

2021 Air Quality Annual Status Report (ASR)

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

Date: June, 2021

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Executive Summary: Air Quality in Our Area

Air Quality in Sevenoaks

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^{1,2}.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of ± 157 million in 2017⁴.

The primary source of air pollution within the district is from nitrogen dioxide and particulate matter from road traffic. The district is traversed by three major motorways and these have a considerable flow of continental HGVs using the port at Dover and the Channel Tunnel. Local journeys, school runs, commuting to London or connection with London contribute significantly to a number of hot spots in Sevenoaks, Swanley and in several small towns along the A25 road.

Air quality monitoring in 2020 has shown a significant decrease in NO_2 levels at all monitoring locations. None of the diffusion tubes recorded NO_2 levels above the annual average objective.

The majority of monitoring carried out within the district is at locations classified as being roadside, and consideration should be given that these results do not indicate the levels of exposure at the nearest receptor to the pollution source which is likely to be lower. As

¹ Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

³ Defra. Air quality appraisal: damage cost guidance, July 2020

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

none of the diffusion tubes recorded levels in excess of air quality objectives distance correction was not required to be carried out.

A decrease in levels were reported at the continuous monitors for both NO_2 and PM_{10} . No breaches of the NO_2 hourly mean or PM_{10} daily mean objectives were recorded within the District.

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 Strategy⁵ sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero⁶ sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

The primary source of nitrogen dioxide pollution within the district is from road traffic. Many of the actions require the input of highways authorities. Sevenoaks District Council continues to work closely with Kent County Council Highways.

The District Council has implemented a number of initiatives and measures to encourage the adoption of greener vehicles including; providing owners of low emission vehicles discounted rates for on street parking permits, the installation of electrical charging points at District Council owned car parks and the procurement of electric vehicles for town centre parking enforcement.

Air quality is a theme that is considered by the Sevenoaks Joint Transport Board.

⁵ Defra. Clean Air Strategy, 2019

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

The council now has eight electrical charging bays within the town centre Buckhurst car park and a further two in the Bradbourne Car Park, as well as operating two electric vehicles as part of its fleet.

Sevenoaks District Council was part of a successful bid with Kent County Council and five other district councils for funding to provide rapid chargers to be used by taxis and private hire vehicles.

In the past 12 months, the Council has adopted a Low Emission and Electric Vehicle Strategy, which commits the council to the transition to a zero-carbon emissions fleet wherever possible, improve electric vehicle charging infrastructure and promote low carbon travel. Council staff have been offered the opportunity to lease electric vehicles at a discounted rate through a council backed scheme.

Sevenoaks District Council has commissioned air quality consultants Bureau Veritas to carry out a review of the existing AQMAs and to produce a new Air Quality Action Plan which will incorporate new measures to reduced levels of pollution within the declared AQMA's.

Air Quality consultants Bureau Veritas were commissioned to undertake a technical review of the AQMAs within the district. This work utilised data obtained in 2018 (an outlying year in terms of the ongoing improvement in pollution levels) to remodel and validate the existing declared areas. The results of this modelling can be considered conservative as pollution levels recorded in 2017 and 2019 were lower. The following recommendation were made:

 AQMA No.1 M20 – The AQMA can be considered for revocation due to no monitored exceedances at any of the monitoring locations, nor has the model predicted exceedances at any receptor locations within the AQMA. Additional monitoring could be carried out at specific receptor locations to confirm this as there are only 2 monitoring locations currently along the stretch of the AQMA;

- AQMA No.2 M25 As a consequence of the modelling results, additional monitoring is recommended to be carried out near the residential property at the roundabout of London Road in Westerham. Monitoring should also be carried out near to residential properties along the A224 and B2211 near to the M25. If these concentrations are shown to be compliant with the annual mean objective, then the AQMA can be revoked;
- AQMA No.3 M26 The model predicted concentrations within 10% of the AQS objective at one location. Therefore, monitoring is recommended to be carried out close to this location (receptor ID 161), along the A224 London Road flyover. If these concentrations are shown to be compliant, then the AQMA can be revoked;
- AQMA No.4 A20T No exceedances were predicted by the dispersion model within the AQMA. However, as no monitoring locations are present within the AQMA, it is recommended that monitoring be carried out close to residential properties on Phillip Avenue/Ladds Way/Cyclamen Road to confirm the modelled results. If no exceedances are reported, the AQMA should be revoked;
- AQMA No.6 (M25-PM10) Based upon the modelling results, no exceedances at relevant receptor locations are expected. Therefore, this AQMA can be revoked. No further actions are required;
- AQMA No.10 (Sevenoaks High Street) The AQMA is to remain in place, with additional monitoring carried out along the narrow section of the High Street near to the Bus Station, as well as at the closest point of relevant exposure to the A224 between the junctions to South Park and Lime Tree Walk. This is to ascertain whether there are any exceedances of the 1-hour NO2 objective.
- AQMA No.13 (A25) The AQMA is to remain in place, whilst potentially being reduced in size west of Westerham and east of Seal where no exceedances are predicted. Additional monitoring could be carried out to confirm this at residential properties along these stretches. Monitoring should be carried out near to the junction of London Road to the A25 Market Square in Westerham, as well as on the north-western side of the southern roundabout in Riverhead in order to determine whether there are any exceedances of the 1-hour NO2 objective.

Conclusions and Priorities

Significant improvements in local air quality have been identified in 2020 with only one monitoring location showing levels of NO_2 in exceedance of air quality objectives.

The priority for 2020 is for the finalisation of the new Air Quality Action Plan and for progress to begin on the delivery of the measures detailed within the plan.

Local Engagement and How to get Involved

Members of the public can help to improve air quality by making small changes to their everyday lives.

- Walking and cycling instead of making car journeys will reduce the amount of traffic on the local roads and reducing emissions and also helping to improve the congestion. Other small changes include not allowing car engines to idle when vehicles are stationary.
- Anticipate traffic flow, keeping in the highest gear possible and maintaining a steady speed at a low revs per minute (RPM). This will help to reduce pollution from your car, and save on fuel consumption.
- Consider purchasing a cleaner electric, hybrid vehicle or one that meets the euro 6 emission standard.
- Maintain your vehicle regularly, if a diesel, make sure the oil and filters are changed frequently. If you notice sooty emissions from the exhaust, take your vehicle to a servicing garage as soon as possible. Ensure your tyres are maintained at the optimum pressure to achieve the best fuel consumption and save you money.
- Turn off your engine if you are caught in a traffic jam or have to wait at level crossings; not only will this reduce your emissions but you will also save fuel.
- Avoid using your car for short journeys short trips are very polluting as vehicle engines needs to reach a very high temperature to work efficiently; on short trips it won't reach that temperature.
- For short journeys, walking, cycling and public transport can be the best and cheapest option.

