Gravesham Borough Council

Annual Status Report 2024

Bureau Veritas

June 2024

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Gravesham Borough Council

2024 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: June, 2024

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Date	June 2024

Executive Summary: Air Quality in Our Area

Air Quality in Gravesham Borough Council

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year[1].

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution[2].

Table 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Gravesham Borough Council monitors air pollution across the borough, with the principal pollutants of concern being Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10} and $PM_{2.5}$). Gravesham Borough Council has two automatic monitoring stations located in AQMA No.1 (A2 Trunk Road) and AQMA No.2 (adjacent to the Northfleet Industrial Area AQMA). The Northfleet Industrial AQMA air station being decommissioned in March 2024 following the revocation of the AQMA following a suitable sustained reduction in levels.

Both automatic monitors demonstrate long-term compliance with the air quality standard (AQS) objective for Nitrogen Dioxide (NO_2), with regards to annual mean and 1-hourly exceedance objectives. Particulate Matter (PM_{10}) also shows long term compliance, regarding the annual mean and the 24-hour mean PM_{10} AQS objectives.

During 2023, all passive monitoring locations, were compliant with the NO_2 AQS objective of 40 µg/m^3, 66 sites reported decreases from 2022, with the remaining one site reporting an increase. There was only one site within 10% of the NO_2 AQS objective, this was at site

[1] UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

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

GR142, situated in Gravesham's A2 AQMA. This site continues to report the highest concentrations within the monitoring network. GR142 (36.9 µg/m^3) is not at a location of relevant exposure, and once fall-off with distance calculations have been carried out to predict the concentration at the nearest relevant receptor, the estimated concentration is 28.4 µg/m^3.

National Highways (NH) has responsibility for the management of the A2 Trunk Road and as such is responsible for any direct actions proposed for the AQMA along the A2 Trunk Road in Gravesham.

Kent County Council (KCC), as the local transport authority, is responsible for the management of the local road network and, as such, is responsible for any direct actions proposed for the AQMAs in the town centre in order to reduce road traffic emissions. Gravesham Borough Council works together with Kent County Highways to improve air quality within these AQMAs and throughout the Borough.

Gravesham Borough Council is continuing to review their declared AQMAs to ascertain whether any significant improvements to pollution levels have been made to allow for boundary adjustment or removal. A detailed modelling assessment has been completed to review the current AQMA boundaries and emission sources contributing to the exceedances. The outcomes of the detailed assessment have informed the update to the new AQAP. Gravesham are currently finalising the updated AQAP to be submitted to DEFRA.

Table 1 – Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan[3] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant of most harmful to human health. The Air Quality Strategy[4] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero[5] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel, and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

The declaration of the existing AQMAs and the adoption of Action Plans continue to enable the Council to make progress on improving air quality within the Borough, for residents and visitors. This has been achieved by working with partners, including Kent County Council, Kent County Highways, National Highways, and the Environment Agency.

Whilst there has been significant progress with the measures in the existing action plans, leading to the revocation of four of the seven AQMAs in the borough, major additional work that has been undertaken to assess air quality includes:

- Incorporation of the new AQAP that incorporates all AQMAs into one AQAP; and
- Continued implementation of the Climate Change Management Plan (CCMP) from 2022.

[3] Defra. Environmental Improvement Plan 2023, January 2023

[4] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

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

Conclusions and Priorities

During 2023, 66 passive monitoring locations reported a decrease in NO_2 concentrations relative to 2022, with the remaining 1 reporting an increase from 2022. GR142 (36.9 µg/m^3) reported the only concentration within 10% of the NO_2 AQS, however fall-off with distance calculations were required to predict the concentration to the nearest relevant receptor, the estimated concentration is 28.4 µg/m^3. The council will continue to use their passive monitoring network to determine whether AQMAs need amending or whether there are any new identifiable areas of concern. Gravesham Borough Council are focused on reducing annual mean NO_2 concentrations via the implementation of currently identified measures, but also through development of new measures as part of the new AQAP. The Council's priorities for the next reporting year are:

- To adopt and start implementing the new AQAP;
- Continue to implement and continue to progress the Climate Change Management Plan 2022;
- Continue working with partners in the Kent and Medway Air Quality Partnership (K&MAQP) to improve air quality throughout the area; and
- Continue reviewing the NO_2 passive monitoring network, in order to identify any areas which may require additional monitoring and to identify any potential areas of exceedances.

Gravesham Borough Council are currently in the process of finalising a new AQAP to cover all three AQMAs. The public consultation finishes at the end of June 2024, the resulting final document will then be taken to Members at Cabinet Committee for the adoption to be approved. It is expected to be published in 2024. It will supersede the Air Quality Strategy and the two existing AQAPs, published in 2004 and 2006, with most of the measures having been significantly progressed or completed, and therefore the AQAPs are considered to be out-of-date. A modelling assessment was undertaken to review all AQMAs within Gravesham's jurisdiction, to support measures within the updated AQAP.

Local Engagement and How to Get Involved

The main source of air pollution within Gravesham Borough Council is from road traffic emissions. Gravesham currently has local initiatives to inform and educate the public on local air quality, through a number of schemes:

- Pollution Patrol – is a website, which allows access to resources that will help you understand more about air pollution and its effects on your health and the environment. The pollution patrol was jointly financed by several councils and a Department for Environment, Food and Rural Affairs (DEFRA) grant. All schools in Gravesham with children of the relevant age are being invited to use the website. This can be accessed via https://pollutionpatrol.org.uk/
- Social Media Campaigns
  - KentAir Week (Pollution Patrol was launched during KentAir Week in April drawn up as a tool for schools in Kent in addition to Care4Air which is available through KentAir).
  - Clean Air Day (UK's largest air pollution campaign, bringing together communities, businesses, schools, and the health sector).

Further to this, the following are suggested alternatives to private travel that would contribute to improving the air quality in the borough:

- Use public transport where available – This reduces the number of private vehicles in operation reducing pollutant concentration through the number of vehicles and reducing congestion. The council has supported its staff in increasing their use of public transport by arranging with Arriva, a discount for council employees who use the bus for their commute;
- Walk or cycle if your journey allows – From choosing to walk or cycle for your journey the number of vehicles is reduced and also there is the added benefit of keeping fit and healthy. The council has supported is staff in increasing their use of cycling to get to work and go out on visits in the borough by providing secure cycle storage, showers and a Cycle to Work scheme with which staff can purchase cycles and cycling equipment at a reduced rate and pay for it through their salaries;
- Car/lift sharing – Where a number of individuals are making similar journeys, such as travelling to work or to school car sharing reduces the number of vehicles on the road and therefore the amount of emissions being released. This can be promoted via travel plans through the workplace and within schools. The council encourages staff

to share cars on work business by paying a passenger rate of mileage. They also promote the Kent County Council Car Share scheme to staff;

- Alternative fuel / more efficient vehicles – Choosing a vehicle that meets the specific needs of the owner, fully electric, hybrid fuel and more fuel-efficient cars are available, and all have different levels benefits by reducing the amount of emissions being released. The council has significantly increased the number of electric vehicle charging points in the main town centre car park used by visitors to the town and staff. It has also increased the number of electric vehicles in its own fleet with them being sign written to the public can see which ones are electric;
- Home working – Choosing to work from home can help to alleviate congestion on the roads during peak times and therefore reduce the amount of emissions being released. The council have supported the staff in working from home with those now able to work from home only being required to work in the office a minimum of two days per week. With many of the council's staff having a long commute by car this has significantly reduced the commuting miles; and
- Remote attendance of meetings – most of the council meetings are now attended remotely including those with colleagues off site. Leading to a further reduction in business miles.

Local Responsibilities and Commitment

This ASR was prepared by Bureau Veritas on behalf of Gravesham Borough Council of Council with the support and agreement of the following officers and departments:

- Planning and Regeneration Services
- Parking Services
- Parks and Open Spaces
- Communication Services
- Climate Change Officer Working Group

This ASR has not been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Deborah Wilders at:

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1 Local Air Quality Management

This report provides an overview of air quality in Gravesham Borough Council during 2023. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), 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 order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by in Gravesham Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

A summary of AQMAs declared by Gravesham Borough Council can be found in Table 2.1. The table presents a description of the 3 AQMAs that are currently designated within Gravesham Borough Council. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the AQMA designations in 2023 are as follows:

- NO_2 Annual Mean;
- PM_{10} Annual Mean; and
- PM_{10} 24-Hour Mean.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Gravesham A2 AQMA	Declared 2002, Amended 2012>	NO_2 Annual Mean PM_{10} Annual Mean	The A2 Trunk Road AQMA. An area extending either side of the length of the A2 within the borough	YES	50.5 µg/m^3	36.9 µg/m^3 (28.4 µg/m^3)		Local Air Quality Management – Final Action Plan – 2004	Visit the AQAP for the A2 Trunk Road AQMA
Gravesham A226 One-way system AQMA	Declared 2005	NO_2 Annual Mean	An area incorporating the entirety of the A226 One-way system in Gravesend	NO	57.4 µg/m^3	35.3 µg/m^3		Local Air Quality Management – Action Plan – 2006	Visit the AQAP for the A226 One-way system in Gravesend AQMA
Gravesham A227 Wrotham Road/ B261 Old Road West AQMA	Declared 2005	NO_2 Annual Mean	An area encompassing the junction of the A227 Wrotham Road and B261 Old Road West extending south to a point just beyond the Woodlands Restaurant	NO	47.3 µg/m^3	26.0 µg/m^3		Local Air Quality Management – Action Plan – 2006	Visit the AQAP for the A227/B261 Wrotham Road/Old Road West Junction AQMA
Note: within brackets reports concentrations subject to fall off with distance calculations									

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

☒ **Gravesham Borough Council confirm that all current AQAPs have been submitted to Defra.**

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

Defra's appraisal of last year's ASR concluded:

1. *"Continue with progress on measures to improve air quality, following the positive work made in this submission.*
2. *Continue analysis of trends in the air quality data in comparison to the Air Quality Objectives.*
3. *Continue maintaining high standards of QA/QC procedures with sufficient supporting evidence provided., with robust analysis shown in this submission.*
4. *This 2023 ASR submission has not been approved by the Director of Public Health; it is recommended to get Director of Public Health approval for the next ASR submission in 2024.*
5. *This ASR has not provided details of the numbers of years of compliance with the air quality objective for each AQMA. 2 of the AQMAs (The Northfleet AQMA for PM_{10} and the A227/B621 Wrotham Road/Old Road West Junction AQMA for NO_2) have shown compliance with the air quality objectives for the past 5 years and should be revoked."*

The appraisal comments provided for last year's 2023 annual status report have been actioned including the revocation of The Northfleet AQMA for PM_{10}. Details of the number of years of compliance with the air quality objective for the A227/B621 Wrotham Road/Old Road West Junction AQMA for NO_2 was provided to Defra, demonstrating that insufficient years of compliance have been achieved to enable revocation of the AQMA.

Gravesham Borough Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 24 measures are included within Table 2.2, with the type of measure and the progress Gravesham Borough Council have made during the reporting year of 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans, which can be accessed via www.kentair.org.uk.

Gravesham Borough Council expects to implement the new AQAP in 2024, with new measures for the three AQMAs.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Measures 1 and 4	Traffic Rerouting using Variable Message Signage (VMS) AND Traffic Management (UTMC and junction improvements) (A226 One way system Gravesend AQMA)	Traffic Management	UTC, Congestion management, traffic reduction	2012	COMPLETED	Kent County Council/Gravesham Borough Council	Kent County Council/ Gravesham Borough Council	-	-	-	COMPLETED	Expected air quality improvement by 0.2µg/m^3 in AQMA	Reduction in journey time, reduction in congestion	Please refer to Gravesham Borough Council's 2023 ASR	COMPLETED
2	HGV rerouting - Gravesend Town Centre Road Network AQMA	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	-	COMPLETED	Kent County Council National Highways	Kent County Council	-	-	-	COMPLETED	Expected air quality improvement by at least 0.2µg/m^3 in AQMA	Reduction in journey time, reduction in congestion	Please refer to Gravesham Borough Council's 2023 ASR	COMPLETED
3	New road infrastructure (Rathmore Link Road)	Transport Planning and Infrastructure	Public transport Improvements interchanges stations and services	2012	COMPLETED	Kent County Council	Kent County Council	-	-	-	COMPLETED	Expected air quality improvement by at least 1µg/m^3 locally	Reduction in journey time, reduction in congestion	Please refer to Gravesham Borough Council's 2023 ASR	COMPLETED
6	Improve emissions standards for Council Fleet and Public Service Vehicles	Promoting Low Emission Transport	Taxi Licensing conditions	-	On-going	Gravesham Borough Council / Transport operators	-	-	-	-	Implementation	Expected air quality improvement by 0.2µg/m^3 in all AQMAs	Fleet vehicles replaced by later Euro standards	Please refer to Gravesham Borough Council's 2023 ASR The council is committed to continue to identify and implement opportunities to improve the efficiency of journeys completed by fleet vehicles. Including to make use of the routing software to ensure fleet vehicles minimise journey times where possible. To further develop the waste service and to take account of new residential developments in the borough, the route scheduling module of the Waste Management Team's Collective System has been procured and is currently being developed. This will allow the Waste Team to reschedule the main collection refuse & recycling routes to ensure that the work and vehicles are efficiently allocated every day/week. It is anticipated that this will further reduce vehicle miles thus reducing emissions.	Taxis - The Council will keep this matter under review and continue to monitor published research, its air quality monitoring results and recommendations, and Government guidelines, etc. with a view to specifying more stringent vehicle emission standards and promoting cleaner fuels in respect of licensed vehicles at the time of the next policy revision, if considered appropriate at that time.

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														Working with key partners to progress the delivery of the new Fastrack bus lane proposed to be installed alongside the taxi rank and feeder lane in the town centre, which supports a reduction in vehicle emissions. Work has commenced and is expected to continue for the remainder of the year, completing in May 2024. KCC took their LEVI (Local Electric Vehicle Infrastructure) fund report to their Environment and Transport Cabinet Committee in January and was provided with the approval to progress with the application. The council has worked with KCC to secure the funding, with stage two of the application process due to be completed in Spring/Summer 2024. We will know in due course how the funds will be distributed among the various districts. The council committed to commence a fleet replacement programme, focusing on the reduction in emissions from smaller fleet vehicles. The electric equivalent (if available) continues to be taken into consideration when smaller fleet vehicles are due for replacement. The Council's depot now has charging capacity installed for smaller electric vehicles which will support the expansion of the EV fleet moving forward. Installation of 18 EV charging points has been completed at the Brookvale site and there are no current plans to further expand the charging infrastructure at this time. Completed in October 2023 For larger vehicles, the industry standard is diesel Euro 6 vehicles which the Council have been operating since 2014. New larger vehicles will continue to be diesel-powered, as EV vehicles are in their infancy with reliability problems.	

