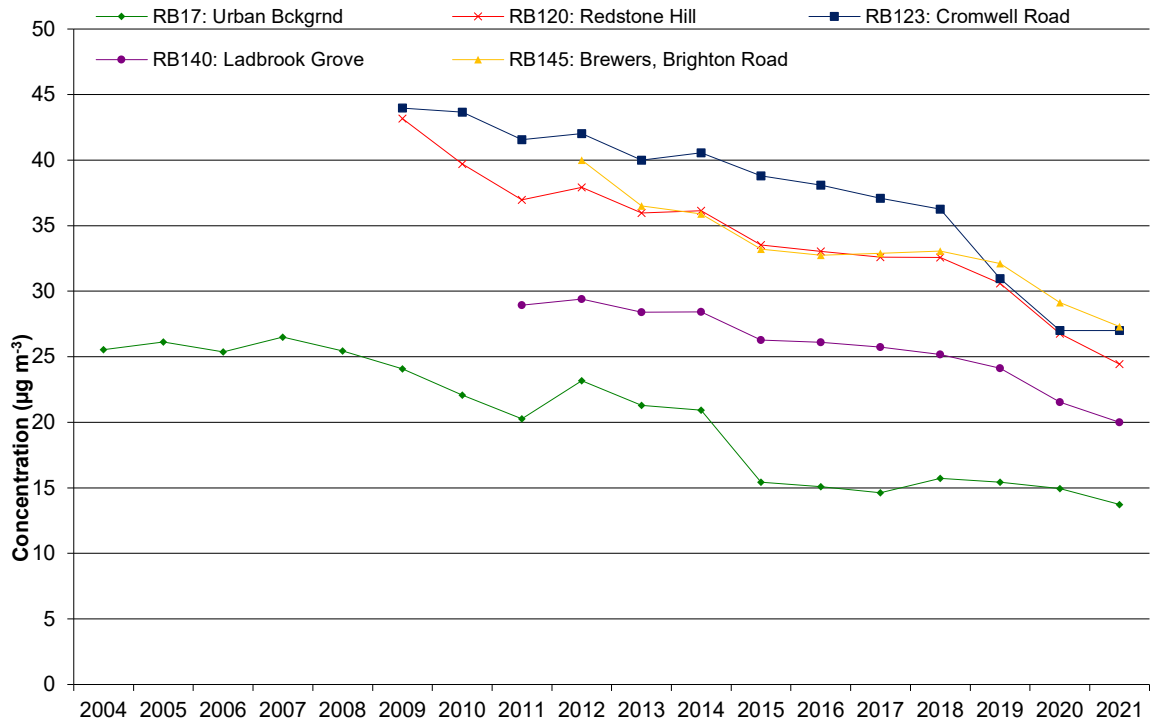


Figure 3.16 3-Year Rolling Annual Averages at Diffusion Tube Sites – Redhill AQMA, 2004 – 2021

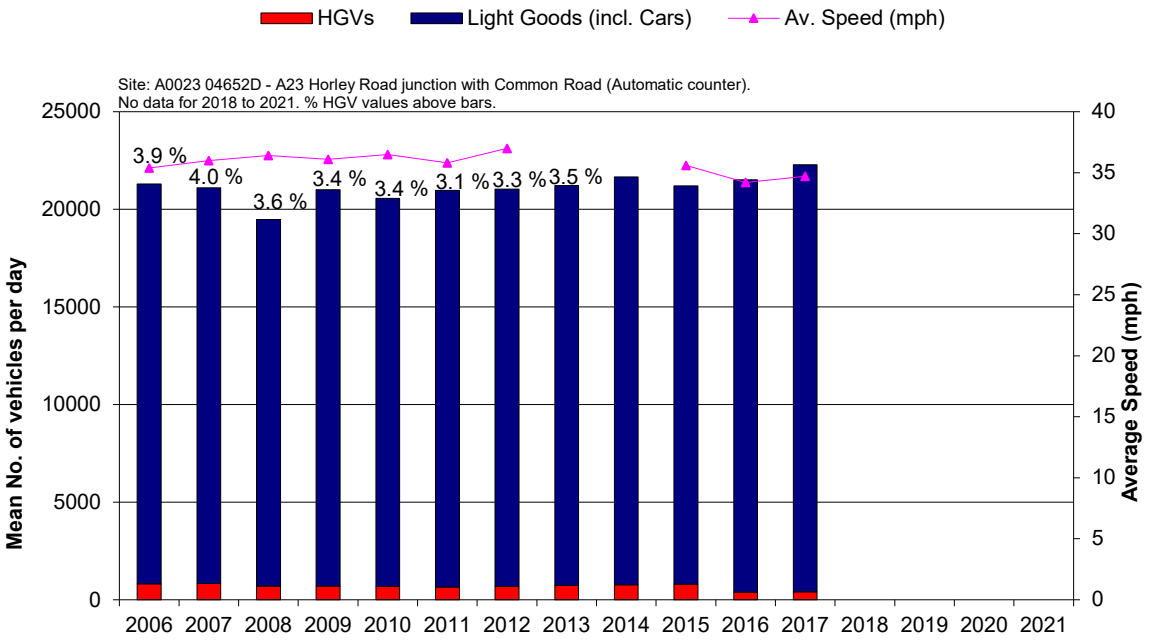


Figure 3.17 A23 South of Redhill Annual Mean Daily Traffic Flows, 2006 – 2017

3.2.6 AQMA No. 13: Hooley

Hooley AQMA covers properties within the Hooley area covering either partially or entirely properties along the A23 Brighton Road, Star Lane, Forge Bridge Lane and Church Lane.

Nitrogen dioxide monitoring sites within the Hooley AQMA increased in 2018 with the addition of an extra 42 diffusion tubes and by an additional automatic site (RG7). The purpose of the additional monitoring is to provide a detailed data set for model validation and in response to the concerns of local residents regarding Highways England's plans for road expansion in the area. Measured concentrations at a number of the diffusion tube sites within the Hooley AQMA exceeded the annual mean nitrogen dioxide objective in all years reported. In 2019, numbers of tubes exceeding had reduced, but still included RB148, 181, 205, 208, 212, 217, 218 and 219. Of these, RB148, 181 and 208 and 218 were distance corrected. All of the sites which were distance corrected fell below the objective at sites of relevant exposure. There are, however, also sites at relevant locations (RB181, 205, 212, 217, 219) which are also exceeding the annual mean objective. Exceedances of the annual mean objective were also noted at RG7. There was one exceedance at site RB148 in 2021, which when distance corrected was well below the annual mean objective, with no exceedances at any other monitoring sites in this year.

The monitoring data show a downward trend from 2011 at all sites (see Figure 3.18). A sharp decrease in concentrations is seen at all sites as a result of changing travel behaviour due to the COVID-19 pandemic.

Figure 3.19 below shows traffic flows along the A23, in Hooley. These data suggest very slightly increasing annual mean daily traffic flows from 2004 to 2008, following which there is a significant decrease in 2009. Between 2009 and 2013 flows are relatively stable, increasing marginally to 2015 and staying relatively stable since then. Data for 2020 and 2021 are not available.

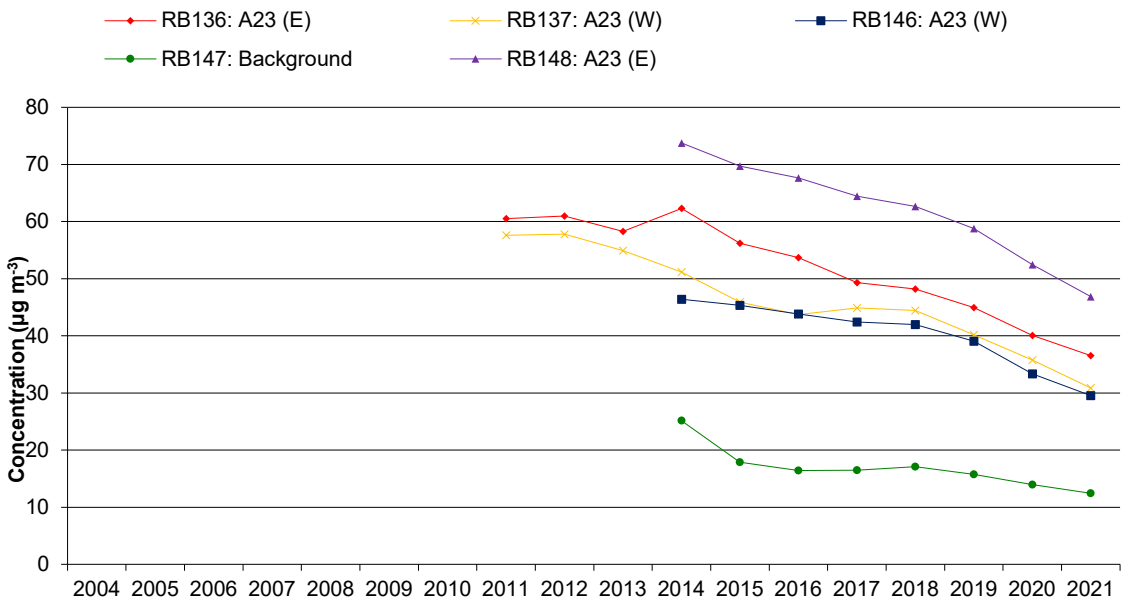


Figure 3.18 3-Year Rolling Annual Averages at Diffusion Tube Sites - Hooley AQMA, 2011 – 2021.

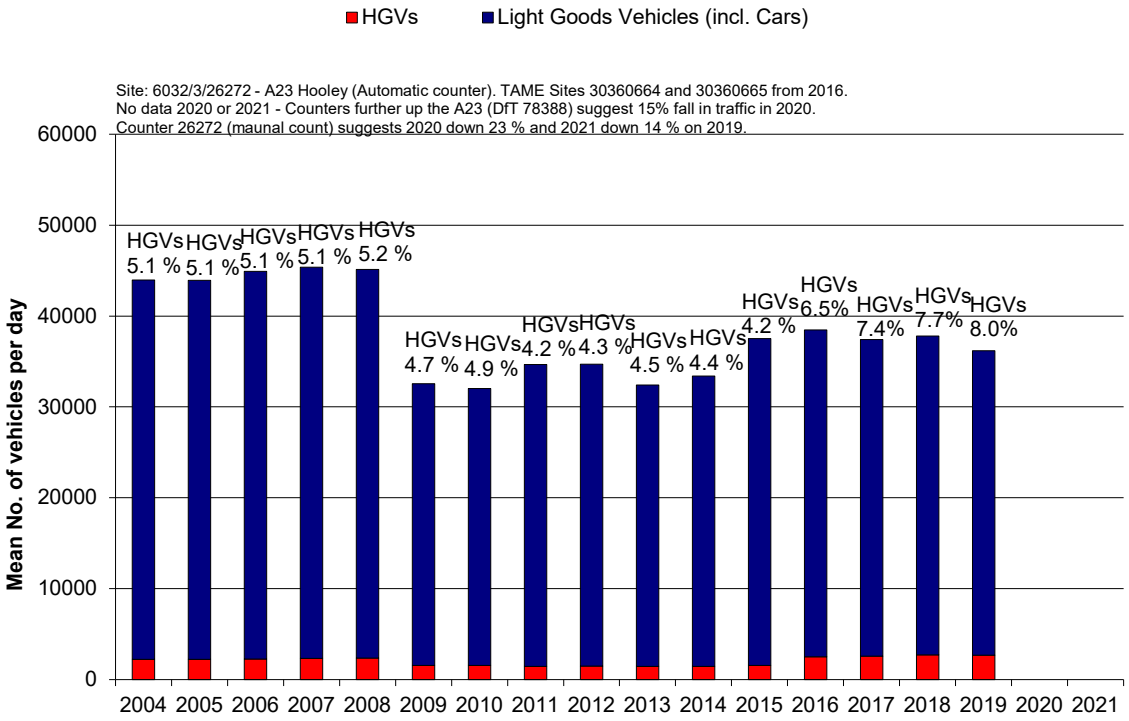


Figure 3.19 A23 Hooley Annual Mean Daily Traffic Flows, 2004 – 2019.

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?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m)	Inlet Height (m)
RG1	RG1 – Michael Crescent, Horley	Suburban	528208	142337	NO_2, PM_{10}	Y (AQMA No. 3)	Chemiluminescence, TEOM	0.0	19.1	3.5
RG3 (2)	RG3 - Poles Lane Pumping Station, Crawley	Rural	526421	139639	NO_2, ozone (not reported in this report)	N	Chemiluminescence	>50.0	12.6	2.0
RG6	RG6 – 106 The Crescent, Horley	Suburban	528592	141831	NO_2	Y (AQMA No. 3)	Chemiluminescence	0.0	0.7	1.5
RG7	RG7 Hooley Real time Site Garages 55-57 Brighton Road Hooley	Roadside	528804	156435	NO_2	Y (AQMA No. 3)	Chemiluminescence	1.7	2.0	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) This automatic monitoring site is located outside Reigate and Banstead Borough but is operated by Reigate and Banstead Borough Council.

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

Nitrogen Dioxide										
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)	Tube Collocated with a Continuous Analyser?	Height (m)
RB1	Boots, 34 – 36 High Street, Reigate, RH2 9AT	Roadside	525246	150252	NO2	Y (AQMA No.9)	0.0	5.1	N	3.1
RB3	Nr Ambulance Station, The Horseshoe, Banstead	Urban background	524944	159630	NO2	N	24.4	0.7	N	3.0
RB8	Rear of Boots, Reigate	Urban background	525246	150286	NO2	N	0.0	39.2	N	3.7
RB9	Back of 63, St Mary's Road, Reigate	Urban background	525750	149677	NO2	N	0.0	24.9	N	2.5
RB11	Outside 38, Riverside, Horley	Suburban	528104	142226	NO2	Y (AQMA No. 3)	0.0	1.4	N	3.0
RB12	Horley Police Station, Massetts Road, Horley	Roadside	528424	142934	NO2	Y (AQMA No. 3)	5.5	0.4	N	2.9
RB13	Public Car Park, off Massetts Road, Horley	Other	528362	142983	NO2	N	0.0	30.0	N	2.9
RB17	11, Sylvan Way, Redhill	Urban background	528511	149715	NO2	N	4.5	1.7	N	2.9

RB18	60, Brook Road, Merstham	Urban background	529263	153156	NO2	N	6.3	1.3	N	3.0
RB19	Village Hall, Station Road, Merstham	Suburban	529067	153375	NO2	N	9.0	0.7	N	2.9
RB20	Corner of London Road, Merstham	Roadside	529026	153420	NO2	Y (AQMA No. 10)	20.2 (Nearest relevant exposure is on opposite side of the road) (Difference between the distance of the site to the kerb and the receptor to the kerb is 2.9 m)	2.6	N	2.9
RB21	Opposite Drift Bridge Hotel, Reigate Road, Banstead	Roadside	523198	160095	NO2	N	13.7	1.7	N	2.9
RB22	Opposite 2 Grey Alders, Banstead	Suburban	523260	160111	NO2	N	13.2 (Nearest relevant exposure is on opposite side of the road) (Difference between the distance of the site to the kerb and the receptor to the kerb is 5.0 m)	1.1	N	2.9

RB23	Outside Warren Mead School, Roundwood Way, Banstead	Urban background	523612	159906	NO2	N	9.5	2.3	N	2.7
RB24	Horley Air Monitoring Station	Background	528208	142337	NO2	Y (AQMA No. 3)	0.0	19.1	Y	3.5
RB25	Horley Air Monitoring Station	Background	528208	142337	NO2	Y (AQMA No. 3)	0.0	19.1	Y	3.5
RB26	Horley Air Monitoring Station	Background	528208	142337	NO2	Y (AQMA No. 3)	0.0	19.1	Y	3.5
RB27	White Lodge, Sturts Lane, WHO	Roadside (Near M25)	521873	153896	NO2	Y (AQMA No. 1)	0.0	5.6	N	3.0
RB29	April Cottage, Sturts Lane, WHO	Roadside (Near M25)	521921	153937	NO2	N	0.0	11.7	N	3.0
RB30	Linden Lea, Chequers Lane, WHO	Roadside (Near M25)	522112	153728	NO2	Y (AQMA No. 1)	0.0	18.9 (27.5 m from the M25)	N	3.0
RB31	Margery Hall, Reigate Hill	Roadside (Near M25)	525506	152366	NO2	N	0.0	19.5	N	3.0
RB33	Rose Cottage, Margery Grove, KT20 7EZ	Roadside (Near M25)	524081	152580	NO2	N	0.0	0.0	N	3.0
RB34	Stagholt, Merrywood Grove	Roadside (Near M25)	524177	152393	NO2	N	0.0	45.6	N	3.0
RB36	Old Church House, Gatton Bottom	Roadside (Near M25)	528887	153760	NO2	N	0.0	74.8 (Distance from the M25, closest road is a very minor access road)	N	3.0

RB37	14 Ashcombe Road, Merstham	Roadside (Near M25)	529217	153605	NO2	N	0.0	12.0	N	3.0
RB39	17 Ashcombe Road, Merstham	Roadside (Near M25)	529205	153572	NO2	N	0.0	10.9 (32.3 m from the M25)	N	3.0
RB40	Dilkusha, Shepherds Hill	Roadside (Near M25)	529252	154291	NO2	N	0.0	15.0	N	3.0
RB43	Glade House, Quality Street, Merstham	Roadside (Near M25)	528797	153612	NO2	N	0.0	52.4	N	3.0
RB44	Outside Gunshop, 45 Church St, Reigate	Roadside	525532	150316	NO2	Y (AQMA No. 9)	0.0	14.6	N	3.0
RB45	Outside Anglian Windows Church Street, Reigate	Roadside	525431	150270	NO2	Y (AQMA No. 9)	2.4	0.1	N	3.0
RB46	Outside Gerrards Menswear, 5 High Street, Reigate	Roadside	525346	150241	NO2	Y (AQMA No. 9)	2.1	0.4	N	3.0
RB47	Outside Nationwide, 78 High Street, Reigate	Roadside	525114	150276	NO2	Y (AQMA No. 9)	2.0	0.5	N	3.0
RB49	Highlands, Brighton Road	Roadside (Near A217)	525705	152947	NO2	Y (AQMA No. 6)	6.1	2.0	N	3.0
RB50	Yew Cottage, Brighton Road	Roadside (Near A217)	525700	152964	NO2	N	0.0	24.0	N	3.0
RB51	Outside 17 Wolverton Gardens, Horley	Suburban	527873	142606	NO2	Y (AQMA No. 3)	0.0	15.1	N	3.5