• Avoid/reduce the burning of solid fuels and garden bonfires as these produce significant particulate pollution.

Further information on air quality monitoring carried out by Sevenoaks District Council can be found on the London Air Quality Network website.

Some areas of the District are subject to smoke control orders under the Clean Air Act 1993. Residents can check if their property is include by visiting the councils <u>Website</u>.

In a Smoke Control area only fuel on the list of authorised fuels, or any of the following 'smokeless' fuels can be burned, unless an exempt appliance is used.

- Anthracite
- Semi-anthracite
- Gas
- Low volatile steam coal

Even if your property is not within a Smoke Control Area, you should be aware that appliances that burn solid fuel contribute to local air pollution and evidence is that their contribution is increasing due to the popularity of solid fuel burning for occasional heating requirements, especially in the winter time. Domestic solid fuel burning can generate significant levels of particulate pollution, and the council have noted an increase in complaints concerning smoke emitted from domestic properties. Non-compliance with the smoke control rules can result in a fine of up to £1000.

The Department for Environmental Food and Rural Affairs have produced <u>Guidance</u> should residents still wish to use solid fuels or solid fuel appliances.

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Local Air Quality Management

This report provides an overview of air quality in Sevenoaks during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

Actions to Improve Air Quality

Air Quality Management Areas

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

A summary of AQMAs declared by Sevenoaks District Council can be found in Table 0.1. The table presents a description of the nine AQMAs that are currently designated within Sevenoaks District Council. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO₂ annual mean;
- PM₁₀ 24-hour mean;

Based on the findings of the AQMA review carried out by Bureau Veritas on behalf of Sevenoaks District Council, we propose to revoke the following AQMA:

- AQMA 1- Declared for NO₂-Junction 3 of the M25 to the district boundary with Tonbridge and Malling Borough Council including part of the A20 at Farningham.
- AQMA 2- Declared for NO₂-- County border with Surrey to district border with Dartford, including Junctions 3, 4 and 5 and the extension of Junction 5 to connect with the A25 at Bessel's Green
- AQMA 3- Declared for NO₂-- M26 from junction 5 of the M25 to the district boundary with Tonbridge and Malling Borough Council
- AQMA 4- Declared for NO₂-- Swanley Bypass from junction 3 of the M25 to the district boundary with the London Borough of Bromley
- AQMA 6- Declared for PM₁₀- Junction 5 to Kent / Surrey border

(see monitoring/additional section).

Table 0.1 - Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 1	01/03/200 2 Amended 2005	NO2 Annual Mean	Junction 3 of the M25 to the district boundary with Tonbridge and Malling Borough Council including part of the A20 at Farningham.	YES	45 μg/m ³	29.58 (DT26)	Sevenoaks Air Quality Action Plan	<u>Sevenoaks AQAP</u>
AQM A 2	01/03/200	NO2 Annual Mean	County border with Surrey to district border with Dartford, including Junctions 3, 4 and 5 and the extension of Junction 5 to connect with the A25 at	YES	55 μg/m3	20.93 (DT14)		<u>Sevenoaks AQAP</u>

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
			Bessel's Green					
AQM A 3	01/03/200 2	NO2 Annual Mean	M26 - from junction 5 of the M25 to the district boundary with Tonbridge and Malling Borough Council.	YES	50 μg/m ³	22.79 μg/m3 (DT 98)	Sevenoaks Air Quality Action Plan	<u>Sevenoaks AQAP</u>
AQM A 4	01/03/200 2	NO2 Annual Mean	Swanley Bypass - from junction 3 of the M25 to the district boundary with the London Borough of Bromley	YES	45 μg/m ³	17.69 μg/m3 (DT 97)	Sevenoaks Air Quality Action Plan	<u>Sevenoaks AQAP</u>

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
AQM A 6	01/09/200 6	PM10 24 Hour Mean	Junction 5 to Kent / Surrey border	YES	Risk predicted	No current monitoring	Sevenoaks Air Quality Action Plan	Sevenoaks AQAP
AQM A 8	01/09/200 6	NO2 Annual Mean	Swanley – London Road (East); High Street; Bartholome w Way and parts of Central town area		56.7 μg/m ³	28.41 (DT40)	Sevenoaks Air Quality Action Plan	<u>Sevenoaks AQAP</u>
AQM A 10	10/01/200 8	NO2 Annual Mean	Sevenoaks – High Street & London Road		46.5 μg/m ³	29.58 (DT02)	Sevenoaks Air Quality Action Plan	<u>Sevenoaks AQAP</u>
AQM A 13	14/01/201 4	NO2 Annual Mean	The entire length of the A25 from the border with Tonbridge and Malling in the east		55.3 μg/m ³	35.68 (DT87)	Sevenoaks Air Quality Action Plan	<u>Sevenoaks AQAP</u>

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
			to the border with Tandridge in the west.					
AQM A 14	14/01/201 4	NO2 Annual Mean	The junction of London Road and Birchwood Road, Swanley.		48.8 μg/m ³	33.34 (DT 83)	Sevenoaks Air Quality Action Plan	<u>Sevenoaks AQAP</u>

□ **<Local Authority>** confirm the information on UK-Air regarding their AQMA(s) is up to date.

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Progress and Impact of Measures to address Air Quality in Sevenoaks

Defra's appraisal of last year's ASR highlighted some discrepancies between the data in the report and that in the accompanying excel table. This was due to a typographical error which was subsequently corrected. The report also highlighted that the maps showing the locations of the diffusion tube monitoring locations could be clearer. This has been rectified for the 2021 ASR.

Sevenoaks District Council's priorities for the coming year are to finalise the new Air Quality Action Plan and to begin action to implement the measures detailed in the plan.

Pollution levels within Sevenoaks have fallen significantly in recent years and compliance with air quality objectives was achieved in all AQMAs.

Whilst the reductions in pollution levels observed in 2020 are partly due to a reduction in traffic movements due to the Covid-19 restrictions. It is considered likely that compliance with air quality objectives will continue to be achieved in future years. Sevenoaks District Council's new air quality action plan will seek to reduce pollution levels beyond the objective levels.