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														Operating a fleet of larger electric vehicles would require extensive development of the Council's depot to allow for sufficient power and charging infrastructure. Officers are actively looking at HVO (Hydrotreated Vegetable Oil) to replace diesel as a more environmentally friendly option. 15 out of 115 vans have been replaced with electric vehicles, representing 13% of the fleet. The council committed to explore opportunities for the provision of on and off street electric vehicle charging points for taxis/ private hire vehicles and implement such charging points where it is feasible to do so. This was completed in September 2023. The council has completed all the planned installations of EV charging points except for one location which is pending due to the legal work at the Church and officers have been following up with them to get it expedited. We now have 52 GBC-owned charging points operated through Connected Kerb (24 charging points) and BP Pulse (26 charging points) and 2 Taxi only chargers in the borough. The council will continue to identify funding sources and additional sites which may benefit from the installation of EV chargers and analyse data from existing sites to identify expansion where there is a demand. The council is committed to work with other businesses and service providers in the borough to support the provision of EV charging points within their own facilities. KCC took their LEVI (Local Electric Vehicle Infrastructure) fund report to their Environment and Transport Cabinet Committee	

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														in January and was provided with the approval to progress with the application. Gravesham council has worked with KCC to secure the funding, with stage two of the application process due to be completed in Spring/Summer 2024. We will know in due course how the funds will be distributed among the various districts.	
7	Road prioritisation (Bus priority)	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2005 – FastTrack 2016 – North Embankment East route	COMPLETED	Kent County Council / GBC / Ebbsfleet Development Corporation	Kent County Council / GBC / Ebbsfleet Development Corporation	-	-	-	COMPLETED	-	Improvements in journey time for public transport users	Please refer to Gravesham Borough Council's 2023 ASR Kent County council as part of its wider strategy to cut carbon emissions, has committed to upgrade the Fastrack fleet with a new line of electric vehicles and infrastructure. This replacement will be accompanied by an upgrade to the infrastructure of our depots to include operational chargers and substations to allow for the buses to rapidly charge while laying over and at other strategic areas such as the Gravesend Bus Hub. The council is committed to work with key partners to progress the delivery of the new Fastrack bus lane proposed to be installed alongside the taxi rank and feeder lane in the town centre, which supports a reduction in vehicle emissions. Work has commenced and is expected to continue for the remainder of the year, completing in May 2024.	COMPLETED However Fastrack continues to grow and will become all electric in 2024/25
8	Public transport improvements	Transport Planning and Infrastructure	Public transport Improvements - interchanges stations and services	-	COMPLETED	Kent County Council / Public transport operators / EDC / GBC	Kent County Council	-	-	-	COMPLETED	-	Reduction in car use and congestion	Please refer to Gravesham Borough Council's 2023 ASR The backbone of this infrastructure is the Fastrack busway; newly built designated paths which can only be utilised by Fastrack services, with a fleet of electric buses. Other infrastructure often used by the Fastrack team include ANPR cameras, designated bus lanes, bridges, and barriers.	COMPLETED Work will continue on developing and expanding the Fastrack system.
9	Car parking strategy	Alternatives to private vehicle use	Bus based Park & Ride	-	On-going	Gravesham Borough Council	-	-	-	-	Implementation	-	Reduction in car use and congestion	Please refer to Gravesham Borough Council's 2023 ASR	Any rise in parking fees could encourage the customers to go

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														The council now have 52 GBC-owned charging points operated through Connected Kerb (24 charging points) and BP Pulse (26 charging points) and 2 Taxi chargers in the borough. The council will continue to identify funding sources and additional sites which may benefit from the installation of EV chargers and analyse data from existing sites to identify expansion where there is a demand. Gravesham will continue to explore opportunities for the provision of electric vehicle charging points within GBC-owned assets and implement actions where a sound business case can be provided.	to Bluewater and other regional shopping centres and retail parks that all offer free parking. Council needs to encourage shoppers and businesses to the town; affordable and competitive parking tariffs is part of the attraction.
10	The Council's Travel Plan measures	Alternatives to private vehicle use Promoting Travel Alternatives	Car & lift sharing schemes Encouraging homeworking	-	On-going	Gravesham Borough Council	-	-	-	-	Implementation	-	% modal shift to car share/public transport/walking /cycling	Please refer to Gravesham Borough Council's 2023 ASR The council are committed to develop a Sustainable Travel Policy to reduce the level and impact of business travel. Develop policies and initiatives to encourage active travel by Members and officers. This includes a commitment to complete research into alternative travel arrangements for staff including different cycle-to work and cycle-hire scheme options as well as potential car-sharing arrangements. **Cycle-to-Work Scheme** The cycle-to-work scheme continues to prove popular with staff, with 14 staff members purchasing a bicycle or accessories via the scheme. Promotional offers are advertised as and when they become available, and staff contact HR regularly for advice on the scheme. As we head into the spring and summer months it is anticipated that the number of	**Car Sharing Initiative** In terms of car sharing arrangements, this was advertised via the Chief Executive's weekly update, but unfortunately, only 1 staff member expressed an interest in a car sharing scheme. Therefore, this potential initiative has not been progressed.

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														staff involved in the scheme will continue to grow. A survey has been planned to be rolled out in May 2024 which will mark 12 months since its implementation. The survey will help us to evaluate the scheme and its success and identify areas for improvement. (Previous cycle-to work programme in 2015 resulted in 21 orders being placed for bicycles) **EV Vehicle Salary Sacrifice Scheme** In 2024 a new leasing service will be launched for all staff offering electric cars on a salary sacrifice scheme. **Hybrid Working Policy**. This was completed in September 2022 and has resulted in a significant number of officers now working from home for up to 3 days per week. With many officers commuting to work this has reduced the commuting mileage significantly reducing transport emissions. **Culture / Behaviour change** It was the intention to embark on a programme of culture/behaviour change training and communication to encourage people to move to alternative travel and working arrangements. A comprehensive cultural change plan has not yet been implemented, mostly because of other ongoing projects about organisational transformation, such as Investors in People programmes, which also have an impact on staff engagement and change throughout the organisation. However, all the alternative travel arrangements and initiatives continue to be promoted to staff such as the Cycle to Work Scheme and Employer Travel Club.	
11	Employer and School Travel Plans	Promoting Travel Alternatives	School Travel Plans, workplace travel Planning and encouraging homeworking	-	On-going	KCC / Gravesham Borough Council	-	-	-	-	COMPLETED	-	No. of travel plans in place	Please refer to Gravesham Borough Council's 2023 ASR	COMPLETED

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														KCC achieved nearly 100% success with school travel plans. **School Travel Plans / Active Travel** KCC has an officer dedicated to supporting Kent schools with any queries or activities around the promotion and enablement of active and sustainable transport, as well as providing resources to assist with problematic parking and congestion. These various resources include: • **School Travel Plans;** we provide support and templates to assist schools in easily creating, storing and maintaining their School Travel Plan. • **Grant funding opportunities**; each year schools can apply for up to £5k to support their projects that enable more sustainable travel methods (e.g. installing EV charging points, active travel infrastructure etc.). • **Responsible Parking toolkit**; these free resources include weatherproof banners, flyers and leaflets that schools can use to support their messages to parents about the importance of parking responsibly. Our materials contain targeted messages that schools can select to address specific issues they face. To name a few: • Do not park on zig-zag lines. • No pavement parking. • Be considerate of our neighbours. • Switch off your engine when stopped. • **Active Travel Maps**; a map resource available to schools so that they can support parents in making healthier and more sustainable journeys to their school site. • **School Streets**; we support schools in exploring	

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														whether a School Streets scheme could be suitable for their site. If the site is appropriate, we enable the school to trial a scheme for at least 6months alongside a live consultation. Each morning and afternoon, during term time only, school staff set out barriers on the road outside their school to create a safer, healthier and cleaner environment near the school gates. School Streets offer a proactive solution for school communities to tackle air pollution, traffic congestion, and poor health & safety. These schemes encourage healthier lifestyles through increased active travel to/from school, by restricting motorised traffic at peak morning and afternoon times, to create a safer, healthier, and cleaner "School Streets Zone" outside the school entrance.	
12	Improve the facilities for cycling and walking	Transport Planning and Infrastructure	Cycle network and other	-	Various and ongoing	KCC / Gravesham Borough Council	-	-	-	-	Implementation	-	%modal shift to cycling/walking On-going No. miles new cycle lanes/routes	Please refer to Gravesham Borough Council's 2023 ASR It is the council's aim to implement policy to ensure adequate consideration is given to the impacts on the environment of new development (residential and commercial). Ensure that such developments support sustainable living and transport infrastructure and solutions for cycling, walking and low/zero-emission vehicles. Through the pre-application advice service, encourage applicants to submit policy-compliant schemes which minimise the impacts of new development on the environment Following on from the Gravesham Local Cycling & Walking Implementation Plan the following cycling schemes are being explored •Thames Way - improvements by EDC to existing provision are still being explored •Northfleet High Street – improvements by EDC being designed •Northfleet to Gravesend – revised scheme along Overcliffe/London Road being developed by KCC	.

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														•Gravesend to Cascades – a report has been produced but needs resources to take forward •A226 enhancement – long term to produce separate highway/ cycleway/ footway •Istead Rise to Meopham – a study being done of possible options to see what might be practical •Improved crossings of Hever Court Road and the slip onto Hall Road from the Ebbsfleet junction are being explored	
13	Environmental and Public Health Services will continue to work closely with the Planning and Regeneration Services to ensure that air quality is taken into account in the planning process	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	-	On-going	Gravesham Borough Council	-	-	-	-	Implementation	-	No. planning applications consulted on for air quality conditions/assessments	Please refer to Gravesham Borough Council's 2023 The council is committed to ensure the council, in its formal consultee role, ensures all planning applications and applications for Development Consent Orders, have due consideration to climate change mitigation and adaption such as EV charging points, air quality consideration, traffic management considerations etc.	The planning process is the strongest tool we have to implement air quality actions resulting in an effective improvement in AQ - therefore it is considered that the planning process's impact on air quality is significant to medium in that it helps prevent worsening of air quality and often allows new development that has lower emissions to replace more polluting development e.g. industrial uses. Ideally the necessity for the installation of ventilation systems for internal air quality in residential units in AQMAs would come under Building Regulation codes rather than Air Quality officer having to vet schemes themselves with no training or expertise in this area.
14	Improve sustainable transport links serving new developments.	Transport Planning and Infrastructure	Public transport Improvements interchanges stations and services	-	On-going	Gravesham Borough Council	-	-	-	-	Implementation	-	No. planning applications where improvements secured	Please refer to Gravesham Borough Council's 2023 The council is committed to implementing policy to ensure adequate consideration is given to the impacts on the environment of new development (residential and commercial). Ensure that such developments support sustainable living and	The proposed LTC will introduce traffic into areas previously without any i.e. it will be a new source of air pollution.

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														transport infrastructure and solutions for cycling, walking and low/zero-emission vehicles. The council is committed to working with Kent County Council to bring the Mobility as a Service project (MaaS) to residents in the borough (including the Electric Vehicle car club) as an alternative to car ownership. KCC received funding for Kent's Bus Service Improvement Plan (BSIP) in March 2023 which includes funding for the introduction of MaaS to the Ebbsfleet area. KCC started procuring a MaaS technology partner and initiating a marketing and behavioural change campaign in winter 2023 (completing Summer 2024) to introduce MaaS to the Thameside area initially during 2025. No Strategic Commissioning resource was available to work with the Public Transport team to progress the MaaS partner procurement until Sept 2023, delaying the procurement process due to the Strategic Commissioning restructure. Electric Car Club for MaaS Ebbsfleet is on hold until the MaaS scheme procurement progresses.	
15	The development of supplementary planning guidance for air quality assessments of developments	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	-	COMPLETED	Gravesham Borough Council / Kent and Medway Air Quality Partnership	-	-	-	-	COMPLETED	-	Completion of a Supplementary Planning Document	Please refer to Gravesham Borough Council's 2023	COMPLETED
16	Develop a local air quality strategy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	-	COMPLETION	Gravesham Borough Council	-	-	-	-	COMPLETED	-	Completion of air quality strategy	Please refer to Gravesham Borough Council's 2023 The AQ Strategy has been in place for 18 years and will now be superseded by new AQ Action Plan 2024	COMPLETED
17	Local air quality monitoring within the GBC Borough	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	-	On-going	Gravesham Borough Council / Kent and Medway	-	-	-	-	Implementation	-	No. monitoring sites % data capture	Please refer to Gravesham Borough Council's 2023 The Painters Ash ZG2 NOx analyser was replaced in 2023. The station also runs a	

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						Air Quality Partnership								continuous BAM PM_{10} analyser. The air station at Lawn Road ZG3 was decommissioned in March 2024 following the revocation of the Northfleet Industrial AQMA. The data is available at www.KentAir.org.uk	
18	Make details of the Action Plan measures and annual progress reports GBC available on the Website to ensure broad access to the consultation and implementation process.	Public Information	Via the Internet	-	On-going	Gravesham Borough Council	-	-	-	-	Completed	-	Availability of recently published reports on the Website	Gravesham has a webpage for air quality with details of the air quality strategy, action plans and consultations on it with a link to KentAir where all of the council's reports are published as well as the monitoring data. Advice posted on website and available to any caller in person or by telephone/email The council's reports are published on KentAir and the continuous monitoring data is posted daily, and the diffusion tube data is regularly posted. The School Air Quality Toolkit – Care For Air – is available to teachers and parents through the KentAir website, financed by Kent County Public Health. The Pollution Patrol educational toolkit is available at https://pollutionpatrol.org.uk/	COMPLETED
19	Work together the Kent and Medway Air Quality Partnership GBC on promotional activities to raise the profile of air quality in Gravesham	Policy Guidance and Development Control	Regional Groups Coordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	-	On-going	Gravesham Borough Council	-	-	-	-	Implementation	-	Promotional activities undertaken with the Partnership	Gravesham take an active role in the air quality partnership. The partnership carries out work with partners e.g. Kent County Public Health. The partnership also delivered, with the finance from Kent Public Health, a school's toolkit – Care For Air - relating to air quality and the co-benefits of exercise, cycling, walking etc. it is available through the KentAir Website www.kentair.org.uk Gravesham helped to fund, along with a Defra grant, the partnership creates a second educational toolkit called the Pollution Patrol which was launched during KentAir week in April 2022. https://pollutionpatrol.org.uk/	

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														The projects run by the AQ Partnership provide each member with social media content to post with a recognisable branding and message to spread a consistent message. This was funded to a significant extent by Defra Grants with match funding and staff resource provided by each member authority. Materials were provided for each member to do a social media campaign on Clean Air Day.	
20	Promote and implement energy efficiency measures	Policy Guidance and Development Control	Other policy	-	On-going	Gravesham Borough Council	-	-	-	-	Implementation	-	% improvement in energy efficiency SAP rating	Please refer to Gravesham Borough Council's 2023 The council is committed to undertake surveys of council-owned properties to identify works required to improve energy efficiency and develop a programme of proposed works, prioritising largest emitting assets. Surveys have been completed on the Council's most significant emitting assets. Explore funding opportunities (Government grants, loans etc.) to progress required works. A bid to the Capital Element of the Sport England Swimming Pool Support Fund was submitted in respect of energy efficiency measures relating to Cygnet Leisure Centre and was recently announced that our application was successful.	
21	The council will encourage the planting of trees which benefit air quality within the borough through the planning process, Gravesham's Open Space Strategy and green initiative partnerships.	Policy Guidance and Development Control	Other policy	-	On-going	Kent County Council/Graves ham Borough Council / Groundwork	-	-	-	-	Implementation	-	No. of trees planted	Please refer to Gravesham Borough Council's 2023 The council has made a commitment to develop and implement a Tree and Biodiversity Strategy. The priority of this strategy leads onto the council's requirement to capture the ongoing carbon from our portfolio and increase this through the BNG (Biodiversity Net Gain) strategy. This is ongoing and will require direction from management in line with corporate plans. The council is currently reviewing companies to run a	

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														feasibility study on GBC parks and open spaces to create a baseline from which we can develop the strategy.	
22	Provide advice to the public and pursue an advocacy role to assist in minimising the effects of poor air quality in public buildings.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	-	On-going	Kent County Council/Gravesham Borough Council	-	-	-	-	Implementation	-	Number utilising the service	Please refer to Gravesham Borough Council's 2023 The council is committed to create and implement a resident strategy in relation to energy improvement works to ensure access and buy-in. As well as create 'Staff Energy Champions' to assist residents and other staff members with energy-saving advice. The Healthy Homes Taskforce was approved and endorsed by the Management Team. Arrangements were made to organise the first meeting which commenced in January 2024 where dampness and mould, rent arrears and the energy performance of a property were key discussion points. This will continue to be explored by the group. The council wishes to improve housing tenant awareness around saving energy and reducing emissions. Having an 'Estate Energy Champion' per estate to increase resident awareness. The have also been encouraged to purchase high-rated A+++ energy-efficient appliances.	
23	Adequate enforcement of on-street parking restrictions	Traffic Management	UTC, Congestion management, traffic reduction	-	On-going	Kent County Council/Gravesham Borough Council / Groundwork	-	-	-	-	Implementation	-	No. on street parking offences	Parking enforcement is carried out in in all congested areas in the urban area and Air Quality Management Areas. The one-way system remains the main area of focus in respect of ensuring parked cars that obstruct the traffic flow are moved on straight away. Parking Services attend regular meetings with County to ensure that the local perspective is put forward. The objective of maintaining the free flow of traffic across	

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														the borough through enforcement of parking restrictions remains the number one objective in the Parking Services Annual Report . The number of on street parking tickets issued are as follows: 19/20 was 18,822 20/21 was 13,139 21/22 was 16, 039 22/23 was 19,408 23/24 was 24,959	
24	Speed Regulation	Traffic Management	UTC, Congestion management, traffic reduction	-	COMPLETED	National Highways	Highways England	-	-	-	COMPLETED	-	Improved journey times with improved traffic flows	Please refer to Gravesham Borough Council's 2023	**COMPLETED** The proposed Lower Thames Crossing is involving the council in discussions with National Highways on the route and speed of the traffic. National Highways intends to have it designated as 70 mph. The LTC is considered by National Highways to be a key way of reducing congestion at the Dartford River Crossing. LTC construction works are likely to create traffic issues on the A2/M2 up tits opening year.
25	Reduction in overall background levels	Policy Guidance and Development Control	Other policy	-	On-going	Central Government / Kent County Council / Gravesham Borough Council	-	-	-	-	Implementation	Air quality improvement by at least 1.8µg/m^3 at background monitoring sites since 2012. Concentrations have decreased further in 2020, however this is likely a resulting impact of the COVID-19 pandemic.	Decline in monitored NO_2 concentrations at background sites	Please refer to Gravesham Borough Council's 2023	Please refer to Gravesham Borough Council's 2023 ASR

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29	Reduction in PM_{10} emissions from combined impact of industrial processes in Northfleet	Environmental Permits	Other measure through permit systems and economic instruments	-	COMPLETED	GBC, the Environment Agency, the Local Business Partnership, local industries	-	-	-	-	COMPLETED	Level of PM_{10} below objective	Reduction in PM_{10} to below objective	Please refer to Gravesham Borough Council's 2023 AQMA revoked in January 2024	COMPLETED
30	Rail Freight Strategy	Freight and Delivery Management	Other	2012	On-going	Kent County Council/ Graves ham Borough Council	-	-	-	-	Implementation	-	-	Please refer to Gravesham Borough Council's 2023 KCC have produced a Freight Action Plan for Kent – which includes Operation Stack, lorry routing, rail freight. The plan describes the situation in Kent and identifies actions that can be taken by KCC, with partners, to mitigate the impact of freight on the county's road network and residents' quality of life. The Plan is designed to identify realistic actions that can be taken to improve the situation.	