RB52	Outside 20 Wolverton Gardens, Horley	Suburban	527892	142463	NO2	Y (AQMA No. 3)	0.0	13.7	N	3.5
RB53	Outside 66 / 68 Cheyne Walk, Horley	Suburban	528030	142373	NO2	Y (AQMA No. 3)	0.0	4.3	N	3.5
RB54	Outside 7 / 9 Crescent Way, Horley	Suburban	528112	142321	NO2	Y (AQMA No. 3)	0.0	4.2	N	3.5
RB55	Outside 40a Crescent Way, Horley	Suburban	528254	142196	NO2	Y (AQMA No. 3)	0.0	1.1	N	3.5
RB56	Outside 8 / 10 The Crescent, Horley	Suburban	528386	142080	NO2	Y (AQMA No. 3)	0.0	2.6	N	3.5
RB57	Outside 29 / 31 The Crescent, Horley	Suburban	528499	141953	NO2	Y (AQMA No. 3)	0.0	2.6	N	3.5
RB58	Outside 39 / 41 The Crescent, Horley	Suburban	528538	141897	NO2	Y (AQMA No. 3)	0.0	2.6	N	3.5
RB59	Outside 92 / 94 The Crescent, Horley	Suburban	528602	141789	NO2	Y (AQMA No. 3)	0.0	2.2	N	3.5
RB60	Outside 120 / 122 The Crescent, Horley	Suburban	528607	141910	NO2	Y (AQMA No. 3)	0.0	2.8	N	3.5
RB61	Outside 79 / 81 The Crescent, Horley	Suburban	528578	142006	NO2	Y (AQMA No. 3)	0.0	1.0	N	3.5
RB64	Outside 16 / 22 The Drive, Horley	Suburban	528608	142432	NO2	Y (AQMA No. 3)	0.0	1.6	N	3.5
RB65	Outside 4 / 6 The Drive, Horley	Suburban	528581	142635	NO2	Y (AQMA No. 3)	0.0	16.8	N	3.5

RB66	Outside 3a / 3b Fairfield Avenue, Horley	Suburban	528499	142512	NO2	Y (AQMA No. 3)	0.0	18.5	N	3.5
RB68	Outside 57 Fairfield Avenue, Horley	Suburban	528505	142246	NO2	Y (AQMA No. 3)	0.0	18.5	N	3.5
RB69	Outside 61 Upfield, Horley	Suburban	528335	142224	NO2	Y (AQMA No. 3)	0.0	14.0	N	3.5
RB70	Outside 58 / 60 Upfield, Horley	Suburban	528360	142384	NO2	Y (AQMA No. 3)	0.0	17.8	N	3.5
RB72	Outside 25 / 27 Upfield, Horley	Suburban	528220	142583	NO2	Y (AQMA No. 3)	0.0	19.2	N	3.5
RB73	Outside 9 / 11 Upfield, Horley	Suburban	528172	142679	NO2	Y (AQMA No. 3)	0.0	17.8	N	3.5
RB74	On Green, 30a / 30b Meadowcroft Close, Horley	Suburban	529149	141953	NO2	Y (AQMA No. 3)	0.0	15.1	N	3.5
RB75	On Roundabout, The Coronet, Horley	Suburban	529203	142192	NO2	Y (AQMA No. 3)	0.0	12.4	N	3.5
RB76	33 Limes Avenue, Horley	Suburban	528958	142468	NO2	Y (AQMA No. 3)	0.0	20.7	N	3.5
RB77	Layby at Entrance to Staffords Place, Horley	Suburban	528789	142570	NO2	Y (AQMA No. 3)	0.0	13.0	N	3.5
RB78	Outside 74 The Crescent, Horley	Suburban	528553	141857	NO2	Y (AQMA No. 3)	0.0	2.7	Y	3.5
RB79	Outside 74 The Crescent, Horley	Suburban	528553	141857	NO2	Y	0.0	2.7	Y	3.5

						(AQMA No. 3)				
RB80	Outside 74 The Crescent, Horley	Suburban	528553	141857	NO2	Y (AQMA No. 3)	0.0	2.7	Y	3.5
RB81	Outside Flying Scud Public House, Brighton Road, Redhill	Roadside (A23 AQMA)	527594	149236	NO2	N	0.0	5.5	N	3.5
RB82	Outside 1 Deans Lane, Hooley	Suburban (A23 AQMA)	528770	155797	NO2	N	0.0	18.3	N	3.5
RB95	Flat 1, Tasboro House, Rushworth Road	Roadside	525382	150639	NO2	N	0.0	5.9	N	2.0
RB98	16 / 17 Woodroyd Gardens	Suburban	527931	142231	NO2	Y (AQMA No. 3)	0.0	1.0	N	2.0
RB99 [2]	Poles Lane Pumping Station, Cawley	Rural / Other	526421	139639	NO2	N	0.0	12.4	Y	2.0
RB100 [2]	Poles Lane Pumping Station, Cawley	Rural / Other	526421	139639	NO2	N	0.0	12.4	Y	2.0
RB101 [2]	Poles Lane Pumping Station, Cawley	Rural / Other	526421	139639	NO2	N	0.0	12.4	Y	2.0
RB102 [2]	In Field near Bridleway, Hathersham Farm, Horley	Rural / Other	530936	144278	NO2	N	>50.0	19.1	N	2.0
RB104	ASK, High Street, Reigate	Roadside	525204	150254	NO2	Y (AQMA No. 9)	0.0	4.9	N	2.0
RB105	Finishing Touch, High Street, Reigate	Roadside	525203	150239	NO2	Y (AQMA No. 9)	0.0	2.8	N	2.0

RB106	Outside Crossways, Fir Tree Road, Banstead	Roadside	523250	160056	NO2	Y (AQMA No. 8)	5.0	2.1	N	2.0
RB107	Sussex Blinds, 29 Church Street	Roadside	525467	150292	NO2	Y (AQMA No. 9)	0.6	2.3	N	2.0
RB109	Male Territory, 27a Bell Street, Reigate	Roadside	525387	150178	NO2	Y (AQMA No. 9)	0.0	3.6	N	2.0
RB110	204 London Road North opposite RB20	Roadside	529016	153439	NO2	Y (AQMA No. 10)	0.0	4.3	N	2.0
RB111	Knotts Pine, 1 West Street, Reigate	Roadside	525031	150291	NO2	Y (AQMA No. 9)	0.0	4.3	N	2.0
RB113	Opposite Newbury Road	Roadside	524795	150404	NO2	Y (AQMA No. 9)	0.0	2.1	N	2.0
RB114	Outside 87, West Street, Reigate	Roadside	524368	150477	NO2	N	5.9	1.7	N	2.0
RB115	Outside 36, West Street, Reigate	Roadside	524751	150428	NO2	Y (AQMA No. 9)	0.0	0.6	N	2.0
RB116	Outside 12, West Street, Reigate	Roadside	525022	150317	NO2	Y (AQMA No. 9)	0.0	2.3	N	2.0
RB117	Crossway House, 8 London Road, Reigate	Roadside	525076	150327	NO2	Y (AQMA No. 9)	0.0	2.9	N	2.0
RB118	8 Burlington Place, Reigate	Roadside	525151	150467	NO2	Y (AQMA No. 9)	0.0	14.2	N	2.0

RB120	Outside 21 Redstone Hill, Redhill	Roadside	528196	150421	NO2	Y (AQMA No. 12)	9.7	2.2	N	2.0
RB121	Opposite Ladbrook Grove, Redhill	Kerbside	528092	150786	NO2	Y (AQMA No. 12)	N/A	1.5	N	2.0
RB122	Roundabout sign 5158 near carpark, Marketfield Way, Redhill	Roadside	528013	150475	NO2	N (AQMA No. 12)	>50	2.9	N	2.0
RB123	Outside Age Concern Cromwell Road, Redhill	Kerbside	527838	150474	NO2	N (AQMA No. 12)	0.9	0.5	N	2.0
RB124	Outside 22 High Street, Merstham	Roadside	529013	153285	NO2	Y (AQMA No. 10)	1.3	1.8	N	2.0
RB125	Opposite Reigate Hill Close, Reigate Hill	Roadside	525589	151655	NO2	N (AQMA No. 11)	4.7	2.7	N	2.0
RB136	Outside 45 Brighton Road, Hooley	Roadside	528810	156474	NO2	Y (AQMA No. 13)	4.9	1.0	N	2.0
RB137	Opposite 23 Brighton Road, Hooley	Roadside	528831	156648	NO2	Y (AQMA No. 13)	21.3 (Nearest relevant exposure is on opposite side of the road, relevant exposure is closer to the kerb than the monitoring site)	6.0	N	2.0

							(Difference between the distance of the site to the kerb and the receptor to the kerb is 0.4 m)			
RB140	Flat 2, 45 Ladbrook Grove, Redhill	Roadside	528122	150799	NO2	Y (AQMA No. 12)	0.2	7.2	N	2.0
RB141	Near roundabout outside 105 Station Road, Redhill	Roadside	527373	150596	NO2	N	1.9	2.7	N	2.0
RB145	Outside Brewers, 33 Brighton Road, Redhill	Kerbside	527852	150158	NO2	Y (AQMA No. 12)	3.3	2.2	N	2.0
RB146	Opposite ESSO Garage, Brighton Road, Hooley	Kerbside	528759	156277	NO2	Y (AQMA No. 13)	21.0	3.2	N	2.0
RB147	Halfway down footpath by the side of 92 / 92b Brighton Road, Hooley	Background	528732	156407	NO2	N	26.3 (Relevant exposure is closer to the kerb than the monitoring site)	51.0	N	2.0
RB148	17 Star Cottages, Brighton Road, Hooley	Kerbside	528855	156674	NO2	Y (AQMA No. 13)	5.5	1.0	N	2.5
RB149	6 Brighton Road, Horley	Roadside	527737	142710	NO2	Y (AQMA No. 3)	4.0	2.8	N	2.5

RB150	8 Elvington Lodge, Reigate Hill	Roadside	525397	150867	NO2	Y (AQMA No. 11)	13.3	3.4	N	2.0
RB151	Between 83 and 85 Victoria Road, Horley	Roadside	528502	142952	NO2	Y (AQMA No. 3)	0.0	1.8	N	2.5
RB152	A23 south of New Battlebridge Lane	Roadside	528599	152439	NO2	N	27.6 (Nearest relevant exposure is on opposite side of the road) (Difference between the distance of the site to the kerb and the receptor to the kerb is 7.8 m)	1.6	N	2.5
RB153	1 Horley Road junction with Three Arch Road	Roadside	527837	148046	NO2	N	6.7	2.9	N	2.5
RB167	Queensway, Redhill	Roadside	527830	150643	NO2	Y (AQMA No. 12)	0.0	3.1	N	3.0
RB174	Opposite 37 Brighton Road, Horley	Roadside	527852	142841	NO2	Y (AQMA No. 3)	2.3	3.0	N	2.0
RB175	23 Brighton Road, Horley	Roadside	527955	142999	NO2	N	12.1	2.8	N	2.5
RB176	15 Brighton Road, Horley	Roadside	527765	142777	NO2	Y (AQMA No. 3)	0.0	10.2	N	2.0

RB177	11 Brighton Road, Horley	Roadside	527754	142762	NO2	Y (AQMA No. 3)	0.0	8.6	N	2.0
RB178	RG6 co-location, 110 The Crescent, Horley	Suburban	528592	141831	NO2	Y (AQMA No. 3)	0.0	0.5 (from V quiet road, measuring emissions from Gatwick)	Y	1.5
RB179	RG6 co-location, 110 The Crescent, Horley	Suburban	528592	141831	NO2	Y (AQMA No. 3)	0.0	0.5 (from V quiet road, measuring emissions from Gatwick)	Y	1.5
RB180	RG6 co-location, 110 The Crescent, Horley	Suburban	528592	141831	NO2	Y (AQMA No. 3)	0.0	0.5 (from V quiet road, measuring emissions from Gatwick)	Y	1.5
RB181	Outside 10D Brighton Road Hooley	Roadside	528852	156724	NO2	Y (AQMA No. 13)	15	2.3	N	2.3
RB182	10D Brighton Road Hooley	Roadside	528835	156728	NO2	Y (AQMA No. 13)	0	18.7	N	2

RB183	58B Brighton Road Hooley	Roadside	528813	156580	NO2	Y (AQMA No. 13)	0	7.8	N	2.4
RB184	Lattice Wood Hooley News 66 Brighton Road Hooley	Roadside	528807	156555	NO2	Y (AQMA No. 13)	0	7.2	N	2.4
RB186	adjacent to 72Brighton Road	Roadside	528790	156500	NO2	Y (AQMA No. 13)	In line with building facade to A23 i.e. 10.3 m. To star Lane tube to kerb 2m, tube to house 3.4m (house 5.4m from kerb)	10.3	N	2.3
RB187	74 Brighton Road Hooley	Roadside	528789	156488	NO2	Y (AQMA No. 13)	0	10.2	N	1.7
RB188	76 Brighton Road Hooley	Roadside	528792	156478	NO2	Y (AQMA No. 13)	0	5.1	N	1.6

RB189	78 Brighton Road Hooley	Roadside	528789	156465	NO2	Y (AQMA No. 13)	0	5.6	N	1.8
RB190	80B Brighton Road Hooley	Roadside	528788	156460	NO2	Y (AQMA No. 13)	0	5.7	N	1.9
RB191	82 Brighton Road Hooley	Roadside	528785	156448	NO2	Y (AQMA No. 13)	0	6.2	N	2
RB192	84 Brighton Road Hooley	Roadside	528784	156442	NO2	Y (AQMA No. 13)	0	6.2	N	1.9
RB193	86 Brighton Road Hooley	Roadside	528782	156430	NO2	Y (AQMA No. 13)	0	6.1	N	2
RB194	Outside 96 Brighton Road	Kerbside	528779	156381	NO2	Y (AQMA No. 13)	25	1	N	2.5

RB195	Outside flats 102 Brighton Road	Kerbside	528772	156349	NO2	Y (AQMA No. 13)	17	Note 0.6 m to kerb but once layby included (2.8m) total 3.4m to road edge	N	2.3
RB196	TopMarks Tyres 75 Brighton Road Hooley	Roadside	528797	156331	NO2	Y (AQMA No. 13)	0	16.8	N	2
RB197	Drain pipe 67 Brighton Road Hooley	Roadside	528795	156373	NO2	Y (AQMA No. 13)	0	6.5	N	1.9
RB198	65 Brighton Road Hooley	Roadside	528796	156379	NO2	Y (AQMA No. 13)	0	6.3	N	2
RB199	63A Brighton Road Hooley	Roadside	528800	156390	NO2	Y (AQMA No. 13)	0	8.1	N	2
RB200	Outside 59 Brighton Road	Roadside	528799	156409	NO2	Y (AQMA No. 13)	4.4	3.6	N	2.6

RB201	Flat 1, 55 Brighton Road Hooley	Roadside	528804	156414	NO2	Y (AQMA No. 13)	0	7.1	N	1.9
RB202	53 Brighton Road Hooley	Roadside	528808	156444	NO2	Y (AQMA No. 13)	0	4.9	N	1.9
RB203	51 Brighton Road Hooley	Roadside	528809	156454	NO2	Y (AQMA No. 13)	0	4.4	N	2.1
RB204	49 Brighton Road Hooley	Roadside	528810	156457	NO2	Y (AQMA No. 13)	0	4.5	N	1.8
RB205	47 Brighton Road Hooley	Roadside	528812	156466	NO2	Y (AQMA No. 13)	0	4	N	1.9
RB206	45 Brighton Road Hooley	Roadside	528816	156477	NO2	Y (AQMA No. 13)	0	5.9	N	1.9

RB207	43 Brighton Road Hooley	Roadside	528818	156486	NO2	Y (AQMA No. 13)	0	6.1	N	1.9
RB208	outside 41 Brighton Road	Roadside	528825	156526	NO2	Y (AQMA No. 13)	2.9	1.1	N	2.7
RB209	39 Brighton Road Hooley	Roadside	528833	156547	NO2	Y (AQMA No. 13)	0	7.7	N	1.9
RB210	37 Brighton Road Hooley	Roadside	528833	156555	NO2	Y (AQMA No. 13)	0	6.7	N	1.8
RB211	33 Brighton Road Hooley	Roadside	528839	156577	NO2	Y (AQMA No. 13)	0	7.3	N	1.7
RB212	29 Brighton Road Hooley	Roadside	528840	156582	NO2	Y (AQMA No. 13)	0	7.5	N	1.9

RB213	27 Brighton Road Hooley	Roadside	528845	156604	NO2	Y (AQMA No. 13)	0	7.5	N	1.9
RB214	25 Brighton Road Hooley	Roadside	528848	156617	NO2	Y (AQMA No. 13)	0	7.3	N	2
RB215	21 Brighton Road Hooley	Roadside	528853	156646	NO2	Y (AQMA No. 13)	0	6.5	N	2
RB216	15 Brighton Road Hooley	Roadside	528862	156690	NO2	Y (AQMA No. 13)	0	5.1	N	1.9
RB217	Flat 2, 9-11 Brighton Road Hooley	Roadside	528866	156712	NO2	Y (AQMA No. 13)	0	3.4	N	1.9
RB218	7 Brighton Road Hooley	Kerbside	528869	156737	NO2	Y (AQMA No. 13)	4	0.5	N	2

RB219	5 Brighton Road Hooley	Roadside	528877	156744	NO2	Y (AQMA No. 13)	0	7.2	N	1.8
RB223	RG7 Hooley Real time Site Garages 55-57 Brighton Road Hooley	Roadside	528804	156435	NO2		1.7	2	Y	1.5
RB224	RG7 Hooley Real time Site Garages 55-57 Brighton Road Hooley	Roadside	528804	156435	NO2		1.7	2	Y	1.5
RB225	RG7 Hooley Real time Site Garages 55-57 Brighton Road Hooley	Roadside	528804	156435	NO2		1.7	2	Y	1.5