Table 0.2 - 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	The Sevenoaks Joint Transport Board will continue to consider and review options and proposals made under the Traffic Management Act and the LTP as well as via the Member/Officer air quality working group and both liaise and lobby KCC Highways Services to establish scheme acceptance, prioritisation and funding	Traffic Management	Other	2010		SDC KCC	N/A	NO	Not Funded				N/A		
2	The District Council will continue to consider the impact new developments have on air quality and take appropriate steps to minimise any increase in air	Policy Guidance and Development Control	Other	2010		SDC	N/A	NO	Not Funded				N/A	Implementation on-going	
3	Set up an internal working group to identify, implement and monitor air quality mitigation measures secured by Section 106 Agreement.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2010		SDC	N/A	NO	Not Funded		Working group set up and meeting regularly		N/A	Implementation on-going	
4	For the KCC/SDC Member/officer air quality working group to make recommendations to the JTB regarding suitable traffic reducing proposals	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2010		SDC	N/A	NO	Not Funded		Regular liaison and reporting of air quality issues to JTB		N/A		
5	The Council will demonstrate best practice in the purchase and operation of its own vehicle fleet in order to cut harmful emissions where possible	Traffic Management	UTC, Congestion management, traffic reduction	2010		КСС	N/A	NO	Not Funded		SDC currently operate 2 Electric cars used for parking enforcement, 2 electric bicycles and an electric road sweeper.		N/A		
6	The District Council will continue to	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	SDC		SDC	N/A	NO	Not Funded		10 electric vehicle charging		N/A		

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
	promote and publicise schemes including working with partners where appropriate to encourage a reduction in car use										points recently installed in public car parks and a programme to install more points in districts car parks in coming year				
7	Reducing congestion and improving air quality as a result through parking schemes	Promoting Travel Alternatives	Personalised Travel Planning			SDC/KCC	N/A	NO	Not Funded		Regular review of car parks to help ensure drivers can find convenient parking rather than searching for a space.		N/A		
8	The District Council will promote a number of initiatives to reduce energy consumption, improve energy efficiency and recycling and develop its carbon management role	Traffic Management	Emission based parking or permit charges			SDC	N/A	NO	Not Funded		Retrofitting low carbon measures in housing stock encouraging switch and save.		N/A		
9	Continue to improve and raise the level of knowledge and publicity relating to air pollution	Policy Guidance and Development Control	Other policy			SDC	N/A	NO	Not Funded		SDC is a member of the London Air Quality Network which disseminates information and health advice via their website.		N/A		
10	AirAlert: Provide AQ health warning for vulnerable people advising them about pollution levels in their area.	Public Information	Other			SDC	N/A	NO	Partially Funded		AirAlert service has been supplemented by the development of an AirAlert app. Allowing information to be accessed by a wider audience.		N/A		
11	Kent Planning Guidance	Other	Other	Kent and Medway Air Quality Partnership	Completed but not adopted			NO	Not Funded		Guidance due for renewal before formal adoption		N/A		

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
12	Kent Energy & Low Emission Strategy	Other	Other			KCC/Kent Air Quality Partnership		NO	Partially Funded				N/A	Sevenoaks District Council has endorsed the Kent Energy & Low Emission Strategy and will work with Kent County Council over the implementation oof the strategy. The aim of the strategy is to identify and prioritise action to reduce harmful emissions that contribute to climate change and poor air quality leading to impacts on people's health.	
13	Anti Idling Project	Public Information	Via other mechanisms	2020	2023	SDC	N/A	NO	Not Funded	< £10k	Planning	Unknown	N/A	Schools within close proximity of AQMAs were contacted to identify where problems existed	Covid and school closures
14	School AQ education project	Public Information	Via other mechanisms	2021	2023	Kent Air Quality Partnership	Defra/LA match fund	YES	Funded	< £10k	Planning	Unknown	N/A	Funding secured for the development of educational materials	

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

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

The Public Health Outcomes Framework data tool compiled by Public Heath England ⁽⁵⁾ quantifies the mortality burden of PM2.5 within England on a National, Regional and Local Authority scale. The latest available data (2019) shows the fraction of mortality attributable to air pollution across England is 5.1% and 5.2% within the South East region. The fraction within Sevenoaks District Council 5.3%.

Sevenoaks District Council is working on producing a new Air Quality Action Plan that will include appropriate measures to reduce PM_{2.5} as well as other priority pollutants.

Parts of the District are subject to smoke control orders under the Clean Air Act 1993. Appliances that burn solid fuel contribute to local air pollution and evidence is that their contribution is increasing due to the popularity of solid fuel burning for occasional heating requirements, especially in the winter time. Non-compliance with the smoke control rules can result in a fine of up to £1000.

The Council will continue to work with developers and planners to reduce particulate emissions from construction site and if necessary, take enforcement action if required.

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

This section sets out the monitoring undertaken within 2020 by Sevenoaks District 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.

Summary of Monitoring Undertaken

1.1.1 Automatic Monitoring Sites

Sevenoaks District Council undertook automatic (continuous) monitoring at 2 sites during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The London Air Quality Network page presents automatic monitoring results for Sevenoaks District 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.

1.1.2 Non-Automatic Monitoring Sites

Sevenoaks District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 51 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.

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.

1.1.3 Nitrogen Dioxide (NO2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of $40\mu g/m^3$. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

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

in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past five years with the air quality objective of $200\mu g/m^3$, not to be exceeded more than 18 times per year.

Levels of NO2 between 8.0 & 20.7 $\mu g/m^3$ have been recorded in 2020 at 2 background sites.

The majority of monitoring carried out within the District of Sevenoaks is at locations classified as being roadside, and consideration should be given that these results do not indicate the levels of exposure at the nearest receptor to the pollution source.

Monitored levels of NO₂ have decreased across the borough. None of the monitoring sites breached the annual mean objective level in 2020.

The diffusion tube monitoring location with the highest recorded value in 2020 was DT87 which recorded a value of $35.7 \mu g/m^3$. This is below the threshold for where a risk of a breach of the 1-hour mean objective may be present.