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[6], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$)). There is clear evidence that $PM_{2.5}$ (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

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

- Regulatory Services will continue to work closely with the Planning and Regeneration Services to ensure that air quality is taken into account in the planning process;
- Continue to improve emissions standards for Council Fleet and Public Service Vehicles;
- Further public transport improvements;
- Further improve the facilities for cycling and walking;
- Continue promoting Employer and School Travel Plans;
- Public information
- HGV rerouting; and
- Continued strict implementation of the Environmental Permitting Regime at minerals sites particularly with regards to cement etc.

The majority of the urban area in Gravesham, including Gravesend and Northfleet, are designated as Smoke Control Areas (SCAs). In these areas, only authorised and smokeless fuels are allowed to be burnt, unless being used in an exempt appliance. This helps control and reduce $PM_{2.5}$ emissions in these areas. Further information on these, including advice, can be found on Gravesham Borough Council's website.

The introduction of a new policy and procedure to implement the additional enforcement powers to tackle smoke control offences are to be publicised and implemented at Gravesham including the use of fixed penalty notices which will further help to reduce $PM_{2.5}$ emissions.

[6] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

The introduction of a new policy and procedure for the early use of enforcement powers to reduce the number of bonfires in the residential areas of the borough including the use of fixed penalty notices which also help control the $PM_{2.5}$ emissions from antisocial burning of waste.

The adoption of the Kent and Medway Energy and Low Emissions Strategy across Kent will help to reduce emissions over the coming years of NO_2, PM_{10} and $PM_{2.5}$ as well as emissions of greenhouse gases such as carbon dioxide and Methane. This was published and implemented in 2020.

The current Defra background maps for Gravesham Borough Council (2018 reference year) show that all 2023 background concentrations of $PM_{2.5}$ are far below the recommended annual mean AQS objective for $PM_{2.5}$ of 25 µg/m^3, with an average of 9.7 µg/m^3. The highest concentration is predicted to be 12.2 µg/m^3 within the 1km x 1km grid square with the centroid grid reference of 563500, 173500. This is largely a residential area within Gravesham located near Dover Road East.

The Department of Health's Public Health Outcomes Framework[7] has a number of public health indicators that are used for public health actions, to identify areas of health inequality and concern, and monitor the differences in health impacts across regions in the UK. This framework includes an indicator "D01- Fraction of Mortality Attributable to Particulate Air Pollution" which is calculated using background annual average $PM_{2.5}$ concentrations, modelled at a 1km^2 resolution based on measured concentrations from the AURN. Gravesham has a 6.3% fraction of mortality calculated for 2022, which is above the average for England overall (5.8%), and above the South East Region (5.7%). The 2022 data is presented as the 2022 dataset has not been made available at the time of writing, and is available via the Fingertips Public Health Outcomes Framework website.

[7] Public Health Outcomes Framework: D01- Fraction of Mortality Attributable to Particulate Air Pollution

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

This section sets out the monitoring undertaken within 2023 by Gravesham Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Gravesham Borough Council undertook automatic (continuous) monitoring at 2 sites during 2023. Table A.1 in Appendix A shows the details of the automatic monitoring sites. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. The KentAir website presents automatic monitoring results for Gravesham Borough Council, with automatic monitoring results also available through the UK-Air website .

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

Gravesham Borough Council undertook non- automatic (i.e., passive) monitoring of NO_2 at 66 sites during 2023, inclusive of 5 triplicate sites. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D: Map(s) of Monitoring Locations and AQMAs. 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: Supporting Technical Information / Air Quality Monitoring Data QA/QC

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

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

For diffusion tubes, the full 2023 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1includes distance corrected values, only where relevant.

Table A.5 in Appendix A: Monitoring Results 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.

Both automatic monitoring sites within Gravesham continue to record compliance against the AQS objective. Additionally, neither of the automatic monitoring sites reported 1-hour concentration exceedances more than 18 times/year of 200 µg/m^3.

During 2023, 66 sites reported decreases in NO_2, and one reported an increase in NO_2, there were no exceedances of the annual mean NO_2 AQS objective of 40 µg/m^3. The maximum concentration was also reported at GR142, which is located within AQMA No.1 A2 Trunk, of 36.9 µg/m^3, which is within 10% of the AQS objective. The remaining sites reported NO_2 concentrations below the AQS objective.

Fall-off with distance calculations were required at one diffusion tube location (GR142), where annual mean concentrations were greater than 36 µg/m^3. This was completed using the Diffusion Tube Data Processing Tool version v4.0, in line with the methodology outlined in LAQM.TG(22). Details of this calculation are presented in Table C.4.

Figure A.1 – Figure A.6 displays NO_2 concentration trends for the last 5 years, there is a general trend of decrease in all passive monitoring locations.

No passive monitoring sites reported an annual mean NO_2 concentration greater than 60 µg/m^3 in 2023, therefore it can be assumed that there are no sites where there is likely to be a risk of exceeding the 1-hour mean NO_2 AQS objective, as per guidance provided in LAQM.TG(22).

AQMA No.1 (A2 Trunk) has achieved 1 year of compliance, 4 out of 9 passive monitoring locations have 5 years compliance. The remaining 5 sites reported one and two years of compliance (excluding COVID years 2020/2021). Taking into account fall off with distance calculations, GR142 has now been compliant for 1 year, therefore the council will need to maintain monitoring at these locations until at earliest to the end of 2025 for revocation to be considered.

AQMA No.3 (A226 One-Way System Gravesend AQMA) has achieved 1 year of compliance, 5 out of 12 sites have 5 years of compliance, 6 sites with two years of compliance (excluding COVID years 2020/2021), and 1 site with 1 year compliance. Therefore, it is expected that revocation at earliest would need 3 more years of monitoring with GR13 currently reporting one year of compliance.

AQMA No.4 (A227/B261 Wrotham Road/Old Road West Junction AQMA) has achieved 2 years of compliance, both sites have 2 years of compliance (excluding COVID years 2020/2021). Therefore, it is expected that revocation at earliest would need 2 more years of monitoring.

3.2.2 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results 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.

Table A.7 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.

Compliance of both the annual mean PM_{10} AQS objective (40 µg/m^3) and 24-hour PM_{10} AQS objective (no more than 35 24-hourly concentrations greater than 50 µg/m^3) has been achieved in 2023 at both automatic monitoring locations.

Over the last 5 years of annual PM_{10} monitoring, PM_{10} concentrations have remained stable at both the A2 Roadside and Industrial Background sites. Both sites underwent minimal

changes from 2022 – 2023, with slight reductions at the A2 Roadside site of 2.7 µg/m^3, and 3.1 µg/m^3 at the Industrial Background site.

The 24-hour mean PM_{10} monitoring for 2023 shows no exceedances of the 50 µg/m^3 AQS objective, which continues the same trend over the last 5 years of monitoring.

3.2.3 Particulate Matter ($PM_{2.5}$)

Gravesham Borough Council does not undertake monitoring of $PM_{2.5}$ within its designation, however as per LAQM.TG(22) Sections 7.118 to 7.124, $PM_{2.5}$ concentrations can be estimated from PM_{10} concentrations. This uses a nationally derived correction ratio of 5.9 (roadside) and 4.7 (background) as per the annual update provided by LAQM.

Using the PM_{10} annual averages, the estimated $PM_{2.5}$ annual average for the A2 Roadside continuous monitoring site in 2023 is as follows:

- ZG2 (A2 Roadside) – 5.8 µg/m^3

The A2 Roadside site estimated $PM_{2.5}$ concentration are well below the recommended $PM_{2.5}$ annual mean objective of 20 µg/m^3.

It is not recommended to calculate $PM_{2.5}$ from PM_{10} at Industrial sites due to their unique site-specific characteristics. Therefore, an estimation can't be calculated for this site.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
ZG2	Gravesham A2 Roadside	Roadside	562589	172076	NO_2, PM_{10}	Y – AQMA A2 Trunk Road	Chemiluminescent BAM	0	72	3
ZG3	Gravesham Industrial Background	Industrial	562155	174360	NO_2, PM_{10}	Y – AQMA Northfleet Industrial Area	Chemiluminescent BAM	3.7	24	3

Notes:

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

(2) N/A if not applicable

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
GR08a, GR08b, GR08c	Painters Ash School Northfleet, Air Monitoring Station, Northfleet	Roadside	562589	172076	NO_2	Y – Gravesham A2 AQMA	0.0	72.0	Yes	3.0
GR13	88 West Street, Gravesend, Kent, DA11 0BX Pelican Crossing	Roadside	564696	174431	NO_2	Y – Gravesham A226 One Way System AQMA	0.1	2.0	No	2.9
GR19a, GR19b, GR19c	Lawn Primary School, Air Monitoring Station, Highstreet, Northfleet, DA11 9HB	Urban Background	562155	174360	NO_2	NO	3.7	20.0	No	2.0
GR24	28- 29 Milton Road (Lamp post),, Gravesend, Kent, DA12 2RF	Roadside	565128	174049	NO_2	Y – Gravesham A226 One Way System AQMA	0.2	2.2	No	2.5
GR31	32 Harmer Street GF (façade), Gravesend, DA12 2AX	Roadside	565052	174149	NO_2	Y – Gravesham A226 One Way System AQMA	0.0	2.0	No	2.7
GR39	19 Stone Street (Downpipe), Gravesend, DA12 1AP	Roadside	564730	174030	NO_2	Y – Gravesham A226 One Way System AQMA	0.1	2.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
GR40	Somerset Public House (sign post), 10 Darnley Road, Gravesend, DA11 0RU	Roadside	564486	174095	NO_2	Y – Gravesham A226 One Way System AQMA	0.1	1.5	No	2.5
GR45	Princes Street (Signpost) (Opp Jury Street), Gravesend, Kent, DA11 0AA	Roadside	564708	174266	NO_2	NO	6.8	2.0	No	2.5
GR47	29- 31 Harmer Street (façade), Gravesend, DA12 2AP	Roadside	565043	174173	NO_2	Y – Gravesham A226 One Way System AQMA	0.0	2.0	No	2.5
GR52	32 The Hill (Lamppost), Northfleet, DA11 9EX	Roadside	562449	174191	NO_2	NO	0.2	1.5	No	2.5
GR55	Butchers (façade) 140 Pelham Road, Gravesend	Roadside	563943	173378	NO_2	NO	0.0	2.5	No	2.7
GR56	Junies (façade), Parrock Road, Gravesend, DA12 1QF	Roadside	565210	172980	NO_2	NO	0.4	2.0	No	2.5
GR57	61 Old Road West (Hairdressers - façade), Gravesend, Kent, DA11 0LW	Roadside	564472	173158	NO_2	Y – Gravesham A227 Wrotham Road/Old Road West AQMA	0.3	2.2	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
GR58	The Venue (Lamppost), Milton Road, Gravesend, DA12 2rf	Roadside	565166	174036	NO_2	Y – Gravesham A226 One Way System AQMA	0.0	3.0	No	2.7
GR59	44 Old Road West (Façade - Pharmacy), Gravesend, Kent, DA11 0LJ	Roadside	564530	173171	NO_2	Y – Gravesham A227 Wrotham Road/Old Road West AQMA	0.4	2.0	No	2.5
GR60	Bookmakers (Down Pipe), 188 Old Road West, Gravesend	Roadside	563899	173368	NO_2	NO	0.0	4.3	No	2.7
GR61	62 New Road (Pounce - Down Pipe), Gravesend, Kent, DA11 0AD	Roadside	564429	174152	NO_2	Y – Gravesham A226 One Way System AQMA	0.2	2.6	No	3.0
GR62	The Terrace (façade), Gravesend, DA12 2BB	Roadside	565004	174324	NO_2	Y – Gravesham A2 AQMA	0.0	4.0	No	2.8
GR66	Russell Quay (Lamppost), West Street, Gravesend, DA11 0BE	Roadside	564512	174448	NO_2	NO	0.1	2.5	No	2.5
GR67	Echo Public House (Façade), Old Road East, Gravesend, DA12 1NR	Roadside	565214	172958	NO_2	NO	3.3	2.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
GR68	Opp The Old Prince of Orange (Lamppost), Old Road West, Gravesend, DA12 1NG	Roadside	564808	173086	NO_2	NO	1.6	1.5	No	2.7
GR69a, GR69b, GR69c	Golf Driving Range (Fencing), Thong Lane, Gravesend, DA12 4LF	Urban Background	567270	171925	NO_2	NO	-	410.0	No	2.5
GR72a, GR72b, GR72c	Northfleet Cemetery (Post), Northfleet, DA11 8HW	Urban Background	562437	173175	NO_2	NO	41.0	157.0	No	2.8
GR75a, GR75b, GR75c	Gravesend Cemetery, Gravesend, DA11 7LY	Urban Background	564087	173080	NO_2	NO	79.0	110.0	No	2.0
GR78	Canal Tavern Public House, Canal Road, Gravesend, DA12 2RS	Roadside	565658	174195	NO_2	NO	0.2	1.8	No	2.5
GR92	1 Hall Road, Northfleet, Kent, DA11 8AW	Roadside	562323	172589	NO_2	Y – Gravesham A2 AQMA	0.0	7.9	No	1.5
GR94	Opp The George PH, Wrotham Road, Meopham, DA13 0AJ	Roadside	564392	166012	NO_2	NO	0.9	0.7	No	2.8
GR96	Parrock Street, Gravesend, DA12 1EZ	Roadside	564963	173717	NO_2	NO	2.0	1.7	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
GR98	The Leather Bottle PH, Dover Road, Northfleet, DA11 9PH	Roadside	562529	174049	NO_2	NO	0.0	2.0	No	2.8
GR104	8 Roman Road (Downpipe), Northfleet	Roadside	562465	172153	NO_2	Y – Gravesham A2 AQMA	0.0	8.7	No	2.6
GR107	46 Pepper Hill (Façade), Northfleet	Roadside	562272	172281	NO_2	Y – Gravesham A2 AQMA	0.0	8.5	No	2.0
GR109	30 Old Road East (Façade) DA11 8EP	Roadside	565229	172955	NO_2	NO	0.0	7.3	No	1.6
GR110	Nells Café, Valley Drive, Gravesend	Roadside	566149	170436	NO_2	Y – Gravesham A2 AQMA	0.0	20.0	No	1.9
GR112	50 Stonebridge Road (Façade), Northfleet	Roadside	561502	174682	NO_2	NO	0.0	4.0	No	2.5
GR116	Saxon Close, Northfleet, Lamp post opposite No.38.	Roadside	562480	172225	NO_2	NO	7.5	1.0	No	2.7
GR118	40 Windmill Street, Gravesend DA12 1BA (Façade)	Roadside	564755	173862	NO_2	NO	0.0	9.0	No	2.4
GR119	Woodville Place (lamp post)	Roadside	564729	173824	NO_2	NO	0.0	2.0	No	2.5
GR122	King & Taylor 10-12 Wrotham Road (façade) DA11	Roadside	564667	173891	NO_2	NO	0.0	8.0	No	2.5
GR123	City Praise Centre Lower Higham	Roadside	566538	173109	NO_2	NO	0.0	9.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
	Road, Gravesend, Kent, DA12 2LY									
GR124	Stonebridge Road Telegraph Post Opposite No.67	Roadside	561338	174925	NO_2	Y – Northfleet Industrial Area AQMA	1.5	4.7	No	2.6
GR125	Café Taj (Façade), 170 Parrack Street, Gravesend	Roadside	564877	173937	NO_2	Y – Gravesham A2 AQMA	0.0	4.9	No	2.4
GR127	17 Darnley Road	Roadside	564456	173979	NO_2		0.0	8.8	No	2.5
GR128	1a Railway Place (façade)	Roadside	564727	174002	NO_2	Y – Gravesham A226 One Way System AQMA	0.0	1.5	No	2.4
GR129	20 Stone Street (façade)	Roadside	564694	173969	NO_2	NO	0.0	2.6	No	2.5
GR130	6 Wrotham Road, The Hair Shop (Façade)	Roadside	564687	173934	NO_2	NO	0.0	5.2	No	2.2
GR131	7 Wrotham Road, Martin Tolhurst Solicitors (façade)	Roadside	564661	173940	NO_2	NO	2.2	34.4	No	1.8
GR133	23 Wrotham Road (façade)	Roadside	564657	173799	NO_2	NO	0.0	5.8	No	1.9
GR134	17 Wrotham Road (façade)	Roadside	564659	173831	NO_2	NO	0.0	5.8	No	2.0
GR135	25 Wrotham Road (lamp post adjacent to building)	Roadside	564657	173764	NO_2	NO	6.0	1.6	No	2.6
GR136	Woodville Place, Lamp Post opp 17 Wrotham Road	Roadside	564686	173828	NO_2	NO	0.2	1.8	No	2.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
GR137	Lamp post Opposite 2 Peartree Place, Gravesend Road	Roadside	570719	171143	NO_2	NO	6.0	2.1	No	0.7
GR138	Telegraph Post, Foxbury Manor, Old Watling Street, Rochester	Roadside	570583	169549	NO_2	Y – Gravesham A2 AQMA	6.1	32.0	No	1.8
GR139	Rosherville Way, Lamppost near Compass Court	Roadside	563178	173976	NO_2	NO	14.1	4.3	No	2.3
GR140	Nuxley Toys, 13-14 Milton Road	Roadside	564955	174098	NO_2	Y – Gravesham A226 One Way System AQMA	0.0	4.0	No	2.4
GR141	Park Pale, Telegraph Post	Roadside	569588	169603	NO_2	Y – Gravesham A2 AQMA	9.4	29.5	No	2.0
GR142	Inn on the Lake, Watling Street, Shorne DA12 3HB (Light post)	Roadside	567500	169836	NO_2	Y – Gravesham A2 AQMA	25.2	21.4	No	2.4
GR143	29 Wrotham Road (Façade)	Roadside	564646	173745	NO_2	NO	0.0	3.0	No	2.0
GR144	43 Singlewell Road (Downpipe)	Roadside	564728	172826	NO_2	NO	0.0	2.3	No	3.7
GR145	Lamp post adjacent Chantry Community Academy, Ordnance Road	Roadside	565336	174066	NO_2	NO	17.0	1.5	No	2.6
GR146	Lamp post adjacent 354 Thong Lane DA12 4LH	Roadside	567150	171231	NO_2	NO	12.0	4.8	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
GR147	36/38 The Street, Cobham DA12 3BZ (façade)	Roadside	567051	168432	NO_2	NO	0.0	9.2	No	2.1
GR148	Byeways, Lower Rochester Road, Higham (Façade) ME3 7HD	Roadside	571572	172847	NO_2	NO	0.0	5.8	No	1.7
GR149	Telegraph Post, adjacent Chequers Court, Canal Road, Higham ME3 7HD	Roadside	571445	172881	NO_2	NO	1.0	1.9	No	2.5
GR150	Telegraph Post, adjacent 10 Michele Cottages, Chalk Road, Higham ME3 7JZ	Roadside	571250	172933	NO_2	NO	7.0	1.6	No	2.2
GR151	Telegraph Post, Higham Primary School, School Lane, Higham ME3 7JL	Roadside	571371	172270	NO_2	NO	0.0	-	No	-
GR152	235 Dover Road (Façade), Northfleet DA11 9QN	Roadside	562974	173653	NO_2	NO	0.0	4.6	No	1.7

