



# 2021 Air Quality Annual Status Report (ASR)

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

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# Executive Summary: Air Quality in Our Area

## Air Quality in Medway

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

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

Medway Council is a unitary authority which is situated in Kent in the South East of England. Medway is the largest single conurbation in the southeast, outside of London, and serves a population of approximately 280,000 people. The area is predominantly urban and includes the towns of Chatham, Gillingham, Rainham, Rochester and Strood. It also includes industrial areas and port facilities, including Thamesport and the Hoo Peninsula.

Medway is recognised as part of the developing Thames Gateway Region, and is an area of significant regeneration. It is well served by transport links to London by the M2 motorway and the A2 trunk road. A network of subsidiary routes connects with other towns and small centres of population across Kent. The north Kent rail link connects Medway to London and the south coast, and the Channel Tunnel Rail Link passes through the district.

The main source of air pollution in the district is road traffic emissions from major roads, notably the M2, A2, A228, A229, A230 and A289. Medway suffers from significant

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<sup>1</sup> Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

<sup>3</sup> Defra. Air quality appraisal: damage cost guidance, July 2020

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

congestion, particularly in the town centres. Other pollution sources, including commercial, industrial and domestic sources, also contribute to background pollution concentrations.

Nitrogen dioxide (NO<sub>2</sub>) is the main pollutant of concern within Medway, with concentrations of all other pollutants measured being below the relevant Air Quality Objectives (AQOs).

Medway has declared four Air Quality Management Areas (AQMA) (Central Medway AQMA, High Street Rainham AQMA, Pier Road Gillingham AQMA and Four Elms Hill Chattenden AQMA), all for exceedances of the annual mean NO<sub>2</sub> AQO. Further details of these AQMA are available at [https://uk-air.defra.gov.uk/aqma/local-authorities?la\\_id=157](https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=157). Medway Council has developed an Air Quality Action Plan (AQAP) (Medway Council, 2015), which includes measures to improve the air quality within Medway. An AQAP for Four Elms AQMA is currently being produced, however has been delayed with permission by Defra to coincide with the release of the new Medway Local Plan. A draft plan is expected to be available for consultation late 2021. During 2018 Medway Council developed the Air Quality Communications Strategy; this plan details a series of recommended communications activities and is designed to support the Medway AQAP.

In 2020 there was one exceedance of the annual NO<sub>2</sub> AQO recorded in the Four Elms Hill AQMA. Based on the recorded concentration and the distance of relevant receptors to the road, it is considered that the AQO was not exceeded at locations of relevant exposure within the AQMA. During the 2020 monitoring period the nation was put into a national lockdown due to COVID-19. As a result, measured concentrations decreased at all sites during 2020.

There were no exceedances of the AQOs for particulate matter (PM<sub>10</sub>) and concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> decreased when compared with 2019 concentrations. Concentrations of sulphur dioxide (SO<sub>2</sub>) also complied with the relevant AQOs.

Medway Council actively manages air quality within its area through the Medway Local Plan (2003) Policy BNE24 'Air Quality', to ensure that new developments do not exacerbate existing air quality issues. A new Local Plan is currently under development and will be used in the future to manage air quality. The Council also uses the technical guidance document 'Medway Air Quality Planning Guidance', issued by the Council in 2016, to deal with planning applications that could impact air quality. Additionally, the Council works to manage local air quality through the implementation of the Medway AQAP and supporting Medway Air Quality Communications Strategy. Medway Council is

also working with Public Health colleagues to prioritise action on air quality in its area to help reduce the health burden from air pollution.

## Actions to Improve Air Quality

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

The 2019 Clean Air Strategy<sup>5</sup> sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero<sup>6</sup> sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of AQMAs are designated due to elevated concentrations heavily influenced by transport emissions.

The Medway AQAP sets out a list of measures that Medway Council will implement to improve air quality within Medway. Medway Council has taken forward measures during the current reporting year of 2020 in pursuit of improving local air quality. Some of the key measures that have been implemented are, and progressed on in 2020 are:

- Medway Council's Climate Change Action Plan (please see Section 2.2 for more information);
- Various projects to progress with Electric Vehicle use in the area, projects include the Kent & Medway District Network Project, the EV Quick Win Project, the Medway ULEV Strategy and the EV Survey Dashboard; and
- Various Public Health Initiatives including walking, cycling, the onurbike program and the Nordic Walking Programme, all implemented through the Supporting Healthy Weight (Adults) team.

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<sup>5</sup> Defra. Clean Air Strategy, 2019

<sup>6</sup> DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

## Conclusions and Priorities

Many challenges still lie ahead for Medway Council in terms of making a positive contribution to improving air quality. A weak trend of decreasing measured concentrations of NO<sub>2</sub> is apparent at most sites from 2011 to 2019. No changes to the number and / or extent of the AQMAs are recommended at this stage. The AQMA declared at Gillingham has consistently recorded concentrations below the AQO, it is recommended that the AQMA remain in place due to ongoing development at Chatham Docks and until trends are recorded which are not associated with the impact of the national lockdown due to COVID-19.

Road transport is the dominant source of pollution within Medway's AQMAs, and reducing road traffic emissions is, therefore, the key air quality priority. Another significant challenge is accommodating the large demand for development in Medway. This is likely to put existing areas of poor air quality under additional pressure and could negate the actions that the Council is implementing to improve air quality. For this reason, continuing the implementation of the Medway Air Quality Planning Guidance is a high priority, prior to the adoption of a new Local Plan for Medway (currently under development and expected to be adopted in 2021).

Medway Council's priorities for the coming year are to continue with the work on the measures outlined in the AQAP and those detailed in Table 2.2 of the ASR.

## Local Engagement and How to get Involved

Medway Council has recently developed the Medway Air Quality Communication Strategy, which the Council uses to manage local engagement (as discussed above) and to gauge the current level of public interest and understanding of air quality.

Members of the public can help to improve air quality in Medway by using sustainable transport options, such as walking cycling and using public transport. Medway Council encourages people to car share whenever possible, and the Council has a database for commuter car sharing (<https://liftshare.com/uk/community/km>).

Further information on local air quality can be obtained from the Kent Air website (<http://www.kentair.org.uk/>).

## Table of Contents

<b>Executive Summary: Air Quality in Our Area .....</b>	<b>i</b>
Air Quality in Medway .....	i
Actions to Improve Air Quality .....	iii
Conclusions and Priorities .....	iv
Local Engagement and How to get Involved.....	iv
<b>1 Local Air Quality Management.....</b>	<b>1</b>
<b>2 Actions to Improve Air Quality.....</b>	<b>2</b>
2.1 Air Quality Management Areas .....	2
2.2 Progress and Impact of Measures to address Air Quality in Medway .....	4
2.3 PM <sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations .....	15
<b>3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance .....</b>	<b>16</b>
3.1 Summary of Monitoring Undertaken.....	16
3.1.1 Automatic Monitoring Sites .....	16
3.1.2 Non-Automatic Monitoring Sites .....	16
3.2 Individual Pollutants .....	16
3.2.1 Nitrogen Dioxide (NO <sub>2</sub> ) .....	17
3.2.2 Particulate Matter (PM <sub>10</sub> ) .....	18
3.2.3 Particulate Matter (PM <sub>2.5</sub> ).....	18
3.2.4 Sulphur Dioxide (SO <sub>2</sub> ).....	18
<b>Appendix A: Monitoring Results .....</b>	<b>19</b>
<b>Appendix B: Full Monthly Diffusion Tube Results for 2020 .....</b>	<b>37</b>
<b>Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC .....</b>	<b>39</b>
New or Changed Sources Identified Within Medway Council During 2020 .....	39
Additional Air Quality Works Undertaken by Medway Council During 2020 .....	40
QA/QC of Diffusion Tube Monitoring .....	40
Diffusion Tube Annualisation.....	40
Diffusion Tube Bias Adjustment Factors .....	40
NO <sub>2</sub> Fall-off with Distance from the Road.....	42
QA/QC of Automatic Monitoring .....	42
PM <sub>10</sub> and PM <sub>2.5</sub> Monitoring Adjustment .....	42
Automatic Monitoring Annualisation .....	43
NO <sub>2</sub> Fall-off with Distance from the Road.....	43
<b>Appendix D: Map(s) of Monitoring Locations and AQMAs .....</b>	<b>47</b>
<b>Appendix E: Summary of Air Quality Objectives in England.....</b>	<b>53</b>
<b>Appendix F: Impact of COVID-19 upon LAQM .....</b>	<b>54</b>
Impacts of COVID-19 on Air Quality within Medway Council .....	55

Opportunities Presented by COVID-19 upon LAQM within Medway Council .....	60
Challenges and Constraints Imposed by COVID-19 upon LAQM within Medway Council .....	60
<b>Glossary of Terms .....</b>	<b>62</b>
<b>References .....</b>	<b>63</b>



## Figures

Figure A.1 – Trends in Annual Mean NO <sub>2</sub> Concentrations.....	28
Figure A.3 – Trends in Annual Mean PM <sub>10</sub> Concentrations .....	31
Figure A.4 – Trends in Number of 24-Hour Mean PM <sub>10</sub> Results > 50µg/m <sup>3</sup> .....	33
Figure A.5 – Trends in Annual Mean PM <sub>2.5</sub> Concentrations .....	35
Figure D.1 – Map of Automatic Monitoring Sites.....	47
Figure D.2 – Map of Non-Automatic Monitoring Sites .....	48
Figure D.3 – Map of Non-Automatic Monitoring Sites within Central Medway AQMA .....	49
Figure D.3 – Map of Non-Automatic Monitoring Sites within Four Elms Hill AQMA .....	50
Figure D.4 – Map of Non-Automatic Monitoring Sites within Gillingham AQMA .....	51
Figure F.1 – Graph of the trend in annual NO <sub>2</sub> concentrations within Rainham AQMA .....	56
Figure F.1 – Graph of the trend in annual NO <sub>2</sub> concentrations within Four Elms Hill AQMA .....	57
Figure F.1 – Graph of the trend in annual NO <sub>2</sub> concentrations within Gillingham AQMA.....	58
Figure F.1 – Graph of the trend in annual NO <sub>2</sub> concentrations within Central Medway AQMA .....	59

## Tables

Table 2.1 – Declared Air Quality Management Areas.....	3
Table 2.2 – Progress on Measures to Improve Air Quality.....	6
Table A.1 – Details of Automatic Monitoring Sites .....	19
Table A.2 – Details of Non-Automatic Monitoring Sites .....	20
Table A.3 – Annual Mean NO <sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m <sup>3</sup> ) .....	25
Table A.4 – Annual Mean NO <sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m <sup>3</sup> ) ....	26
Table A.5 – 1-Hour Mean NO <sub>2</sub> Monitoring Results, Number of 1-Hour Means > 200µg/m <sup>3</sup> .....	29
Table A.6 – Annual Mean PM <sub>10</sub> Monitoring Results (µg/m <sup>3</sup> ) .....	30
Table A.7 – 24-Hour Mean PM <sub>10</sub> Monitoring Results, Number of PM <sub>10</sub> 24-Hour Means > 50µg/m <sup>3</sup> .....	32
Table A.8 – Annual Mean PM <sub>2.5</sub> Monitoring Results (µg/m <sup>3</sup> ).....	34
Table A.9 – SO <sub>2</sub> 2020 Monitoring Results, Number of Relevant Instances .....	36
Table B.1 – NO <sub>2</sub> 2020 Diffusion Tube Results (µg/m <sup>3</sup> ) .....	37
Table C.1 – Bias Adjustment Factor .....	41
Table C.2 – Annualisation Summary (concentrations presented in µg/m <sup>3</sup> ).....	44

Table C.3 – Local Bias Adjustment Calculation .....	45
Table C.4 – NO <sub>2</sub> Fall off With Distance Calculations (concentrations presented in µg/m <sup>3</sup> )	46
Table E.1 – Air Quality Objectives in England .....	53
Table F 1 – Impact Matrix .....	61

# 1 Local Air Quality Management

This Annual Status Report (ASR) provides an overview of air quality in Medway during 2020. It fulfils the Local Air Quality Management (LAQM) duties of Medway Council as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the Air Quality Objectives (AQOs) are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This ASR is an annual requirement showing the strategies employed by Medway Council to improve air quality and any progress that has been made.

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

## 2 Actions to Improve Air Quality

### 2.1 Air Quality Management Areas

AQMAs are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an AQAP within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Medway Council can be found in Table 2.1. The table presents a description of the four AQMAs that are currently designated within Medway. Appendix D: Map(s) of Monitoring Locations and AQMAs provides further details. All of the AQMAs have been declared with respect to the NO<sub>2</sub> annual mean AQO.

Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at [https://uk-air.defra.gov.uk/aqma/local-authorities?la\\_id=157](https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=157).

**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 ( $\mu\text{g}/\text{m}^3$ )	Level of Exceedance: Current Year ( $\mu\text{g}/\text{m}^3$ )	Name and Date of AQAP Publication	Web Link to AQAP
Central Medway AQMA	29/06/2010	NO <sub>2</sub> Annual Mean	A large central AQMA which includes previous AQMAs and new areas	YES	58.4	31.4	Air Quality Action Plan 2015	<a href="https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015">https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015</a>
Rainham AQMA	29/06/2010	NO <sub>2</sub> Annual Mean	An area running along the High Street in Rainham	YES	52.9	30.5	Air Quality Action Plan 2015	<a href="https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015">https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015</a>
Gillingham AQMA	29/06/2010	NO <sub>2</sub> Annual Mean	An area along Pier Road in Gillingham	YES	52.7	29.1	Air Quality Action Plan 2015	<a href="https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015">https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015</a>
Four Elms Hill AQMA	01/11/2017	NO <sub>2</sub> Annual Mean	Part of Four Elms Hill, Chattenden	YES	52.0	37.5	Delay in production of the new Local Plan has impacted delivery of the Four Elms Hill AQAP. Consultation will commence at the end of 2021 and the AQAP is expected to be completed late in July 2022.	