1.1.4 Particulate Matter (PM₁₀)

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of $40\mu g/m^3$.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of $50\mu g/m^3$, not to be exceeded more than 35 times per year.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
CM1	Greatness	Urban Background	553603	156774	NOx, NO, NO2, PM10, O3	NO	Chemiluminescent / Teom	Y	46m	1.8
CM2	Bat & Ball	Roadside	553044	156690	NOx, NO, NO2, PM10	YES	Chemiluminescent / Teom	N - (30m)	8m	1.8

Notes:

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

(2) N/A if not applicable

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co- located with a Continuous Analyser?	Tube Height (m)
DT2	High Street South 1 (Guitar) Sevenoaks	Roadside	553157	154415	NO2	AQMA 10	Y	1	Ν	2m
DT3	Garvock Drive Sevenoaks	Urban Background	552467	154167	NO2	No	Y	0	Ν	2m
DT27	High Street South 2 (Sev School) Sevenoaks	Roadside	553139	154259	NO2	AQMA 13	Y	3	Ν	2.5m
DT28	High Street North 2 (Sev Sennockian) Sevenoaks	Kerbside	553043	154890	NO2	AQMA 13	N (2m)	0.5	N	2.5m
DT29	High Street North 3 (Water Trough) Sevenoaks	Roadside	553073	155026	NO2	AQMA 13	N (3m)	2	Ν	2.5m
DT48	73 London Road(Brunch) Sevenoaks	Roadside	552863	154873	NO2	AQMA 13	Y	1.5	N	2m
DT49	20 London Road (Butchers) Sevenoaks	Roadside	553018	154654	NO2	AQMA 13	Y	2	Ν	2m
DT51	130 London Road (Opp Car Sales) Sevenoaks	Kerbside	552662	155153	NO2	AQMA 8	N (3m)	0.5	N	2.5m
DT52	142 London Road (Lulworth) Sevenoaks	Roadside	552506	155272	NO2	AQMA2	N (6m)	2	Ν	2.5m

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co- located with a Continuous Analyser?	Tube Height (m)
DT77	Montreal Cott/ Amherst Hill Sevenoaks	Roadside	551529	155967	NO2	AQMA 13	N (4m)	2	Ν	2.5m
DT87	Bradbourne Vale Road South	Roadside	551640	156335	NO2	AQMA 13	N (10m)	2.5	Ν	2.5m
DT88	Bradbourne Vale Road North	Roadside	552963	156583	NO2	AQMA 13	N (20m)	1.5	Ν	2.5m
DT90	4a St Johns Hill Sevenoaks	Roadside	553140	155898	NO2	AQMA 1	N (4m)	1.5	Ν	2.5m
DT23	Bat & Ball 1 Sevenoaks (Ferrari)	Roadside	553059	156624	NO2	AQMA 10	Y	4	Ν	2.5m
DT30	Bat & Ball 2 Otford Road Sevenoaks	Roadside	553019	155692	NO2	AQMA 10	N (7m)	3	Ν	2.5m
DT31	Bat & Ball 3 Seal Road Sevenoaks	Roadside	553165	156685	NO2	AQMA 10	N (1.5m)	1.5	Ν	2.5m
DT32	Bat & Ball 4 St Johns Sevenoaks	Roadside	553151	156558	NO2	AQMA 13	Y	1.5	Ν	2.5m
DT5	Riverhead 2 (Laundry) North West	Kerbside	551414	156197	NO2	AQMA 13	N (1.5m)	0.5	Ν	2.5m
DT6	Riverhead 3 (Opp shops) East	Roadside	551440	156165	NO2	AQMA 13	N (6m)	3	Ν	2.5m
DT42	62 London Road Riverhead	Roadside	551318	156373	NO2	AQMA 13	N (2m)	2	Ν	2.5m
DT76	Worships Hill/ Witches Lane, Riverhead	Roadside	551026	155710	NO2	AQMA 13	N (36m)	2	Ν	2.5m
DT7	High Street East 1 (Road Sign) Seal	Roadside	555092	156694	NO2	AQMA 13	Y	1	Ν	2.5m

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co- located with a Continuous Analyser?	Tube Height (m)
DT8	High Street West 1 (Garage) Seal	Roadside	554991	156726	NO2	AQMA 13	N (3m)	3	N	2.5m
DT33	High Street East 2 (Pizza) Seal	Roadside	555068	156711	NO2	AQMA 8	Y	1.5	Ν	2m
DT34	16 Main Road, Sundridge Dunbrik	Roadside	549427	155691	NO2	AQMA 8			Ν	
DT35	Seal Hollow Road/ A25	Roadside	554093	156798	NO2	AQMA 8	N (18m)	2.5	N	2.5m
DT43	Miners Arms, London Road, Dunton Green	Roadside	551281	156860	NO2	AQMA 13	N (2.5m)	2	N	2.5m
DT54	57 London Road, Dunton Green	Roadside	551216	157007	NO2	AQMA 13	N (8m)	2	Ν	2.5m
DT74	Westerham Road, (Devon Cott) Bessels Green	Roadside	550768	155584	NO2	AQMA 10	N (8m)	2	N	2.5m
DT86	59 Westerham Road, Bessels Green	Roadside	550308	155593	NO2	AQMA 10	Y	1.5	N	2m
DT71	204 Main Road, Sundridge	Roadside	548239	155353	NO2	AQMA 10	N (1.5m)	1	N	2.5m
DT12	Station Road (M25) Brasted	Roadside	546816	155851	NO2	No	N (42m)	7m to M25	N	2m
DT84	West End Brasted	Roadside	546802	155000	NO2	AQMA 13	Y	1	N	2.5m
DT85	Chart Lane Brasted	Roadside	547097	155099	NO2	AQMA 13	Y	1	N	2.5m
DT24	High Street, (Wells Close) Westerham	Roadside	544415	153914	NO2	AQMA 13	N (3m)	1	N	2.5m
DT25	Vicarage Hill, Westerham	Roadside	544770	154000	NO2	AQMA 13	N (3m)	1	N	2.5m

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co- located with a Continuous Analyser?	Tube Height (m)
DT36	Market Square, Westeham	kerbside	544594	154025	NO2	AQMA 13	N (3m)	1	Ν	2.5m
DT13	Wested Lane, Swanley	Roadside	552504	167700	NO2	AQMA 1	N (14m)	5	Ν	2.5m
DT14	Wadard Terrace, Button St Swanley	Roadside	553107	167868	NO2	AQMA 14	N (15m)	115m to M25	Ν	2.5m
DT39	Bartholomew Way, Swanley	Roadside	551492	168695	NO2	AQMA 13	N (13m)	2	Ν	2.5m
DT40	London Road 1(traffic lights) Swanley	Kerbside	551575	168508	NO2	AQMA 13	N (2m)	0.5	Ν	2.5m
DT41	London Road 2 (Bus) Swanley	Roadside	552174	168162	NO2	AQMA 13	N (6m)	1.5	Ν	2.5m
DT81	Farningham Hill Road, Swanley	Urban	553416	167615	NO2	AQMA 13	N (17m)	27m to M20	Ν	2.5m
DT83	Jessamine Terrace, Birchwood Road Swanley	Roadside	550297	169682	NO2	AQMA 13	N (0.5m)	1	Ν	2.5m
DT93	Pucknells, Birchwood Road, Swanley	Roadside	550283	169743	NO2	No	N (10m)	2	Ν	2.5m
DT94	Birchwood Road Junction London Road	Roadside	550258	169575	NO2	No	N (10m)	2	Ν	2m
DT95	Malvern, Birchwood Road, Swanley	Roadside	550351	169499	NO2	AQMA 14	N (20m)	2	Ν	2.5m
DT26	Farningham Hill (A20)	Roadside	554217	167252	NO2	AQMA 14	Y	5m to A20/ 90m to M20	Ν	2m

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co- located with a Continuous Analyser?	Tube Height (m)
DT96 (1)	Sevenoaks Station 1	Roadside	552371	155345	NO2	No	1.8	2.9	N	2.5m
DT97	Ellis Close	Urban Background	550557	168258	NO2	AQMA 4	35m	14m	No	2.5m
DT98	Dunton Green M26	Roadside	550955	157680	NO2	AQMA 3	16m	2m	No	2.5m

Notes:

(1) Om 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.