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
ZG2	562589	172076	Roadside	98.2	98.2	29.1	23.7	22.8	22.2	19.5
ZG3	562155	174360	Industrial	98.4	98.4	24.5	22.0	21.0	18.2	15.1

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

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

☒ **Where exceedances of the NO_2 annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2023.**

Notes:

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

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

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Figure A.1 – Trends in Annual Mean NO_2 at Automatic Monitors

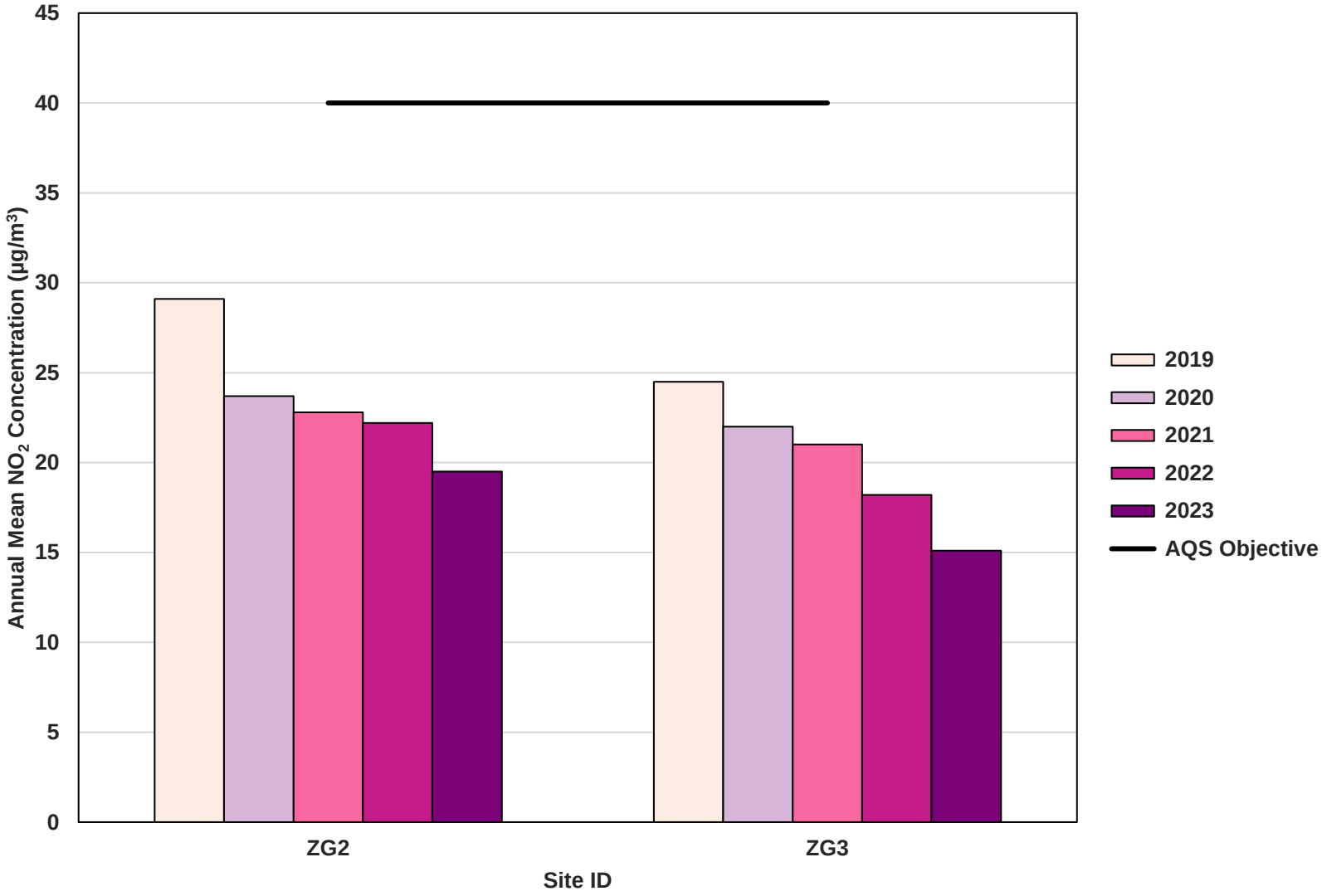


Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
GR08a, GR08b, GR08c	562589	172076	Roadside	100.0	100.0	30.9	24.3	23.9	22.4	18.9
GR13	564696	174431	Roadside	100.0	100.0	**46.1**	38	**41.2**	37.6	31.0
GR19a, GR19b, GR19c	562155	174360	Urban Background	100.0	100.0	23.2	20.6	20.9	18.9	15.5
GR24	565128	174049	Roadside	100.0	100.0	**42.7**	36.7	**40.0**	35.0	31.0
GR31	565052	174149	Roadside	100.0	100.0	**43.7**	38.2	37.4	34.0	30.3
GR39	564730	174030	Roadside			35	28.3	31.0	29.3	25.0
GR40	564486	174095	Roadside	100.0	100.0	**43.4**	35	38.3	35.3	29.6
GR45	564708	174266	Roadside	100.0	100.0	29.3	24.1	24.4	21.7	19.7
GR47	565043	174173	Roadside	100.0	100.0	**42.9**	36.3	**41.0**	35.0	30.7
GR52	562449	174191	Roadside	100.0	100.0	32.6	27.5	30.1	27.8	22.4
GR55	563943	173378	Roadside	100.0	100.0	32.1	27.3	28.9	26.6	23.0
GR56	565210	172980	Roadside	100.0	100.0	30.3	27	27.7	24.7	21.6
GR57	564472	173158	Roadside	100.0	100.0	40.2	31.1	33.7	31.7	26.0
GR58	565166	174036	Roadside	100.0	100.0	38	31.2	33.0	31.6	26.4
GR59	564530	173171	Roadside	100.0	100.0	37.7	30.2	32.4	28.7	24.5
GR60	563899	173368	Roadside	92.3	92.3	36.5	30.5	33.7	30.7	27.5
GR61	564429	174152	Roadside	100.0	100.0	35.1	27.7	30.7	30.2	24.4
GR62	565004	174324	Roadside	100.0	100.0	30.8	25.8	25.6	24.8	21.2
GR66	564512	174448	Roadside	100.0	100.0	31.6	27.9	28.2	26.3	22.3
GR67	565214	172958	Roadside	100.0	100.0	36.3	28.6	29.6	28.3	24.8
GR68	564808	173086	Roadside	100.0	100.0	35.8	28.4	28.6	27.1	22.4
GR69a, GR69b, GR69c	567270	171925	Urban Background	100.0	100.0	20.7	16.3	15.8	15.2	13.1
GR72a, GR72b, GR72c	562437	173175	Urban Background	100.0	100.0	24.4	20.8	21.4	19.8	17.1

GR75a, GR75b, GR75c	564087	173080	Urban Background	92.3	92.3	21.8	17.2	19.5	16.2	13.5
GR78	565658	174195	Roadside	100.0	100.0	32.5	26.2	27.5	26.9	22.5
GR92	562323	172589	Roadside	100.0	100.0	38.6	33.3	33.0	29.0	27.8
GR94	564392	166012	Roadside	100.0	100.0	36.1	27.2	25.5	26.6	23.3
GR96	564963	173717	Roadside	90.4	90.4	31.4	27.3	25.5	25.0	22.0
GR98	562529	174049	Roadside	100.0	100.0	33.2	28.5	30.3	25.8	23.8
GR104	562465	172153	Roadside	100.0	100.0	34.2	29.2	28.3	26.9	23.2
GR107	562272	172281	Roadside	100.0	100.0	36.3	30.6	29.8	27.7	24.1
GR109	565229	172955	Roadside	100.0	100.0	34.3	28.8	27.3	29.5	27.6
GR110	566149	170436	Roadside	92.3	92.3	38.7	32.1	29.7	28.3	24.6
GR112	561502	174682	Roadside	100.0	100.0	35.7	30.1	31.1	30.5	23.1
GR116	562480	172225	Roadside	100.0	100.0	32.3	28.3	29.3	26.3	21.7
GR118	564755	173862	Roadside	100.0	100.0	34.9	29	30.9	30.3	25.9
GR119	564729	173824	Roadside	90.4	90.4	**49.5**	37.6	**41.7**	39.4	35.3
GR122	564667	173891	Roadside	92.3	92.3	37	30.7	32.6	31.4	25.6
GR123	566538	173109	Roadside	100.0	100.0	26.3	21.5	21.2	20.8	17.0
GR124	561338	174925	Roadside	100.0	100.0	31	29	27.6	27.7	23.0
GR125	564877	173937	Roadside	100.0	100.0	33.2	27.5	29.6	28.3	23.1
GR127	564456	173979	Roadside	92.3	92.3	30.4	24.9	26.6	24.0	21.5
GR128	564727	174002	Roadside	100.0	100.0	31.8	26	29.6	26.0	23.1
GR129	564694	173969	Roadside	100.0	100.0	28.4	24.7	25.0	23.4	19.4
GR130	564687	173934	Roadside	100.0	100.0	31.3	26	27.0	25.7	22.0
GR131	564661	173940	Roadside	57.7	57.7	26.4	22.5	22.1	21.8	18.0
GR133	564657	173799	Roadside	100.0	100.0	36.2	28.7	28.3	27.5	25.5
GR134	564659	173831	Roadside	82.7	82.7	33.7	24.9	25.2	27.6	22.1
GR135	564657	173764	Roadside	100.0	100.0	**43.9**	36.8	35.7	31.1	31.4
GR136	564686	173828	Roadside	90.4	90.4	37.4	32.3	31.1	30.1	27.8
GR137	570719	171143	Roadside	100.0	100.0	33.1	26.9	26.7	27.0	21.5
GR138	570583	169549	Roadside	100.0	100.0	30.2	25.3	24.1	24.8	24.0
GR139	563178	173976	Roadside	100.0	100.0	34	31.5	30.7	29.6	23.8
GR140	564955	174098	Roadside	90.4	90.4	38.5	33.7	34.2	30.8	27.8
GR141	569588	169603	Roadside	100.0	100.0	27.1	25.2	22.5	21.2	18.3
GR142	567500	169836	Roadside	92.3	92.3	**59.8**	**46.1**	**41.1**	**42.9**	36.9
GR143	564646	173745	Roadside	100.0	100.0	37	29.5	29.0	28.2	25.3
GR144	564728	172826	Roadside	82.7	82.7	34.9	28.9	30.3	28.5	25.6
GR145	565336	174066	Roadside	100.0	100.0	30.6	28.9	29.6	29.3	23.1

GR146	567150	171231	Roadside	92.3	92.3	18.5	14.9	14.3	13.9	12.5
GR147	567051	168432	Roadside	92.3	92.3	-	23.9	25.3	22.1	19.7
GR148	571572	172847	Roadside	100.0	100.0	-	-	14.3	13.4	10.8
GR149	571445	172881	Roadside	100.0	100.0	-	-	14.7	13.0	11.6
GR150	571250	172933	Roadside	100.0	100.0	-	-	16.1	15.1	12.6
GR151	571371	172270	Roadside	90.4	90.4	-	-	18.8	18.4	15.8
GR152	562974	173653	Roadside	-	-	-	-	-	19.7	-

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

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

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

Notes:

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

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

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

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Figure A.2 – Trends in Annual Mean NO_2 Concentrations: AQMA No.1 A2 Trunk

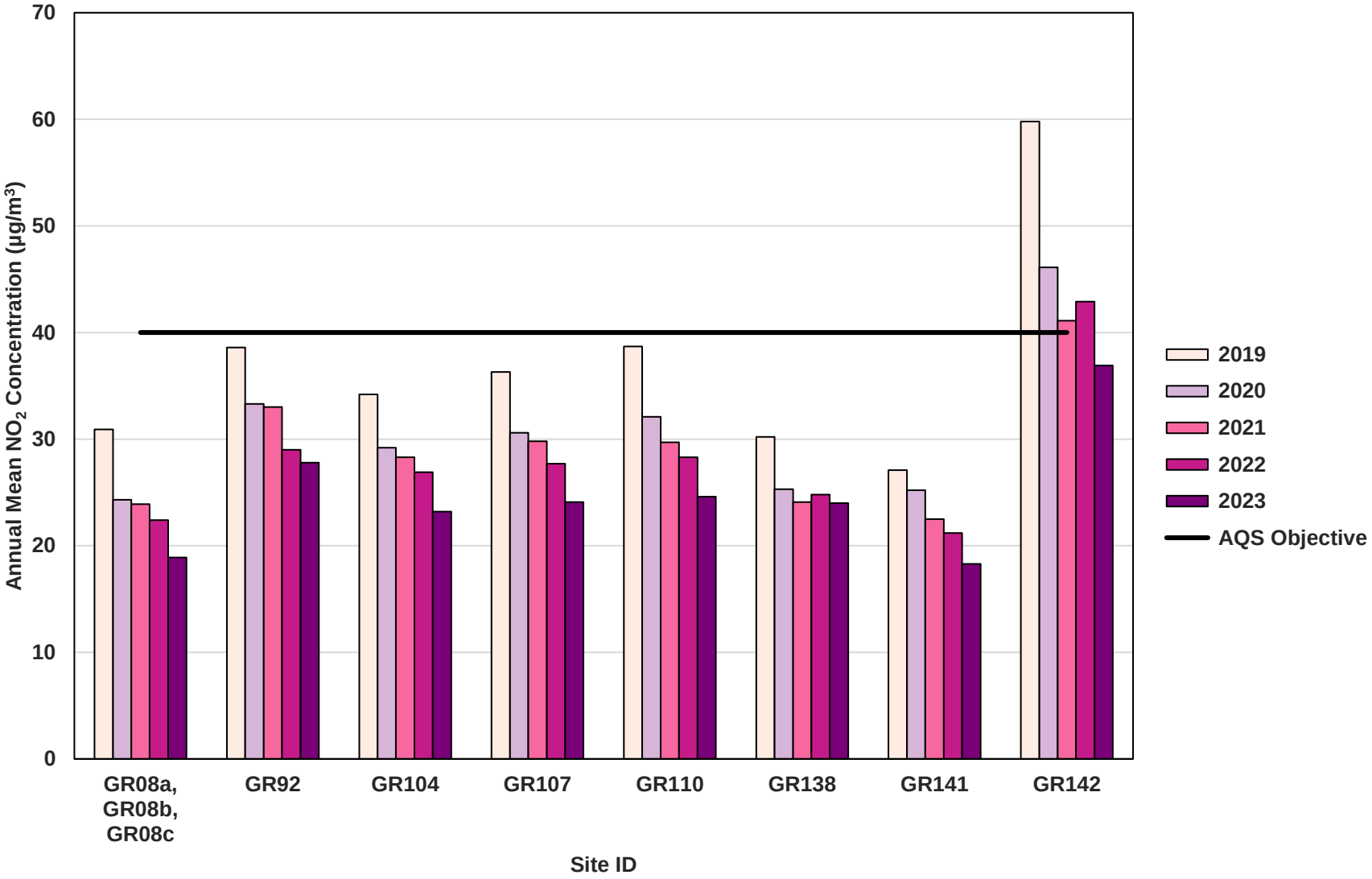


Figure A.3 – Trends in Annual Mean NO_2 Concentrations: AQMA No.3 A226 One-way System