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

☒ Medway Council confirm that all current AQAPs have been submitted to Defra

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

Defra's appraisal of last year's ASR concluded that robust and accurate QA/QC procedures were applied in the 2020 ASR and it was recognised that Medway Council has a proactive and detailed approach to improving air quality across Medway. Further details of additional comments from the appraisal are listed below:

- The Council has an extensive NO<sub>2</sub> monitoring strategy. Monitoring of other pollutants is also carried out to better inform how to tackle the different types of air pollution.
- The Public Health Outcomes Frameworks was mentioned, and this is encouraged. The Council referred specifically to indicator D01. Fraction of mortality attributable to particulate air pollution.
- Council have provided a clear map of the diffusion tube monitoring network and presenting trends through graphs and a discussion is welcomed.
- Overall the report is detailed, concise and satisfies the criteria of relevant standards. The Council should continue their good and thorough work.

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

More detail on these measures can be found in the AQAP (2015). Key completed measures during 2020 include the review of the Regional Freight Strategy and the completion of the Medway Climate Change Action Plan (2021). Further details of the key objectives and outcomes of the Climate Change Action Plan are listed below, and can be found at the following location: <https://www.medway.gov.uk/climatechangeplan>

- Medway Council will continue to contribute to the county-level version of the UK Climate Change Risk Assessment (CCRIA) which is being led by Kent County Council (KCC). It is Medway Council's responsibility to identify gaps and opportunities to build a climate resilient Medway over the next few years.

- In April 2019 Medway Council declared a Climate Emergency and the Climate Change Action Plan (2021) commits Medway Council to this declaration. The declaration passed a motion to commit to reducing the districts carbon footprint and providing the local community with clean, green future and to be a place people want to work and live which has a sustainable future. The declaration also commits Medway Council to establish a clear action plan for Medway to deal with climate change, setting out an achievable and clear timeline.
- The Climate Change Action Plan (2021) sets out 11 priority areas for the next five years. There is an aim to develop a joint Kent and Medway approach to achieving a reduction in carbon emissions.

Medway Council's priorities for the coming year are:

- Various projects to progress with Electric Vehicle use in the area. projects include the Kent & Medway District Network Project, the Electric Vehicle (EV) Quick Win Project, the Medway Ultra Low Emission Vehicle (ULEV) Strategy and the EV Survey Dashboard; and
- Various Public Health Initiatives including walking, cycling, the onurbike program and the Nordic Walking Programme, all implemented through the Supporting Healthy Weight (Adults) team.

The principal challenge and barrier to implementation that Medway Council anticipates facing is security of funding, and this has lead to various measures progressing slower than expected during 2020.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Medway Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Central Medway AQMA, Rainham AQMA, Gillingham AQMA and Four Elms Hill AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Review Regional Freight Strategy	Freight and Delivery Management	Other	2017	2020	Medway Council Transport & Parking and Kent County Council	n/a					5%	Completed or not	Complete. Medway Council worked with Kent County Council on a draft revised regional Freight Action Plan (including Medway). Consultation and adoption to be undertaken during 2017. Movement of freight also tackled locally through the Medway draft Network Management Plan for 2017-2020. The draft plan aims to tackle road congestion, and performance indicators, such as journey times, traffic data, cycle count data, air quality monitoring data can be used as a means of measuring the plans impact against a baseline scenario.	
2	HGV route optimisation	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2017	2020. Ongoing for life of plans under no.1 above.	Medway Council Transport & Parking and Kent County Council	n/a						Completed or not	Ongoing. Tackled through no.1 above.	
3	HGV Sat Nav review	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2017	2020. Ongoing for life of plans under no.1 above.	Medway Council Transport & Parking and Kent County Council	n/a						Completed or not	Ongoing. Tackled through no.1 above.	
4	Monitor % HGV's through AQMA's	Freight and Delivery Management	Other		Ongoing	Medway Council Transport & Parking, DfT							Completed or not	HGV flows are not monitored by Medway Council. However, DfT data are available for a number of locations on the Medway road network, and includes locations within/near to AQMA's. Ongoing analysis of HGV traffic flow data could be used to determine effectiveness of no.1-3 above, and whether further intervention/review is required.	Relies on continued monitoring by DfT
5	Investigate the feasibility of a Quality Bus Partnership (or equivalent) with the local bus operator	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services		2021	Medway Council Transport & Parking	n/a						Completed or not	Following publication of the new government Bus Strategy in March 2021 "Bus Back Better", all Local Transport Authorities are required to produce a Statutory document - a Bus Service Improvement Plan (BSIP) by October 2021. This will focus on a number of themes that	Relies on support from local bus operator and Medway council.



Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														the government want to do to promote buses, such as ticketing, promotion, reducing emissions, and bus priority amongst others. As part of the strategy all LTAs must enter into an Enhanced Partnership with authorities to work together on advancing the use of buses. These Enhanced Partnerships must be in place by March 2022, although we need to state we are working towards them by 30 June 2021. These EPs will essentially supersede Quality Bus Partnerships.	
6	Increase proportion of Euro V, and subsequent (or equivalent) buses in fleet	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes		Ongoing	Medway Council Transport & Parking	External funding required for vehicle retrofit/renewal					5%	Annual fleet status.	As of April 2021 all 57 of ASD's fleet is Euro 5 or 6 standard. Of Arriva's 109 fleet at Gillingham Depot, 72 are Euro 5 or 6 or 66.1% of vehicles. Other operators are also uplifting their fleets. The council will continue to look at further funding initiatives to improve fleets as opportunities arise with the new Bus strategy. ZEBRA funding was not applied for due to a significant amount of capital that was required to fund the difference between electric and diesel vehicles.	Operator investment budgets. External funding is likely to be required to support the smaller bus operators in renewal/retrofitting of their vehicle fleets.
7	Increase bus patronage	Promoting Travel Alternatives	Other		Ongoing	Medway Council Transport & Parking							Annual bus patronage figures	All Medway's operators are contactless now. The Covid 19 pandemic has seen patronage levels plunge as social distancing, work patterns, and stay at home messaging has been applied by national government. As of May 2021, patronage is back at around 63-65% on non school services, and 80% on school bus routes. The industry is looking at 80% being a good marker for the future as working and retail patterns are changing. This same pattern is being seen nationally.	
8	Improve bus flow and reliability	Transport Planning and Infrastructure	Bus route improvements		Ongoing	Medway Council Transport & Parking	Bus infrastructure improvements currently delivered through internal budgets.						Number of bus infrastructure improvements	The new Bus Strategy has bus priority being placed with greater emphasis by government, and the new Bus Service Improvement Plan will be a document which will be used as a bidding document from DfT. Within limited LTP budgets small scale interventions at bus stops are being considered, but these are subject to ongoing consultations.	Reliant on continued budget provision for improvements to be made.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
9	Review taxi licensing conditions	Promoting Low Emission Transport	Taxi Licensing conditions		2021/22	Medway Council Licensing	External funding secured through DfT funded programmes.						Completed or not	<p>An engagement exercise has been undertaken by the Environmental Protection Team in conjunction with the Energy Saving Trust seeking views on opportunities and barriers to the adoption of EVs by taxi and private hire drivers/operators in Medway. The results of the engagement exercise have been shared with Licensing and other officers working on development an EV Strategy for Medway. The council plans to continue to investigate what further opportunities are available for encouraging uptake of EVs by the trade, including infrastructure, and what regulatory changes can be taken forward in the future.</p> <p>Medway's Hackney and Carriage and Private Hire Policy has been reviewed and came into effect on the 1<sup>st</sup> May 2021. The policy states that all all vehicles presented for the first time of licensing, with the exception of wheelchair accessible vehicles and stretched limousines, will have to meet or exceed the Euro 6 emission standards. This emission standard is also now included in the vehicle criteria at Appendix A. Medway Council will keep this under review and continue to monitor with a view to specifying more stringent vehicle emissions and/or inspection standards.</p>	Funding required for ULEV feasibility study/policy analysis.
10	Annual audit of taxi fleet	Promoting Low Emission Transport	Other		2022	Medway Council Licensing	External funding secured through DfT funded programmes.						Percent ULEV in annual audit of taxi fleet	<p>Historic fleet information is available. Analysis of the information is needed to identify any trends in the numbers of ULEVs present in the taxi fleet before any interventions are investigated. See measure 9 above.</p>	Detailed fleet analysis required. External funding may be required to support drivers/companies to renew/retrofit vehicles, and provide supporting infrastructure (EV charging points). Funding required for ULEV feasibility study/policy analysis.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
11	Carry out maintenance of E-mote system to protect asset for future use	Traffic Management	Other		Unknown	Medway Council Transport & Parking						8-10%	Completed or not	No action is being proposed at present to progress this measure. The e-motes have not been operative for several years since a pilot project was carried out in Medway. There are currently no plans, or funding available to carry out maintenance of the system.	No budget is available for this measure. The E-mote system would also have to be a beneficial traffic management tool for this measure to be progressed.
12	Annually report number and location of roadworks in or around AQMA's	Traffic Management	Other		Ongoing	Medway Council Transport & Parking	n/a						Completed or not	No further action is proposed as this is not a SMART indicator. However, a Street Works Permit scheme was introduced by the Council in January 2017 as a traffic management tool to reduce the disruption caused by work on the highway. Contractors are required to obtain a permit before work commences, and day of the week/time restrictions are in place for Traffic Sensitive Streets, where permits will only be issued where there is to be compliance with the time restrictions. Time restrictions may include weekend, off peak and/or night time working hours. The scheme covers all roads in Medway.	Ongoing implementation of permit scheme required.
13	Report AADT annually	Traffic Management	Other		Ongoing	Medway Council Transport & Parking							Completed or not	No further action is proposed as this is not a SMART indicator. However, performance indicators for the draft Network Management Plan (see no.1 above) are more appropriate going forward (journey times etc.). DfT traffic flow data are also available for many locations/roads in Medway.	Regular reporting of internal indicators required. Relies on continued monitoring by DfT.
14	Link ANPR vehicle class data to provide detailed source apportionment to support feasibility study work	Traffic Management	Other		Ongoing	Medway Council Transport & Parking							Completed or not	ANPR has not worked for several years, and has never been capable of giving vehicle split classifications. Traffic master data and base map software are used to obtain results. This is based on phone signal data, and is not for every vehicle. It provides journey times and volumes only. Dedicated surveys therefore may be required for future studies or source apportionment work. More detailed DfT data are however available for a number of locations/roads within Medway.	Regular reporting of internal indicators required. Relies on continued monitoring by DfT.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
15	Promoting and monitoring cycling and walking	Promoting Travel Alternatives	Promotion of cycling		Ongoing	Medway Council Sustainable Transport Team	n/a					1%	Medway mode of travel data	Cycling and walking are actively promoted by Medway Council through their website, including routes available, groups to join and guided tours/ training. Cycling is monitored in line with the Medway Cycling Action Plan. Bid outcomes for a local cycling and walking infrastructure plan 'LCWIP' are expected in June 2021.  Schemes are being progressed in accordance with the DfT Active Travel Fund with Tranche 1 having been completed in Summer 2020 and Tranche 2 Scheme currently in progress.	
16	Develop and continue walk or cycle to school scheme and events	Promoting Travel Alternatives	School Travel Plans		Ongoing	Medway Council Sustainable Transport Team	n/a						Number of schools participating	Medway Council have partnered with KM Charity Team to promote walking and cycling to school through a number of events.	
17	Develop and continue healthy walk scheme and cycle scheme	Promoting Travel Alternatives	Promotion of cycling		Ongoing	Medway Council Supporting Healthy Weight Team	n/a						Number of individuals involved	Cycling and walking are actively promoted by Medway Council through their website, including routes available, groups to join and guided tours/ training. In addition, events are held to encourage uptake.	
18	Run internal Eco-driving courses	Vehicle Fleet Efficiency	Driver training and ECO driving aids		Unknown	Medway Council Business Development and Environmental Protection	May require external funding to progress this measure.					<1%	Number of drivers on training courses	No progress has been made during 2020.	No budget available for this measure.
19	Engage with business to promote Eco-driving	Vehicle Fleet Efficiency	Driver training and ECO driving aids		Unknown	Medway Council Business Development	May require external funding to progress this measure.						Number of business engaged	No progress has been made during 2020.	Budget constraints.
20	Increase ULEV component within Medway fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles		Ongoing	Medway Council Procurement							Number of ULEV within Medway fleet	Medway Council currently do not have any ULEVs. The EU class is not currently logged but the fuel type is estimated at over 90% diesel. There are contracts which Medway Council award where there is an initiative within the industry to deploy ULEVs. The number of ULEVs is heavily dependent on the councils Procurement activities, which has so	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														far failed to result in a switch to cleaner vehicles. The Medway Air Quality Steering Group have discussed progressing this measure as a priority, and The Environmental Protection Team have carried out a council wide fleet review with the Energy Saving Trust as the basis for further work on this measure. Fleet reviews have been carried out focusing on the Grey Fleet and the Commercial Vehicle Fleet (including refuse collection vehicles). A range of recommendations have been made and these were represented to senior managers in early 2020 to seek agreement to take these forward with the relevant departments. It was agreed that recommendations of the fleet reviews shall be included in the Climate Change Action Plan. Whilst Medway's own fleet is still not inclusive of ULEV vehicle, tenders are composed to promote the use of such vehicles.	
21	Review of Medway Procurement Policy to ensure positive support for ULEV and third party emission reduction	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles		2019/20	Medway Council Procurement	n/a						Completed or not	A Procurement Strategy covering 2016-2021 has been produced. No obvious support for ULEV and third party emissions reduction. This will need to be explored further. The current Procurement Strategy needs reworking and is showing its age. This was expected to be carried out during 2019/20 but has been put on hold. Whilst greater consideration has been given to the utilisation of ULEV vehicles, no corporate decision has been made to weight these elements, meaning that whilst they are desirable, they are not mandatory. Whilst this will be addressed in the Procurement Strategy, a Social Value Policy is also being enacted which will propose the weighting of environmental impacts is considered on future projects.	
22	Develop and improve school travel plans	Promoting Low Emission Transport	School Travel Plans		Ongoing	Medway Council Business Development Team							Number of schools with active travel plans	90% of all schools in Medway have previously developed a school travel plan, and there is a continued requirement to produce these in accordance with planning applications that impact upon the	Relies on significant changes occurring that require planning permission



Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
														travel and transport needs associated with school journeys.	
23	Review and align Medway Travel Plan with AQAP	Promoting Travel Alternatives	Workplace Travel Planning		Ongoing	Medway Council Business Development Team							Completed or not	No progress has been made during 2020, though actions in the climate change action plan are likely to lead to progress in this area. Various staff travel benefits are still running, including discounted bus tickets, interest free loans for bus and rail tickets, cycling facilities, interest free cycle loans, and various other ICT developments and working practices that reduce the need for office attendance, including ongoing investment to facilitate home/remote working.	No budget available for this measure.
24	Develop work place travel plans	Promoting Travel Alternatives	Workplace Travel Planning		Unknown	Medway Council Business Development Team							Number of businesses with a travel plan	No budget is allocated to travel planning, and no staff availability to promote this. A new travel plan steering group has been set up for the London Medway Commercial Park as result of a Section 106 agreement drawn up through the planning process. The travel plan has a dedicated travel plan coordinator, ongoing monitoring arrangements and trip reduction initiatives.  The Climate Change Action Plan 2021 stipulates a requirement for Medway Council to produce a Staff Travel Plan survey. This is expected to inform aims, objectives and targets, including n action plan of supportive measures.	No budget available for this measure.
25	Promote car sharing and reduce the number of trips	Alternatives to private vehicle use	Car & lift sharing schemes		Ongoing	Medway Council Environmental Protection Team	Currently being delivered through internal budgets.						Number registered on Liftshare scheme	The Medway car share scheme has been in existence for a number of years and has received little ongoing support in terms of promoting the scheme and increasing the number of registered users. In 2018, the Environmental Protection Team took on the scheme, as it supports implementation of the Air Quality Communications Strategy. Engagement and awareness raising initiatives were suspended during 2020 due to the pandemic.	No budget available for this measure.
26	Review and re-write relevant planning policies and develop a	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance		2021	Medway Council Planning and Environmental Protection	n/a						Number of relevant policies reviewed and re-written that	New air quality planning guidance was adopted in April 2016, emphasising mitigation of impacts using a damage costs approach.	Requires implementation and recording of policy on decision notices.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	supplementary planning document to reflect this action plan and relevant and related corporate strategies												are beneficial to air quality	Work on the new Medway Local Plan has continued.	
27	Improve and then maintain awareness of the health and financial impacts of air pollution to all stakeholder groups; businesses, schools, public, vulnerable groups, members, and internal managers	Public Information	Other		Ongoing	Medway Council Environmental Protection Team	Currently being delivered through internal budgets.						Number of notifications and consultations carried out	The Air Quality Communication Strategy facilitates increasing public awareness of the impacts of poor air quality on health. Methods of effective communication to stakeholders specified in the AQCS are followed by Medway Council.	
28	Development of promotional material to support Eco-driving within businesses	Vehicle Fleet Efficiency	Other		Unknown	Medway Council Environmental Protection, Public Health and Communications	May require external funding to progress this measure.					<1%	Number of press releases, reports on websites, presentations delivered, workshops delivered and leaflets dropped	No progress has been made during 2020.	
29	Develop an air quality communication strategy with public relations team	Public Information	Other	2018	2018	Medway Council Communications and Environmental Protection	Delivered through internal budgets.						Completed or not	Complete. The Medway Air Quality Communication Strategy was launched in 2018.	
30	Set up AQAP Steering Group and book 6 monthly meetings with stakeholders	Policy Guidance and Development Control	Other policy	2016	Ongoing	Medway Council Environmental Protection							Completed or not	Complete. The Air Quality Steering Group did not meet during 2020, however measures continued to be progressed.	
31	Engage with business,	Public Information	Via other mechanisms		Unknown	Medway Council Communications	n/a						Number of events and	We have promoted the Kent Realising Electric Van Scheme	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
	internal members and managers as priority					and Environmental Protection							presentations where the AQAP has been represented	(REVS) to business in Medway via social media platforms and our Low Carbon Business Support pages on the Council's website. The scheme provides businesses with an opportunity to try an electric van for 2 months for free. The scheme was launched in September 2020 to all business in Kent and to date, one business in Medway has signed up to participate.	
32	Integrate, where appropriate, AQAP target into internal service plans	Policy Guidance and Development Control	Other policy		Ongoing	Medway Council Performance Hub and Environmental Protection	n/a						Number of service plans with AQAP related actions included	The AQAP features in the Environmental Protection Team service plan. Work required to identify if appropriate to integrate AQAP into other service plans going forward. No progress to report during 2020.	
33	Identify corporate policies and strategies where consultation of changes is requested and notify accountable department	Policy Guidance and Development Control	Other policy		Ongoing	Medway Council Environmental Protection	n/a						Number identified	Ongoing input provided in to development of the new Local Plan and HIF project. In April 2019, Full Council declared a climate emergency and committed to producing a rolling 5 year Climate Change action plan (to be reviewed annually). Estimated Actual Completion Date – Summer 2021 A key focus of the Climate Change action plan will be a reduction in emissions from transport. This will serve to reduce air pollution from vehicles and by doing so improve air quality in Medway.	
34	Develop business case for evaluation or quantification studies to take forward 2016-2017	Other	Other		Ongoing	Medway Council Environmental Protection	External funding may be required on a case by case basis.						Completed or not	See above updates on EST fleet reviews and Taxi licensing.	Budget constraints. Staff resources.



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

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

Contained within the AQAP are a variety of measures that are aimed at managing emissions from road traffic. Measures intended to tackle road traffic pollution emissions (including PM<sub>2.5</sub> emissions) include a variety of traffic management measures, freight and delivery management measures, transport planning and infrastructure measures, vehicle fleet efficiency measures, measures to promote travel alternatives and alternatives to private vehicle use and measures to promote low emission transport. Other measures being implemented by Medway Council, including the establishment of the Medway Air Quality Steering Group, the development and implementation of new air quality planning guidance, local enterprise partnership funding, activity supporting walking and cycling and public health initiatives, will also help to reduce concentrations of PM<sub>2.5</sub> within Medway.

Medway Council also support the Local Transport Plan for Kent (2017) and has developed a Local Plan which the Council is in the process of updating; both of these plans include measures aimed at improving air quality through the management of road traffic, which will have a positive impact on concentrations of PM<sub>2.5</sub>.

Medway Council is part of the Kent Health and Wellbeing Board, which works to improve public health through tackling key health issues (including poor air quality). In addition, the Kent and Medway Air Quality Partnership (K&MAQP) aims to tackle air pollution across the County and works with Public Health colleagues to prioritise action on air quality in its area, taking into consideration the PHOF, which includes an indicator based on the effect of PM<sub>2.5</sub> on mortality (indicator 3.01).

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

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

### 3.1 Summary of Monitoring Undertaken

#### 3.1.1 Automatic Monitoring Sites

Medway undertook automatic (continuous) monitoring at two sites during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The <https://kentair.org.uk/> website presents automatic monitoring results for Medway 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

Medway Council undertook non-automatic (i.e. passive) monitoring of NO<sub>2</sub> at 44 sites during 2020. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

### 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<sub>2</sub>)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO<sub>2</sub> hourly mean concentrations for the past five years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.

Measured concentrations at both automatic monitoring sites were below the annual mean AQO in 2020. Measured concentrations were also below the annual mean AQO at 43 of the 44 NO<sub>2</sub> diffusion tube monitoring sites. The distance-correction calculation indicates that the NO<sub>2</sub> concentration at the nearest location of relevant exposure to the single tube showing exceedance is below the annual mean AQO.

There were no measured exceedances of the 1-hour AQO in 2020 by either of the automatic monitoring sites. Furthermore, measured annual mean concentrations at all diffusion tube monitoring sites were below 60 µg/m<sup>3</sup>, indicating that an exceedance of the 1- hour mean objective is unlikely.

The exceedance of the annual mean NO<sub>2</sub> AQO recorded in 2020 was at monitoring site DT24 which is found within the Four Elms Hill AQMA. There were no exceedances recorded in 2020 in either of the remaining three AQMAs currently declared by Medway Council. The concentration at DT24 was recorded at 44.5 µg/m<sup>3</sup> during 2020, the distance-correction calculation indicates that the concentration at the nearest location of relevant exposure was 36.2 µg/m<sup>3</sup>. It should be noted that concentrations were lower in 2020 as a result of the national COVID-19 lockdown. Further detail regarding the challenges

Medway Council has faced as a result of COVID-19 and the opportunities that COVID-19 has presented to Medway Council can be found in Appendix F.

### 3.2.2 Particulate Matter (PM<sub>10</sub>)

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM<sub>10</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>.

Table A.7 in Appendix A compares the ratified continuous monitored PM<sub>10</sub> daily mean concentrations for the past five years with the air quality objective of 50µg/m<sup>3</sup>, not to be exceeded more than 35 times per year.

Measured concentrations at both monitoring sites were well below the annual and 24-hour mean AQOs in 2020, and the number daily means above 50µg/m<sup>3</sup> decreased compared to 2019.

There is a weak trend of increasing concentrations at both the Chatham and Rochester automatic monitors between 2016 and 2018, with concentrations decreasing slightly by 2020.

The PM monitoring equipment at the Chatham site was changed from an FDMS TEOM to a BAM at the end of 2016, which may have affected results.

### 3.2.3 Particulate Matter (PM<sub>2.5</sub>)

Table A.8 in Appendix A presents the ratified and adjusted monitored PM<sub>2.5</sub> annual mean concentrations for the past five years.

There is a trend of increasing concentrations of PM<sub>2.5</sub> between 2016 and 2018 at the Chatham monitoring site, however concentrations decreased in 2019 and 2020. As mentioned above, some of this change may have been attributable to the change in monitoring equipment in 2016. The Rochester Stoke monitoring site shows concentrations fluctuating between 9.7 µg/m<sup>3</sup> and 11.3 µg/m<sup>3</sup> in 2016 to 2020.

### 3.2.4 Sulphur Dioxide (SO<sub>2</sub>)

Table A.9 in Appendix A compares the ratified continuous monitored SO<sub>2</sub> concentrations for 2020 with the air quality objectives for SO<sub>2</sub>. In 2020 there were no measured exceedances of the 15-minute mean, 1-hour mean or 24-hour mean AQO for SO<sub>2</sub>.

## 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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Inlet Height (m)
Chatham	Chatham	Urban	577437	166993	NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub>	YES (3)	NO <sub>2</sub> - Chemiluminescent analyser, PM <sub>10</sub> and PM <sub>2.5</sub> - BAM (FDMS previous to November 2016)	0	4	2.5
Rochester Stoke	Rochester Stoke (AURN)	Rural	583158	176314	NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , O <sub>3</sub>	NO	NO <sub>2</sub> - Chemiluminescent analyser, PM <sub>10</sub> and PM <sub>2.5</sub> - FIDAS (FDMS previous to August 2018, SO <sub>2</sub> and O <sub>3</sub> - UV fluorescent analyser	0	N/A	2.5

**Notes:**

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

(2) N/A if not applicable

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

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT01	60 High Street, Rainham	Roadside	581568	165952	NO <sub>2</sub>	YES	0.0	2.5	No	2.3
DT02	High Street, Strood (Tanning studio)	Roadside	573482	169282	NO <sub>2</sub>	YES	0.0	2.5	No	2.5
DT03	46 High Street, Strood (Heating shop)	Roadside	573793	169164	NO <sub>2</sub>	YES	0.0	2.1	No	2.5
DT04	30-32 Luton Road (Funeral Directors)	Roadside	576565	167336	NO <sub>2</sub>	YES	0.0	2.9	No	2.5
DT05	27 High Street, Luton	Roadside	577426	166506	NO <sub>2</sub>	YES	0.0	2.0	No	2.5
DT06	18 Star Hill	Roadside	574589	168087	NO <sub>2</sub>	YES	0.0	3.3	No	2.5
DT07	92 Cuxton Road, Strood	Roadside	573078	168908	NO <sub>2</sub>	YES	0.0	4.2	No	2.2
DT08	Railway Street, Chatham	Roadside	575642	167779	NO <sub>2</sub>	YES	0.0	5.5	No	3.0
DT09	Chatham AQ station	Roadside	577434	166993	NO <sub>2</sub>	YES	0.0	3.3	Yes	2.5
DT10	Flat, 4 New Road, Chatham	Roadside	575681	167691	NO <sub>2</sub>	YES	0.0	8.2	No	4.0
DT11	High Street, Chatham (Orbit Housing)	Roadside	576393	167495	NO <sub>2</sub>	YES	0.0	3.1	No	2.5
DT12	28 Frindsbury Road	Roadside	573865	169646	NO <sub>2</sub>	YES	0.0	3.1	No	2.1
DT13	Stoke AQ station	Rural	583152	176305	NO <sub>2</sub>	YES	0.0	N/A	Yes	2.5
DT15	Lamp post adjacent White	Roadside	581709	165922	NO <sub>2</sub>	YES	1.0	2.4	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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	Horse pub, 95 High Street, Rainham									
DT16	Care home, 117 High Street, Rainham	Roadside	581843	165886	NO <sub>2</sub>	YES	0.0	4.9	No	2.5
DT17	Lamp post adjacent 159 Rainham Road, Gillingham (Canterbury Street junction)	Roadside	577768	166922	NO <sub>2</sub>	YES	2.8	1.9	No	2.5
DT18	Lamp post adjacent 4b Luton Road (Luton Arches junction)	Roadside	576508	167404	NO <sub>2</sub>	YES	1.0	1.8	No	2.5
DT19	5 London Road, Strood (Dentist)	Roadside	573329	169294	NO <sub>2</sub>	YES	0.0	2.5	No	2.5
DT20	Lamp post adjacent 33 London Road, Strood	Roadside	573168	169305	NO <sub>2</sub>	YES	6.7	1.7	No	2.0
DT21	88 Spire Way, Wainscott	Roadside	574999	170882	NO <sub>2</sub>	YES	0.0	29.0	No	2.2
DT22	Joy Lodge, Four Elms Hill	Roadside	575488	171616	NO <sub>2</sub>	YES	0.0	12.0	No	1.2
DT23	1 Omaha Place, Wainscott	Roadside	575044	171351	NO <sub>2</sub>	NO	0.0	34.0	No	2.1
DT24	Sign post RS106 adjacent 1A Main	Kerbside	575948	171847	NO <sub>2</sub>	YES	2.2	0.5	No	2.6