Y OS Grid Valid Data Capture X OS Grid Valid Data Capture 2017 2019 Site ID Ref Site Type for Monitoring Period 2016 2018 2020 2020 (%) (2) Ref (Easting) (%) (1) (Northing) 553603 156774 Urban Background N/A 17 15 Greatness 86% 16 14 12 25 Bat & Ball 553044 156690 Roadside N/A 97% 31 28 23 18

Table A.3 – Annual Mean NO₂ Monitoring Results: Automatic Monitoring (µg/m³)

CLICK HERE THEN PASTE COMPLETED DATA ROWS FROM ASR EXCEL TEMPLATE

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16 (confirm by selecting in box).

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

Notes:

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

Exceedances of the NO₂ annual mean objective of $40\mu g/m^3$ are shown in **bold**.

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

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

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

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
DT02	553157	154415	Roadside		82.7	54.7	48.1	49.9	40.4	29.6
DT03	552467	154167	Urban Background		100.0	12.7	11.1	11.8	9.9	8.0
DT05	553139	154259	Roadside		92.3	47.0	42.7	39.3	34.4	30.3
DT06	553043	154890	Kerbside		92.3	47.1	40.2	41.7	34.8	27.3
DT07	553073	155026	Roadside		100.0	46.8	42.7	41.3	36.6	26.2
DT08	552863	154873	Roadside		92.3	35.2	26.9	28.3	23.7	19.2
DT12	553018	154654	Roadside		75.0	43.1	40.0	39.8	33.2	26.6
DT13	552662	155153	Kerbside		100.0	36.5	30.5	32.9	27.7	21.7
DT14	552506	155272	Roadside		100.0	32.6	30.1	27.6	25.2	20.9
DT23	551529	155967	Roadside		100.0	40.5	34.3	39.2	33.0	26.6
DT24	551640	156335	Roadside		100.0	35.3	30.4	35.8	28.2	23.0
DT25	552963	156583	Roadside		80.8	29.8	25.9	26.1	23.5	18.4
DT26	553140	155898	Roadside		100.0	45.8	41.8	42.7	34.8	29.6

Table A.4 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
DT27	553059	156624	Roadside		92.3	39.8	38.2	37.7	33.2	21.6
DT28	553019	155692	Roadside		100.0	44.1	36.7	36.8	31.5	23.5
DT29	553165	156685	Roadside		100.0	31.5	28.0	28.2	23.7	17.6
DT30	553151	156558	Roadside		100.0	36.1	32.4	35.1	30.8	24.2
DT31	551414	156197	Kerbside		92.3	57.9	51.2	51.1	43.6	35.0
DT32	551440	156165	Roadside		100.0	56.3	47.6	51.9	40.7	32.5
DT33	551318	156373	Roadside		92.3	48.1	40.5	40.5	34.6	26.3
DT34	551026	155710	Roadside		100.0	31.7	27.5	26.1	23.5	18.3
DT35	555092	156694	Roadside		82.7	39.6	32.5	33.7	30.0	24.3
DT36	554991	156726	Roadside		90.4	45.1	39.6	40.1	33.5	28.2
DT39	555068	156711	Roadside		100.0	40.9	34.5	36.4	34.8	28.1
DT40	549427	155691	Roadside		90.4	51.5	40.9	45.6	37.5	28.4
DT41	554093	156798	Roadside		100.0	42.7	40.1	38.6	32.6	27.2
DT42	551281	156860	Roadside		100.0	39.3	35.5	34.5	27.4	23.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
DT43	551216	157007	Roadside		100.0	34.1	29.5	28.5	26.5	19.3
DT48	550768	155584	Roadside		75.0	27.7	40.7	23.9	20.0	13.6
DT49	550308	155593	Roadside		100.0	33.7	28.2	29.1	25.1	17.2
DT51	548239	155353	Roadside		100.0	40.4	35.1	39.0	30.2	22.3
DT52	546816	155851	Roadside		92.3	38.3	33.1	34.0	29.5	21.8
DT54	546802	155000	Roadside		100.0	36.0	33.8	32.7	28.8	24.8
DT71	547097	155099	Roadside		100.0	33.5	30.0	31.3	25.6	22.5
DT74	544415	153914	Roadside		82.7	37.1	35.4	35.9	30.7	22.2
DT76	544770	154000	Roadside		92.3	40.0	33.9	37.9	33.3	27.4
DT77	544594	154025	kerbside		73.1	40.0	38.8	38.7	31.6	25.0
DT81	552504	167700	Urban Background		100.0	32.9	30.9	28.6	25.7	20.7
DT83	553107	167868	Roadside		92.3	<u>60.5</u>	49.8	46.7	42.4	33.3
DT84	551492	168695	Roadside		100.0	35.4	31.2	32.5	26.5	23.0
DT85	551575	168508	Kerbside		100.0	51.1	43.9	43.7	35.7	31.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
DT86	552174	168162	Roadside		84.6	40.8	36.0	34.7	30.7	21.1
DT87	553416	167615	Urban		100.0	51.7	45.7	47.0	42.3	35.7
DT88	550297	169682	Roadside		59.6	32.9	28.7	30.3	28.1	20.7
DT90	550283	169743	Roadside		100.0	36.9	31.5	34.5	29.5	21.1
DT93	550258	169575	Roadside		100.0	32.4	27.2	28.8	25.9	19.5
DT94	550351	169499	Roadside		100.0	36.9	32.2	33.8	28.6	22.8
DT95	554217	167252	Roadside		92.3	38.0	33.6	33.0	30.2	25.0
DT96	552371	155345	Roadside		100.0			34.5	30.5	21.2
DT97	550557	168258	Urban Background		59.6					17.7
DT98	550955	157680	Roadside		34.6					22.8

☑ 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 $\mu g/m^3$.
Exceedances of the NO₂ annual mean objective of $40\mu g/m^3$ are shown in **bold**.