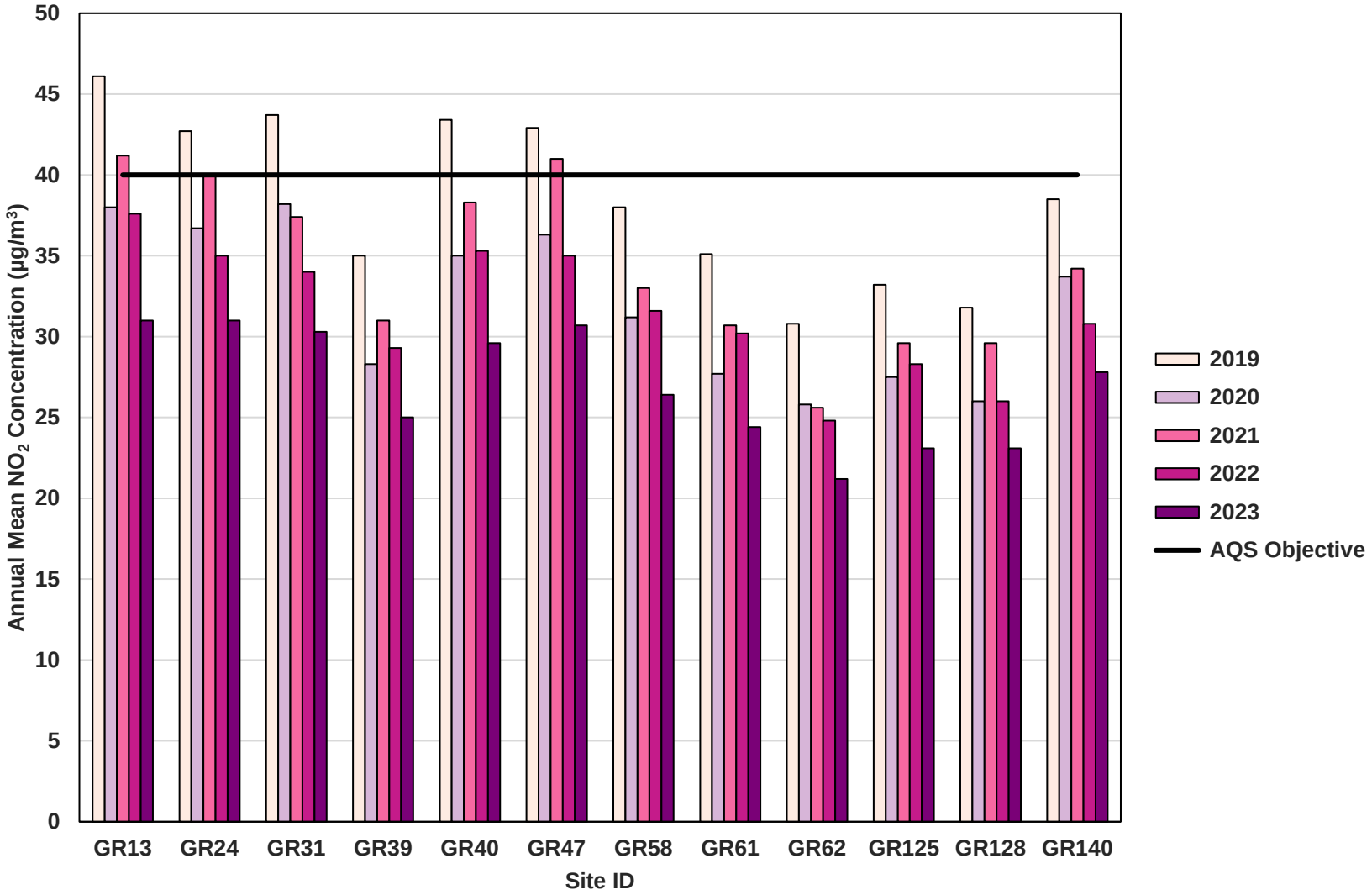


Figure A.4 – Trends in Annual Mean NO_2 Concentrations: AQMA No.4 A227 Wrotham Road/ B261 Old Road West

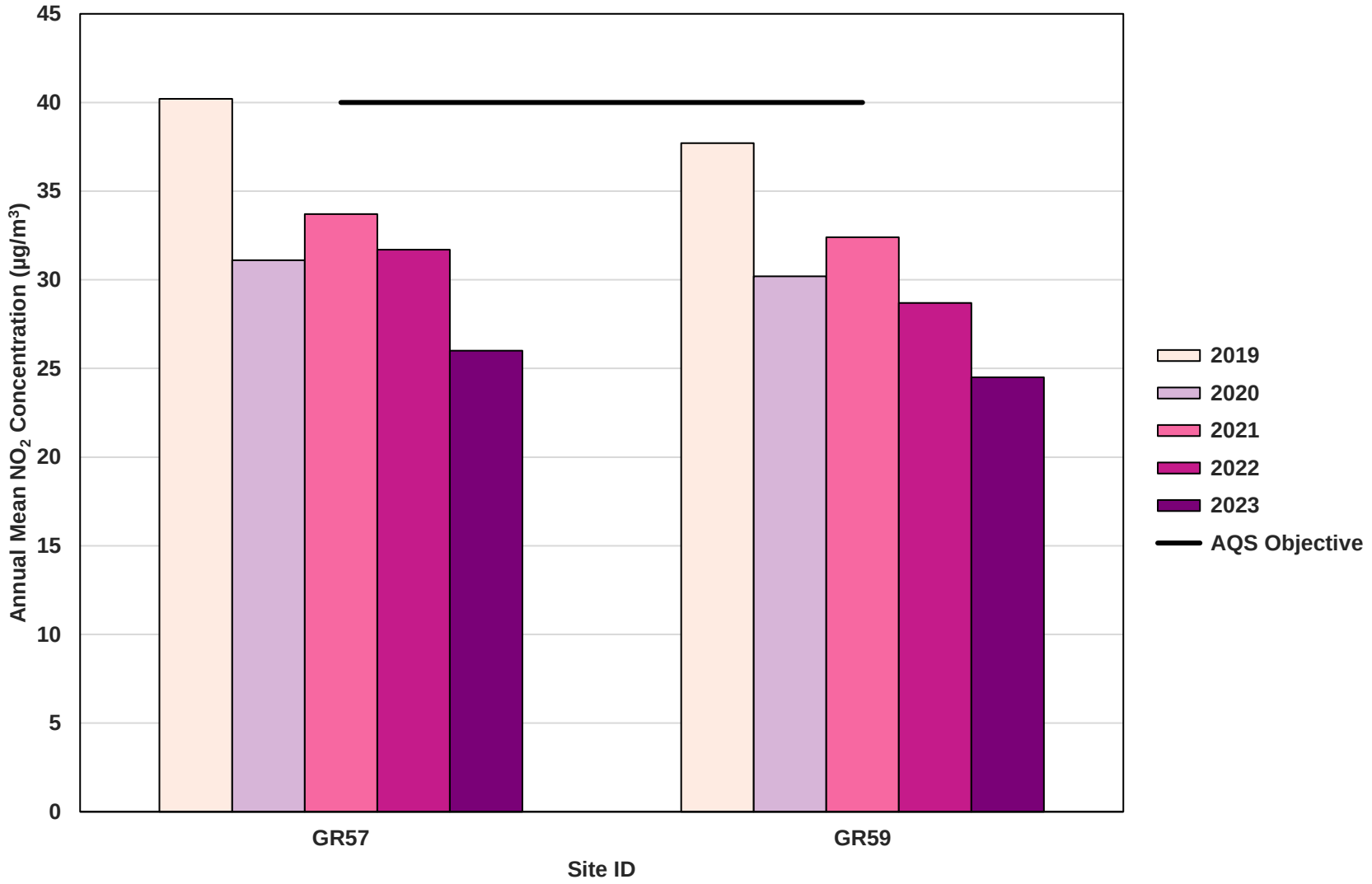


Figure A.5 – Trends in Annual Mean NO_2 Concentrations: Outside AQMAs

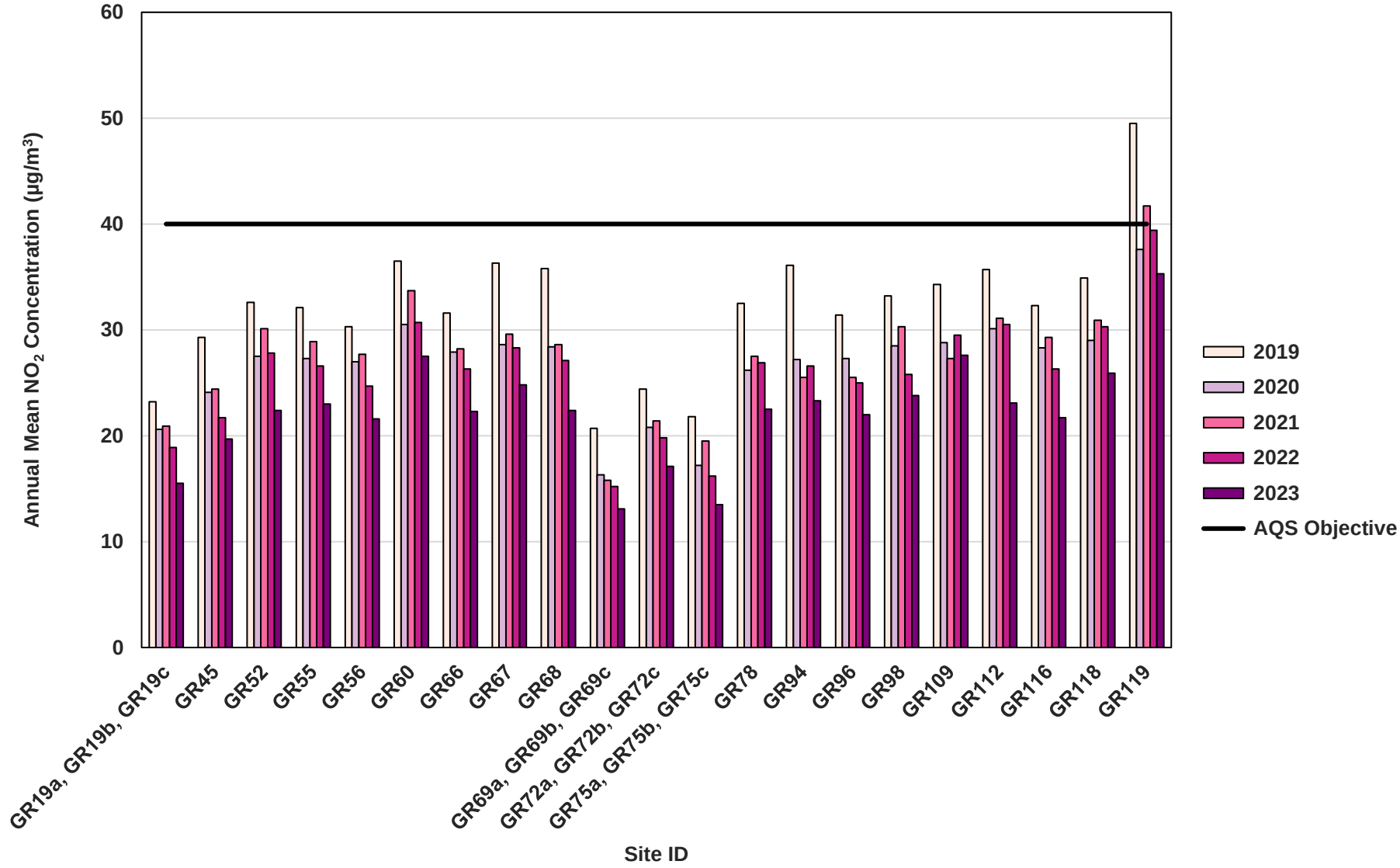


Figure A.6 – Trends in Annual Mean NO2 Concentrations: Outside AQMAs (2)

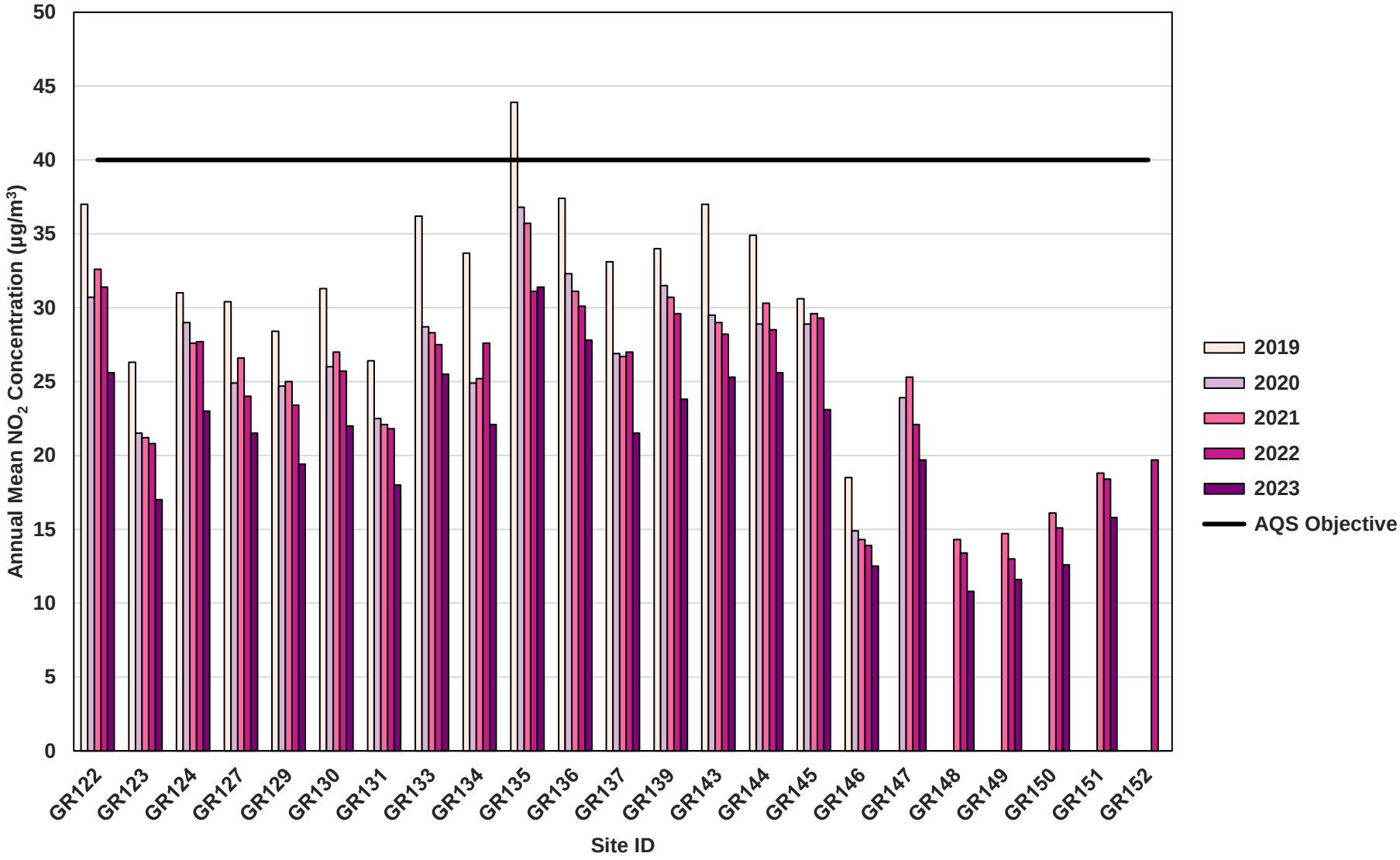


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
ZG2	562589	172076	Roadside	98.2	98.2	0	0	0	0	0
ZG3	562155	174360	Industrial	98.4	98.4	0	0	0	0	0

Notes:

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

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

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

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

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

Table A.6 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
ZG2	562589	172076	Roadside	99.7	99.7	15.3	16.3	16.0	15.3	11.7
ZG3	562155	174360	Industrial	95.1	95.1	22.3	21.3	20.6	22.5	18.2

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

Notes:

The annual mean concentrations are presented as $\mu g/m^3$.