Benzene

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)	Tube Collocated with a Continuous Analyser?	Height (m)
RB1	Boots, 34 – 36 High Street, Reigate, RH2 9AT	Roadside	525246	150252	Benzene	Y (AQMA No. 9)	0.0	5.1	N	3.1

RB11	Outside 38, Riverside, Horley	Suburban	528104	142226	Benzene	Y (AQMA No. 3)	0.0	1.4	N	3.0
RB20	Corner of London Road, Merstham	Roadside	529026	153420	Benzene	Y (AQMA No. 10)	20.2 (Nearest relevant exposure is on opposite side of the road) (Difference between the distance of the site to the kerb and the receptor to the kerb is 2.9 m)	2.6	N	2.9

Notes:

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

[2] This diffusion tube monitoring site is located outside Reigate and Banstead Borough, but is operated by Reigate and Banstead Council

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	NO_2 Annual Mean Concentration (µg/m³) [3] [4] 2017	NO_2 Annual Mean Concentration (µg/m³) [3] [4] 2018	NO_2 Annual Mean Concentration (µg/m³) [3] [4] 2019	NO_2 Annual Mean Concentration (µg/m³) [3] [4] 2020	NO_2 Annual Mean Concentration (µg/m³) [3] [4] 2021
RG1	528208	142337	Suburban	Automatic	94.6	94.6	20.4	18.8	19.1	13.1	15.4
RG3	526421	139639	Rural	Automatic	97.8	97.8	13.9	15.5	15.1	9.7	9.7
RG6	528592	141831	Suburban	Automatic	97.3	97.3	26.7	24.9	24.2	14.6	13.8
RG7	528804	156436	Roadside	Automatic	90.5	90.5	-	**47.4**	**45.0**	37.6	**41.0**
RB1	525246	150252	Roadside	Diffusion tube	82.4	82.4	32.4	30.6	29.5	21.5	21.4
RB3	524944	159630	Urban background	Diffusion tube	100.0	100.0	17.6	17.5	16.1	11.7	13.6
RB8	525246	150286	Urban Background	Diffusion tube	100.0	100.0	17.8	19.0	17.2	11.5	12.4
RB9	525750	149677	Urban background	Diffusion tube	100.0	100.0	16.6	16.4	16.2	12.2	12.4
RB11	528104	142226	Suburban	Diffusion tube	100.0	100.0	22.8	23.9	21.3	14.6	15.0
RB12	528424	142934	Roadside	Diffusion tube	100.0	100.0	28.3	25.3	25.8	20.7	19.7
RB13	528362	142983	Other	Diffusion tube	100.0	100.0	19.9	23.1	19.8	13.3	14.6
RB17	528511	149715	Urban background	Diffusion tube	92.3	92.3	14.0	16.3	16.0	12.3	12.6
RB18	529263	153156	Urban background	Diffusion tube	100.0	100.0	22.6	21.9	20.8	15.3	16.3

RB19	529067	153375	Suburban	Diffusion tube	100.0	100.0	23.5	23.1	21.6	16.3	17.5
RB20	529026	153420	Roadside	Diffusion tube	100.0	100.0	32.8	30.3	29.4	21.1	23.1
RB21	523198	160095	Roadside	Diffusion tube	100.0	100.0	34.1	32.4	31.5	22.3	24.7
RB22	523260	160111	Suburban	Diffusion tube	92.6	92.6	19.7	19.7	18.7	13.7	14.1
RB23	523612	159906	Urban background	Diffusion tube	100.0	100.0	16.2	16.2	15.0	11.9	12.4
RB24	528208	142337	Background	Diffusion tube	100.0	100.0	21.1	19.8	21.8	14.2	13.7
RB25	528208	142337	Background	Diffusion tube	100.0	100.0	21.8	21.6	21.2	13.4	14.0
RB26	528208	142337	Background	Diffusion tube	100.0	100.0	20.9	21.6	21.7	15.0	13.8
RB27	521873	153896	Roadside (near M25)	Diffusion tube	100.0	100.0	25.3	24.7	21.0	16.3	16.6
RB29	521921	153937	Roadside (near M25)	Diffusion tube	100.0	100.0	24.8	21.5	20.5	14.3	14.6
RB30	522112	153728	Roadside (near M25)	Diffusion tube	100.0	100.0	24.3	22.0	21.0	14.6	15.0
RB31	525506	152366	Roadside (near M25)	Diffusion tube	100.0	100.0	16.0	16.3	13.8	9.8	11.9
RB33	524081	152580	Roadside (near M25)	Diffusion tube	84.6	84.6	21.1	20.3	18.9	13.1	13.3
RB34	524177	152393	Roadside (near M25)	Diffusion tube	100.0	100.0	24.1	26.4	22.3	15.3	17.9
RB36	528887	153760	Roadside (near M25)	Diffusion tube	100.0	100.0	20.3	23.8	20.2	14.4	15.0
RB37	529217	153605	Roadside (near M25)	Diffusion tube	80.5	80.5	24.0	22.0	21.0	16.0	16.7
RB39	529205	153572	Roadside (Near M25)	Diffusion tube	100.0	100.0	25.1	22.1	20.4	16.8	15.8

RB40	529252	154291	Roadside (near M25)	Diffusion tube	100.0	100.0	20.3	19.0	19.1	13.2	14.3
RB43	528797	153612	Roadside (near M25)	Diffusion tube	82.7	82.7	23.3	23.8	22.2	14.9	18.3
RB44	525532	150316	Roadside	Diffusion tube	90.4	90.4	30.8	28.5	27.7	21.0	22.2
RB45	525431	150270	Roadside	Diffusion tube	73.1	73.1	28.0	29.2	29.4	19.6	20.5
RB46	525346	150241	Roadside	Diffusion tube	100.0	100.0	35.9	31.0	33.2	22.0	25.0
RB47	525114	150276	Roadside	Diffusion tube	100.0	100.0	35.0	34.8	32.8	24.3	27.2
RB49	525705	152947	Roadside (near A217)	Diffusion tube	100.0	100.0	**42.4**	39.2	36.1	24.6	26.5
RB50	525700	152964	Roadside (near A217)	Diffusion tube	-	-	26.1	24.7	26.2	18.2	-
RB51	527873	142606	Suburban	Diffusion tube	100.0	100.0	20.8	20.8	20.7	13.1	15.1
RB52	527892	142463	Suburban	Diffusion tube	100.0	100.0	24.7	25.0	24.6	16.1	16.4
RB53	528030	142373	Suburban	Diffusion tube	100.0	100.0	25.3	24.4	25.6	16.3	16.5
RB54	528112	142321	Suburban	Diffusion tube	100.0	100.0	23.4	24.5	22.9	15.0	16.0
RB55	528254	142196	Suburban	Diffusion tube	100.0	100.0	22.8	24.8	23.6	16.0	16.0
RB56	528386	142080	Suburban	Diffusion tube	100.0	100.0	24.0	22.2	24.7	14.6	15.0
RB57	528499	141953	Suburban	Diffusion tube	100.0	100.0	26.2	24.2	24.6	15.2	14.5
RB58	528538	141897	Suburban	Diffusion tube	90.4	90.4	26.8	24.7	25.9	15.6	15.8
RB59	528602	141789	Suburban	Diffusion tube	90.4	90.4	27.8	26.5	26.0	15.3	15.1

RB60	528607	141910	Suburban	Diffusion tube	100.0	100.0	27.3	24.9	26.1	15.0	14.4
RB61	528578	142006	Suburban	Diffusion tube	90.4	90.4	22.6	21.3	23.1	15.6	13.8
RB64	528608	142432	Suburban	Diffusion tube	100.0	100.0	22.1	21.6	23.1	15.0	15.5
RB65	528581	142635	Suburban	Diffusion tube	100.0	100.0	22.4	22.8	23.1	16.4	17.5
RB66	528499	142512	Suburban	Diffusion tube	100.0	100.0	21.8	22.5	21.6	14.4	15.3
RB68	528505	142246	Suburban	Diffusion tube	100.0	100.0	24.0	21.7	24.0	14.8	14.6
RB69	528335	142224	Suburban	Diffusion tube	100.0	100.0	26.5	24.7	25.2	16.2	16.0
RB70	528360	142384	Suburban	Diffusion tube	100.0	100.0	24.3	23.3	23.7	14.2	15.4
RB72	528220	142583	Suburban	Diffusion tube	100.0	100.0	22.2	25.1	23.6	15.7	15.3
RB73	528172	142679	Suburban	Diffusion tube	100.0	100.0	22.0	22.0	21.5	15.4	15.3
RB74	529149	141953	Suburban	Diffusion tube	100.0	100.0	22.5	22.3	21.2	14.3	13.3
RB75	529203	142192	Suburban	Diffusion tube	100.0	100.0	23.9	21.9	22.3	14.5	14.2
RB76	528958	142468	Suburban	Diffusion tube	100.0	100.0	20.1	19.6	19.9	13.4	12.9
RB77	528789	142570	Suburban	Diffusion tube	100.0	100.0	20.9	19.8	19.7	13.7	13.4
RB78	528553	141857	Suburban	Diffusion tube	100.0	100.0	27.0	25.5	25.0	15.9	14.9
RB81	527594	149236	Roadside (A23 AQMA)	Diffusion tube	100.0	100.0	2.5	2.3	2.2	24.0	24.0
RB82	528770	155797	Suburban (A23 AQMA)	Diffusion tube	100.0	100.0	3.0	2.2	2.0	22.4	21.9

RB95	525382	150639	Roadside	Diffusion Tube	100.0	100.0	25.2	25.1	22.0	14.4	16.9
RB98	527931	142231	Suburban	Diffusion Tube	100.0	100.0	25.8	24.7	24.2	15.9	17.1
RB99	526421	139639	Rural / Other	Diffusion tube	100.0	100.0	14.1	15.0	13.8	9.3	10.0
RB100	526421	139639	Rural / Other	Diffusion tube	100.0	100.0	13.7	15.8	13.8	9.0	10.6
RB101	526421	139639	Rural / Other	Diffusion tube	100.0	100.0	14.0	15.3	14.9	9.2	10.1
RB102	530936	144278	Rural / Other	Diffusion tube	90.1	90.1	20.9	23.4	19.3	13.6	15.9
RB104	525204	150254	Roadside	Diffusion tube	100.0	100.0	34.7	34.0	33.9	24.5	26.9
RB105	525203	150239	Roadside	Diffusion tube	100.0	100.0	39.0	35.0	37.5	28.5	26.6
RB106	523250	160056	Roadside	Diffusion tube	100.0	100.0	29.3	27.7	28.6	20.5	23.0
RB107	525467	150292	Roadside	Diffusion tube	100.0	100.0	26.1	27.0	25.0	18.5	20.8
RB109	525387	150178	Roadside	Diffusion tube	100.0	100.0	32.5	30.3	29.8	20.1	22.2
RB110	529016	153439	Roadside	Diffusion tube	100.0	100.0	29.3	27.1	24.7	17.5	19.6
RB111	525031	150291	Roadside	Diffusion tube	92.3	92.3	30.3	27.1	27.2	23.1	23.0
RB113	524795	150404	Roadside	Diffusion tube	100.0	100.0	27.1	24.9	23.0	16.6	18.8
RB114	524368	150477	Roadside	Diffusion tube	67.3	67.3	26.3	23.5	21.8	17.8	16.8
RB115	524751	150428	Roadside	Diffusion tube	100.0	100.0	30.5	26.3	27.7	20.1	22.7
RB116	525022	150317	Roadside	Diffusion tube	100.0	100.0	31.9	29.6	30.7	21.2	23.0
RB117	525076	150327	Roadside	Diffusion tube	100.0	100.0	35.1	36.3	35.8	29.5	28.5

RB118	525151	150467	Roadside	Diffusion tube	100.0	100.0	31.5	32.8	32.1	25.7	27.3
RB120	528196	150421	Roadside	Diffusion tube	100.0	100.0	32.9	31.5	27.4	21.1	24.3
RB121	528092	150786	Kerbside	Diffusion tube	100.0	100.0	-	**41.1**	39.9	29.1	29.3
RB122	528013	150475	Roadside	Diffusion tube	-	-	31.5	30.6	30.7	23.3	-
RB123	527838	150474	Kerbside	Diffusion tube	100.0	100.0	35.8	33.5	33.6	23.6	33.4
RB124	529013	153285	Roadside	Diffusion tube	100.0	100.0	34.5	31.7	31.5	24.6	26.1
RB125	525589	151655	Roadside	Diffusion tube	82.7	82.7	34.9	31.8	33.5	24.8	24.2
RB136	528810	156474	Roadside	Diffusion tube	90.4	90.4	**49.4**	**45.9**	39.5	34.3	36.0
RB137	528831	156648	Roadside	Diffusion tube	92.3	92.3	**42.3**	**43.2**	35.2	28.5	28.4
RB140	528122	150799	Roadside	Diffusion tube	100.0	100.0	25.5	22.6	24.3	17.4	17.9
RB141	527373	150596	Roadside	Diffusion tube	100.0	100.0	23.7	22.9	21.8	15.6	17.8
RB145	527852	150158	Kerbside	Diffusion tube	100.0	100.0	33.7	30.9	31.7	24.5	25.3
RB146	528759	156277	Kerbside	Diffusion tube	100.0	100.0	**40.9**	**40.4**	35.8	23.5	28.8
RB147	528732	156407	Background	Diffusion tube	100.0	100.0	16.5	17.0	13.8	10.9	12.5
RB148	528855	156674	Kerbside	Diffusion tube	100.0	100.0	**62.6**	**59.5**	**54.2**	**43.0**	**42.5**
RB149	525698	152940	Roadside	Diffusion tube	90.4	90.4	**46.0**	**43.4**	**43.5**	30.9	33.0
RB150	525397	150867	Roadside	Diffusion tube	100.0	100.0	37.5	33.1	35.3	27.3	27.3
RB151	528502	142952	Roadside	Diffusion tube	90.4	90.4	33.3	29.4	33.5	22.7	26.3

RB152	528599	152439	Roadside	Diffusion tube	92.3	92.3	33.4	32.4	32.4	24.3	23.8
RB153	527837	148046	Roadside	Diffusion tube	100.0	100.0	29.0	25.9	25.4	19.9	20.8
RB167	527830	150643	Roadside	Diffusion tube	100.0	100.0	24.9	24.7	24.3	17.9	20.7
RB174	527852	142841	Roadside	Diffusion tube	100.0	100.0	31.1	30.3	29.1	19.1	21.4
RB175	527955	142999	Roadside	Diffusion tube	100.0	100.0	30.6	27.5	29.8	22.2	22.5
RB176	527765	142777	Roadside	Diffusion tube	100.0	100.0	25.4	25.5	25.4	17.3	19.3
RB177	527754	142762	Roadside	Diffusion tube	100.0	100.0	24.9	23.8	25.1	16.6	18.4
RB178	528592	141831	Suburban	Diffusion tube	100.0	100.0	25.6	23.0	24.0	13.6	13.7
RB179	528592	141831	Suburban	Diffusion tube	100.0	100.0	25.3	23.4	23.2	13.4	13.8
RB180	528592	141831	Suburban	Diffusion tube	100.0	100.0	25.9	23.4	23.1	13.8	14.0
RB181	528852	156724	Roadside	Diffusion tube	100.0	100.0	-	**47.0**	**46.5**	39.0	35.9
RB182	528835	156728	Roadside	Diffusion tube	100.0	100.0	-	30.3	24.0	19.6	20.3
RB183	528813	156580	Roadside	Diffusion tube	92.3	92.3	-	36.4	37.0	28.5	29.1
RB184	528807	156555	Roadside	Diffusion tube	100.0	100.0	-	34.8	33.7	24.8	25.8
RB186	528790	156500	Roadside	Diffusion tube	100.0	100.0	-	30.8	31.3	24.3	25.6
RB187	528789	156488	Roadside	Diffusion tube	100.0	100.0	-	27.0	27.0	20.1	21.6
RB188	528792	156478	Roadside	Diffusion tube	100.0	100.0	-	32.2	29.0	22.1	23.2
RB189	528789	156465	Roadside	Diffusion tube	100.0	100.0	-	31.4	30.0	21.0	22.7

RB190	528788	156460	Roadside	Diffusion tube	100.0	100.0	-	30.7	29.1	21.3	22.2
RB191	528785	156448	Roadside	Diffusion tube	100.0	100.0	-	26.5	27.3	20.3	21.6
RB192	528784	156442	Roadside	Diffusion tube	100.0	100.0	-	28.5	27.1	19.4	21.2
RB193	528782	156430	Roadside	Diffusion tube	100.0	100.0	-	24.6	24.2	17.7	19.9
RB194	528779	156381	Kerbside	Diffusion tube	100.0	100.0	-	32.5	30.7	22.0	25.5
RB195	528772	156349	Kerbside	Diffusion tube	100.0	100.0	-	37.0	34.2	24.7	27.5
RB196	528797	156331	Roadside	Diffusion tube	100.0	100.0	-	26.8	25.2	19.2	20.5
RB197	528795	156373	Roadside	Diffusion tube	100.0	100.0	-	36.2	32.9	25.1	26.9
RB198	528796	156379	Roadside	Diffusion tube	90.4	90.4	-	38.2	38.8	26.6	29.9
RB199	528800	156390	Roadside	Diffusion tube	100.0	100.0	-	34.1	31.8	23.9	25.3
RB200	528799	156409	Roadside	Diffusion tube	100.0	100.0	-	**42.1**	39.4	31.4	30.4
RB201	528804	156414	Roadside	Diffusion tube	100.0	100.0	-	34.2	34.0	25.2	26.5
RB202	528808	156444	Roadside	Diffusion tube	100.0	100.0	-	37.7	37.7	29.6	32.2
RB203	528809	156454	Roadside	Diffusion tube	100.0	100.0	-	36.9	39.2	30.3	30.5
RB204	528810	156457	Roadside	Diffusion tube	92.3	92.3	-	36.8	39.3	30.4	29.6
RB205	528812	156466	Roadside	Diffusion tube	100.0	100.0	-	**44.0**	**42.2**	32.7	32.7
RB206	528816	156477	Roadside	Diffusion tube	100.0	100.0	-	34.5	33.1	26.6	30.5
RB207	528818	156486	Roadside	Diffusion tube	100.0	100.0	-	35.2	37.3	26.1	26.9

RB208	528825	156526	Roadside	Diffusion tube	100.0	100.0	-	**53.0**	**50.3**	36.0	34.9
RB209	528833	156547	Roadside	Diffusion tube	100.0	100.0	-	27.8	27.8	21.4	22.3
RB210	528833	156555	Roadside	Diffusion tube	100.0	100.0	-	39.3	36.3	28.5	28.2
RB211	528839	156577	Roadside	Diffusion tube	100.0	100.0	-	36.6	37.0	29.5	30.6
RB212	528840	156582	Roadside	Diffusion tube	100.0	100.0	-	39.3	**40.6**	30.1	29.9
RB213	528845	156604	Roadside	Diffusion tube	100.0	100.0	-	36.5	37.9	28.0	27.3
RB214	528848	156617	Roadside	Diffusion tube	100.0	100.0	-	33.1	33.5	22.4	25.2
RB215	528853	156646	Roadside	Diffusion tube	100.0	100.0	-	29.0	27.6	22.6	22.3
RB216	528862	156690	Roadside	Diffusion tube	100.0	100.0	-	42.5	39.3	39.9	35.4
RB217	528866	156712	Roadside	Diffusion tube	100.0	100.0	-	43.2	**45.2**	33.8	35.5
RB218	528869	156737	Kerbside	Diffusion tube	100.0	100.0	-	42.6	**40.7**	33.3	33.3
RB219	528877	156744	Roadside	Diffusion tube	100.0	100.0		39.2	**40.6**	33.8	30.3
RB223	528804	156435	Roadside	Diffusion tube	100.0	100.0			**42.3**	32.9	33.1
RB224	528804	156435	Roadside	Diffusion tube	100.0	100.0			36.5	32.5	35.4
RB225	528804	156435	Roadside	Diffusion tube	100.0	100.0			38.7	32.3	34.3

☒ Diffusion tube data has been bias corrected

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

☒ 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 adjustment

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(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.