 NO_2 annual means exceeding 60μ g/m³, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in <u>bold and</u> <u>underlined</u>.

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.

Figure A.1 – Trends in Annual Mean NO₂ Concentrations

Annual Mean NO₂ Trends – Automatic Analysers



Annual Mean NO₂ Trends - Sevenoaks



Annual Mean NO₂ trends - Sevenoaks High Street



Annual Mean NO₂ trends – Bat & Ball



Annual Mean NO₂ trends – Riverhead



Annual Mean NO₂ trends – Seal



Annual Mean NO2 trends - Dunton Green



Annual Mean NO₂ trends – Bessels Green



Annual Mean NO₂ trends – Brasted



Annual Mean NO₂ trends – Westerham



Annual Mean NO₂ trends – Swanley







Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
Greatness	553603	156774	Urban Background	N/A	86%	0	0	0	0	0
Bat & Ball	553044	156690	Roadside	N/A	97%	3	0	0	0	0

Notes:

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

Exceedances of the NO₂ 1-hour mean objective ($200\mu g/m^3$ not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

Table A.6 – Annual Mean PM₁₀ Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
Greatness	553603	156774	Urban Background	N/A	99%	18	18	19	20	17
Bat & Ball	553044	156690	Roadside	N/A	98%	21	20	21	20	18

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

Notes:

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

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

All means have been "annualised" as per LAQM.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.





Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
CM1: Greatness	553603	156774	Urban Background		99	0	4	1	9	3
CM2: Bat & Ball	553044	156690	Roadside		98	7	5	8	8	4

Table A.7 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

Notes:

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

Exceedances of the PM₁₀ 24-hour mean objective ($50\mu g/m^3$ not to be exceeded more than 35 times/year) are shown in **bold**.

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

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





Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 - NO₂ 2020 Diffusion Tube Results (µg/m³)

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 0.78	Annual Mea Distance Corrected to Nearest Exposure
DT02	553157	154415	61.9	44.8	26.7	24.0	28.3	35.6	32.6	29.7	missin g	*0.6	48.0	45.5	37.7	29.6	-
DT03	552467	154167	14.5	9.2	7.6	12.8	7.5	7.0	7.0	8.5	10.3	8.7	15.1	14.1	10.2	8.0	-
DT05	553139	154259	51.0	missin g	31.5	32.9	36.4	37.0	28.0	44.9	43.3	39.9	40.5	39.4	38.6	30.3	_
DT06	553043	154890	44.3	missin g	28.6	25.7	27.4	33.5	34.6	35.9	45.1	35.5	25.6	46.9	34.8	27.3	-
DT07	553073	155026	19.8	39.7	27.3	25.6	27.1	36.8	31.5	38.7	38.1	33.0	43.4	39.7	33.4	26.2	-
DT08	552863	154873	32.1	missin g	21.8	19.1	18.5	19.0	19.5	23.2	25.2	36.8	26.8	27.7	24.5	19.2	-
DT12	553018	154654	44.9	40.9	32.5	23.4	missin g	missin g	on floor	27.5	39.0	30.4	33.0	34.2	34.0	26.6	-
DT13	552662	155153	35.5	26.2	19.1	29.2	24.7	23.7	19.6	26.7	33.6	26.1	32.5	34.8	27.6	21.7	_
DT14	552506	155272	39.6	32.0	24.2	19.7	16.1	20.8	21.6	24.2	30.8	25.7	34.7	30.9	26.7	20.9	-
DT23	551529	155967	45.1	32.0	30.7	26.8	32.1	31.1	27.3	38.0	39.9	31.3	33.1	39.4	33.9	26.6	_
DT24	551640	156335	40.6	23.2	27.0	30.5	28.3	20.5	21.3	33.5	37.0	30.9	31.3	28.4	29.4	23.0	-
DT25	552963	156583	31.4	27.3	18.3	20.2	missin g	18.6	19.1		28.8	20.4	28.5	21.9	23.5	18.4	-
DT26	553140	155898	50.3	38.7	26.9	28.6	31.5	37.1	33.2	39.1	44.1	37.3	44.2	41.6	37.7	29.6	-
DT27	553059	156624	46.5	27.9	9.5	17.9	19.0	23.7	26.7	44.1	missin g	26.2	31.4	30.7	27.6	21.6	-
DT28	553019	155692	45.9	31.2	15.3	21.8	21.5	23.6	26.9	31.3	34.3	32.1	37.2	38.8	30.0	23.5	-
DT29	553165	156685	35.9	26.9	12.9	17.4	15.2	16.8	17.2	21.7	25.7	23.5	30.2	26.6	22.5	17.6	-
DT30	553151	156558	43.4	36.1	19.2	25.7	25.8	29.0	26.5	35.3	38.8	30.5	34.2	26.3	30.9	24.2	
DT31	551414	156197	59.7	50.5	28.0	31.3	35.2		44.9	42.2	55.3	42.7	53.3	47.2	44.6	35.0	-