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	Road, Chattenden									
DT25	Lamp post PAS23 adjacent 2A Pier Road	Roadside	577908	169285	NO <sub>2</sub>	YES	0.4	3.3	No	2.3
DT26	Lamp post PAS512 adjacent 24 Pier Road	Roadside	578007	169262	NO <sub>2</sub>	YES	6.8	2.6	No	2.4
DT27	Lamp post PAS22 adjacent Liberty Quays, Pier Road	Roadside	577880	169319	NO <sub>2</sub>	YES	4.6	3.8	No	2.4
DT28	Lamp post NDL49 adjacent 9 New Road, Chatham	Roadside	575737	167670	NO <sub>2</sub>	YES	6.4	1.0	No	2.5
DT29	Lamp post NDJ4 adjacent Trinity College, New Road Avenue	Roadside	574760	167892	NO <sub>2</sub>	YES	6.1	2.9	No	2.5
DT30	Lamp post NDK6 adjacent Tuition Centre, New Road Avenue/Manor Road junction	Roadside	575473	167837	NO <sub>2</sub>	YES	0.0	3.1	No	2.5
DT31	7 Highview Drive, Chatham	Roadside	574788	164568	NO <sub>2</sub>	YES	0.0	8.4	No	2.5
DT32	Lamp post FEA016 adjacent 6 Balls Cottages,	Roadside	575903	171802	NO <sub>2</sub>	YES	8.4	1.9	No	2.4



Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	Main Road, Chattenden									
DT33	Lamp post FEA20 adjacent 2 Broadwood Road, Chattenden	Roadside	575971	171833	NO <sub>2</sub>	YES	2.4	1.8	No	2.6
DT34	Lamp post CP019, Corporation Street	Roadside	574499	168495	NO <sub>2</sub>	YES	N/A	2.6	No	1.8
DT35	Sign post adjacent McDonalds, Commercial Road, Strood	Roadside	573518	169176	NO <sub>2</sub>	YES	8.0	1.5	No	2.2
DT37	Lamp post adjacent former Churchills Pub, The Brook, Chatham	Roadside	575862	168104	NO <sub>2</sub>	YES	2.4	2.4	No	2.2
DT38	Lamp post adjacent The Brook/Queen Street junction	Roadside	576056	167835	NO <sub>2</sub>	YES	N/A	3.7	No	2.2
DT39	Lamp post adjacent Iceland, The Brook, Chatham	Roadside	576084	167762	NO <sub>2</sub>	YES	N/A	3.9	No	2.1
DT40	Lamp post adjacent 7 Rochester Road	Roadside	570615	166065	NO <sub>2</sub>	NO	2.9	1.2	No	1.9

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT41	3 Formby Terrace	Roadside	570281	164949	NO <sub>2</sub>	NO	0.0		No	1.9
DT42	Lamp post ASP3 adjacent Aspdin Close	Roadside	570276	165016	NO <sub>2</sub>	NO	6.5	32.5	No	2.0
DT43	13 Squires Close, Strood	Roadside	570713	169417	NO <sub>2</sub>	NO	0.0	14.1	No	2.0
DT44	Lamp post adjacent Strood Hub, High Street, Strood	Roadside	573590	169263	NO <sub>2</sub>	YES	3.7	2.0	No	2.0
DT45	Lamp post RAM11 adjacent 77 Rock Avenue. Gillingham	Roadside	577322	167449	NO <sub>2</sub>	NO	3.1	4.5	No	2.1
DT46	Lamp post MFZ6 Montgomery Road, Gillingham	Roadside	577221	167485	NO <sub>2</sub>	NO	0.3	1.6	No	2.2

**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<sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m<sup>3</sup>)**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
Chatham	577437	166993	Urban Centre	Automatic	98.3	23.5	25.7	25.4	23.4	18.4
Rochester Stoke	583158	176314	Rural	Automatic	98.7	13.0	13.3	14.7	13.0	10.2

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16**

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

**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>.

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

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

**Table A.4 – Annual Mean NO<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)**

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
DT01	581568	165952	Roadside	100	100.0	<b>42.2</b>	<b>45.4</b>	37.3	39.3	30.5
DT02	573482	169282	Roadside	100	100.0	<b>47.0</b>	<b>43.0</b>	<b>43.8</b>	30.8	34.6
DT03	573793	169164	Roadside	84.6	84.6	<b>51.7</b>	<b>51.0</b>	<b>46.4</b>	<b>43.6</b>	37.5
DT04	576565	167336	Roadside	100	100.0	38.6	37.9	32.5	33.8	27.3
DT05	577426	166506	Roadside	100	100.0	33.0	34.2	30.3	30.3	23.8
DT06	574589	168087	Roadside	100	100.0	<b>50.9</b>	<b>51.0</b>	<b>45.9</b>	<b>47.8</b>	39.3
DT07	573078	168908	Roadside	100	100.0	39.4	38.8	35.9	34.6	27.9
DT08	575642	167779	Roadside	82.7	82.7	39.3	38.8	37.6	<b>40.5</b>	32.8
DT09	577434	166993	Roadside	100	100.0	25.6	25.5	22.8	24.5	18.0
DT10	575681	167691	Roadside	100	100.0	34.0	32.4	31.0	32.5	25.6
DT11	576393	167495	Roadside	100	100.0	35.6	35.7	32.2	32.7	27.9
DT12	573865	169646	Roadside	100	100.0	36.6	35.5	33.6	33.2	26.3
DT13	583152	176305	Rural	92.3	92.3	12.2	13.8	13.1	13.1	10.0
DT15	581709	165922	Roadside	82.7	82.7	35.3	36.0	31.8	30.8	25.3
DT16	581843	165886	Roadside	75	75.0	28.6	28.6	24.1	24.2	18.6
DT17	577768	166922	Roadside	92.3	92.3	<b>43.5</b>	<b>45.3</b>	<b>40.6</b>	38.8	31.2
DT18	576508	167404	Roadside	100	100.0	<b>46.3</b>	<b>48.0</b>	<b>40.4</b>	<b>42.9</b>	35.7
DT19	573329	169294	Roadside	100	100.0	<b>47.4</b>	<b>48.0</b>	<b>43.7</b>	<b>42.1</b>	35.9
DT20	573168	169305	Roadside	92.3	92.3	<b>48.5</b>	<b>51.0</b>	<b>47.2</b>	<b>43.3</b>	39.1
DT21	574999	170882	Roadside	100	100.0	23.4	22.4	21.4	19.9	21.5
DT22	575488	171616	Roadside	100	100.0	29.0	31.0	28.0	27.2	23.4
DT23	575044	171351	Roadside	100	100.0	27.0	25.3	29.0	24.4	19.5
DT24	575948	171847	Kerbside	90.4	90.4	<b>50.9</b>	<b>50.8</b>	<b>47.4</b>	<b>53.2</b>	<b>44.5</b>
DT25	577908	169285	Roadside	90.4	90.4	36.5	<b>42.9</b>	37.9	35.8	29.1
DT26	578007	169262	Roadside	84.6	84.6	33.6	28.1	27.9	24.4	19.0
DT27	577880	169319	Roadside	92.3	92.3	33.5	39.1	35.6	34.1	26.6
DT28	575737	167670	Roadside	100	100.0	39.6	<b>41.9</b>	<b>40.5</b>	<b>44.4</b>	31.1
DT29	574760	167892	Roadside	92.3	92.3	35.9	35.4	30.5	32.5	24.9
DT30	575473	167837	Roadside	92.3	92.3	24.5	38.2	36.2	34.1	27.6
DT31	574788	164568	Roadside	75	75.0	<b>N/A</b>	26.5	21.6	21.0	18.0
DT32	575903	171802	Roadside	100	100.0	<b>N/A</b>	<b>47.5</b>	<b>46.3</b>	<b>43.1</b>	38.9
DT33	575971	171833	Roadside	100	100.0	<b>N/A</b>	<b>43.5</b>	<b>41.6</b>	<b>42.0</b>	36.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
DT34	574499	168495	Roadside	65.4	65.4	<u>N/A</u>	37.3	38.6	36.1	26.3
DT35	573518	169176	Roadside	40.4	40.4	<u>N/A</u>	30.2	31.5	29.4	23.2
DT37	575862	168104	Roadside	92.3	92.3	<u>N/A</u>	<u>N/A</u>	31.4	33.1	23.9
DT38	576056	167835	Roadside	92.3	92.3	<u>N/A</u>	<u>N/A</u>	30.7	29.1	24.4
DT39	576084	167762	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	31.1	31.5	26.0
DT40	570615	166065	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<b>43.4</b>	33.1
DT41	570281	164949	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	23.1	18.9
DT42	570276	165016	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	18.8	14.3
DT43	570713	169417	Roadside	65.4	65.4	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	29.4	24.6
DT44	573590	169263	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<b>48.3</b>	31.4
DT45	577322	167449	Roadside	100	100.0	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	25.9
DT46	577221	167485	Roadside	92.3	92.3	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	25.0

☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16

☒ Diffusion tube data has been bias adjusted

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

#### Notes:

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

Exceedances of the NO<sub>2</sub> annual mean objective of  $40\mu\text{g}/\text{m}^3$  are shown in **bold**.

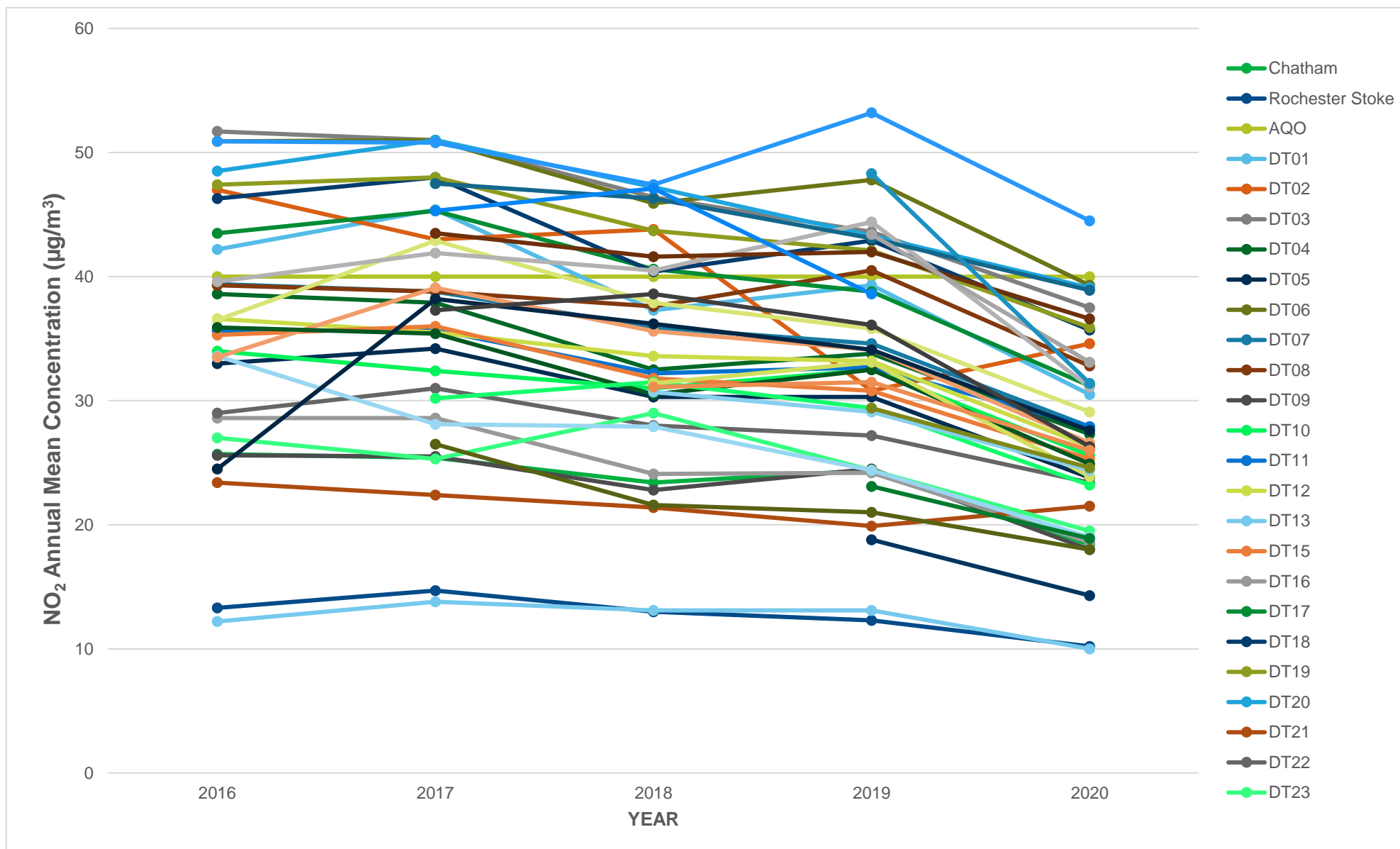
NO<sub>2</sub> annual means exceeding  $60\mu\text{g}/\text{m}^3$ , indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is 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<sub>2</sub> Concentrations

**Table A.5 – 1-Hour Mean NO<sub>2</sub> Monitoring Results, Number of 1-Hour Means > 200µg/m<sup>3</sup>**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
Chatham	577437	166993	Urban Centre	98.3	98.3	0	0	0	0	0
Rochester Stoke	583158	176314	Rural	98.7	98.7	0	0	0	0	0

**Notes:**

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

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

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<sub>10</sub> Monitoring Results (µg/m<sup>3</sup>)**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
Chatham	577437	166993	Urban Centre	95.6	95.6	19.1	21.6	23.7	23.0	22.0
Rochester Stoke	583158	176314	Rural	99.8	99.8	15.8	15.8	17.4	15.0	15.0