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

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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.7 – Trends in Annual Mean PM_{10} Concentrations

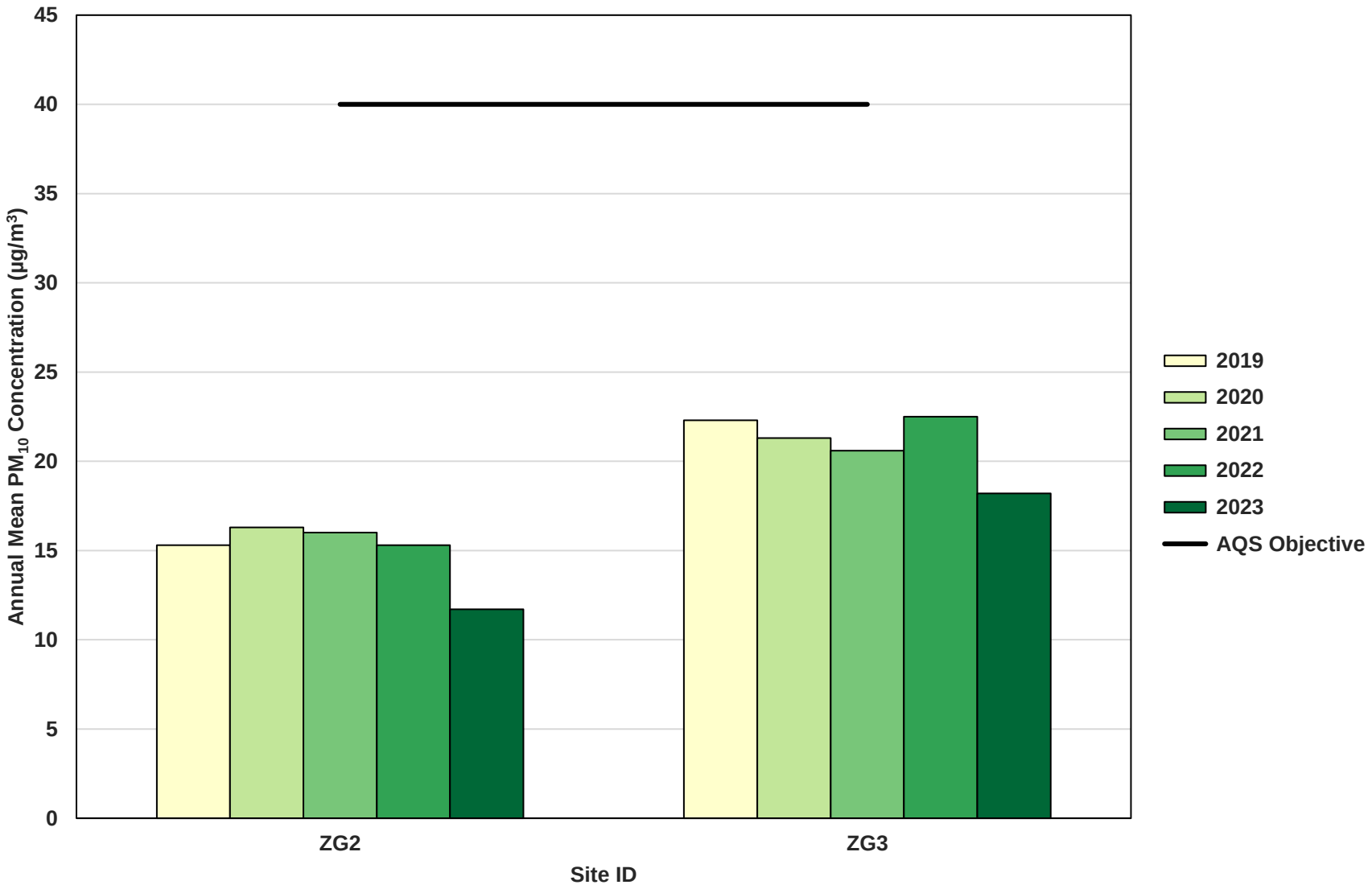


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
ZG2	562589	172076	Roadside	99.7	99.7	1	1	0	0	0
ZG3	562155	174360	Industrial	95.1	95.1	10	8	1	0	1

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m^3 have been recorded.

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
GR08a	562589	172076	30.1	30.2	22.8	16.8	17.8	14.8	20.8	23.5	27.2	26.2	25.6	20.4	-	-	-	Triplicate Site with GR08a, GR08b and GR08c - Annual data provided for GR08c only
GR08b	562589	172076	29.8	30.6	23.9	19.5	16.5	17.6	19.1	23.1	23.9	24.1	27.6	22.6	-	-	-	Triplicate Site with GR08a, GR08b and GR08c - Annual data provided for GR08c only
GR08c	562589	172076	23.9	32.0	23.6	19.4	15.5	19.3	20.2	21.6	26.5	26.6	24.5	20.3	23.0	18.9	-	Triplicate Site with GR08a, GR08b and GR08c - Annual data provided for GR08c only
GR13	564696	174431	44.6	47.7	38.4	38.2	35.9	35.5	27.7	34.1	41.7	40.1	41.3	28.0	37.8	31.0	-	-
GR19a	562155	174360	26.9	31.1	16.9	17.3	15.5	16.3	12.7	17.3	17.6	19.3	22.5	12.7	-	-	-	Triplicate Site with GR19a, GR19b and GR19c - Annual data provided for GR19c only
GR19b	562155	174360	27.4	29.5	17.4	16.8	16.9	16.4	11.9	18.4	18.0	19.5	23.6	13.3	-	-	-	Triplicate Site with GR19a, GR19b and GR19c - Annual data provided for GR19c only
GR19c	562155	174360	27.7	29.8	18.4	14.9	15.4	16.8	12.4	18.3	-	17.9	23.9	14.3	19.0	15.5	-	Triplicate Site with GR19a, GR19b and GR19c - Annual data provided for GR19c only
GR24	565128	174049	44.1	51.6	38.3	42.1	38.6	41.9	24.7	40.6	32.6	37.2	37.9	23.9	37.8	31.0	-	-
GR31	565052	174149	41.8	47.7	37.9	36.4	30.4	31.9	30.5	36.6	38.5	38.9	42.5	30.4	37.0	30.3	-	-
GR39	564730	174030	37.1	43.5	29.6	32.1	31.2	28.5	20.8	28.9	-	34.1	29.2	21.0	30.5	25.0	-	-
GR40	564486	174095	36.2	42.2	35.6	39.2	38.0	38.8	24.5	38.0	40.7	40.4	35.1	24.4	36.1	29.6	-	-
GR45	564708	174266	30.3	33.9	23.9	21.4	20.5	19.5	18.0	19.2	24.7	26.8	30.2	20.0	24.0	19.7	-	-
GR47	565043	174173	38.4	51.2	38.6	43.3	39.8	39.6	26.5	39.1	42.3	35.4	29.8	25.9	37.5	30.7	-	-
GR52	562449	174191	34.4	38.5	23.6	30.5	35.4	25.3	14.9	24.2	26.8	24.1	34.1	16.6	27.4	22.4	-	-
GR55	563943	173378	36.0	39.3	28.1	29.9	21.7	28.4	17.3	23.6	28.4	31.8	30.8	20.8	28.0	23.0	-	-
GR56	565210	172980	26.2	37.8	26.5	20.9	17.5	17.9	22.3	23.7	31.4	29.9	37.4	24.8	26.4	21.6	-	-
GR57	564472	173158	39.5	43.3	35.9	32.4	26.8	31.2	26.2	21.8	37.1	34.4	24.5	28.0	31.8	26.0	-	-
GR58	565166	174036	44.5	44.8	32.2	28.7	26.7	24.9	24.0	32.7	31.5	36.8	36.9	22.4	32.2	26.4	-	-
GR59	564530	173171	16.4	43.0	34.3	32.3	31.3	30.1	21.4	26.1	32.8	34.2	34.7	21.5	29.8	24.5	-	-
GR60	563899	173368	42.8	46.0	34.5	32.3	27.5	30.4	-	27.4	33.3	35.7	32.5	26.8	33.6	27.5	-	-
GR61	564429	174152	32.5	39.7	30.5	31.1	31.0	29.1	19.9	29.4	30.7	29.4	34.0	20.4	29.8	24.4	-	-
GR62	565004	174324	36.2	37.4	25.4	22.7	21.0	19.6	16.6	22.6	23.6	29.7	34.2	21.6	25.9	21.2	-	-

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
GR66	564512	174448	32.6	39.5	26.6	27.8	28.1	26.6	15.9	22.0	26.5	32.9	24.6	22.9	27.2	22.3	-	-
GR67	565214	172958	38.6	40.9	30.6	28.9	26.5	24.1	21.5	27.4	32.5	32.0	35.9	23.7	30.2	24.8	-	-
GR68	564808	173086	38.7	42.3	29.3	26.8	21.2	19.4	18.0	23.2	27.4	27.8	29.8	24.3	27.4	22.4	-	-
GR69a	567270	171925	27.6	27.1	14.3	12.7	9.1	10.5	9.0	13.3	12.3	16.5	24.6	18.2	-	-	-	Triplicate Site with GR69a, GR69b and GR69c - Annual data provided for GR69c only
GR69b	567270	171925	29.3	27.5	16.8	11.5	9.6	9.2	10.0	13.3	14.3	17.2	21.9	17.1	-	-	-	Triplicate Site with GR69a, GR69b and GR69c - Annual data provided for GR69c only
GR69c	567270	171925	30.5	23.0	14.8	12.1	11.3	8.8	8.3	12.9	13.1	9.2	21.5	14.9	15.9	13.1	-	Triplicate Site with GR69a, GR69b and GR69c - Annual data provided for GR69c only
GR72a	562437	173175	30.0	31.4	22.2	19.7	19.0	20.4	14.0	21.2	22.6	11.8	26.5	17.8	-	-	-	Triplicate Site with GR72a, GR72b and GR72c - Annual data provided for GR72c only
GR72b	562437	173175	30.2	32.5	19.6	18.5	20.8	18.7	12.6	17.6	19.0	19.5	18.1	18.6	-	-	-	Triplicate Site with GR72a, GR72b and GR72c - Annual data provided for GR72c only
GR72c	562437	173175	29.8	33.2	18.1	19.2	17.4	16.6	13.0	18.1	19.0	18.7	29.6	16.9	20.9	17.1	-	Triplicate Site with GR72a, GR72b and GR72c - Annual data provided for GR72c only
GR75a	564087	173080	23.5	27.8	18.2	-	13.0	13.0	-	16.1	15.1	13.6	23.1	14.3	-	-	-	Triplicate Site with GR75a, GR75b and GR75c - Annual data provided for GR75c only
GR75b	564087	173080	24.7	28.2	17.8	-	13.5	12.4	5.7	14.6	14.2	15.6	23.2	8.1	-	-	-	Triplicate Site with GR75a, GR75b and GR75c - Annual data provided for GR75c only
GR75c	564087	173080	23.3	28.0	16.3	-	12.4	14.0	5.6	16.6	12.7	16.4	21.2	14.0	16.4	13.5	-	Triplicate Site with GR75a, GR75b and GR75c - Annual data provided for GR75c only
GR78	565658	174195	34.0	37.3	26.7	24.9	22.2	23.3	20.3	25.5	29.7	34.3	28.6	22.8	27.5	22.5	-	-
GR92	562323	172589	41.5	45.6	33.7	33.7	24.6	28.9	31.5	28.7	37.6	37.8	34.9	28.8	33.9	27.8	-	-
GR94	564392	166012	34.2	36.9	28.7	28.5	23.6	26.9	23.3	27.2	30.3	31.6	31.5	18.9	28.5	23.3	-	-
GR96	564963	173717	38.2	39.9	27.7	24.6	26.1	21.1	14.3		23.7	28.0	29.1	22.8	26.9	22.0	-	-
GR98	562529	174049	38.0	47.2	32.1	30.3	27.6	24.7	18.3	22.5	29.2	25.8	32.5	19.6	29.0	23.8	-	-
GR104	562465	172153	34.9	37.9	26.7	23.6	20.0	21.4	32.0	25.9	36.7	26.8	31.6	22.2	28.3	23.2	-	-
GR107	562272	172281	37.7	38.7	29.1	26.2	23.3	22.8	27.7	25.4	30.9	34.2	27.9	28.4	29.4	24.1	-	-
GR109	565229	172955	42.8	49.8	37.6	38.9	30.6	26.8	20.8	22.3	30.2	37.4	39.0	28.2	33.7	27.6	-	-
GR110	566149	170436	39.8	39.1	29.6	24.9	22.5	26.3		25.4	33.3	33.9	29.5	25.2	30.0	24.6	-	-
GR112	561502	174682	36.7	40.5	31.6	27.7	26.1	26.9	20.3	25.2	27.4	29.2	28.3	17.8	28.1	23.1	-	-
GR116	562480	172225	35.3	40.3	27.5	21.3	17.4	19.4	23.4	21.9	28.8	31.2	30.0	21.0	26.5	21.7	-	-
GR118	564755	173862	33.8	44.3	30.4	31.2	27.3	28.4	23.6	31.1	32.4	39.8	34.1	23.1	31.6	25.9	-	-

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
GR119	564729	173824	50.4	52.8	44.3	44.3	34.8	-	40.1	43.8	48.4	51.4	35.3	27.5	43.0	35.3	-	-
GR122	564667	173891	34.8	40.7	30.7	-	29.7	29.1	26.7	32.5	32.9	36.1	26.0	24.0	31.2	25.6	-	-
GR123	566538	173109	26.0	32.0	20.7	16.4	13.9	16.6	16.0	16.3	21.9	24.7	27.6	17.1	20.8	17.0	-	-
GR124	561338	174925	39.3	41.1	27.7	26.9	33.8	23.8	18.1	24.4	26.1	28.8	25.3	20.8	28.0	23.0	-	-
GR125	564877	173937	33.2	37.5	29.8	32.6	22.4	24.6	13.0	28.3	29.0	34.1	31.5	21.9	28.2	23.1	-	-
GR127	564456	173979	29.5	36.8	24.4	26.5	24.8	23.6	-	24.3	21.7	27.8	30.8	18.5	26.2	21.5	-	-
GR128	564727	174002	26.0	39.5	29.6	27.5	25.0	26.4	21.7	25.8	28.1	31.3	35.4	22.3	28.2	23.1	-	-
GR129	564694	173969	24.6	36.2	25.7	22.7	21.8	19.2	14.9	22.2	21.0	26.9	28.1	20.5	23.7	19.4	-	-
GR130	564687	173934	27.7	35.4	28.0	26.0	22.9	23.9	19.0	25.6	27.1	31.8	31.8	22.5	26.8	22.0	-	-
GR131	564661	173940	31.6	32.9	22.4	21.1	18.0	16.1	13.3	-	-	-	-	-	22.2	18.0	-	-
GR133	564657	173799	37.8	40.7	32.1	30.9	33.4	26.1	23.2	23.4	33.2	28.5	36.7	27.4	31.1	25.5	-	-
GR134	564659	173831	34.0	35.2	28.1	27.7	23.6	20.9	20.2	22.8	27.2	30.4			27.0	22.1	-	-
GR135	564657	173764	51.1	47.3	42.7	36.6	36.2	33.8	30.4	32.3	36.9	41.9	36.5	34.1	38.3	31.4	-	-
GR136	564686	173828	33.2	39.3	31.8	31.0	31.5	-	24.7	35.0	41.2	39.7	40.0	26.2	34.0	27.8	-	-
GR137	570719	171143	29.6	35.6	24.7	23.7	24.9	26.8	18.2	26.1	34.8	31.3	24.9	14.3	26.2	21.5	-	-
GR138	570583	169549	25.4	32.7	25.5	18.8	65.6	19.5	24.6	21.4	31.2	32.0	32.0	23.2	29.3	24.0	-	-
GR139	563178	173976	39.4	43.2	27.0	27.4	23.7	28.6	11.3	23.5	33.4	32.7	31.9	26.2	29.0	23.8	-	-
GR140	564955	174098	36.2	46.6	<0.5	35.1	35.3	35.9	23.9	32.6	33.9	35.4	32.1	25.9	33.9	27.8	-	-
GR141	569588	169603	29.2	30.4	20.6	19.7	15.0	17.2	18.6	19.9	26.3	26.0	24.7	19.7	22.3	18.3	-	-
GR142	567500	169836	52.4	56.1	47.5	41.7	25.5	33.8	46.3	43.7	55.8	45.5	46.5	-	45.0	36.9	28.4	-
GR143	564646	173745	39.2	40.9	34.0	24.6	28.1	27.7	26.1	27.5	30.7	35.8	29.3	27.0	30.9	25.3	-	-
GR144	564728	172826	38.8	43.7	29.9	23.8	25.1	-	-	24.9	30.7	34.3	35.9	25.5	31.3	25.6	-	-
GR145	565336	174066	38.1	39.7	26.3	28.3	28.5	29.6	18.6	28.9	26.0	27.1	25.5	21.3	28.2	23.1	-	-
GR146	567150	171231	23.7	21.6	14.5	12.1	10.4	10.7	-	12.3	14.6	15.1	20.3	12.0	15.2	12.5	-	-
GR147	567051	168432	32.1	31.0	23.4	23.0	22.7	22.1	-	22.4	23.6	23.9	24.9	15.3	24.0	19.7	-	-
GR148	571572	172847	20.4	18.7	12.4	9.8	11.9	10.3	7.4	11.6	13.5	14.2	17.9	9.4	13.1	10.8	-	-
GR149	571445	172881	20.8	21.0	13.9	10.8	11.1	10.8	8.4	12.2	15.7	14.4	18.7	11.9	14.1	11.6	-	-
GR150	571250	172933	24.2	23.9	15.4	12.3	11.8	9.8	10.0	13.5	16.3	15.0	18.1	14.6	15.4	12.6	-	-
GR151	571371	172270	24.1	29.0	19.5	20.2	18.5	15.5	13.0	16.8	21.5	19.5	-	14.2	19.3	15.8	-	-

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

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

☒ **Gravesham Borough Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Gravesham Borough Council During 2023

Gravesham Borough Council have identified the following planning applications as having the potential to impact air quality:

Planning Reference: 20221064

The phased redevelopment will include other sui generis uses, delivery of open space and significant realignment of the road network including the A226 Galley Hill Road / Stonebridge Road / Lower Road with hard / soft landscaping, car and cycle parking provisions, infrastructure works, ancillary and associated works.