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

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3) 2017	NO_2 1-Hour Means > 200µg/m^3 (3) 2018	NO_2 1-Hour Means > 200µg/m^3 (3) 2019	NO_2 1-Hour Means > 200µg/m^3 (3) 2020	NO_2 1-Hour Means > 200µg/m^3 (3) 2021
RG1	528208	142337	Suburban	Automatic	99.1	99.1	0	0	0	0	0
RG3	526421	139639	Rural	Automatic	97.6	97.6	0	0	0	0	0
RG6	528592	141831	Suburban	Automatic	99.5	99.5	0	0	0	0	0
RG7	528804	156436	Roadside	Automatic	90.5	90.5	-	(128)	(139)	0	0

Notes:

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.**

(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.

Table A.5 – Annual Mean PM_{10} (VCM [1]) Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (2)	Valid Data Capture 2020 (%) (3)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (4) 2017	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (4) 2018	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (4) 2019	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (4) 2020	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (4) 2021
RG1	528208	142337	Suburban	99.3	99.3	16.2	17.2	15.9	15.1	15.2

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

Notes:

Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ are shown in **bold.**

(1) Data have been adjusted using the Volatile Correction Model (www.volatile-correction-model.info).

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

(3) 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%).

(4) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG22, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.1 – Trends in Annual Mean PM_{10} Concentrations at Site RG1

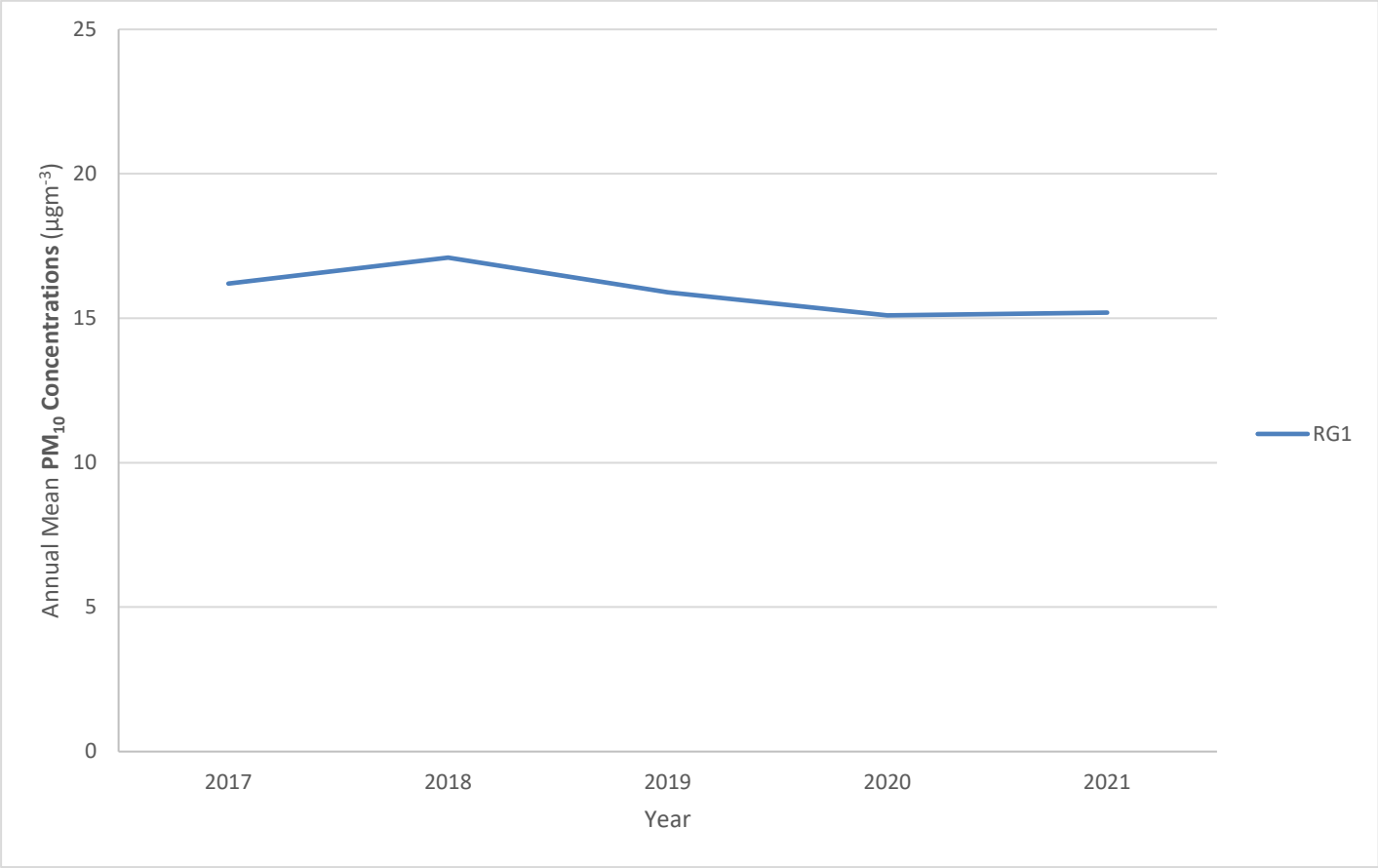


Table A.6 – 24-Hour Mean PM_{10} (VCM [1]) Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [2]	Valid Data Capture 2019 (%) [3]	PM_{10} 24-Hour Means > 50µg/m³ 2017	PM_{10} 24-Hour Means > 50µg/m³ 2018	PM_{10} 24-Hour Means > 50µg/m³ 2019	PM_{10} 24-Hour Means > 50µg/m³ 2020	PM_{10} 24-Hour Means > 50µg/m³ 2021
RG1	528208	142337	Suburban	99.3	99.3	2	0	0	0	0

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold.**

(1) Data have been adjusted using the Volatile Correction Model (www.volatile-correction-model.info).

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

(3) 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.2 – Trends in Number of 24-Hour Mean PM_{10} Results >50µg/m^3 at Site RG1

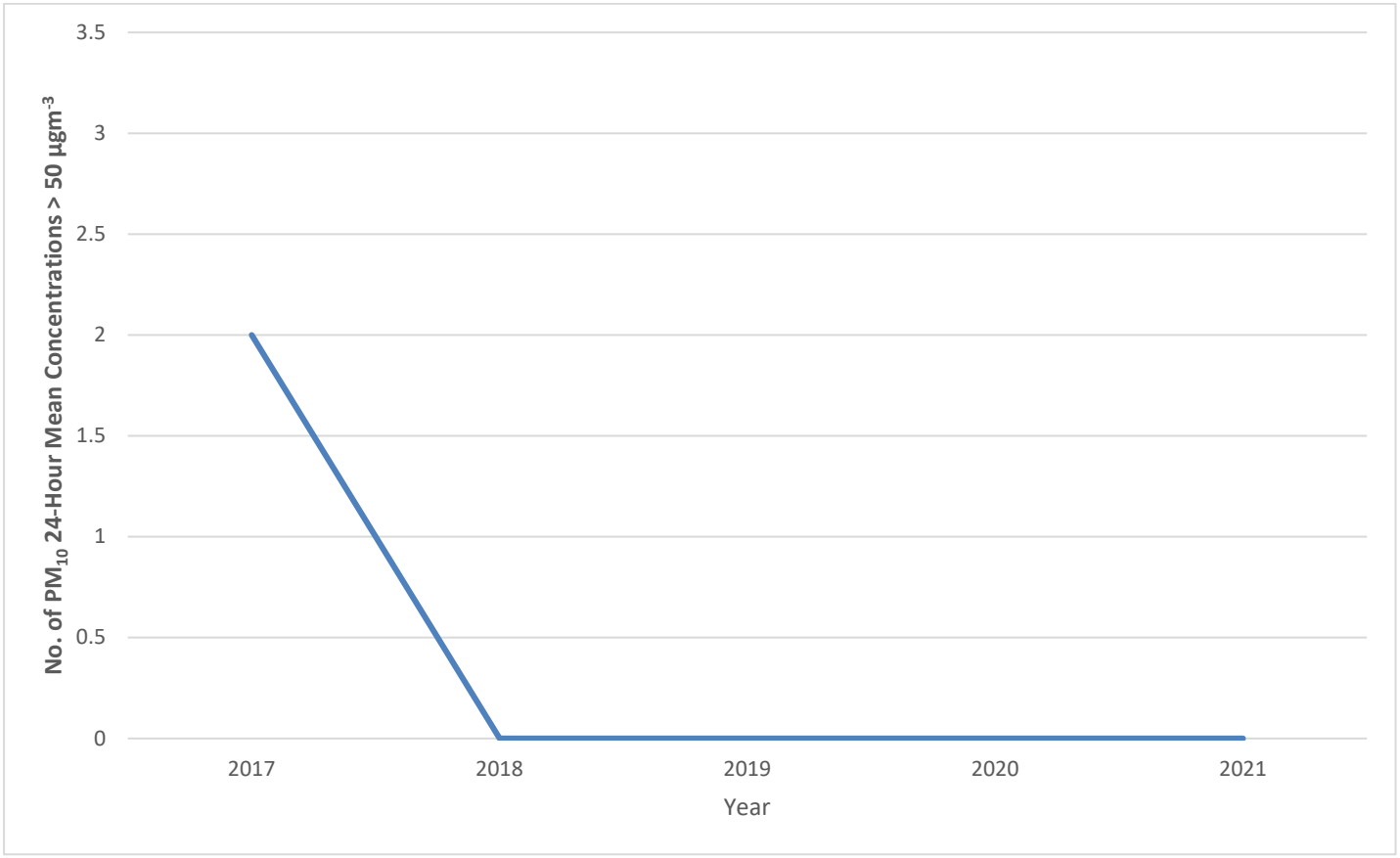


Table A.7 – Annual Mean Benzene Monitoring Results

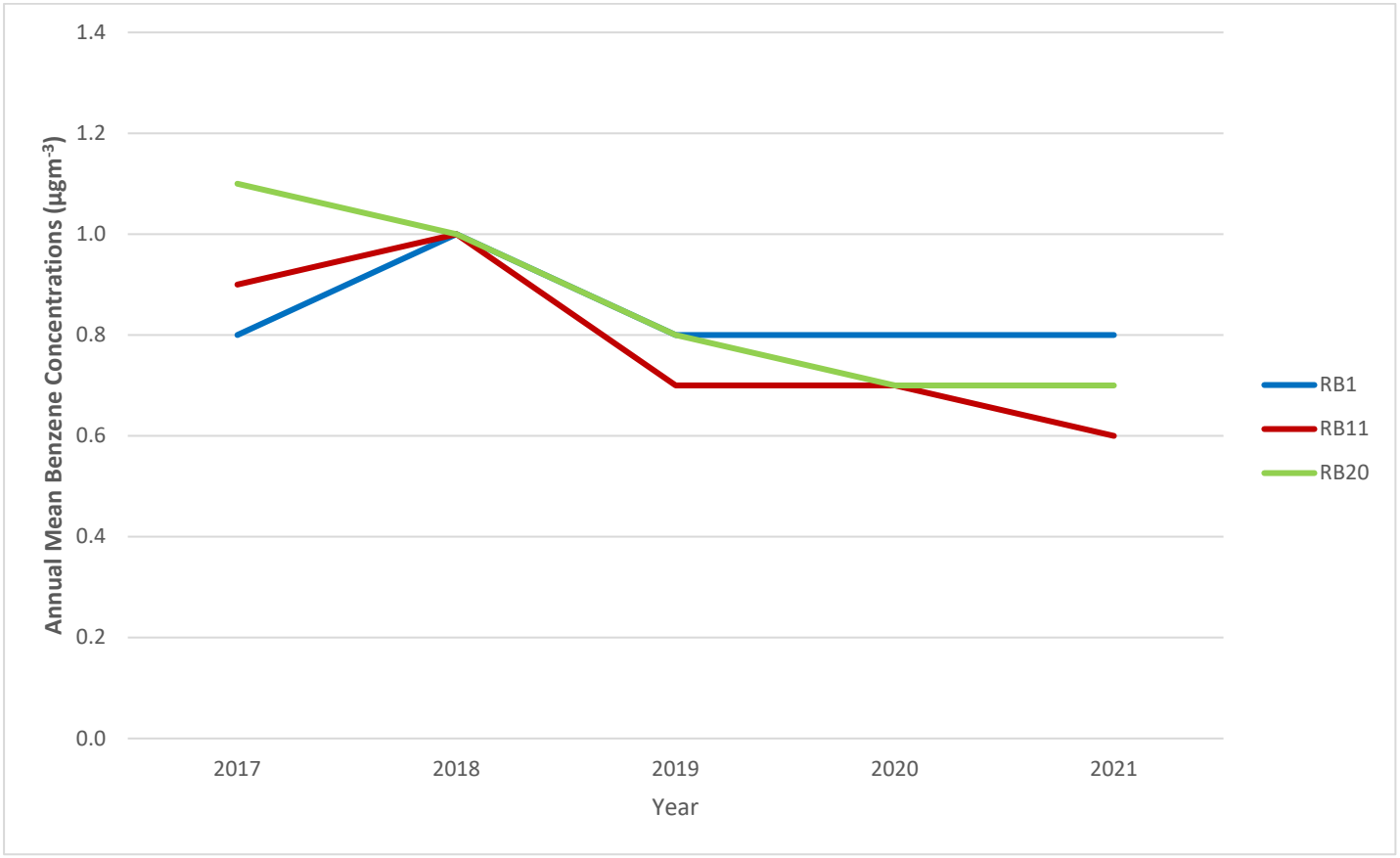
Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [2]	Valid Data Capture 2020 (%) [3]	Annual Mean Benzene Concentrations 2017	Annual Mean Benzene Concentrations 2017	Annual Mean Benzene Concentrations 2017	Annual Mean Benzene Concentrations 2017	Annual Mean Benzene Concentrations 2017
RG1	525246	150252	Roadside	92	92	0.8	1.0	0.8	0.8	0.8
RB11	528104	142226	Suburban	92	92	0.9	1.0	0.7	0.7	0.6
RB20	529026	153420	Roadside	92	92	1.1	1.0	0.8	0.7	0.7

Notes:

(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.3 – Trends in Benzene Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 - NO_2 Monthly Diffusion Tube Results – 2021

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m^3) **Jan**	NO_2 Mean Concentrations (µg/m^3) Feb	NO_2 Mean Concentrations (µg/m^3) Mar	NO_2 Mean Concentrations (µg/m^3) Apr	NO_2 Mean Concentrations (µg/m^3) May	NO_2 Mean Concentrations (µg/m^3) Jun	NO_2 Mean Concentrations (µg/m^3) Jul	NO_2 Mean Concentrations (µg/m^3) Aug	NO_2 Mean Concentrations (µg/m^3) Sep	NO_2 Mean Concentrations (µg/m^3) Oct	NO_2 Mean Concentrations (µg/m^3) Nov	NO_2 Mean Concentrations (µg/m^3) Dec	Annual Mean Raw Data	Annual Mean Bias Adjusted (0.9) and Annualised (1)	Annual Mean Distance Corrected to Nearest Exposure (2)
RB 1	525246	150252	26.0	-	18.0	-	21.0	25.0	23.0	18.0	30.0	20.0	29.0	29.0	23.9	21.4	-
RB 3	524944	159630	16.0	19.0	16.0	17.0	13.0	15.0	12.0	11.0	13.0	13.0	20.0	17.0	15.2	13.6	-
RB 8	525246	150286	17.0	14.0	13.0	15.0	12.0	12.0	12.0	11.0	14.0	13.0	15.0	18.0	13.8	12.4	-
RB 9	525750	149677	16.0	14.0	16.0	16.0	11.0	12.0	11.0	11.0	14.0	11.0	18.0	16.0	13.8	12.4	-
RB 11	528104	142226	22.0	16.0	21.0	15.0	16.0	14.0	12.0	13.0	16.0	16.0	21.0	19.0	16.8	15.0	-
RB 12	528424	142934	26.0	24.0	18.0	23.0	20.0	21.0	19.0	13.0	23.0	25.0	29.0	23.0	22.0	19.7	-
RB 13	528362	142983	25.0	18.0	17.0	14.0	14.0	14.0	12.0	12.0	16.0	17.0	19.0	18.0	16.3	14.6	-
RB 17	528511	149715	-	16.0	13.0	15.0	12.0	13.0	10.0	12.0	14.0	14.0	21.0	15.0	14.1	12.6	-
RB 18	529263	153156	24.0	18.0	18.0	21.0	15.0	16.0	15.0	14.0	18.0	17.0	23.0	20.0	18.3	16.3	-