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16**

**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>.

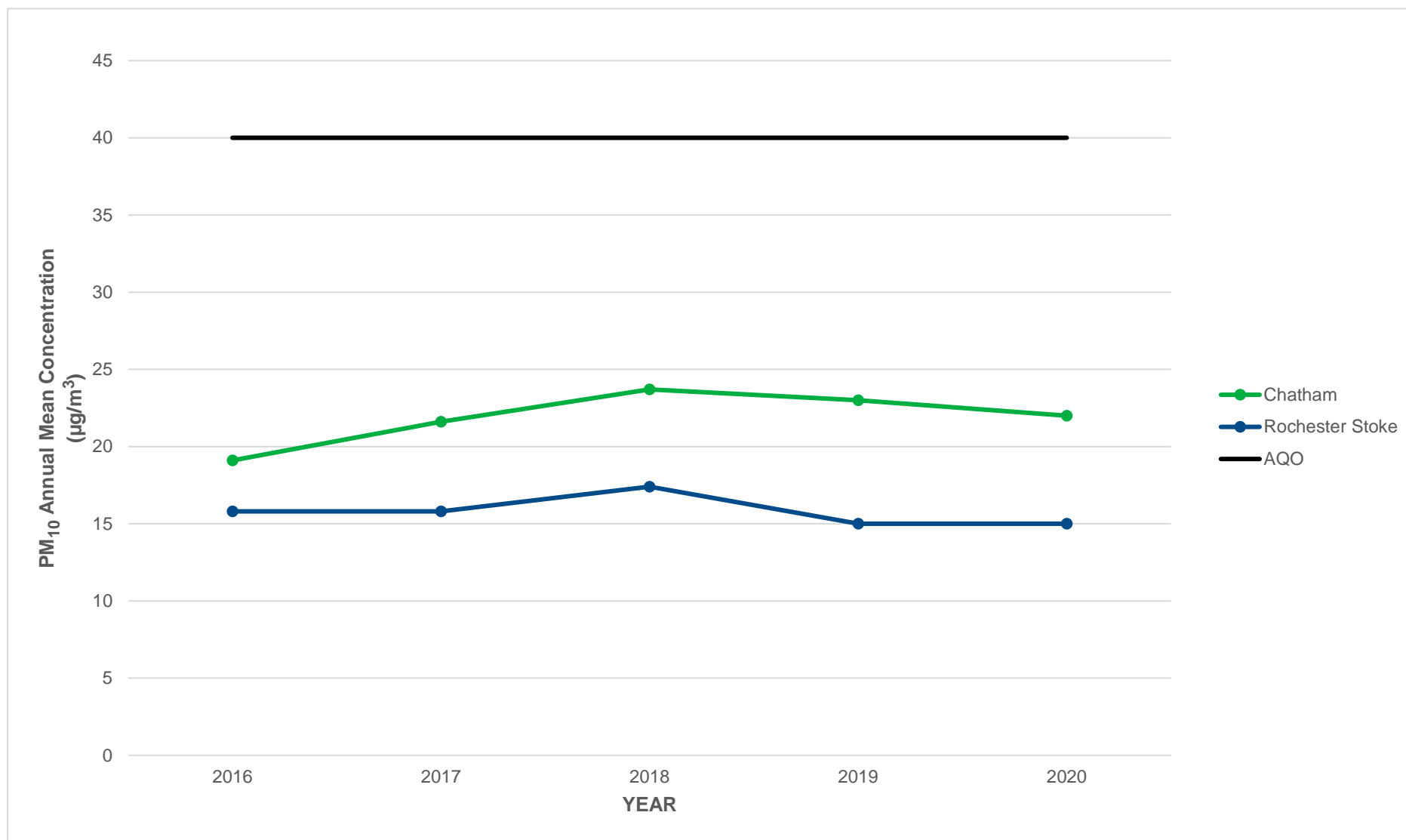
Exceedances of the PM<sub>10</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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 PM<sub>10</sub> Concentrations**

**Table A.7 – 24-Hour Mean PM<sub>10</sub> Monitoring Results, Number of PM<sub>10</sub> 24-Hour Means > 50µg/m<sup>3</sup>**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
Chatham	577437	166993	Urban Centre	95.6	95.6	3	7	11	14	7
Rochester Stoke	583158	176314	Rural	99.8	99.8	<b>4 (32)</b>	4	0	10	7

**Notes:**

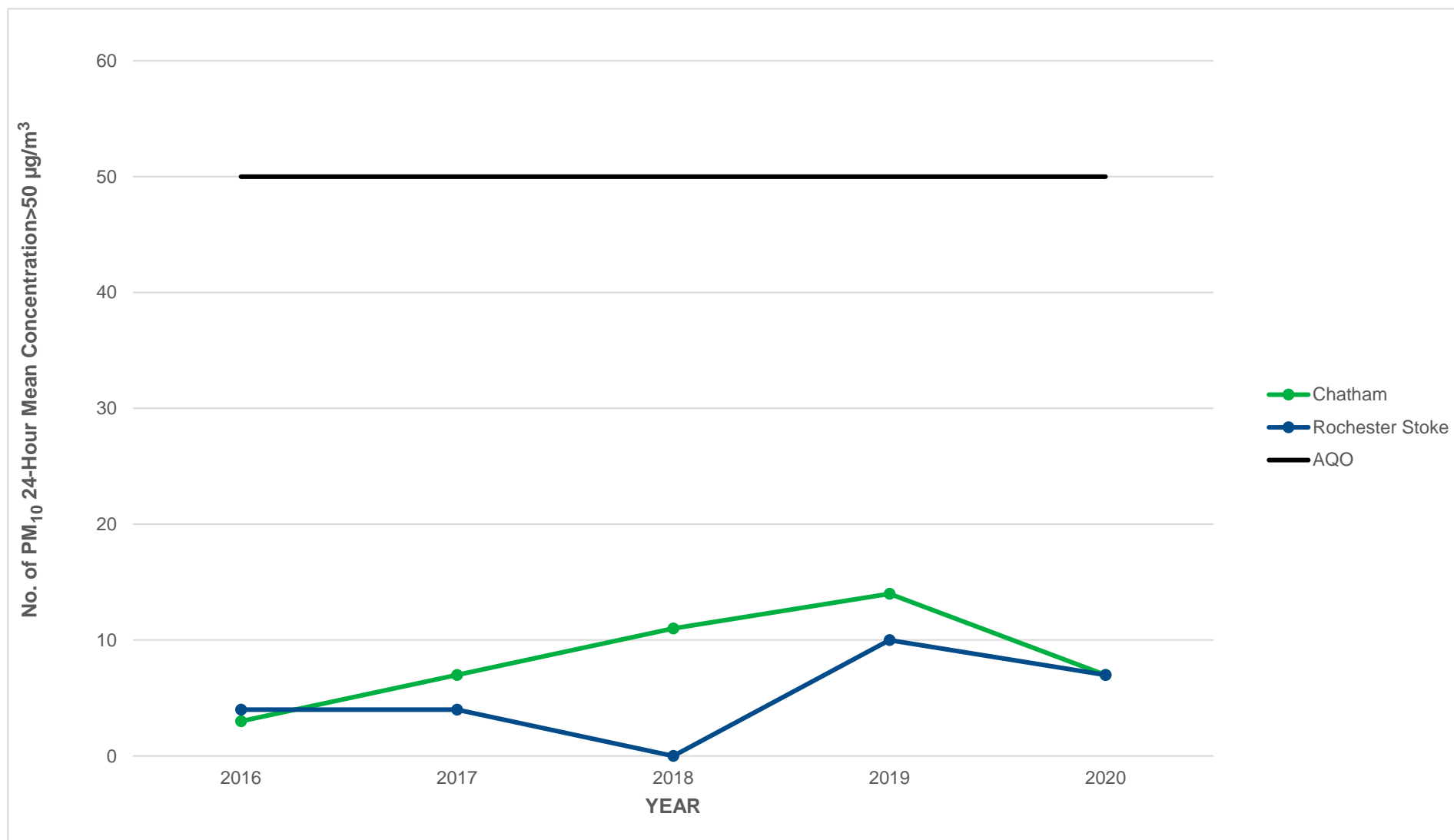
Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m<sup>3</sup> have been recorded.

Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> 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%).

**Figure A.3 – Trends in Number of 24-Hour Mean PM<sub>10</sub> Results > 50µg/m<sup>3</sup>**

**Table A.8 – Annual Mean PM<sub>2.5</sub> Monitoring Results (µg/m<sup>3</sup>)**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
Chatham	577437	166993	Urban Centre	90.1	90.1	11.5	14.1	15.2	13.7	11.0
Rochester Stoke	583158	176314	Rural	99.8	99.8	11.3	9.7	10.1	10.9	10.0

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16**

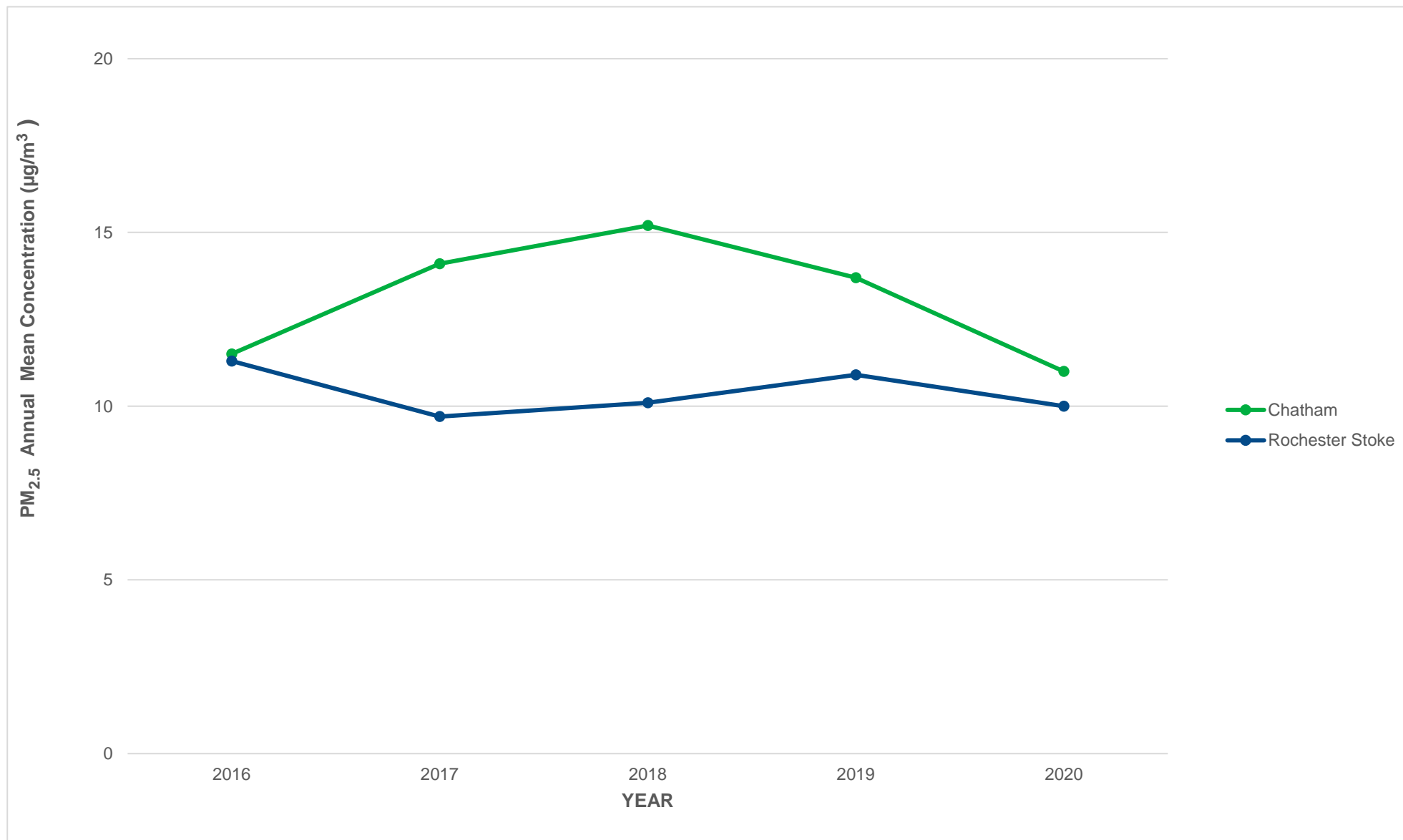
**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>.

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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.4 – Trends in Annual Mean PM<sub>2.5</sub> Concentrations**

**Table A.9 – SO<sub>2</sub> 2020 Monitoring Results, Number of Relevant Instances**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2020 (%) <sup>(2)</sup>	Number of 15-minute Means > 266µg/m <sup>3</sup>	Number of 1-hour Means > 350µg/m <sup>3</sup>	Number of 24-hour Means > 125µg/m <sup>3</sup>
Rochester Stoke	583158	176314	Rural	54.7	54.7	0	0	0

**Notes:**

Results are presented as the number of instances where monitored concentrations are greater than the objective concentration.

Exceedances of the SO<sub>2</sub> objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year).

If the period of valid data is less than 85%, the relevant percentiles are provided in brackets.