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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 0.78	Annual Mean: Distance Corrected to Nearest Exposure
DT32	551440	156165	54.2	41.2	31.4	33.8	35.6	37.9	33.4	47.5	49.0	36.5	47.1	49.2	41.4	32.5	
DT33	551318	156373	missin g	36.7	25.4	28.3	30.4	34.4	31.6	36.8	43.1	27.8	34.9	39.9	33.6	26.3	-
DT34	551026	155710	33.6	25.7	17.2	20.0	18.8	22.8	17.8	22.3	28.6	18.3	27.9	27.7	23.4	18.3	-
DT35	555092	156694	45.8	31.6	26.6	24.2	missin g	30.8	25.6	33.0	missin g	23.4	37.1	31.7	31.0	24.3	-
DT36	554991	156726	51.8	37.3	34.6	24.9	25.8	36.8	29.3	37.6	39.7	missin g	38.3	39.2	35.9	28.2	-
DT39	555068	156711	47.6	37.9	22.6	29.1	30.6	34.6	31.4	40.6	44.4	37.2	30.5	43.4	35.8	28.1	_
DT40	549427	155691	46.1	30.8	31.8	36.7	34.6	32.9	26.9	45.1	44.3	35.9	33.4	missin g	36.2	28.4	-
DT41	554093	156798	47.2	38.7	22.2	29.8	25.2	31.7	30.0	34.8	41.1	35.2	41.2	38.8	34.7	27.2	-
DT42	551281	156860	44.0	32.9	19.8	21.2	21.6	25.9	25.7	31.7	31.9	31.1	36.7	38.0	30.0	23.6	-
DT43	551216	157007	34.9	24.0	17.2	21.6	19.9	19.6	17.2	26.1	27.9	24.0	31.1	32.1	24.6	19.3	-
DT48	550768	155584	missin g	missin g	13.0	17.1	14.1	15.6	14.0	18.8	19.3	16.6	27.4	missin g	17.3	13.6	-
DT49	550308	155593	33.8	20.9	19.2	18.5	17.9	17.8	15.1	23.5	25.2	18.9	24.9	27.5	21.9	17.2	-
DT51	548239	155353	42.7	30.5	20.8	23.2	24.4	24.2	23.1	30.5	34.9	24.7	31.6	31.0	28.5	22.3	-
DT52	546816	155851	35.3	missin g	19.8	24.9	24.6	24.0	22.6	31.0	36.4	24.5	30.1	32.3	27.8	21.8	-
DT54	546802	155000	47.3	37.1	25.1	23.2	22.4	24.4	26.3	29.9	35.2	32.5	36.7	38.6	31.6	24.8	-
DT71	547097	155099	42.4	28.0	26.3	19.8	23.3	23.6	20.1	24.9	38.5	28.5	35.3	33.8	28.7	22.5	-
DT74	544415	153914	missin g	31.5	26.6	17.3	missin g	25.4	23.6	29.5	34.8	29.6	36.0	28.7	28.3	22.2	-
DT76	544770	154000	41.4	35.9	30.7	24.1	26.3	missin g	34.5	37.3	46.9	39.2	38.7	28.6	34.9	27.4	-
DT77	544594	154025	31.6	missin g	29.8	27.9	25.6	31.4	29.7	missin g	40.9	35.6	33.9	missin g	31.8	25.0	-
DT81	552504	167700	38.5	30.1	22.5	19.6	17.4	23.1	22.4	27.4	26.9	21.0	36.4	31.1	26.4	20.7	-
DT83	553107	167868	66.7	49.2	28.8	27.1	28.6	35.0	44.9	45.2	missin g	48.5	48.0	45.6	42.5	33.3	-

Sevenoaks District Council

Mean: nce ed to est ure	Comment

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 0.78	Annual Me Distance Corrected Nearest Exposur
DT84	551492	168695	37.5	31.6	21.6	19.0	26.1	27.6	25.1	33.5	35.4	27.1	31.8	35.4	29.3	23.0	-
DT85	551575	168508	52.8	35.1	34.5	22.9	30.0	40.7	36.9	40.0	50.5	44.1	49.1	45.9	40.2	31.5	-
DT86	552174	168162	missin g	missin g	13.0	22.5	20.6	23.6	24.9	28.6	35.7	29.4	37.0	34.3	27.0	21.1	-
DT87	553416	167615	62.4	48.8	37.0	31.8	35.1	43.0	42.3	47.9	53.3	52.0	52.9	39.4	45.5	35.7	-
DT88	550297	169682	missin g	missin g	missin g	missin g	missin g	24.9	21.0	28.1	30.0	23.8	32.0	27.1	26.7	20.7	-
DT90	550283	169743	39.1	27.0	27.0	24.3	19.8	20.5	17.8	26.6	33.8	23.6	29.2	34.4	26.9	21.1	-
DT93	550258	169575	34.8	23.0	25.6	24.8	19.4	22.7	18.8	26.9	25.9	20.4	25.3	31.5	24.9	19.5	-
DT94	550351	169499	40.8	31.4	22.8	25.7	22.1	25.8	22.2	27.8	31.3	27.4	37.6	34.3	29.1	22.8	-
DT95	554217	167252	43.3	missin g	26.4	31.9	26.9	31.5	24.0	32.4	34.8	28.1	35.1	36.1	31.9	25.0	-
DT96	552371	155345	42.2	16.9	22.0	19.5	18.6	23.1	21.5	27.3	30.5	31.0	34.6	36.4	27.0	21.2	-
DT97	550557	168258						18.5	19.0	20.1	25.6	20.9	29.0	26.9	22.9	17.7	-
DT98	550955	157680									42.0	27.5	39.4	34.6	35.9	22.8	-

 \boxtimes All erroneous data has been removed from the NO₂ 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.

 $\hfill\square$ National bias adjustment factor used.

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

Sevenoaks District Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

Exceedances of the NO₂ annual mean objective of $40\mu g/m^3$ are shown in **bold**.

 NO_2 annual means exceeding 60μ g/m³, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in <u>bold and underlined</u>.

See Appendix C for details on bias adjustment and annualisation.

Sevenoaks District Council

ean: e I to t e	Comment



Executive Summary

Bureau Veritas have been commissioned by Sevenoaks District Council to complete a review of the Council's existing Air Quality Management Areas (AQMAs) to help inform a new Air Quality Action Plan (AQAP). The Council currently have nine AQMAs, however only seven have been reviewed due to data availability. All of the AQMAs in question have been declared in relation to traffic emissions; six of which have been designated for exceedances of the NO₂ annual mean Air Quality Strategy objective. The remaining AQMA, No.6, along the M25, has been declared due to exceedances of the PM₁₀ 24-hour mean AQS objectives.

A dispersion modelling assessment has been completed whereby NO₂ and PM₁₀ concentrations have been predicted across all relevant areas within the district at both specific receptor locations, and across a number of gridded areas to allow the production of concentration isopleths. This has been used to supplement local monitoring data to provide a clear picture of the pollutant conditions within the borough.