Location

Northfleet Harbourside - Land Surrounding Ebbsfleet United Football Club, Stonebridge Road, Northfleet

Status

Pending Consultation

Additional Air Quality Works Undertaken by Gravesham Borough Council During 2023

Gravesham Climate Change Annual Report

Gravesham Borough Council adopted its Climate Change Strategy in December 2021, Gravesham has seen a renewed focus on delivering actions to reduce carbon emissions across council operations, its housing stock, and the wider borough.

Within 2023 Gravesham Council progressed and completed the following:

- Plan facilitation and delivery of the training toolkits provided by the Carbon Literacy Project for the target audiences (officers and members) and finalise the rollout plan.
- Become a Carbon Literate Organisation (as defined by the Carbon Literacy Project), achieving Bronze status by August 2022.
- Commence tender exercise for the procurement of renewable energy for council use.

- Finalise plans to deliver fleet vehicle charging infrastructure at the Brookvale Depot.
- Continue to develop a driver training programme to ensure all drivers of GBC fleet vehicles know how to make the cost-efficient use of the vehicles available to them, particularly as new vehicles are brought online.
- Create and implement a resident strategy in relation to energy improvement works to ensure access and buy-in.
- Making allowance within the council's development standards and requirements that EV charging is included when identifying areas and preparing proposals for new council homes.
- Explore opportunities for the provision of on and off-street electric vehicle charging points for taxis/ private hire vehicles and implement such charging points where it is feasible to do so.

The full Climate Change Strategy can be accessed here: https://www.gravesham.gov.uk/downloads/file/469/climate-change-annual-report-2022

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2023 were supplied and analysed by SOCOTEC Didcot, the tubes were prepared using the 50% Triethanolamine (TEA) in acetone preparation method. All results have been bias adjusted and annualised where required before being presented in Table A.4.

SOCOTEC participates in the AIR-PT scheme which is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL).

Defra and the Devolved Administrations advise that diffusion tubes used for Local Air Quality Management should be obtained from laboratories that have demonstrated satisfactory performance in the AIR-PT scheme. Laboratory performance in AIR-PT is also assessed, by the National Physical Laboratory (NPL), alongside laboratory data from the monthly NPL Field Intercomparison Exercise carried out at Marylebone Road, central London. A laboratory is assessed and given a 'z' score. A score of 2 or less indicates satisfactory laboratory performance.

Additionally, the precision of the NO_2 diffusion tubes supplied by SOCOTEC have been classified as 'good' for all observations during 2023. This precision reflects the laboratory's performance and consistency in preparing and analysing the tubes, as well as the

subsequent handling of the tubes in the field. Precision summary results are available from the LAQM website.

The passive monitoring network changeover was aligned with the DEFRA LAQM calendar for the 2023 reporting year.

Diffusion Tube Annualisation

The LAQM.TG(22) states that annualisation is required for any site which has a data capture of less than 75%, but greater than 25%. Passive monitoring site GR131 recorded a 57.7% data capture in 2023, and therefore required annualisation. Annualisation was completed using version 4.0 of the 'Diffusion Tube Data Processing Tool'. Two continuous background monitoring locations were used, the three locations within a 50 mile radius selected to annualise the data are:

- London Bexley; and
- Thurrock

These continuous background monitoring sites were applicable to use as they all had >85% data capture and therefore could be used for annualisation. Table C.1 presents the annualisation summary, taken from the 'Diffusion Tube Data Processing Tool'.

Table C.1 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor London Bexley	Annualisation Factor Thurrock	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
GR131	0.9580	1.0232	0.9906	22.2	22.0

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Gravesham Borough Council have applied a local bias adjustment factor of 0.82 to the 2023 monitoring data. A summary of bias adjustment factors used by Gravesham Borough Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	Local	-	0.82
2022	Local	-	0.85
2021	Local	-	0.90
2020	Local	-	0.89
2019	Local	-	0.78

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2
Periods used to calculate bias	12	12
Bias Factor A	0.85 (0.8 - 0.9)	0.8 (0.75 - 0.85)
Bias Factor B	18% (12% - 25%)	26% (18% - 34%)
Diffusion Tube Mean (µg/m^3)	23.0	19.0
Mean CV (Precision)	6.6%	3.8%
Automatic Mean (µg/m^3)	19.5	15.1
Data Capture	98%	98%
Adjusted Tube Mean (µg/m^3)	20 (18 - 21)	15 (14 - 16)

Notes:

A combined local bias adjustment factor of 0.82 has been used to bias adjust the 2023 diffusion tube results.

NO_2 Fall-off with Distance from the Road

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

Fall-off with distance calculations were required at one passive monitoring location, where annual mean concentrations were greater than 36 µg/m^3 . Distance correction was applied to passive monitoring site GR142, however annual mean concentrations should be treated with caution because the receptor is more than 20m further from the kerb than the monitoring site. Distance correction calculations were completed using the Diffusion Tube Data Processing Tool version 4.0, in line with the methodology outlined in LAQM.TG(22). Details of these calculations and results are presented in Table C.4.

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

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
GR142	21.4	46.6	36.9	16.2	28.4	Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution.

QA/QC of Automatic Monitoring

2023 data management and ratification for Gravesham Borough Council was carried out by Air Quality Data Management (AQDM) as part of the KentAir contract.

All LSO duties are carried out by Gravesham Borough Council.

Calibrations are carried out every three weeks. These were previously conducted every two weeks, however due to limited staff resources this was not manageable. There does not however appear to be any negative impacts on the data as a result of this. BAM tapes are changed every six weeks in order to coincide with the calibrations.

PM_{10} Monitoring Adjustment

The type of PM_{10} monitor(s) utilised within Gravesham Borough Council do not require the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within Gravesham Borough Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website.

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

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

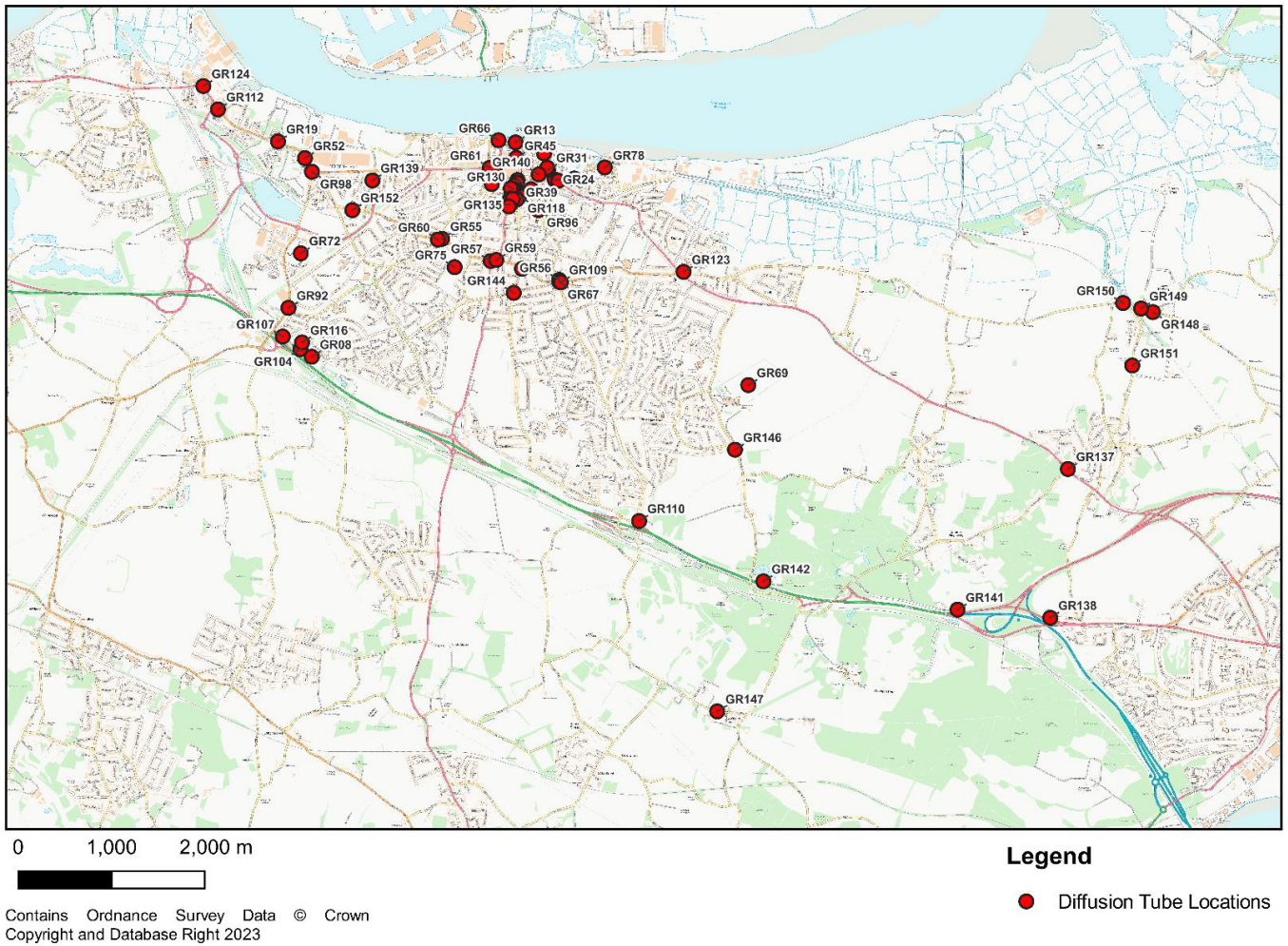


Figure D.2 – Map of Monitoring Sites Within/Near AQMA No.1: Gravesham A2

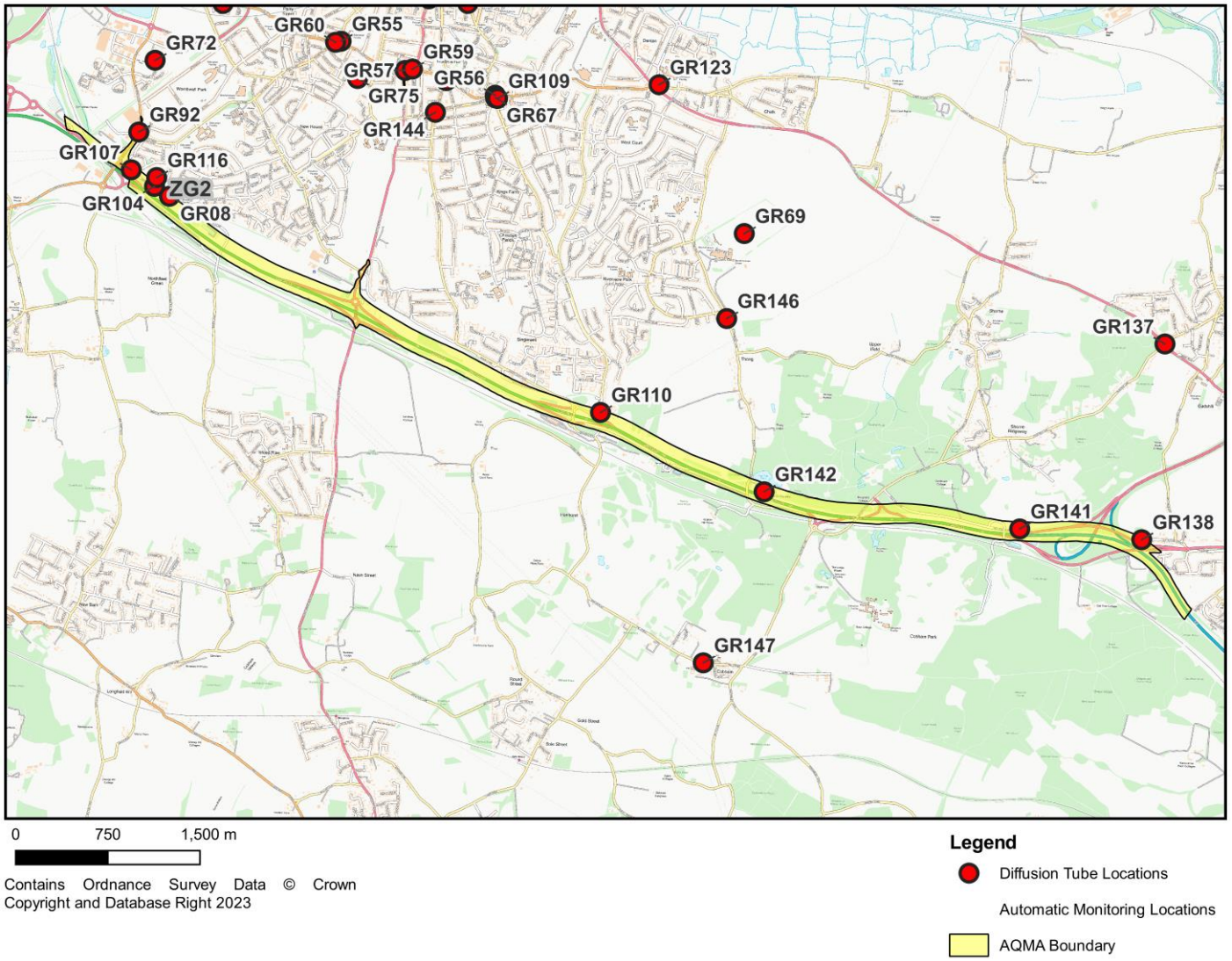


Figure D.3 – Map of Monitoring Sites Within/Near AQMA No.3: A226 One-Way System, Gravesend