RB19	529067	153375	26.0	20.0	20.0	21.0	17.0	18.0	16.0	14.0	20.0	18.0	24.0	20.0	19.5	17.5	-
RB20	529026	153420	28.0	28.0	26.0	27.0	24.0	26.0	26.0	13.0	31.0	26.0	31.0	23.0	25.8	23.1	-
RB21	523198	160095	33.0	22.0	26.0	29.0	26.0	33.0	26.0	21.0	29.0	24.0	33.0	29.0	27.6	24.7	-
RB22	523260	160111	19.0	17.0	-	14.0	12.0	15.0	12.0	18.0	16.0	13.0	20.0	17.0	15.7	14.1	-
RB23	523612	159906	19.0	15.0	14.0	17.0	11.0	11.0	11.0	10.0	13.0	11.0	19.0	15.0	13.8	12.4	-
RB24	528208	142337	22.0	14.0	16.0	13.0	13.0	13.0	13.0	11.0	14.0	17.0	19.0	18.0	15.3	13.7	-
RB25	528208	142337	19.0	16.0	16.0	14.0	13.0	13.0	12.0	17.0	14.0	16.0	19.0	19.0	15.7	14.0	-
RB26	528208	142337	19.0	17.0	15.0	13.0	14.0	12.0	12.0	12.0	16.0	16.0	21.0	18.0	15.4	13.8	-
RB27	521873	153896	22.0	20.0	18.0	15.0	17.0	17.0	16.0	11.0	20.0	21.0	22.0	23.0	18.5	16.6	-
RB29	521921	153937	21.0	16.0	16.0	14.0	15.0	16.0	15.0	12.0	16.0	16.0	21.0	17.0	16.3	14.6	-
RB30	522112	153728	19.0	17.0	14.0	16.0	15.0	15.0	15.0	15.0	19.0	19.0	19.0	18.0	16.8	15.0	-
RB31	525506	152366	15.0	15.0	13.0	13.0	11.0	14.0	11.0	13.0	13.0	11.0	19.0	12.0	13.3	11.9	-
RB33	524081	152580	18.0	14.0	15.0	15.0	-	14.0	15.0	12.0	-	15.0	19.0	11.0	14.8	13.3	-
RB34	524177	152393	19.0	18.0	17.0	24.0	19.0	21.0	19.0	14.0	23.0	21.0	25.0	20.0	20.0	17.9	-
RB36	528887	153760	20.0	18.0	18.0	17.0	15.0	15.0	14.0	12.0	17.0	15.0	22.0	18.0	16.8	15.0	-
RB37	529217	153605	24.0	15.0	17.0	-	16.0	16.0	-	14.0	18.0	19.0	26.0	22.0	18.7	16.7	-
RB39	529205	153572	22.0	17.0	19.0	18.0	16.0	14.0	14.0	14.0	19.0	18.0	22.0	19.0	17.7	15.8	-
RB40	529252	154291	17.0	16.0	20.0	14.0	14.0	14.0	13.0	12.0	18.0	16.0	20.0	17.0	15.9	14.3	-
RB43	528797	153612	22.0	-	18.0	23.0	17.0	20.0	-	20.0	22.0	18.0	26.0	18.0	20.4	18.3	-
RB44	525532	150316	27.0	26.0	27.0	24.0	26.0	27.0	22.0	19.0	24.0	21.0	30.0	-	24.8	22.2	-

RB45	525431	150270	26.0	21.0	26.0	23.0	22.0	23.0	-	12.0	-	-	26.0	27.0	22.9	20.5	-
RB46	525346	150241	28.0	28.0	32.0	27.0	27.0	24.0	25.0	25.0	28.0	29.0	31.0	31.0	27.9	25.0	-
RB47	525114	150276	30.0	23.0	30.0	34.0	32.0	29.0	30.0	25.0	33.0	27.0	43.0	28.0	30.3	27.2	-
RB49	525705	152947	31.0	25.0	29.0	21.0	32.0	31.0	31.0	18.0	31.0	28.0	49.0	29.0	29.6	26.5	-
RB50	525700	152964	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RB51	527873	142606	19.0	22.0	16.0	15.0	14.0	15.0	13.0	11.0	16.0	17.0	23.0	21.0	16.8	15.1	-
RB52	527892	142463	23.0	25.0	17.0	17.0	15.0	14.0	15.0	11.0	17.0	18.0	27.0	21.0	18.3	16.4	-
RB53	528030	142373	22.0	19.0	20.0	16.0	16.0	17.0	15.0	13.0	17.0	20.0	23.0	23.0	18.4	16.5	-
RB54	528112	142321	23.0	19.0	21.0	18.0	16.0	14.0	17.0	12.0	15.0	18.0	23.0	19.0	17.9	16.0	-
RB55	528254	142196	29.0	18.0	17.0	15.0	16.0	16.0	14.0	11.0	16.0	19.0	24.0	20.0	17.9	16.0	-
RB56	528386	142080	19.0	16.0	17.0	16.0	12.0	15.0	12.0	12.0	16.0	19.0	26.0	21.0	16.8	15.0	-
RB57	528499	141953	20.0	16.0	17.0	16.0	13.0	14.0	12.0	12.0	15.0	18.0	21.0	20.0	16.2	14.5	-
RB58	528538	141897	21.0	20.0	15.0	16.0	14.0	13.0	-	19.0	17.0	18.0	21.0	20.0	17.6	15.8	-
RB59	528602	141789	17.0	19.0	17.0	11.0	12.0	13.0	-	14.0	17.0	18.0	26.0	21.0	16.8	15.1	-
RB60	528607	141910	19.0	16.0	16.0	15.0	14.0	12.0	13.0	11.0	17.0	19.0	22.0	19.0	16.1	14.4	-
RB61	528578	142006	21.0	15.0	14.0	15.0	12.0	12.0	13.0	10.0	18.0	18.0	21.0	-	15.4	13.8	-
RB64	528608	142432	20.0	19.0	19.0	16.0	15.0	14.0	14.0	11.0	16.0	18.0	26.0	20.0	17.3	15.5	-
RB65	528581	142635	25.0	21.0	23.0	20.0	14.0	17.0	14.0	14.0	18.0	21.0	26.0	22.0	19.6	17.5	-
RB66	528499	142512	30.0	20.0	18.0	16.0	13.0	12.0	13.0	12.0	16.0	16.0	19.0	20.0	17.1	15.3	-
RB68	528505	142246	19.0	17.0	17.0	16.0	13.0	14.0	13.0	11.0	17.0	17.0	20.0	21.0	16.3	14.6	-

RB69	528335	142224	24.0	18.0	16.0	17.0	15.0	15.0	12.0	13.0	16.0	20.0	26.0	22.0	17.8	16.0	-
RB70	528360	142384	25.0	18.0	15.0	17.0	15.0	14.0	14.0	13.0	15.0	17.0	21.0	23.0	17.3	15.4	-
RB72	528220	142583	24.0	16.0	16.0	18.0	15.0	15.0	13.0	12.0	16.0	15.0	25.0	20.0	17.1	15.3	-
RB73	528172	142679	22.0	21.0	16.0	17.0	15.0	14.0	14.0	13.0	15.0	18.0	20.0	20.0	17.1	15.3	-
RB74	529149	141953	17.0	16.0	17.0	13.0	11.0	11.0	11.0	10.0	15.0	16.0	20.0	21.0	14.8	13.3	-
RB75	529203	142192	18.0	15.0	15.0	17.0	12.0	13.0	13.0	11.0	18.0	15.0	23.0	20.0	15.8	14.2	-
RB76	528958	142468	17.0	16.0	16.0	16.0	10.0	13.0	11.0	9.0	14.0	14.0	19.0	18.0	14.4	12.9	-
RB77	528789	142570	21.0	14.0	17.0	15.0	13.0	11.0	11.0	10.0	15.0	15.0	21.0	16.0	14.9	13.4	-
RB78	528553	141857	19.0	20.0	15.0	14.0	14.0	13.0	12.0	12.0	18.0	19.0	25.0	19.0	16.7	14.9	-
RB81	527594	149236	35.0	25.0	23.0	28.0	22.0	27.0	23.0	24.0	27.0	27.0	34.0	27.0	26.8	24.0	-
RB82	528770	155797	26.0	28.0	26.0	25.0	23.0	28.0	22.0	18.0	24.0	22.0	27.0	24.0	24.4	21.9	-
RB95	525382	150639	20.0	18.0	19.0	20.0	19.0	19.0	16.0	14.0	20.0	18.0	24.0	20.0	18.9	16.9	-
RB98	527931	142231	24.0	19.0	20.0	16.0	18.0	13.0	16.0	20.0	17.0	19.0	22.0	25.0	19.1	17.1	-
RB99	526421	139639	14.0	12.0	10.0	10.0	9.0	11.0	9.0	9.0	13.0	9.0	15.0	13.0	11.2	10.0	-
RB100	526421	139639	13.0	15.0	11.0	11.0	12.0	11.0	9.0	11.0	12.0	10.0	15.0	12.0	11.8	10.6	-
RB101	526421	139639	12.0	13.0	10.0	11.0	9.0	11.0	9.0	12.0	12.0	10.0	14.0	12.0	11.3	10.1	-
RB102	530936	144278	18.0	21.0	17.0	-	17.0	20.0	18.0	13.0	18.0	16.0	19.0	18.0	17.7	15.9	-
RB104	525204	150254	28.0	29.0	32.0	33.0	31.0	29.0	29.0	19.0	32.0	27.0	42.0	30.0	30.1	26.9	-

RB105	525203	150239	30.0	31.0	30.0	25.0	29.0	31.0	27.0	17.0	36.0	35.0	35.0	30.0	29.7	26.6	-
RB106	523250	160056	23.0	26.0	28.0	29.0	25.0	27.0	23.0	23.0	27.0	21.0	31.0	25.0	25.7	23.0	-
RB107	525467	150292	19.0	24.0	21.0	26.0	18.0	20.0	20.0	18.0	23.0	34.0	33.0	23.0	23.3	20.8	-
RB109	525387	150178	19.0	26.0	21.0	29.0	22.0	28.0	26.0	18.0	30.0	21.0	28.0	29.0	24.8	22.2	-
RB110	529016	153439	23.0	20.0	20.0	26.0	20.0	20.0	21.0	14.0	24.0	23.0	30.0	22.0	21.9	19.6	-
RB111	525031	150291	23.0	-	27.0	29.0	27.0	26.0	21.0	23.0	30.0	23.0	28.0	26.0	25.7	23.0	-
RB113	524795	150404	25.0	24.0	18.0	21.0	19.0	18.0	17.0	20.0	23.0	23.0	20.0	24.0	21.0	18.8	-
RB114	524368	150477	-	17.0	-	-	-	20.0	17.0	12.0	18.0	18.0	24.0	21.0	18.4	16.8	-
RB115	524751	150428	28.0	26.0	24.0	23.0	22.0	26.0	18.0	15.0	28.0	25.0	36.0	33.0	25.3	22.7	-
RB116	525022	150317	28.0	28.0	28.0	31.0	23.0	27.0	22.0	14.0	32.0	26.0	30.0	19.0	25.7	23.0	-
RB117	525076	150327	28.0	36.0	28.0	41.0	33.0	35.0	32.0	25.0	41.0	31.0	30.0	22.0	31.8	28.5	-
RB118	525151	150467	25.0	33.0	29.0	30.0	32.0	32.0	22.0	22.0	37.0	34.0	35.0	35.0	30.5	27.3	-
RB120	528196	150421	27.0	28.0	28.0	28.0	23.0	27.0	21.0	18.0	31.0	26.0	38.0	31.0	27.2	24.3	-

RB121	528092	150786	36.0	31.0	33.0	32.0	35.0	31.0	28.0	20.0	34.0	36.0	39.0	37.0	32.7	29.3	-
RB122	528013	150475	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RB123	527838	150474	33.0	47.0	47.0	32.0	35.0	40.0	32.0	30.0	40.0	48.0	37.0	26.0	37.3	33.4	-
RB124	529013	153285	31.0	28.0	28.0	33.0	25.0	33.0	25.0	20.0	36.0	30.0	32.0	29.0	29.2	26.1	-
RB125	525589	151655	26.0	26.0	-	-	28.0	26.0	24.0	17.0	30.0	33.0	33.0	27.0	27.0	24.2	-
RB136	528810	156474	46.0	36.0	38.0	39.0	41.0	42.0	41.0	40.0	41.0	-	41.0	37.0	40.2	36.0	-
RB137	528831	156648	37.0	29.0	36.0	36.0	37.0	-	30.0	19.0	32.0	30.0	36.0	27.0	31.7	28.4	-
RB140	528122	150799	20.0	18.0	18.0	19.0	18.0	18.0	17.0	15.0	24.0	26.0	26.0	21.0	20.0	17.9	-
RB141	527373	150596	21.0	21.0	21.0	22.0	16.0	18.0	15.0	12.0	22.0	18.0	30.0	23.0	19.9	17.8	-
RB145	527852	150158	29.0	24.0	27.0	29.0	21.0	26.0	22.0	26.0	28.0	40.0	33.0	34.0	28.3	25.3	-
RB146	528759	156277	37.0	35.0	32.0	31.0	28.0	31.0	30.0	21.0	33.0	32.0	38.0	38.0	32.2	28.8	-
RB147	528732	156407	16.0	19.0	14.0	16.0	10.0	13.0	11.0	10.0	15.0	12.0	17.0	14.0	13.9	12.5	-
RB148	528855	156674	58.0	45.0	47.0	45.0	51.0	52.0	48.0	33.0	49.0	47.0	50.0	45.0	47.5	**42.5**	31.2

RB149	527737	142710	41.0	30.0	32.0	38.0	31.0	37.0	-	27.0	39.0	46.0	47.0	37.0	36.8	33.0	-
RB150	525397	150867	31.0	26.0	34.0	28.0	28.0	32.0	28.0	27.0	31.0	31.0	40.0	30.0	30.5	27.3	-
RB151	528502	142952	29.0	28.0	23.0	22.0	29.0	27.0	-	47.0	26.0	26.0	36.0	30.0	29.4	26.3	-
RB152	528599	152439	16.0	22.0	30.0	31.0	32.0	23.0	26.0	-	30.0	26.0	28.0	28.0	26.5	23.8	-
RB153	527837	148046	26.0	23.0	20.0	27.0	25.0	23.0	22.0	16.0	24.0	22.0	28.0	23.0	23.3	20.8	-
RB167	527830	150643	13.0	29.0	30.0	23.0	21.0	18.0	19.0	13.0	22.0	39.0	26.0	25.0	23.2	20.7	-
RB174	527852	142841	28.0	24.0	23.0	26.0	20.0	24.0	20.0	15.0	25.0	26.0	30.0	26.0	23.9	21.4	-
RB175	527955	142999	27.0	29.0	22.0	24.0	23.0	22.0	21.0	19.0	27.0	26.0	35.0	27.0	25.2	22.5	-
RB176	527765	142777	25.0	22.0	20.0	20.0	20.0	19.0	19.0	14.0	23.0	23.0	28.0	26.0	21.6	19.3	-
RB177	527754	142762	23.0	22.0	19.0	22.0	19.0	19.0	18.0	14.0	23.0	22.0	23.0	23.0	20.6	18.4	-
RB178	528592	141831	19.0	17.0	13.0	16.0	13.0	13.0	11.0	11.0	15.0	17.0	21.0	17.0	15.3	13.7	-
RB179	528592	141831	16.0	17.0	16.0	15.0	14.0	16.0	11.0	12.0	14.0	15.0	20.0	19.0	15.4	13.8	-
RB180	528592	141831	19.0	18.0	16.0	13.0	13.0	13.0	12.0	10.0	16.0	17.0	23.0	18.0	15.7	14.0	-

RB181	528852	156724	45.0	39.0	37.0	39.0	37.0	37.0	41.0	25.0	39.0	42.0	51.0	49.0	40.1	35.9	-
RB182	528835	156728	26.0	23.0	18.0	24.0	21.0	21.0	20.0	27.0	23.0	22.0	24.0	23.0	22.7	20.3	-
RB183	528813	156580	40.0	27.0	34.0	33.0	36.0	36.0	34.0	24.0	34.0	30.0	-	30.0	32.5	29.1	-
RB184	528807	156555	31.0	24.0	30.0	31.0	29.0	31.0	28.0	19.0	30.0	26.0	40.0	27.0	28.8	25.8	-
RB186	528790	156500	30.0	26.0	28.0	32.0	28.0	28.0	28.0	19.0	30.0	28.0	37.0	29.0	28.6	25.6	-
RB187	528789	156488	28.0	23.0	22.0	26.0	22.0	25.0	24.0	16.0	26.0	21.0	32.0	24.0	24.1	21.6	-
RB188	528792	156478	26.0	25.0	25.0	27.0	29.0	27.0	27.0	19.0	28.0	24.0	29.0	25.0	25.9	23.2	-
RB189	528789	156465	26.0	25.0	23.0	30.0	25.0	28.0	25.0	17.0	30.0	24.0	27.0	24.0	25.3	22.7	-
RB190	528788	156460	28.0	28.0	25.0	26.0	24.0	26.0	25.0	19.0	27.0	21.0	25.0	24.0	24.8	22.2	-
RB191	528785	156448	26.0	24.0	20.0	29.0	25.0	27.0	24.0	16.0	27.0	23.0	26.0	23.0	24.2	21.6	-
RB192	528784	156442	24.0	26.0	22.0	24.0	24.0	26.0	26.0	16.0	26.0	20.0	26.0	24.0	23.7	21.2	-
RB193	528782	156430	22.0	24.0	21.0	27.0	21.0	23.0	23.0	17.0	25.0	18.0	25.0	21.0	22.3	19.9	-
RB194	528779	156381	27.0	29.0	28.0	29.0	30.0	29.0	28.0	19.0	29.0	29.0	35.0	30.0	28.5	25.5	-