Following the completion of the analysis of both monitoring data and modelled concentrations across all of the assessed areas a number of recommendations have been made in terms of the AQMAs within Sevenoaks:

- AQMA No.1 M20 The AQMA can be considered for revocation due to no monitored exceedances at any of the monitoring locations, nor has the model predicted exceedances at any receptor locations within the AQMA. Additional monitoring could be carried out at specific receptor locations to confirm this as there are only 2 monitoring locations currently along the stretch of the AQMA;
- AQMA No.2 M25 As a consequence of the modelling results, additional monitoring is recommended to be carried out near the residential property at the roundabout of London Road in Westerham. Monitoring should also be carried out near to residential properties along the A224 and B2211 near to the M25. If these concentrations are shown to be compliant with the annual mean objective, then the AQMA can be revoked;
- AQMA No.3 M26 The model predicted concentrations within 10% of the AQS objective at one location. Therefore, monitoring is recommended to be carried out close to this location (receptor ID 161), along the A224 London Road flyover. If these concentrations are shown to be compliant, then the AQMA can be revoked;
- AQMA No.4 A20T No exceedances were predicted by the dispersion model within the AQMA. However, as no monitoring locations are present within the AQMA, it is recommended that monitoring be carried out close to residential properties on Phillip Avenue/Ladds Way/Cyclamen Road to confirm the modelled results. If no exceedances are reported, the AQMA should be revoked;
- AQMA No.6 (M25-PM10) Based upon the modelling results, no exceedances at relevant receptor locations are expected. Therefore, this AQMA can be revoked. No further actions are required;
- AQMA No.10 (Sevenoaks High Street) The AQMA is to remain in place, with additional monitoring
 carried out along the narrow section of the High Street near to the Bus Station, as well as at the closest
 point of relevant exposure to the A224 between the junctions to South Park and Lime Tree Walk. This
 is to ascertain whether there are any exceedances of the 1-hour NO₂ objective, as well as whether the
 AQMA should be extended along part of the A224;
- AQMA No.13 (A25) The AQMA is to remain in place, whilst potentially being reduced in size west of Westerham and east of Seal where no exceedances are predicted. Additional monitoring could be carried out to confirm this at residential properties along these stretches. Monitoring should be carried out near to the junction of London Road to the A25 Market Square in Westerham, as well as on the north-western side of the southern roundabout in Riverhead in order to determine whether there are any exceedances of the 1-hour NO₂ objective.

The next steps upon completion of this Technical Note are to develop, through consideration of merit, a defined set of achievable measures to be drawn forward into the revised action plan document.

QA/QC of Diffusion Tube Monitoring

Diffusion Tube Annualisation

Three diffusion tube locations had a data capture of less than 75% and therefore required annualisation. Details of this can be seen in Table C.2.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Sevenoaks District Council has applied a local bias adjustment factor of 0.78 to the 2020 monitoring data. A summary of bias adjustment factors used by Sevenoaks District Council over the past five years is presented in Table C.1.

The diffusion tube data processing tool highlighted poor data capture for three months at one of the continuous analysers and therefore poor overall data capture. The data from this site was still used as the inclusion of it provided a more conservative bias correction factor. A combined local bias adjustment factor of 0.78 has been used to bias adjust the 2020 diffusion tube results.

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	Local	-	0.78
2019	National	06/20	0.75
2018	Local	-	0.80
2017	Local	-	0.77
2016	Local	-	0.83

Table C.1 – Bias Adjustment Factor

NO₂ Fall-off with Distance from the Road

No diffusion tube NO₂ monitoring locations within Sevenoaks required distance correction during 2020.

QA/QC of Automatic Monitoring

- Data management and Local Site Operator (LSO) duties for any automatic monitoring sites within the authority is carried out by the Environmental Research Group at Imperial College London;
- Calibrations are carried out every two weeks;
- Data presented within the ASR is ratified;
- Data is available from the <u>London Air Quality Network</u>.

PM₁₀ and PM_{2.5} Monitoring Adjustment

The TEOM PM₁₀ monitors utilised within Sevenoaks have been converted to reference equivalence using the volatile correction method.

Automatic Monitoring Annualisation

All automatic monitoring locations within Sevenoaks 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.

NO₂ Fall-off with Distance from the Road

No automatic NO₂ monitoring locations within Sevenoaks required distance correction during 2020.

Site ID	Annualisation Factor Bat & Ball	Annualisation Factor Maidstone Rural	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DT88	0.9698	1.0041	0.9870	26.7	26.4	
DT97	0.9698	1.0041	0.9870	22.9	22.6	
DT98	0.7974	0.8224	0.8099	35.9	29.1	

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

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	9	11			
Bias Factor A	0.87 (0.78 - 1)	0.71 (0.6 - 0.86)			
Bias Factor B	14% (0% - 29%)	41% (17% - 65%)			
Diffusion Tube Mean (µg/m³)	12.8	25.3			
Mean CV (Precision)	5.3%	4.7%			
Automatic Mean (μg/m³)	11.2	17.9			
Data Capture	96%	100%			
Adjusted Tube Mean (μg/m³)	11 (10 - 13)	18 (15 - 22)			

Notes:

Despite the poor overall data capture for one of the continuous monitors (Input 1) the inclusion of it provides a more conservative bias correction factor. A combined local bias adjustment factor of 0.78 has been used to bias adjust the 2020 diffusion tube results.

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













LAQM Annual Status Report 2021


















LAQM Annual Status Report 2021







Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁷

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO2)	$200\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO ₂)	40μg/m ³	Annual mean
Particulate Matter (PM ₁₀)	$50\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM ₁₀)	40μg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350μg/m³, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO ₂)	$125\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO ₂)	266μg/m³, not to be exceeded more than 35 times a year	15-minute mean

 $^{^7}$ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

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 (NO₂) 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 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_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)⁹ has estimated that during the initial lockdown

⁸ Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

⁹ Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

period in 2020, within urbanised areas of the UK reductions in NO₂ annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10 to $20\mu g/m^3$ if expressed relative to annual mean averages. During this period, changes in PM_{2.5} concentrations were less marked than those of NO₂. PM_{2.5} concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that PM_{2.5} concentrations during the initial lockdown period are of the order 2 to $5\mu g/m^3$ lower relative to those that would be expected under business-as-usual conditions.

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

Impacts of COVID-19 on Air Quality within Sevenoaks

Monitored levels of nitrogen dioxide continued to fall across the district. The change in recorded values between 2019 and 2020 was a more significant reduction than has been observed in previous years. It is likely that COVID-19 restrictions and reduced traffic volumes was a significant factor. Recorded NO₂ Levels fell at all locations when compared to 2019 levels by between 35% and 12%

Opportunities Presented by COVID-19 upon LAQM within Sevenoaks

No new measures were developed and implemented during 2020 as a consequence of COVID-19, however instructions to work from home has resulted in long term behavioural change and air quality benefits.

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

A campaign to raise awareness and reduce idling vehicles in areas was delayed due to COVID-19 restrictions. School closures and restrictions meant that educational promotions were not carried out.

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	
FDMS	Filter Dynamics Measurement System	
LAQM	Local Air Quality Management	
NO ₂	Nitrogen Dioxide	
NOx	Nitrogen Oxides	
PM10	Airborne particulate matter with an aerodynamic diameter of $10\mu m$ or less	
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of $2.5\mu m$ or less	
QA/QC	Quality Assurance and Quality Control	
SO ₂	Sulphur Dioxide	

References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021.
 Published by Defra in partnership with the Scottish Government, Welsh Assembly
 Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.