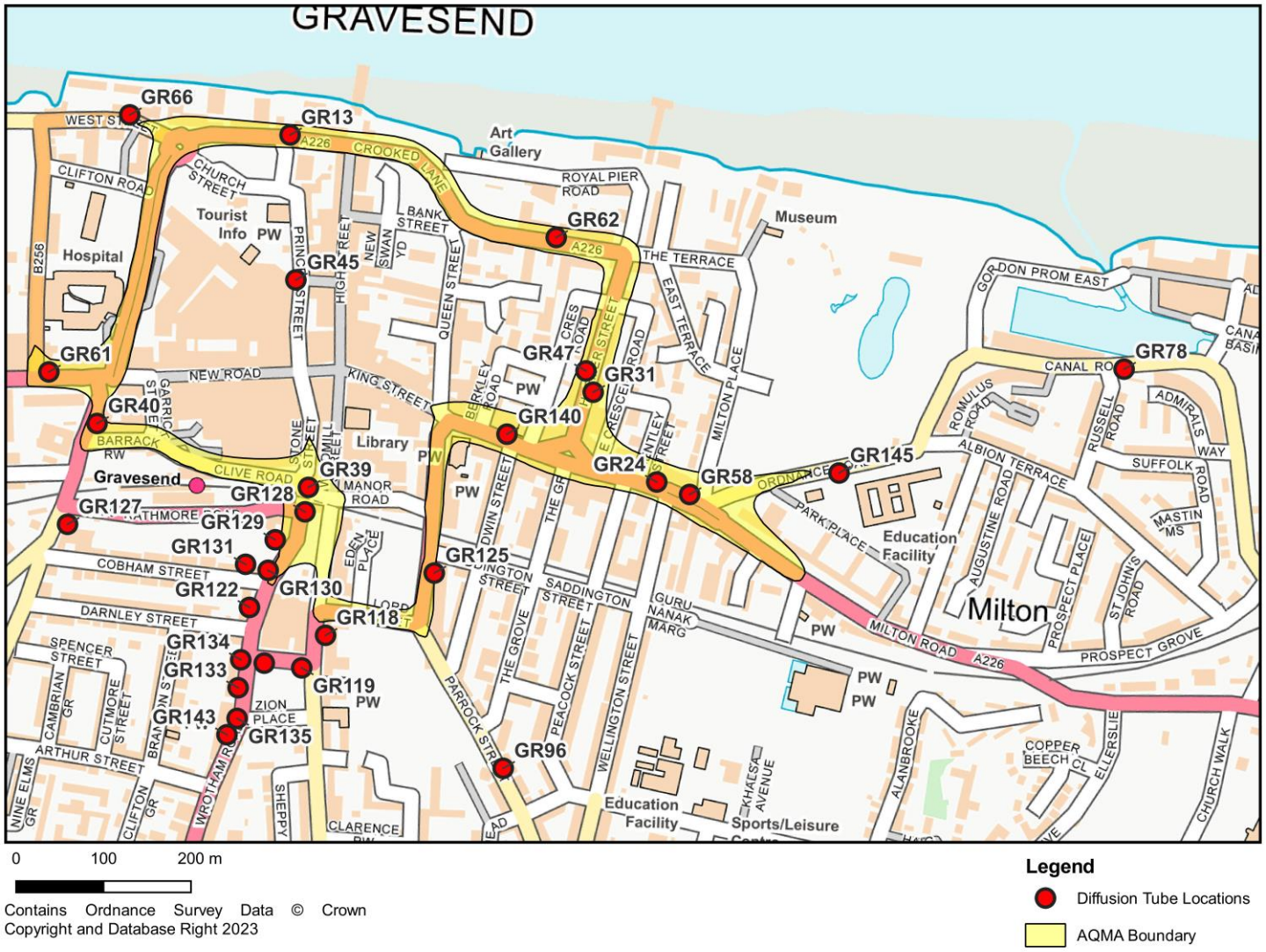


Figure D.4 – Map of Monitoring Sites Within/Near AQMA No.4: A227/B261 Wrotham Road/Old Road West Junction

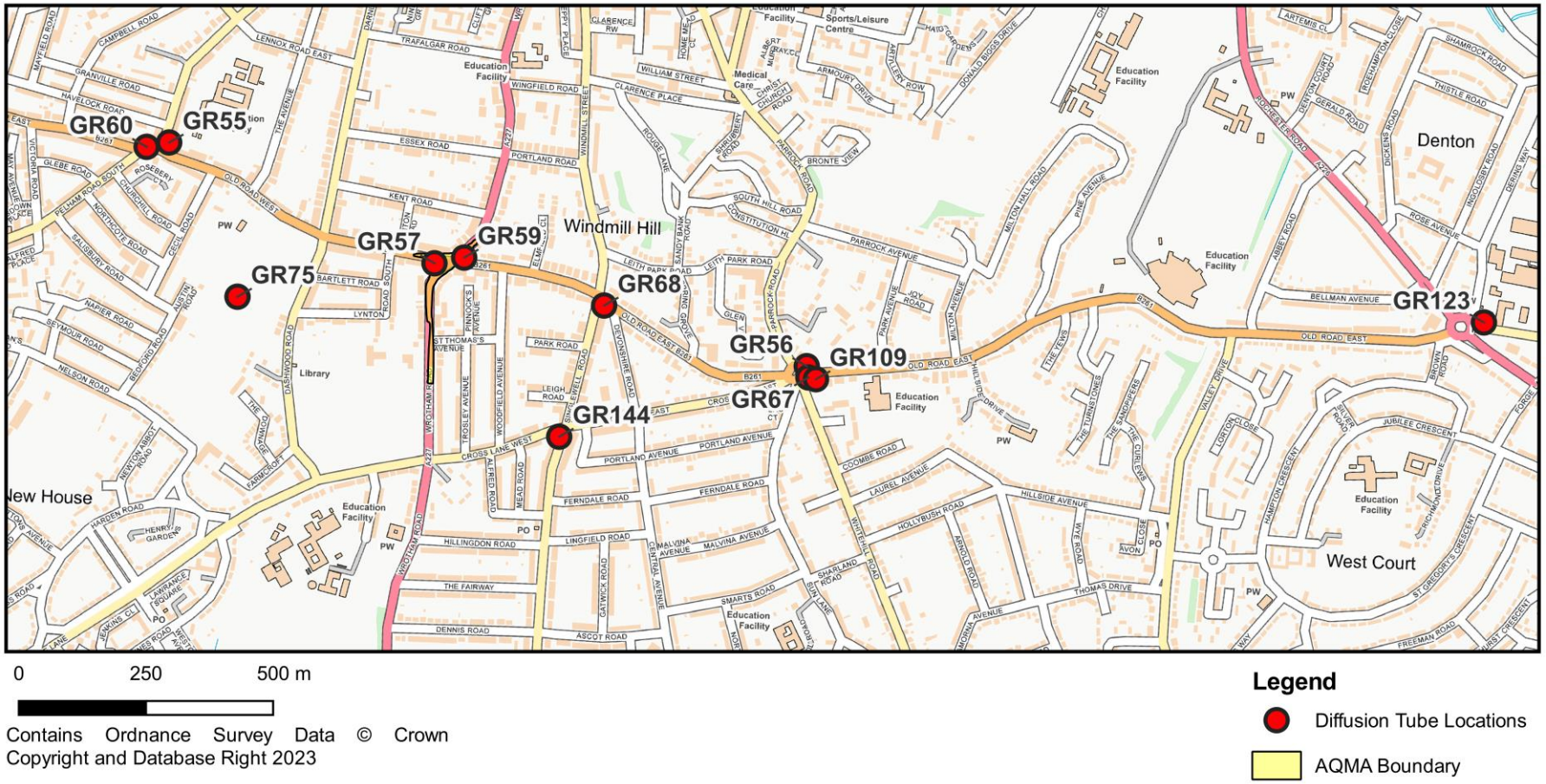


Figure D.5 – Map of Monitoring Sites Outside of Any AQMA Near Meopham

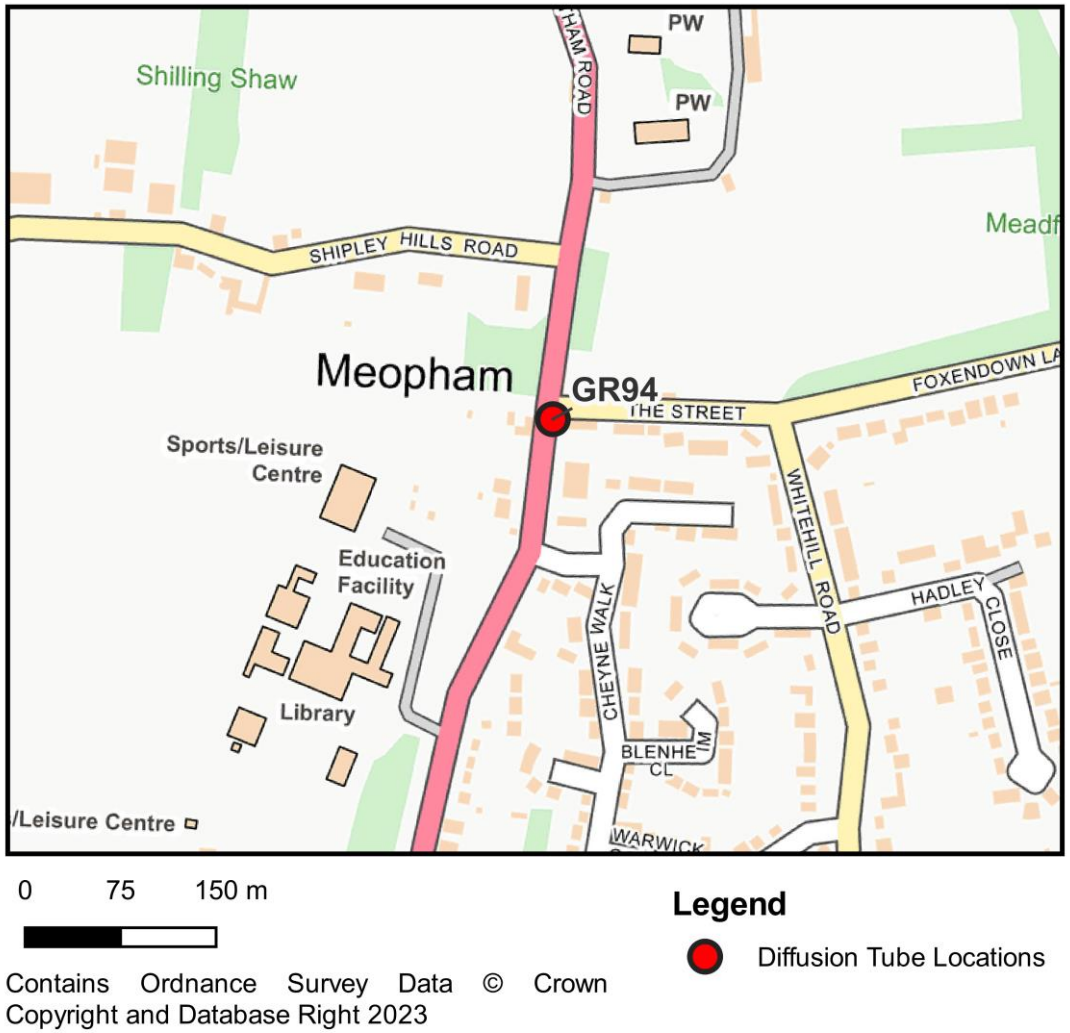


Figure D.6 – Map of Monitoring Sites Outside of Any AQMA Near Cobham

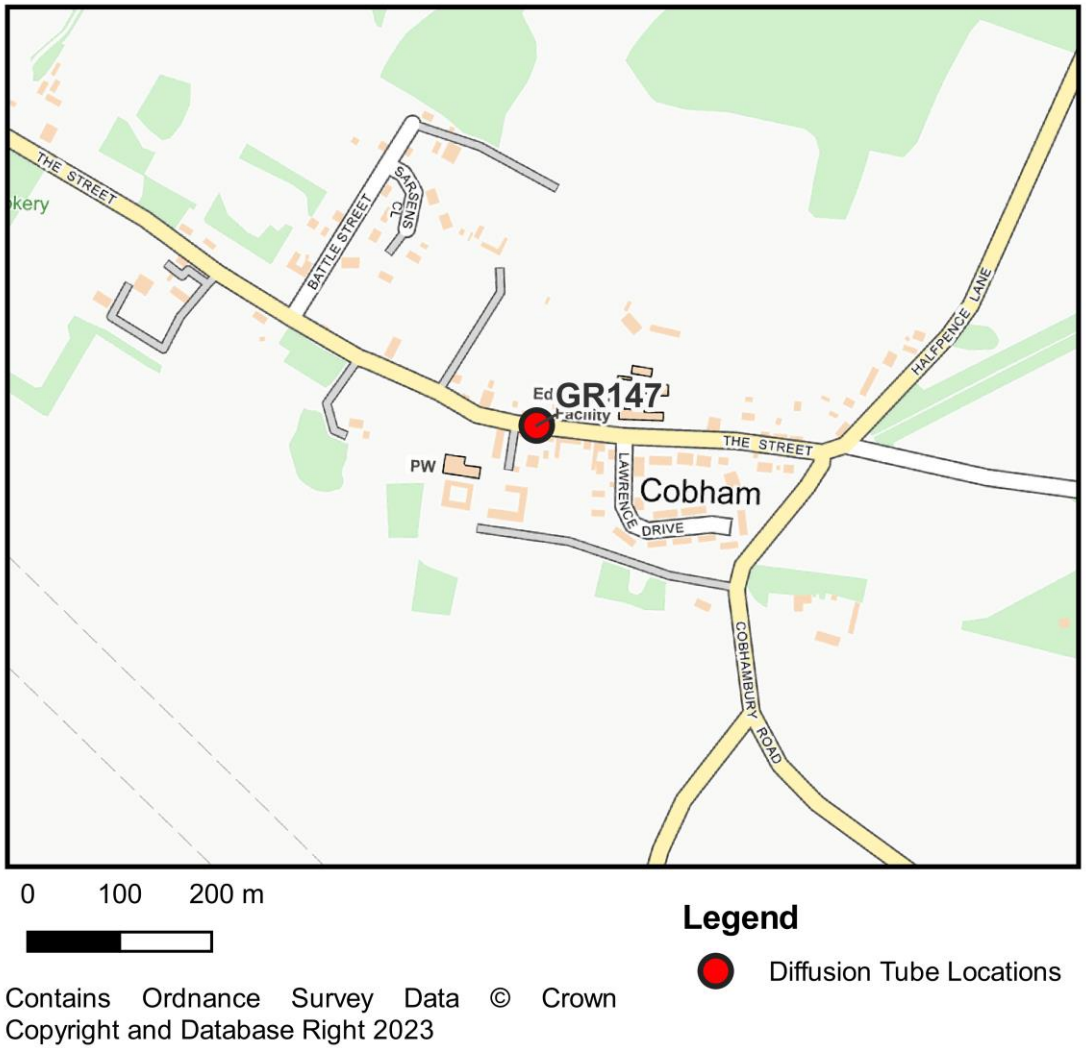
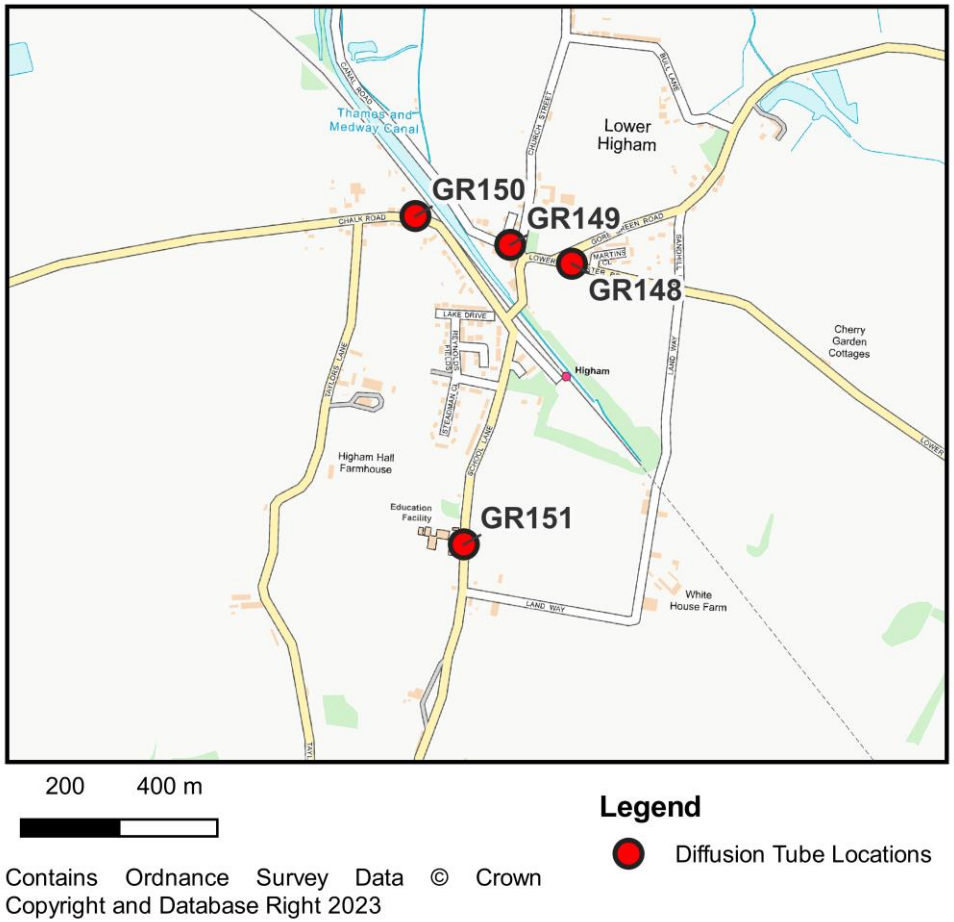


Figure D.7 – Map of Monitoring Sites Outside of Any AQMA Near Lower Higham



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[8]

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.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.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.