RB195	528772	156349	29.0	32.0	29.0	32.0	31.0	34.0	28.0	27.0	37.0	28.0	30.0	31.0	30.7	27.5	-
RB196	528797	156331	22.0	19.0	24.0	23.0	21.0	23.0	20.0	22.0	24.0	25.0	26.0	26.0	22.9	20.5	-
RB197	528795	156373	37.0	23.0	30.0	28.0	31.0	31.0	32.0	22.0	27.0	29.0	39.0	31.0	30.0	26.9	-
RB198	528796	156379	34.0	35.0	32.0	35.0	33.0	36.0	31.0	23.0	37.0	30.0	41.0	-	33.4	29.9	-
RB199	528800	156390	32.0	29.0	29.0	28.0	30.0	30.0	26.0	21.0	28.0	27.0	33.0	26.0	28.3	25.3	-
RB200	528799	156409	36.0	38.0	31.0	40.0	35.0	38.0	35.0	21.0	34.0	33.0	35.0	31.0	33.9	30.4	-
RB201	528804	156414	36.0	27.0	26.0	32.0	27.0	34.0	28.0	21.0	33.0	31.0	32.0	28.0	29.6	26.5	-
RB202	528808	156444	41.0	38.0	38.0	38.0	32.0	37.0	34.0	26.0	40.0	36.0	34.0	37.0	35.9	32.2	-
RB203	528809	156454	42.0	36.0	31.0	38.0	35.0	33.0	30.0	25.0	34.0	35.0	43.0	27.0	34.1	30.5	-
RB204	528810	156457	38.0	37.0	33.0	38.0	32.0	34.0	29.0	25.0	33.0	32.0	-	32.0	33.0	29.6	-
RB205	528812	156466	38.0	40.0	31.0	37.0	41.0	41.0	35.0	24.0	40.0	37.0	39.0	35.0	36.5	32.7	-
RB206	528816	156477	33.0	28.0	28.0	37.0	30.0	50.0	24.0	40.0	34.0	27.0	46.0	32.0	34.1	30.5	-
RB207	528818	156486	29.0	29.0	32.0	35.0	29.0	35.0	29.0	21.0	31.0	27.0	34.0	29.0	30.0	26.9	-

RB208	528825	156526	45.0	41.0	37.0	31.0	48.0	45.0	39.0	29.0	40.0	37.0	33.0	42.0	38.9	34.9	-
RB209	528833	156547	27.0	21.0	24.0	26.0	22.0	23.0	21.0	22.0	23.0	26.0	39.0	25.0	24.9	22.3	-
RB210	528833	156555	33.0	29.0	33.0	32.0	32.0	34.0	30.0	30.0	34.0	33.0	28.0	30.0	31.5	28.2	-
RB211	528839	156577	33.0	38.0	31.0	36.0	32.0	35.0	34.0	31.0	37.0	30.0	40.0	33.0	34.2	30.6	-
RB212	528840	156582	37.0	39.0	34.0	29.0	36.0	30.0	30.0	30.0	32.0	30.0	42.0	32.0	33.4	29.9	-
RB213	528845	156604	33.0	34.0	26.0	31.0	29.0	34.0	28.0	21.0	33.0	36.0	34.0	27.0	30.5	27.3	-
RB214	528848	156617	32.0	27.0	26.0	30.0	26.0	28.0	26.0	19.0	30.0	31.0	33.0	30.0	28.2	25.2	-
RB215	528853	156646	29.0	28.0	28.0	24.0	22.0	23.0	16.0	22.0	27.0	25.0	28.0	27.0	24.9	22.3	-
RB216	528862	156690	66.0	38.0	32.0	36.0	39.0	42.0	38.0	26.0	40.0	37.0	44.0	37.0	39.6	35.4	-
RB217	528866	156712	44.0	39.0	37.0	41.0	42.0	43.0	39.0	27.0	41.0	41.0	41.0	41.0	39.7	35.5	-
RB218	528869	156737	35.0	34.0	32.0	41.0	36.0	44.0	37.0	26.0	40.0	37.0	47.0	37.0	37.2	33.3	-
RB219	528877	156744	39.0	29.0	33.0	26.0	45.0	39.0	32.0	25.0	35.0	35.0	39.0	29.0	33.8	30.3	-
RB223	528804	156435	40.0	32.0	39.0	38.0	36.0	39.0	38.0	36.0	35.0	36.0	41.0	34.0	37.0	33.1	-

RB224	528804	156435	42.0	36.0	33.0	41.0	35.0	44.0	38.0	25.0	40.0	41.0	56.0	43.0	39.5	35.4	-
RB225	528804	156435	42.0	40.0	36.0	42.0	37.0	43.0	38.0	24.0	34.0	38.0	45.0	40.0	38.3	34.3	-

☒ **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 in the final column**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

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

(2) Distance corrected to nearest relevant public exposure.

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

New or Changed Sources Identified Within Reigate and Banstead

Reigate and Banstead Borough has not identified any new sources relating to air quality within the reporting year of 2021.

Additional Air Quality Works Undertaken by Reigate and Banstead During 2021

Reigate and Banstead has not completed any additional works within the reporting year of 2021.

QA/QC of Monitoring

Diffusion Tube Nitrogen Dioxide Bias Adjustment Factors

Reigate and Banstead Borough Council use diffusion tubes prepared and analysed by Lambeth Scientific Services (50% TEA in acetone method). The local bias adjustment factors are presented in the table below for 2017 to 2021, which are based on orthogonal regression of the three sets of triplicate diffusion tubes co-located at automatic monitoring sites RG1, RG3 and RG6. For comparison, the national bias-adjustment factor for Lambeth Scientific Services is included in the table below (National Diffusion Tube Bias Adjustment Factor Spreadsheet (09/22)).

Table C.1 – Local and National Bias Adjustment Factors

Year	Local Bias Adjustment Factor	National Bias Adjustment Factor
2017	0.91	0.93
2018	0.97	1.04
2019	0.87	0.91
2020	0.91	0.96
2021	0.90	0.95

For each year, the local bias adjustment factor has been used in order to be consistent with other air quality reports.

PM_{10} Monitoring Adjustment

The RG1 automatic monitoring station PM_{10} data have been adjusted using the Volatile Correction Model (www.volatile-correction-model.info).

Annualisation

Only diffusion tube RB114 has a data capture lower than 75% in 2021. Annualisation has been undertaken using the approach detailed within Box 7.10 within LAQM (TG16). The factor applied to diffusion tube results are detailed within Table C.3.

Table C.3 –Diffusion Tube Annualisation

Annualisation Summary - Information Only

Go to STEP 3 - Bias Adjustment

Diffusion Tube ID	Annualisation Factor Site 1 Name	Annualisation Factor Site 2 Name	Annualisation Factor Site 3 Name	Annualisation Factor Site 4 Name	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m3)	Annualised Data Simple Annual Mean (µg/m3)	Comments
RB114	1.0221	1.0239	1.0111		1.0190	18.4	18.7	

Nitrogen Dioxide Distance Correction

One roadside monitoring site measuring nitrogen dioxide concentrations in 2021 was not located at a site of relevant public exposure. As such, it is necessary to distance correct the measured concentrations in order to estimate concentrations experienced at the nearest relevant exposure to this site. The estimated concentration can then be compared to the relevant air quality objectives to establish whether or not an exceedance is likely to have taken place.

Distance correction calculations have been undertaken, which requires the following inputs:

- Distance from the monitoring site to the kerb (m);
- distance from the closest receptor to the kerb (m);
- the local annual mean background nitrogen dioxide concentration (µg/m^3) (determined using Defra's background maps (Defra, 2018)); and

- the measured annual mean nitrogen dioxide concentration (µg/m^3).

The distance corrected nitrogen dioxide annual mean concentration at RB148 is presented in Table B.1. The distance calculations for 2021 are reproduced below.

Figure C.1 – NO_2 Fall Off with Distance 2021

Fall off with Distance Inputs

i) Enter background concentration for each diffusion tube listed. Once completed see Annual Results Summary tab

Enter data into the pink cells

Diffusion Tube ID	Distance (m)		NO_2 Annual Mean Concentration (µg/m^3)			Comment
	Monitoring Site to Kerb	Receptor to Kerb	Bias Adjusted and Annualised	Background	Predicted at Receptor	
RB148	1.0	6.5	42.5	12.5	31.2	

QA/QC of Diffusion Tube Monitoring

Reigate and Banstead Borough Council use nitrogen dioxide diffusion tubes prepared and analysed by Lambeth Scientific Services, using the 50% TEA in acetone method.

Reigate and Banstead Borough Council also use diffusion tubes prepared and analysed by Lambeth Scientific Services to monitor benzene. AIRBTX Analysis was undertaken using a passive sampling method.

QA/QC of Automatic Monitoring

The NOx analyser at RG1 is also part of the Automatic Urban and Rural Network (AURN); and has data verification and ratification undertaken by Kings ERG and bi-annual QA / QC undertaken by AEA Ricardo. All other data are ratified and verified by Kings ERG to AURN standards. QA/QC is carried out by NPL.

Appendix D: Maps of Monitoring Locations and AQMAs

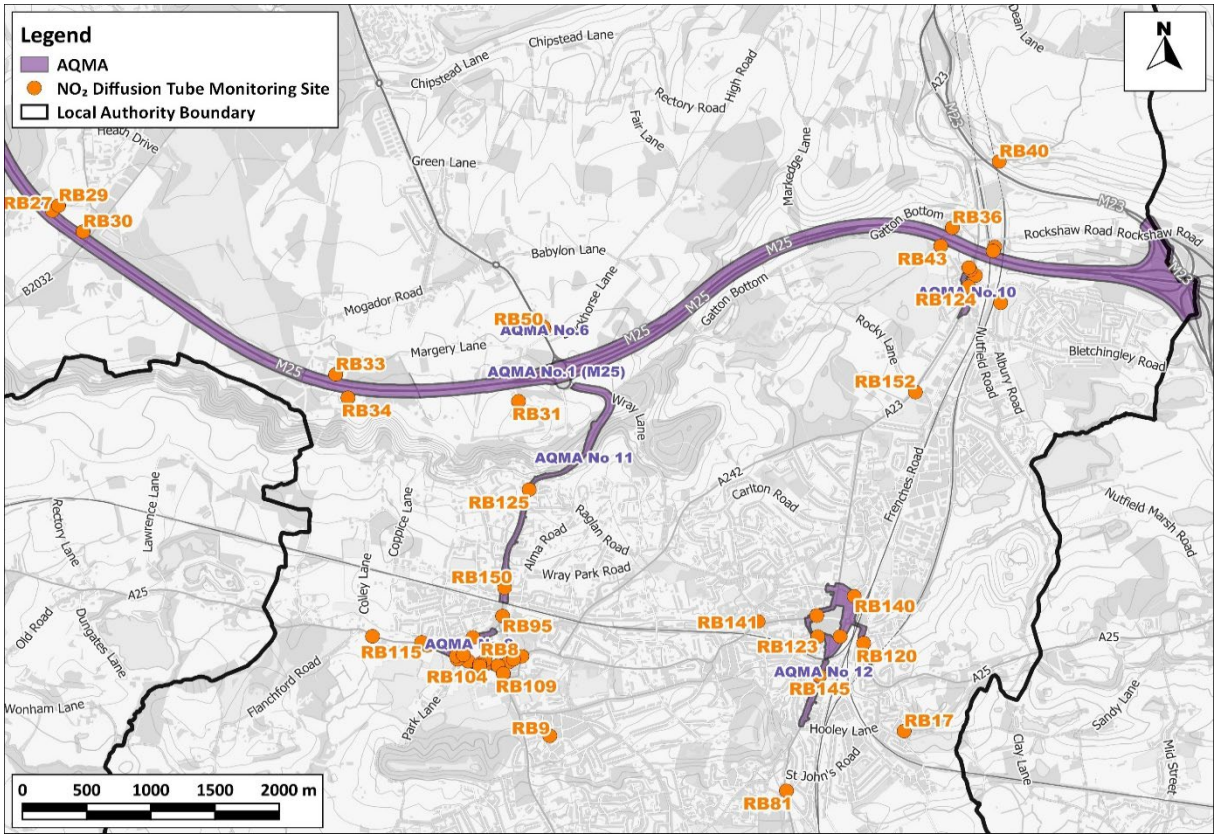


Figure D.1 AQMA No. 1 (M25), AQMA 6 (A217 / Blackhorse Lane), AQMA 10 (Merstham), AQMA No. 11 (Reigate Hill), AQMA No. 12 (Redhill), Nitrogen Dioxide Diffusion Tube Monitoring Site Locations Within and Close to AQMA No. 1 and the Local Authority Boundaries.

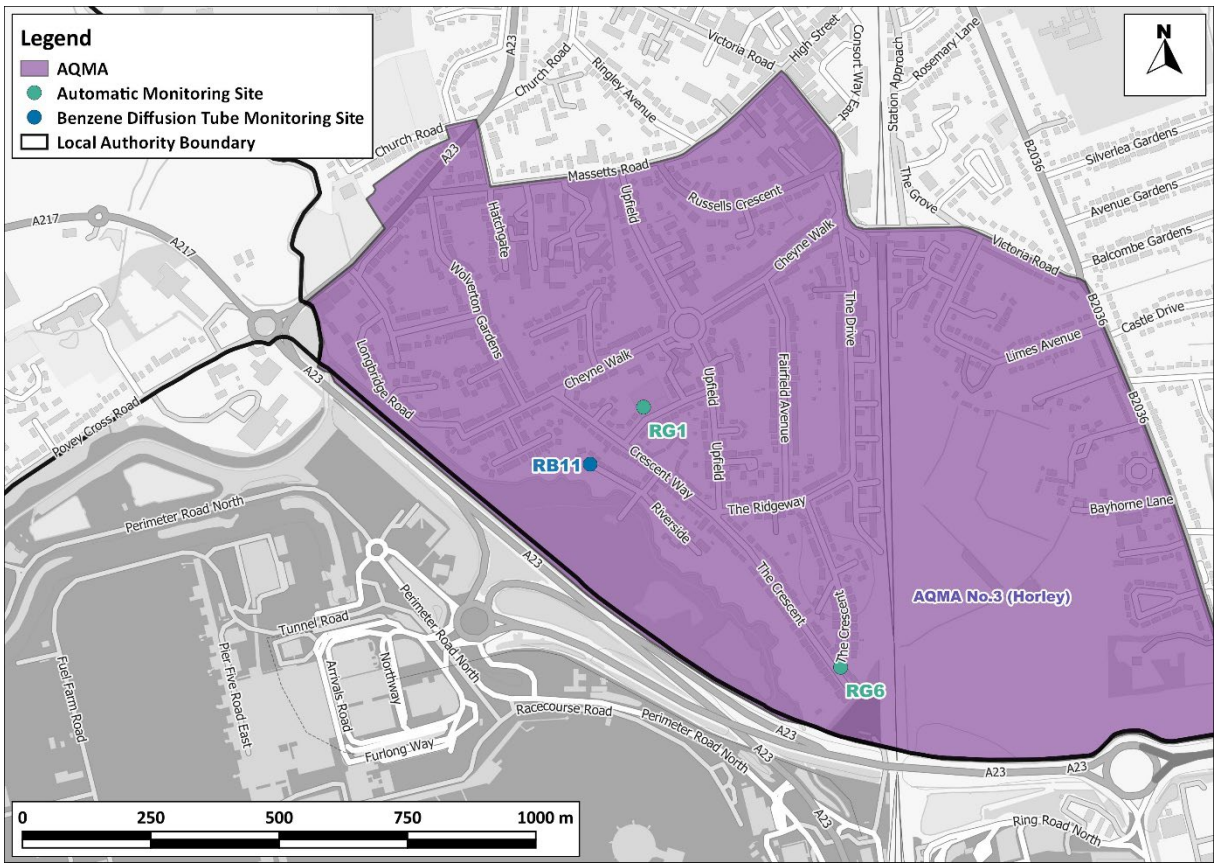


Figure D.2 AQMA No. 3 (Horley), Automatic Monitoring Sites and Benzene Diffusion Tube Monitoring Site Locations Within the AQMA and Local Authority Boundaries.

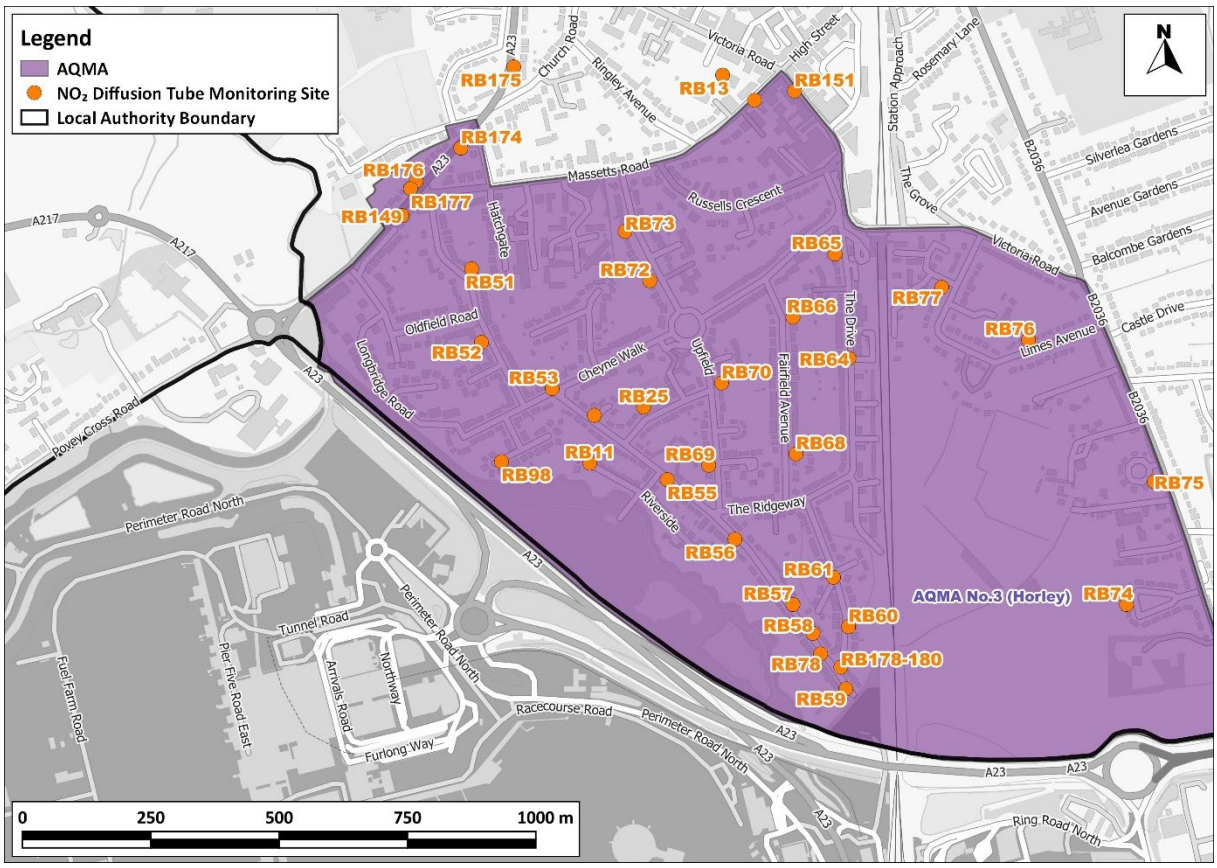


Figure D.3 AQMA No. 3 (Horley), Nitrogen Dioxide Diffusion Tube Monitoring Site Locations Within and Close to the AQMA and Local Authority Boundaries.