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

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

## Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO<sub>2</sub> 2020 Diffusion Tube Results (µg/m<sup>3</sup>)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77 and local factors)*	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT01	581568	165952	56.4	47.0	33.6	27.0	29.8	38.2	37.1	42.9	42.0	36.6	47.1	38.3	39.7	30.5	-	
DT02	573482	169282	56.5	35.8	43.4	39.2	41.0	41.4	35.3	49.8	51.0	45.3	53.4	46.5	44.9	34.6	-	
DT03	573793	169164	57.9	-	-	42.5	42.3	42.5	39.4	48.8	54.1	52.1	56.3	50.8	48.7	37.5	-	
DT04	576565	167336	47.5	33.6	30.9	31.3	25.6	31.0	28.3	37.0	40.6	37.3	41.7	41.2	35.5	27.3	-	
DT05	577426	166506	44.5	29.8	29.6	22.5	22.5	27.5	23.2	33.2	34.5	31.1	38.0	33.8	30.9	23.8	-	
DT06	574589	168087	57.8	53.1	42.1	37.8	37.9	50.4	43.0	57.7	55.3	61.3	61.9	54.0	51.0	39.3	-	
DT07	573078	168908	46.4	31.2	33.6	32.4	32.1	32.3	29.7	41.5	41.5	36.5	42.1	36.0	36.3	27.9	-	
DT08	575642	167779	54.5	39.7	-	26.9	-	37.6	31.3	48.2	46.7	48.4	49.8	43.5	42.7	32.8	-	
DT09	577434	166993	40.0	30.7	23.1	20.3	17.2	20.6	21.6	23.0	27.7	28.0	32.9	27.0	26.0	15.7	-	
DT10	575681	167691	50.2	30.1	26.5	28.0	21.8	30.0	23.8	35.1	33.9	37.0	43.7	38.5	33.2	25.6	-	
DT11	576393	167495	51.0	43.5	31.8	29.6	23.6	31.5	28.4	36.3	38.6	40.1	43.9	35.8	36.2	27.9	-	
DT12	573865	169646	47.9	33.6	26.6	32.7	27.6	31.2	22.9	33.6	35.5	35.2	45.7	36.7	34.1	26.3	-	
DT13	583152	176305	32.7	16.8	14.6	17.5	10.0	14.4	11.2	14.6	-	32.9	28.8	22.8	19.7	11.9	-	
DT15	581709	165922	43.1	24.3	27.5	32.1	30.3	32.9	28.9	-	-	35.5	42.6	31.3	32.9	25.3	-	
DT16	581843	165886	35.8	-	-	15.9	17.8	19.2	21.0	22.8	27.7	24.8	32.4	-	24.2	18.6	-	
DT17	577768	166922	61.6	-	32.4	26.2	30.4	35.1	39.1	40.6	45.6	42.9	47.5	44.1	40.5	31.2	-	
DT18	576508	167404	64.8	53.8	37.0	36.5	31.6	44.5	36.7	47.4	50.8	49.4	55.4	48.2	46.3	35.7	-	
DT19	573329	169294	60.3	55.4	37.5	34.4	35.4	45.5	44.5	47.4	49.7	55.3	50.1	43.7	46.6	35.9	-	
DT20	573168	169305	64.9	-	33.9	45.2	41.1	50.8	51.1	53.9	54.1	55.5	58.2	49.2	50.7	39.1	31.1	
DT21	574999	170882	31.1	18.3	18.4	22.5	16.1	20.0	16.1	20.8	23.3	55.5	51.0	42.7	28.0	21.5	-	
DT22	575488	171616	41.3	27.7	25.8	16.3	25.7	30.3	27.1	32.8	35.5	31.3	39.1	32.4	30.4	23.4	-	
DT23	575044	171351	31.9	18.8	22.5	28.4	22.3	24.3	16.6	26.6	30.5	22.5	31.7	27.9	25.3	19.5	-	
DT24	575948	171847	89.4	51.6	49.4	44.3	42.9	51.8	48.9	54.0	65.6	-	77.3	60.6	57.8	44.5	36.2	
DT25	577908	169285	57.5	36.1	32.3	28.6	29.6	32.9	30.6	-	38.8	38.0	49.7	41.3	37.8	29.1	-	
DT26	578007	169262	39.1	-	-	22.4	18.5	19.2	15.4	23.4	27.9	21.7	34.5	24.6	24.7	19.0	-	
DT27	577880	169319	55.5	26.7	30.8	29.1	30.6	-	27.5	37.0	32.1	33.1	44.4	33.2	34.5	26.6	-	
DT28	575737	167670	45.6	29.1	35.7	42.1	36.8	41.6	29.2	47.2	48.5	40.4	45.2	44.0	40.5	31.1	-	
DT29	574760	167892	-	32.8	31.3	28.8	22.2	28.4	25.3	32.9	38.9	33.3	44.5	38.0	32.4	24.9	-	
DT30	575473	167837	50.5	-	28.5	34.9	30.3	33.1	26.2	34.1	41.2	37.9	45.7	32.1	35.9	27.6	-	
DT31	574788	164568	32.9	21.2	17.5	16.8	-	-	15.4	20.4	-	26.1	33.5	26.9	23.4	18.0	-	
DT32	575903	171802	75.3	47.3	41.7	38.6	40.6	46.7	45.6	51.9	53.5	52.8	62.1	49.4	50.5	38.9	30.2	
DT33	575971	171833	66.3	45.5	41.3	36.2	35.1	41.1	41.7	44.3	53.5	54.9	60.6	50.4	47.6	36.6	32.8	
DT34	574499	168495	46.8	28.9	31.1	31.5	28.0	31.0	22.7	36.3	-	-	-	-	32.0	26.3	-	
DT35	573518	169176	-	29.8	-	26.4	-	27.1	23.5	-	-	-	-	39.0	29.2	23.2	-	
DT37	575862	168104	45.4	17.1	29.8	27.8	24.4	29.0	24.4	31.3	-	35.2	39.7	37.3	31.0	23.9	-	
DT38	576056	167835	45.2	31.8	25.6	30.2	20.2	24.3	-	30.1	34.8	36.1	34.2	35.6	31.6	24.4	-	
DT39	576084	167762	48.7	31.0	31.4	28.1	22.7	25.5	24.1	35.3	39.6	35.8	42.5	40.5	33.8	26.0	-	
DT40	570615	166065	72.3	50.3	38.6	36.2	32.4	35.2	28.9	39.3	38.3	45.0	51.1	48.8	43.0	33.1	-	
DT41	570281	164949	36.3	24.1	20.8	21.5	17.2	19.1	17.1	22.1	23.9	26.4	34.6	31.2	24.5	18.9	-	
DT42	570276	165016	28.9	14.7	18.2	22.5	14.2	15.3	10.7	16.3	18.8	18.2	21.5	23.2	18.5	14.3	-	
DT43	570713	169417	48.1	30.8	-	27.8	23.1	25.7	27.7	-	28.2	30.7	-	-	30.3	24.6	-	
DT44	573590	169263	72.0	47.7	38.0	34.6	31.6	44.0	36.3	53.3	51.9	24.4	29.7	26.1	40.8	31.4	-	
DT45	577322	167449	48.6	35.6	28.9	27.1	23.6	29.4	30.4	31.9	33.5	33.4	43.0	39.0	33.7	25.9	-	
DT46	577221	167485	48.8	-	24.4	33.6	19.9	29.2	24.5	31.0	36.5	29.7	42.8	36.1	32.4	25.0	-	

☒ All erroneous data has been removed from the NO<sub>2</sub> diffusion tube dataset presented in Table B.1

- ☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16
- ☒ Local bias adjustment factor used
- ☒ National bias adjustment factor used
- ☒ Where applicable, data has been distance corrected for relevant exposure in the final column
- ☒ Medway Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System

**Notes:**

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

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

See Appendix C for details on bias adjustment and annualisation.

\*A local bias adjustment factor of 0.51 and 0.71 has been used for DT09 and DT13. The national bias adjustment factor of 0.77 was used for all remaining monitoring locations.



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

### New or Changed Sources Identified Within Medway Council During 2020

Medway Council has not identified any new sources relating to air quality within the reporting year of 2020.

Medway Council has identified the following development proposals as sources which could have an impact on the local air quality in the area:

- MC/20/2246 Air quality mitigation condition included on permission
- MC/20/0554 Application yet to be determined
- MC/19/3258 Air quality mitigation conditions included on permission
- MC/19/3217 Air quality mitigation condition included on permission
- MC/20/0816 Air quality mitigation condition included on permission
- MC/20/2585 Air quality mitigation condition included on permission
- MC/20/2979 Application yet to be determined
- MC/20/3169 Air quality cannot be considered under prior approval applications
- MC/20/1318 Air quality mitigation conditions included on permission
- MC/20/1363 Application yet to be determined
- MC/20/1638 Air quality mitigation condition included on permission
- MC/20/0932 Air quality mitigation condition included on permission
- MC/20/1638 Air quality mitigation condition included on permission
- MC/19/2814 Application yet to be determined
- MC/19/2530 Air quality mitigation conditions included on permission
- MC/19/3275 Air quality mitigation condition included on permission
- MC/19/0299 Air quality mitigation conditions included on permission
- MC/20/0058 No air quality mitigation condition(s) included on permission
- MC/19/3158 Air quality mitigation condition included on permission
- MC/20/0302 Application yet to be determined
- MC/19/2532 Air quality mitigation included on permission
- MC/20/0559 Air quality mitigation condition included on permission

- MC/18/1796 Air quality mitigation condition included on permission
- MC/19/2898 Air quality mitigation condition included on permission
- MC/19/0287 Air quality mitigation condition included on permission
- MC/20/2165 Application yet to be determined
- MC/20/1472 Air quality mitigation condition included on permission
- MC/20/3077 Air quality mitigation condition included on permission

## **Additional Air Quality Works Undertaken by Medway Council During 2020**

Medway Council has not completed any additional works within the reporting year of 2020.

## **QA/QC of Diffusion Tube Monitoring**

The diffusion tubes for 2020 were supplied and analysed by SOCOTEC Didcot utilising the 50% Triethanolamine (TEA) in acetone preparation method. SOCOTEC Didcot is a UKAS accredited laboratory which participates in the WASP scheme.

### **Diffusion Tube Annualisation**

Results were annualised in line with guidance included in Box 7.9 and 7.10 of the LAQM.TG(16) for monitoring sites DT34, DT35 and DT43 as data capture was below 75%.

Data from London Bexley, Canterbury, Rochester Stoke and Thurrock automatic monitoring stations were used to derive the adjustment factors. All monitors are in background locations and had a data capture above 85% in 2020. They are both managed by the Automatic Urban and Rural Network (AURN), and ratified data was downloaded from the Air Quality England website<sup>7</sup>. Table C.2 details the calculations used to derive the annualisation factors for DT34, DT35 and DT43. The calculations led to the use of annualisation factors of 1.07, 1.03 and 1.05 for DT34, DT35 and DT43 respectively.

### **Diffusion Tube Bias Adjustment Factors**

The diffusion tube data presented within the 2020 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under

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<sup>7</sup> <https://www.airqualityengland.co.uk/>

or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Medway Council have applied local bias adjustment factors to the 2020 monitoring data recorded at DT09 and DT13 non-automatic co-located monitoring locations. Both DT09 and DT13 recorded concentrations from triplet diffusion tubes. The triplet monthly means were calculated to provide monthly means for the co-located site. For DT09, 12 months of monitoring data was captured to use for the bias calculation. For DT13, 10 months of monitoring data was captured to use for the bias calculation. A bias adjustment factor of 0.71 was calculated for DT09 and a bias adjustment factor of 0.51 was calculated for DT13.

A national bias adjustment factor of 0.77 was applied to the 2020 monitoring data recorded at all remaining non-automatic monitoring stations. 22 studies contributed towards the calculation of this national bias adjustment factor.

A summary of bias adjustment factors used by Medway Council over the past five years is presented in Table C.1.

**Table C.1 – Bias Adjustment Factor**

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
<b>2020</b>	National	03/21	0.77
	Local	-	0.71 (DT09) and 0.51 (DT13)
<b>2019</b>	National	09/20	0.75
	Local	-	0.74 (DT09) and 0.64 (DT13)
<b>2018</b>	National	03/19	0.76
	Local	-	0.75 (DT09) and 0.63 (DT13)
<b>2017</b>	National	03/18	0.77
	Local	-	0.68
<b>2016</b>	National	03/16	0.77
	Local	-	0.66

## NO<sub>2</sub> Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

A number of the roadside diffusion tube monitoring sites measuring nitrogen dioxide concentrations in 2020 were not located at sites of relevant public exposure. As such, it is necessary to distance correct the measured concentrations at these sites in order to estimate concentrations experienced at the nearest relevant exposure to these sites. These estimated concentrations can then be compared to the relevant AQO to establish whether or not an exceedance is likely to have taken place. The sites which required a distance correction calculation to be undertaken included DT20, DT24, DT32 and DT33.

Distance correction calculations have been undertaken for each nitrogen dioxide monitoring site that is not representative of relevant exposure using Defra's 'Diffusion Tube Data Processing Tool v1.1', which requires the following inputs:

- distance from the monitoring site to the kerb (m);
- distance from the closest relevant exposure to the kerb (m);
- the local annual mean background nitrogen dioxide concentration ( $\mu\text{g}/\text{m}^3$ ), determined using Defra's background maps; and
- the measured annual mean nitrogen dioxide concentration at the site ( $\mu\text{g}/\text{m}^3$ )

## QA/QC of Automatic Monitoring

The Chatham (AURN) monitoring site is calibrated every two weeks and the Rochester Stoke (AURN) monitoring site every three months.

## PM<sub>10</sub> and PM<sub>2.5</sub> Monitoring Adjustment

The type of PM<sub>10</sub> and PM<sub>2.5</sub> monitor(s) utilised within Medway Council do not required the application of a correction factor.

### Automatic Monitoring Annualisation

All automatic monitoring locations within Medway 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<sub>2</sub> Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure should be estimated using the NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

No automatic NO<sub>2</sub> monitoring locations within Medway Council required distance correction during 2020.

**Table C.2 – Annualisation Summary (concentrations presented in  $\mu\text{g}/\text{m}^3$ )**

Site ID	Annualisation Factor London Bexley	Annualisation Factor Canterbury	Annualisation Factor Rochester Stoke	Annualisation Factor Thurrock	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DT34	1.0716	1.0392	1.0866	1.0659	1.0658	32.0	34.1	
DT35	1.0306	1.0010	1.0328	1.0611	1.0314	29.2	30.1	

**Table C.3 – Local Bias Adjustment Calculation**

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2
<b>Periods used to calculate bias</b>	12	10
<b>Bias Factor A</b>	0.71 (0.67 - 0.75)	0.51 (0.4 - 0.7)
<b>Bias Factor B</b>	42% (34% - 49%)	96% (43% - 148%)
<b>Diffusion Tube Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	26	20
<b>Mean CV (Precision)</b>	4.0%	7.0%
<b>Automatic Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	18	10
<b>Data Capture</b>	98%	99%
<b>Adjusted Tube Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	18	10

**Notes:**

**Table C.4 – NO<sub>2</sub> Fall off With Distance Calculations (concentrations presented in µg/m<sup>3</sup>)**

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
DT20	1.7	8.4	39.1	17.1	31.1	
DT24	0.5	2.7	44.5	16.7	36.2	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
DT32	1.9	10.3	38.9	16.7	30.2	
DT33	1.8	4.2	36.6	16.7	32.8	



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

Figure D.1 – Map of Automatic Monitoring Sites

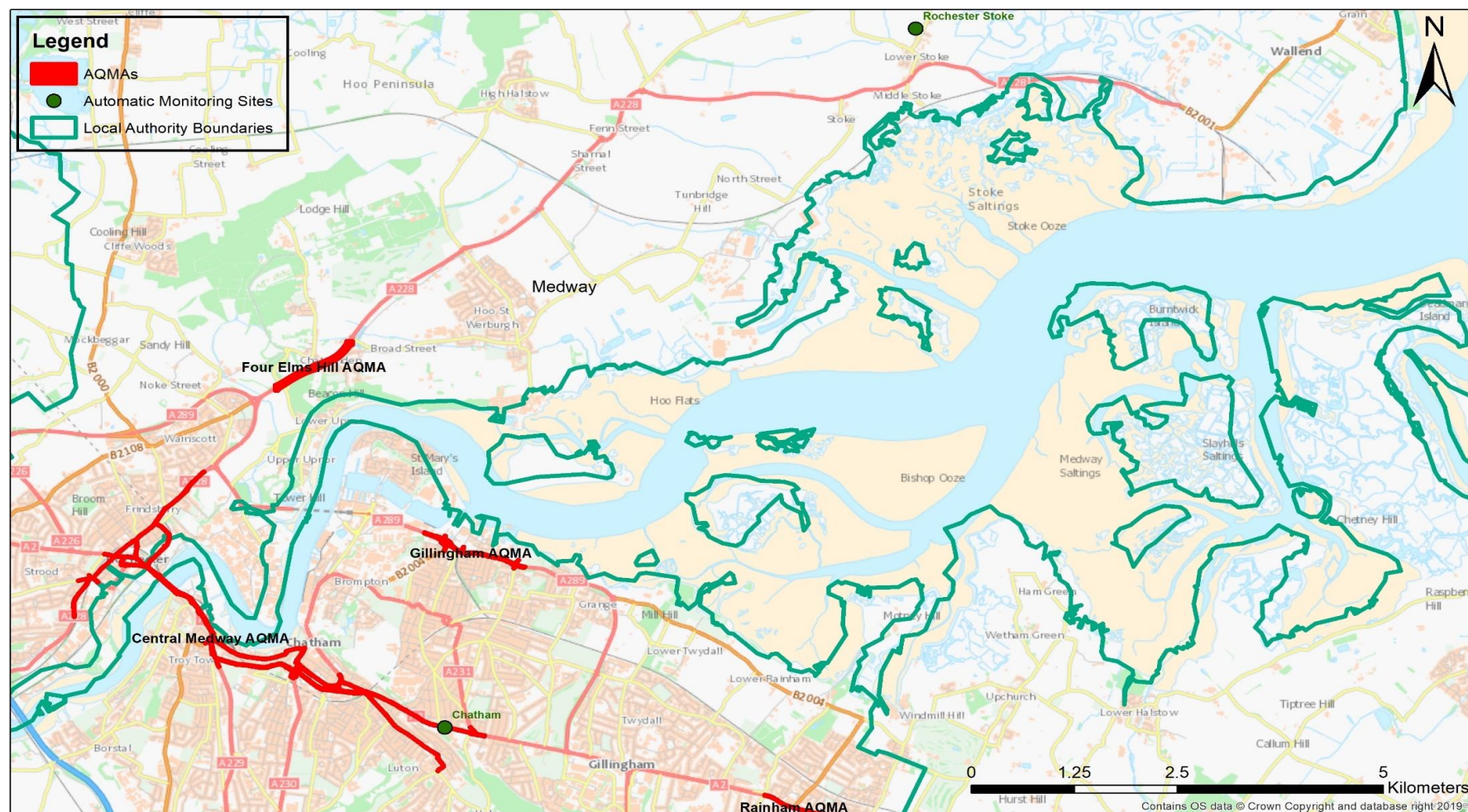




Figure D.2 – Map of Non-Automatic Monitoring Sites

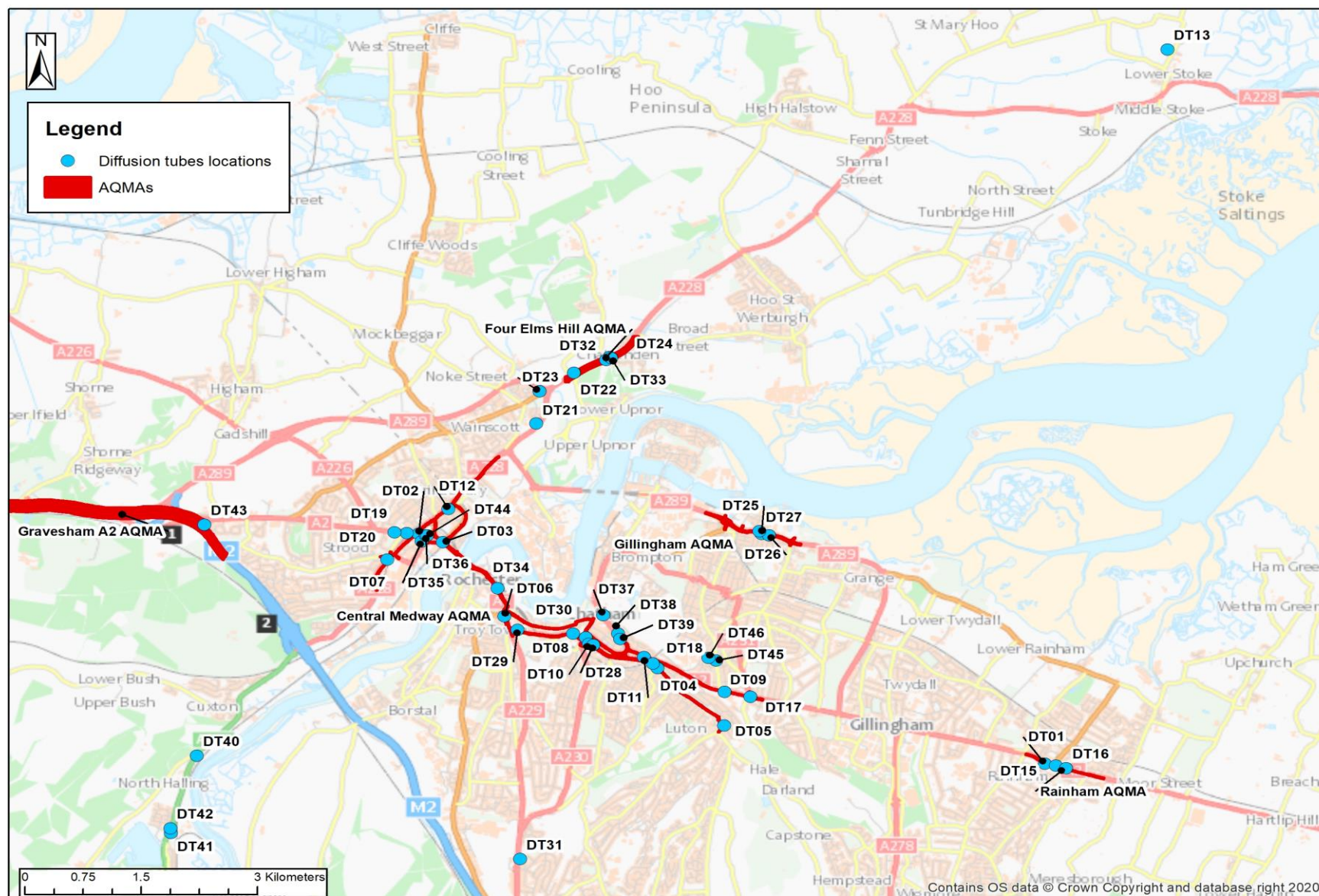




Figure D.3 – Map of Non-Automatic Monitoring Sites within Central Medway AQMA



Figure D.4 – Map of Non-Automatic Monitoring Sites within Four Elms Hill AQMA

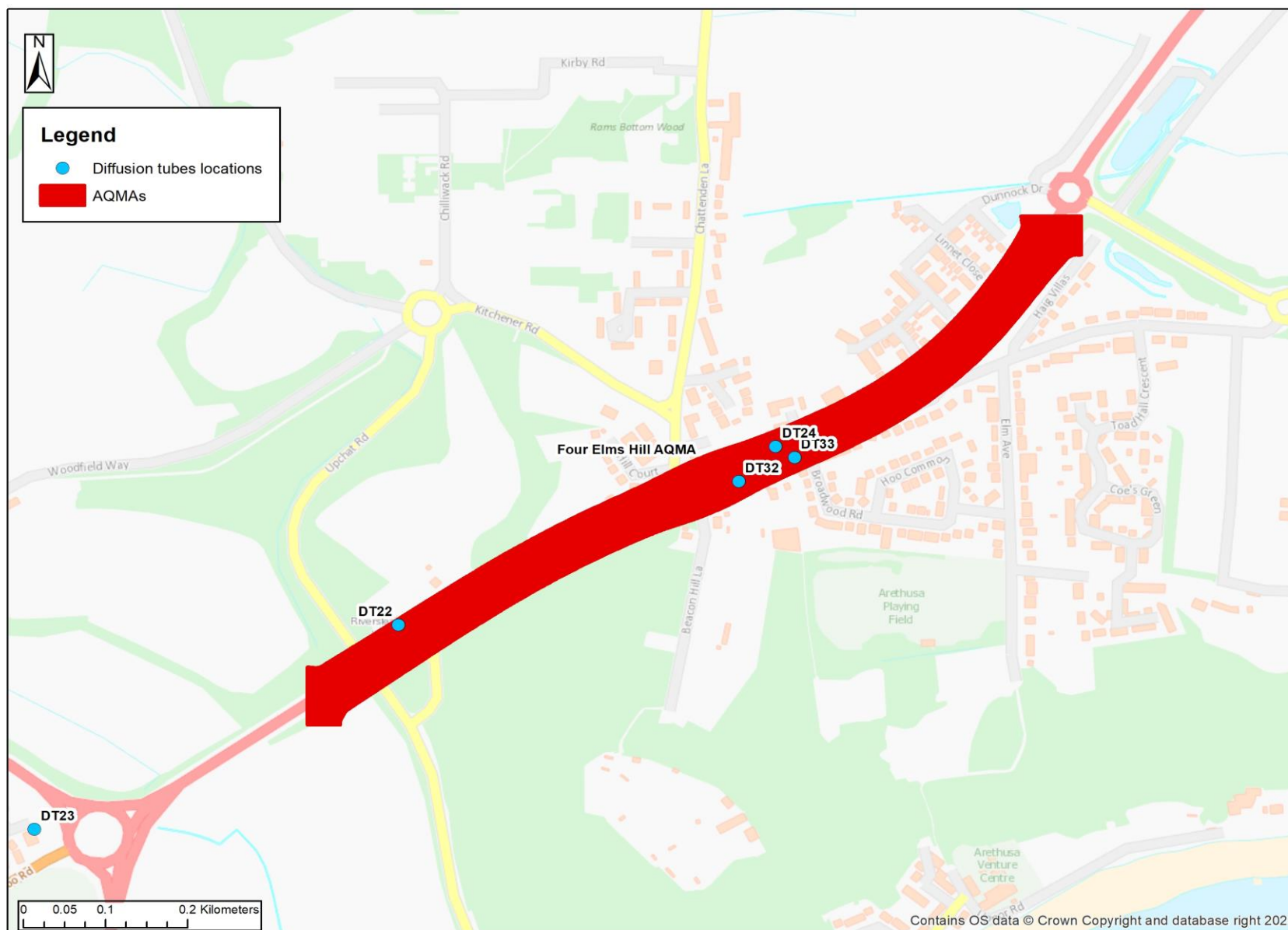




Figure D.5 – Map of Non-Automatic Monitoring Sites within Gillingham AQMA



Figure D.6 – Map of Non-Automatic Monitoring Sites within Rainham AQMA



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

**Table E.1 – Air Quality Objectives in England<sup>8</sup>**

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

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<sup>8</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).



## Appendix F: Impact of COVID-19 upon LAQM

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

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

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO<sub>2</sub>) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data<sup>9</sup> suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO<sub>x</sub>), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)<sup>10</sup> has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO<sub>2</sub> annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

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<sup>9</sup> Prime Minister's Office, COVID-19 briefing on the 31<sup>st</sup> of May 2020

<sup>10</sup> Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020



represents an absolute reduction of between 10 to 20µg/m<sup>3</sup> if expressed relative to annual mean averages. During this period, changes in PM<sub>2.5</sub> concentrations were less marked than those of NO<sub>2</sub>. PM<sub>2.5</sub> concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that PM<sub>2.5</sub> concentrations during the initial lockdown period are of the order 2 to 5µg/m<sup>3</sup> lower relative to those that would be expected under business-as-usual conditions.

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

## Impacts of COVID-19 on Air Quality within Medway Council

Medway Council note that COVID-19 has impacted non-automatic monitoring results for 2020. An analysis of monthly data from each diffusion tube has been undertaken to observe the trends recorded during 2020 compared with the average trend recorded in concentrations for the period of 2015 – 2019.

The impact of the first national lockdown is most apparent as reported in the figures below for two non-automatic monitoring sites. For the months outside of the first national lockdown, the general trend in NO<sub>2</sub> concentrations for 2020 follows that of the average trend in NO<sub>2</sub> concentrations for the period 2015-2019. Figures F.1 – F.4 show the trends in NO<sub>2</sub> concentration recorded at diffusion tubes DT01, DT22, DT27 and DT06 compared to the trends in NO<sub>2</sub> concentration recorded in the period 2015-2019. All diffusion tubes are found within each of the AQMAs declared by Medway Council.