Figure D.4 AQMA No. 6 (A217 / Blackhorse Lane) and Nitrogen Dioxide Diffusion Tube Monitoring Site Locations Within and Close to the AQMA.

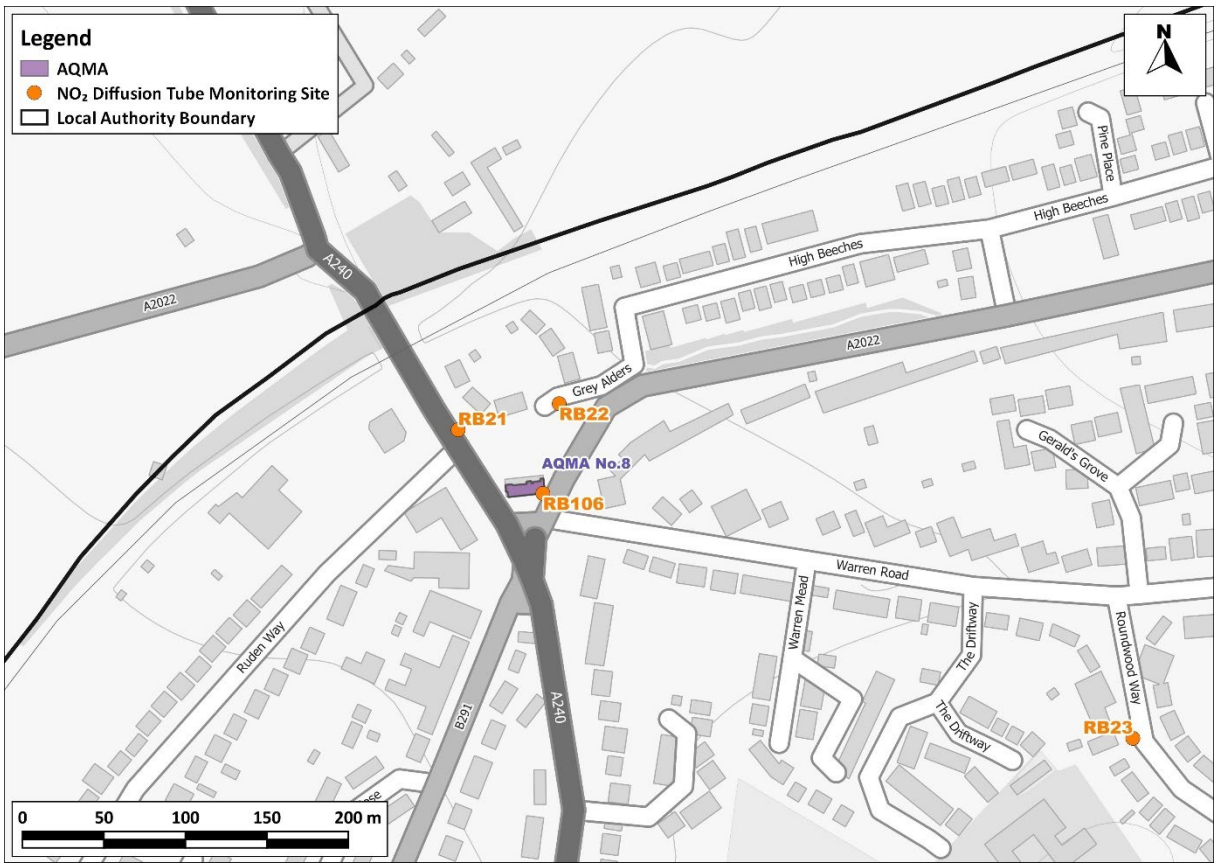


Figure D.5 AQMA No. 8 (Drift Bridge) and Nitrogen Dioxide Diffusion Tube Monitoring Site Locations Within and Close to the AQMA.

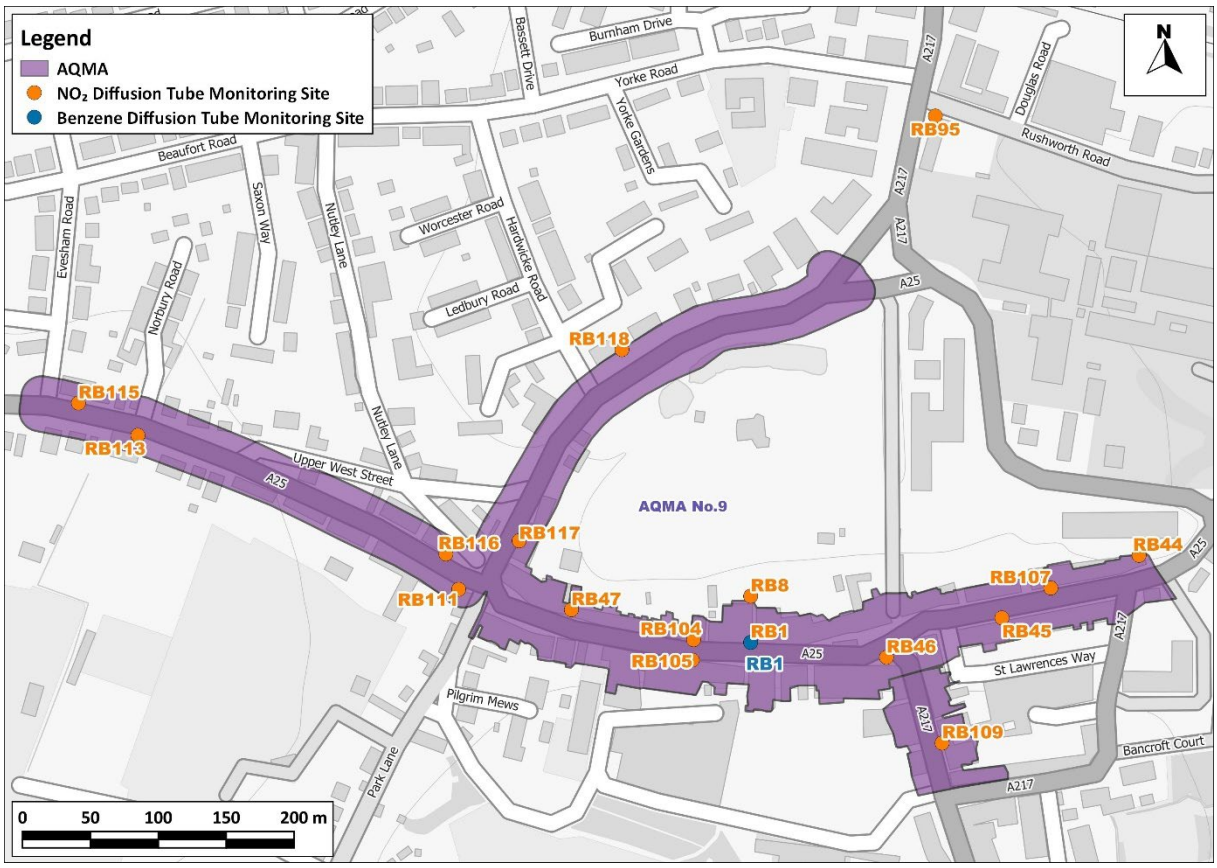


Figure D.6 AQMA No. 9 (Reigate High Street / West St / Bell St) and Nitrogen Dioxide or Benzene Diffusion Tube Monitoring Site Locations Within and Close to the AQMA.

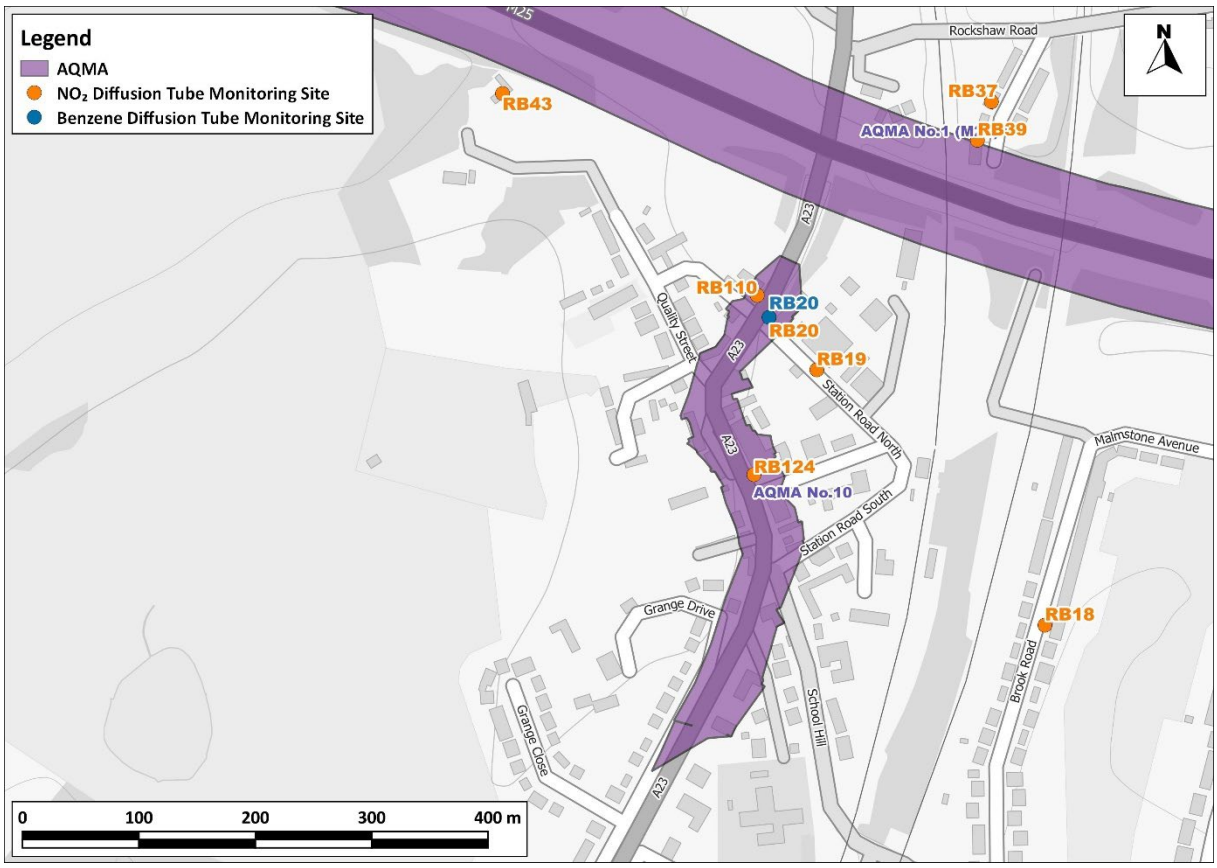


Figure D.7 AQMA No. 10 (Merstham) and Nitrogen Dioxide or Benzene Diffusion Tube Monitoring Site Locations Within and Close to the AQMA Benzene.

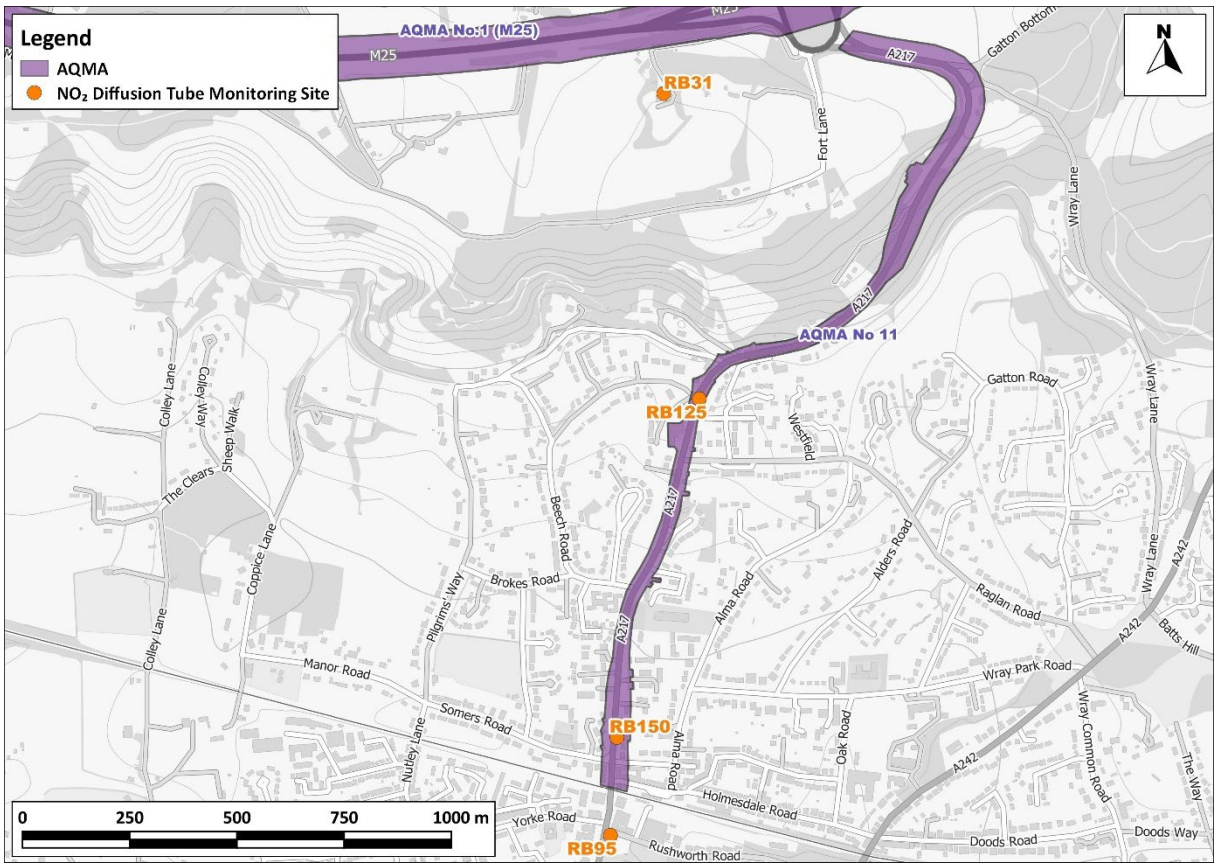


Figure D.8 AQMA No. 11 (Reigate Hill), AQMA No. 1(M25) and Diffusion Tube Monitoring Site Locations Within and Close to AQMA No. 11.

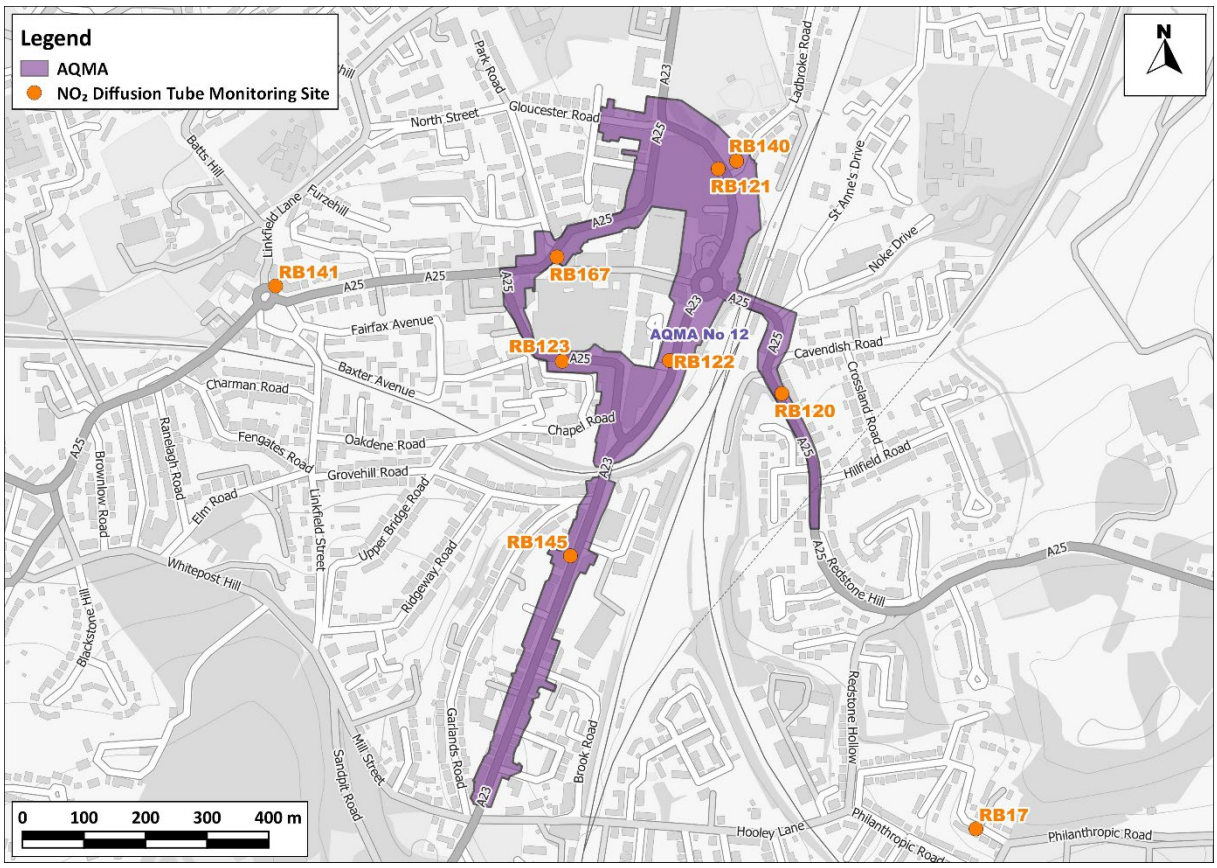


Figure D.9 AQMA No. 12 (Redhill) and Diffusion Tube Monitoring Site Locations Within and Close to the AQMA.