Figure F.7 – Graph of the trend in annual NO<sub>2</sub> concentrations within Rainham AQMA

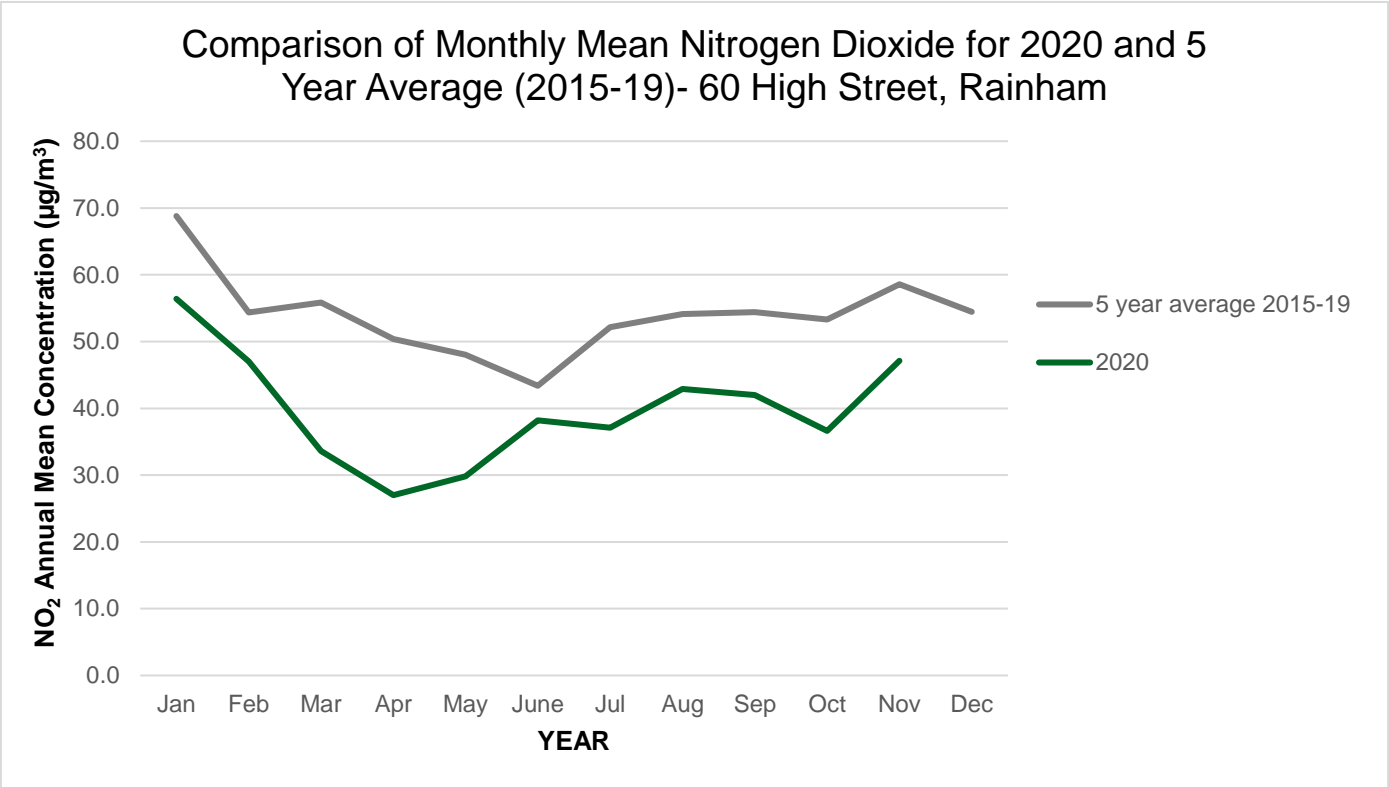
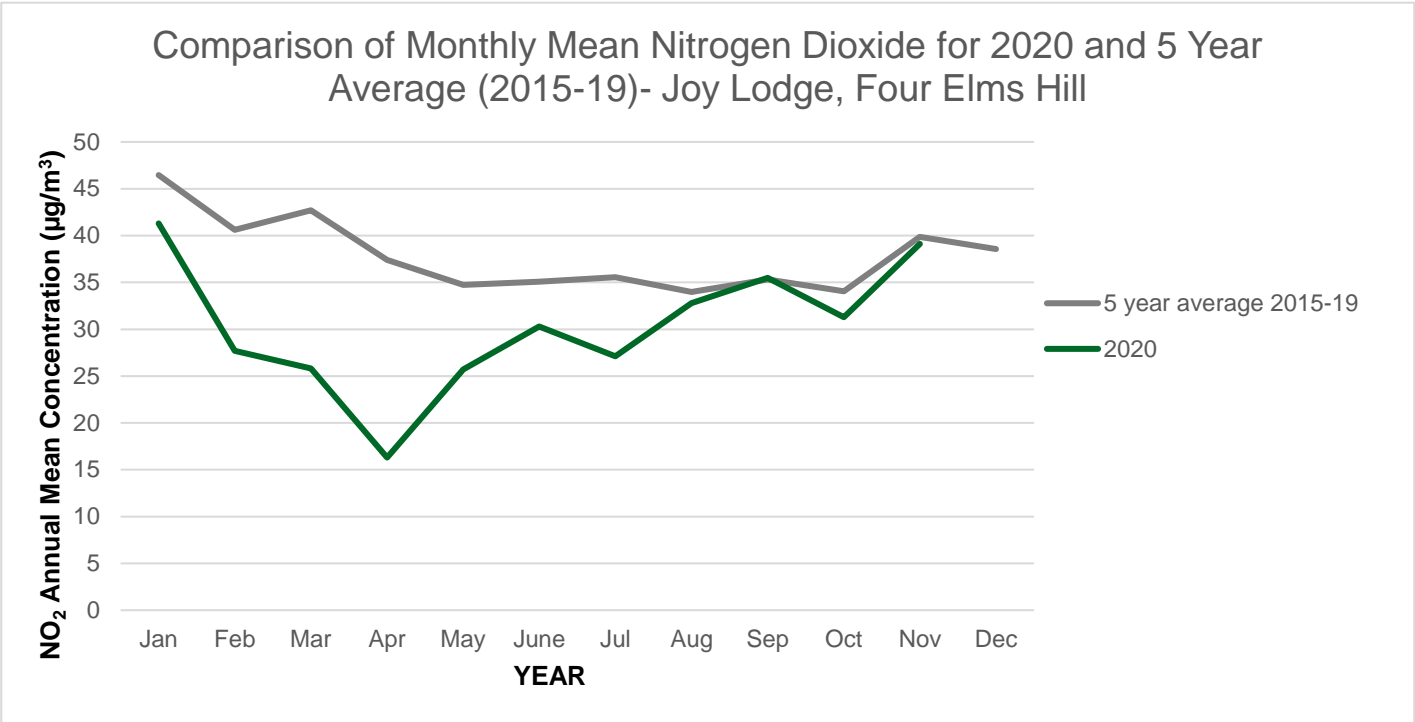
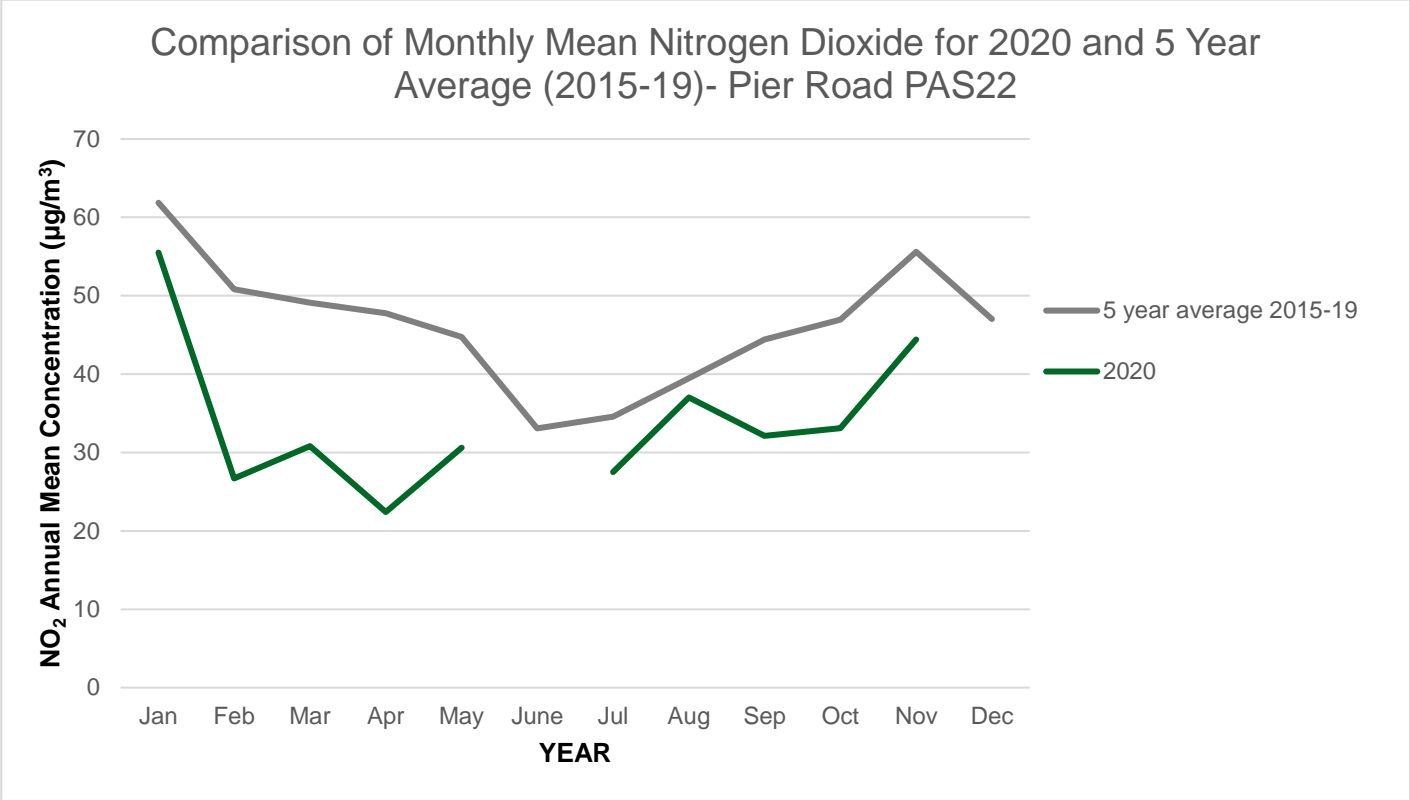


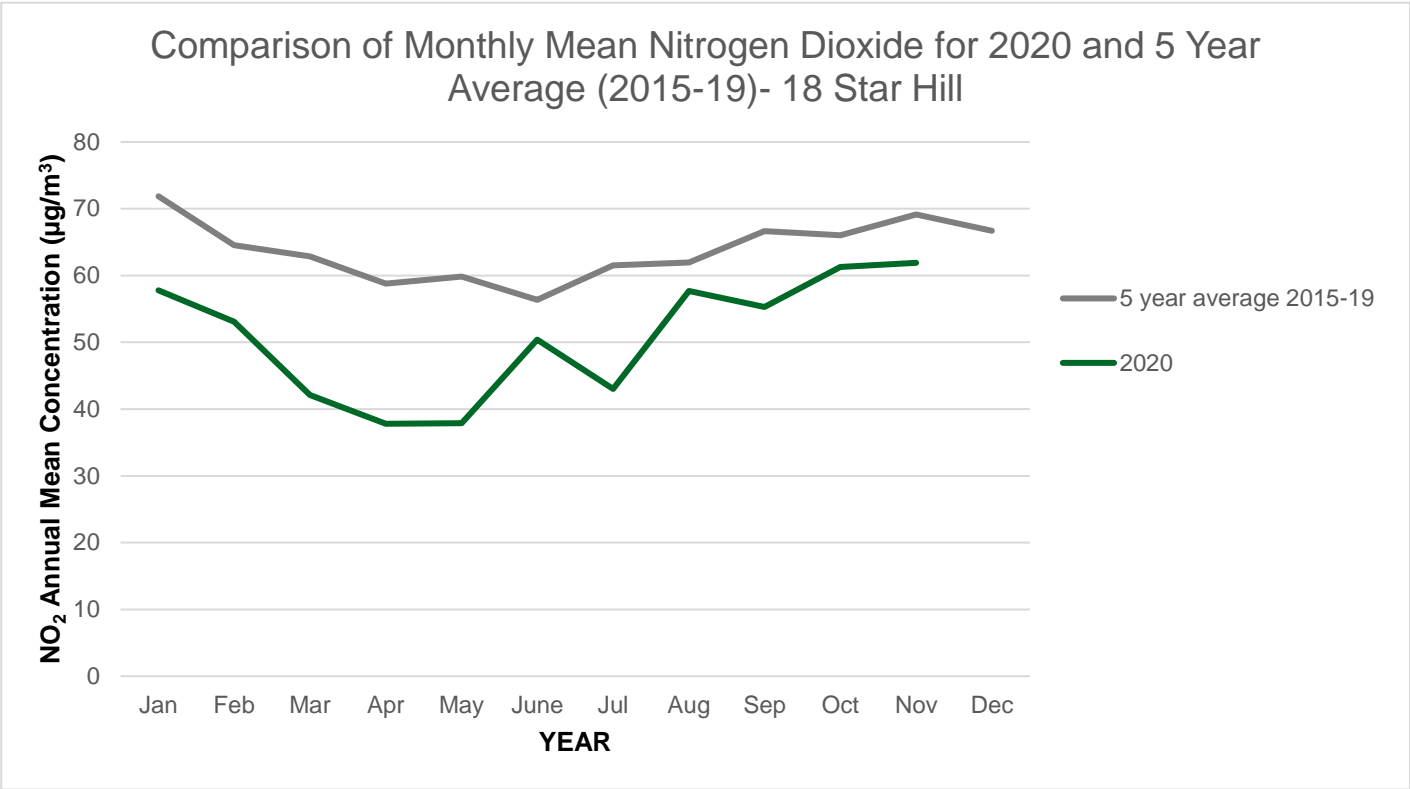
Figure F.8 – Graph of the trend in annual NO<sub>2</sub> concentrations within Four Elms Hill AQMA



**Figure F.9 – Graph of the trend in annual NO<sub>2</sub> concentrations within Gillingham AQMA**



**Figure F.10 – Graph of the trend in annual NO<sub>2</sub> concentrations within Central Medway AQMA**



## **Opportunities Presented by COVID-19 upon LAQM within Medway Council**

The pandemic impacted upon the ongoing engagement work with schools in Medway. Medway Council was unable to carry out usual engagement work to visit schools and talk to children about air pollution. In response an air quality video has been produced as an alternative means of engaging with children. This video has been sent to all schools in Medway and has therefore increased reach which was limited previously by the number of schools who had signed up to our engagement programme. The video can be found on our website at:

[https://www.medway.gov.uk/info/200140/environment\\_health\\_and\\_safety/416/air\\_quality](https://www.medway.gov.uk/info/200140/environment_health_and_safety/416/air_quality)

## **Challenges and Constraints Imposed by COVID-19 upon LAQM within Medway Council**

The pandemic resulted in the whole council having to adapt very quickly to new ways of working, including a shift to working at home. And whilst there have and continue to be some resourcing issues, maintaining our LAQM work and implementing action plan measures remained a top priority. The Environmental Protection Team took over the deployment of diffusion tubes from the Community Warden Team as their resources were directed elsewhere, and this will continue to be undertaken by the team for the foreseeable future. The team continued to calibrate automatic instruments and respond to call outs when required to deal with site issues and faults. This reflects the high priority Medway places on local air quality management. And although the pandemic did present some challenges around implementing air quality action plan measures, Medway adapted to these challenges by changing how it approached some key measures.

Table F 1 – Impact Matrix

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

## 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 Highways England
EU	European Union
EV	Electric Vehicle
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide
ULEV	Ultra Low Emission Vehicle



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