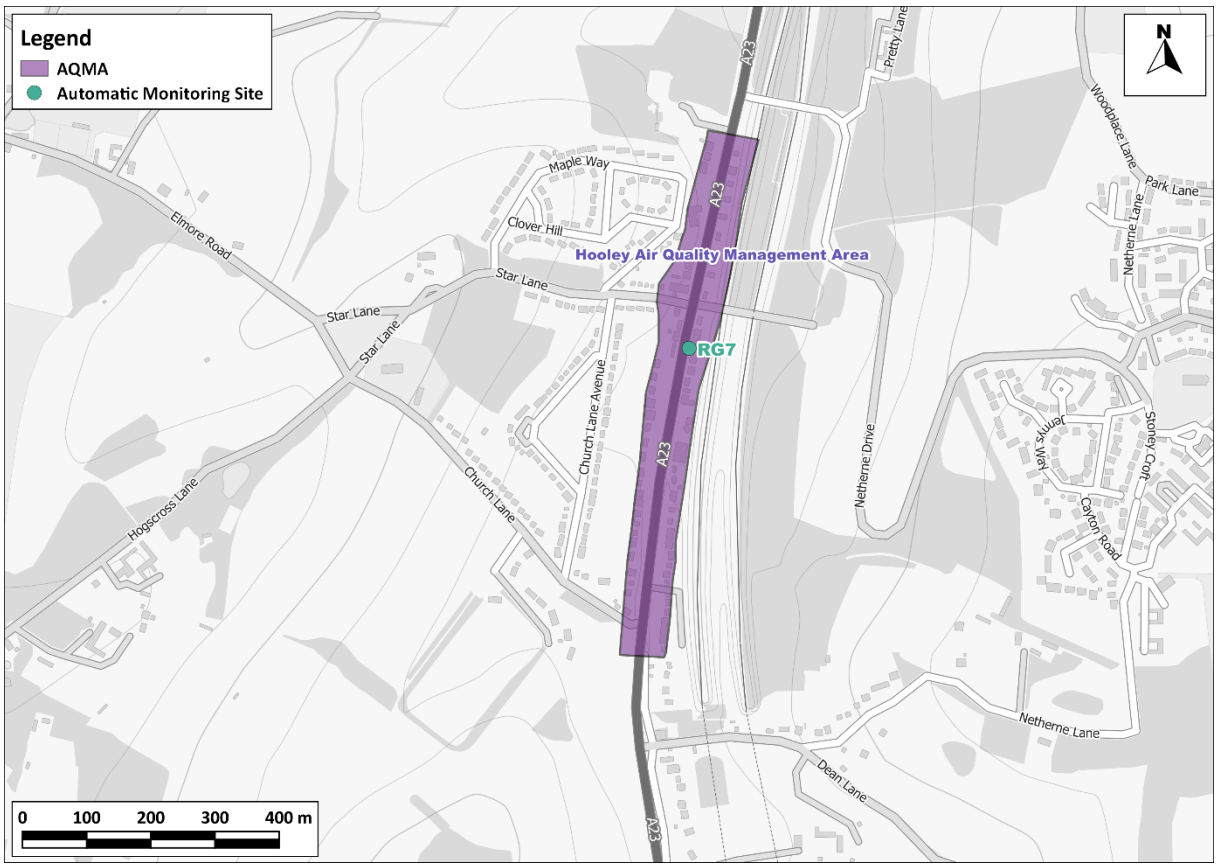


Figure D.10 AQMA No. 13 (Hooley) and Automatic Monitoring Site Location Within the AQMA.

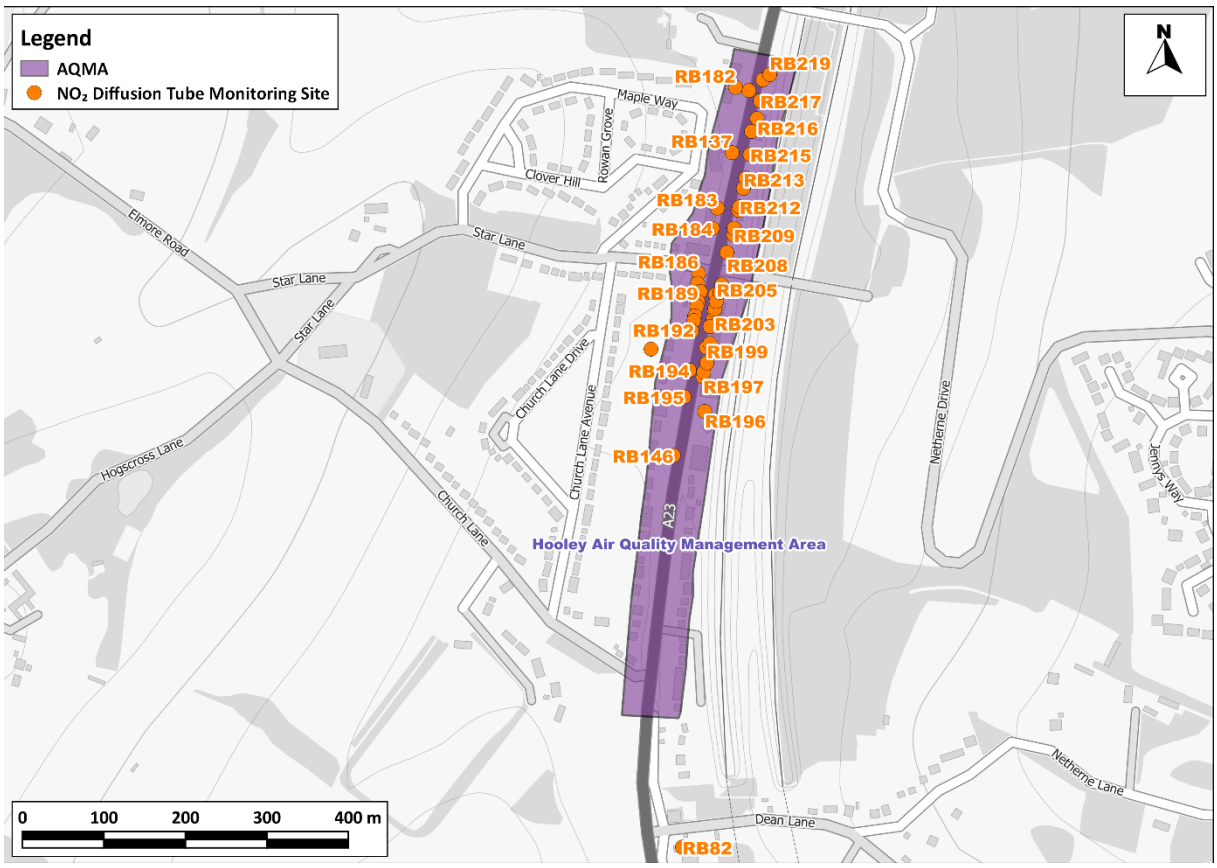


Figure D.11 AQMA No. 13 (Hooley) and Diffusion Tube Monitoring Site Locations Within and Close to the AQMA.

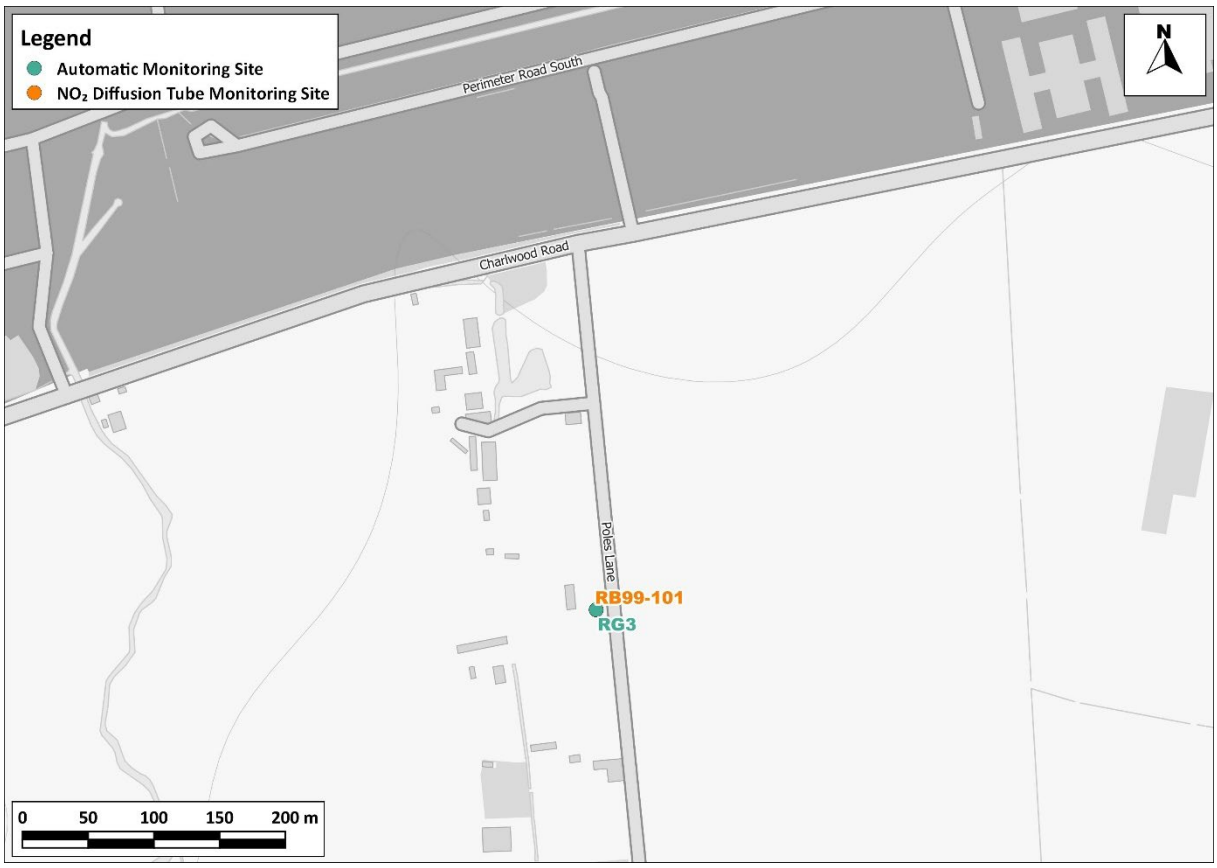


Figure D.12 Automatic Monitoring Site and Nitrogen Dioxide Diffusion Tube Monitoring Site Locations (South of London Gatwick Airport, Crawley Borough).

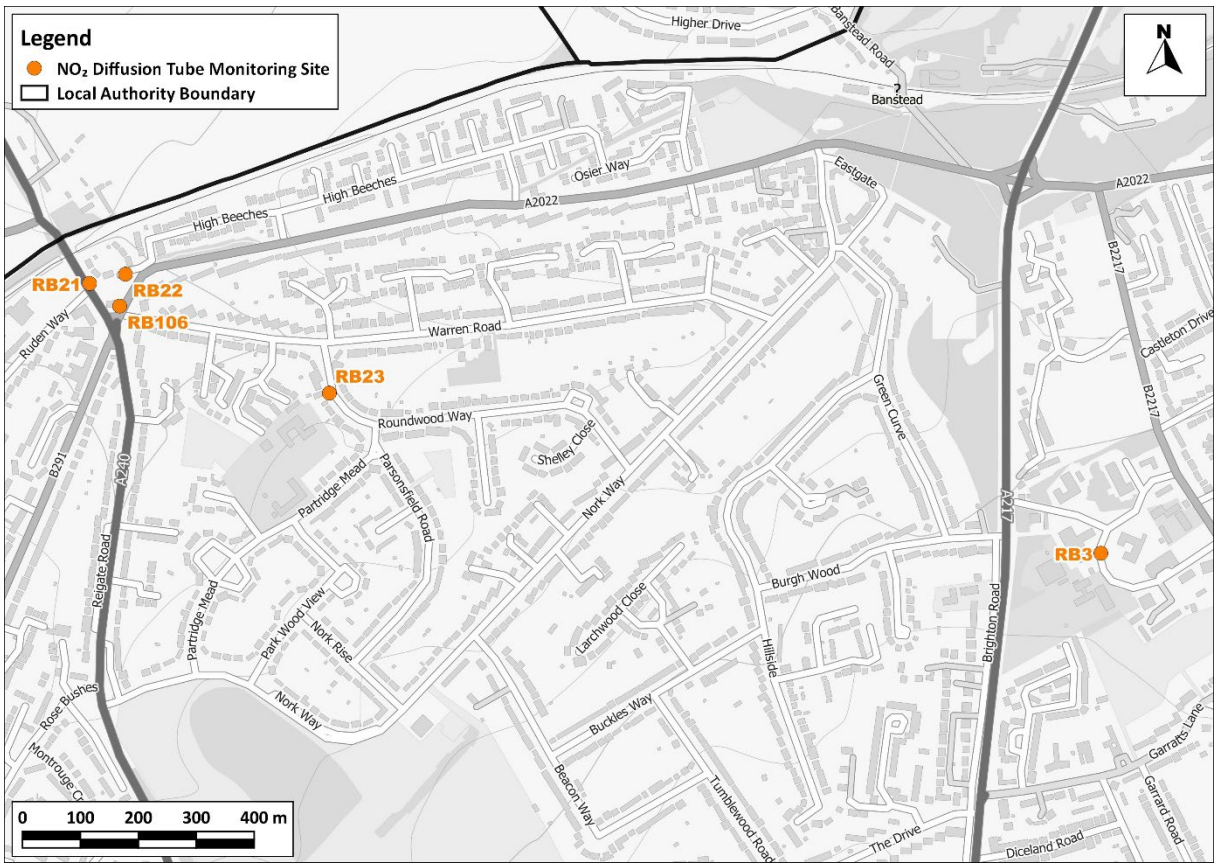


Figure D.13 Nitrogen Dioxide Diffusion Tube Monitoring Site Locations (Banstead) and Local Authority Boundaries.

Figure D.14 Nitrogen Dioxide Diffusion Tube Monitoring Site Location (M23, Tandridge District).

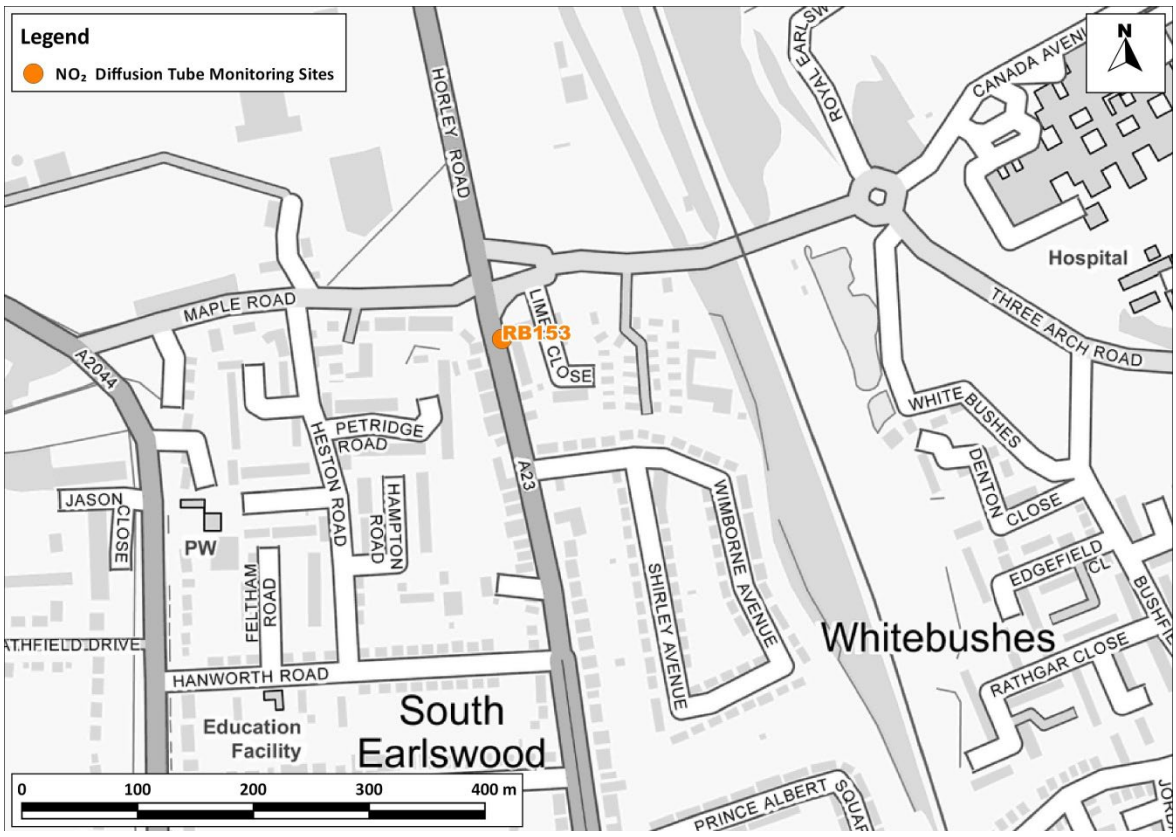


Figure D.15 Nitrogen Dioxide Diffusion Tube Monitoring Site Location (South Earlswood).

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[17] Concentration	Air Quality Objective[18] Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	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
Particulate Matter (PM_{10})	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
Sulphur Dioxide (SO_2)	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean
Benzene	5 µg/m^3	Annual mean

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
AURN	Automatic Urban and Rural Network
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EU	European Union
HE	Highways England
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
RBBC	Reigate and Banstead Borough Council
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.