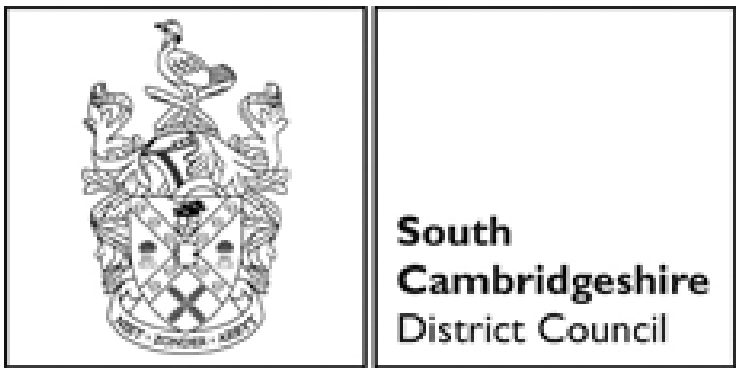

2022 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: June 2022

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Executive Summary: Air Quality in Our Area

Air Quality in South Cambridgeshire District Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, 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 ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

South Cambridgeshire District Council (SCDC) is a rural district with good rail and road links to London and South-East, including the A14 and M11/A11 corridors. The only Air Quality Management Area (AQMA) was declared along the A14 between Bar Hill and Milton in 2008. The main pollutants of concern i.e. Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}) have been monitored through a network of Diffusion Tubes and Automatic Monitors since. A trend of decreasing monitored concentrations has been recorded within the AQMA, with pollution levels consistently below the objective levels since 2014. As a result, revocation of this AQMA was proposed and supported by Defra in 2020. Following the approval process in accordance with the Council's constitution in 2021, the revocation order was officially signed off and published on 20th January 2022.

Following the revocation of the AQMA, a new Air Quality Strategy[5] has been approved setting out a new approach to monitor air quality across the district and to identify potential hotspots.

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[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 2021

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

[5] South Cambridgeshire District Council 2021 Air Quality Strategy

Given that future developments in the district are mainly residential and reliant on road-based transport for travel, there is a potential for cumulative impacts on local air quality. This strategy outlines three focussed actions to ensure that:

1. air quality is monitored and understood district wide and appropriate measures are introduced to meet air quality objectives,
2. policies are in place to minimise impacts from future developments and
3. public engagement is aimed at increasing local knowledge and supporting better choices in reducing daily impact on air quality.

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[6] sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero[7] 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 key actions undertaken or underway to monitor and improve air quality are summarised here:

- A new Air Quality Strategy has been approved. The Strategy outlines a new approach to monitor and improve the air quality across the district and to ensure both the new and existing communities are considered to benefit a better air quality district wide.
- A review of the monitoring network has been completed, focusing on the areas of future major development in the district. As the result, the monitoring network has

[6] Defra. Clean Air Strategy, 2019

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

been updated with new diffusion tubes, new automatic continuous monitors and new indicative real-time Zephyr monitors.

- Two new automatic continuous monitors will be operational in new locations i.e. Northstowe and Hasrton in 2022. This will allow the Council to establish a new continuous monitoring network across the district. The existing network is likely to be subject to relocation or decommissioning in line with the new Air Quality Strategy.
- A hotspot monitoring initiative is carried out using indicative real-time monitors (Zephyrs). The aim of this initiative is to conduct targeted studies such as monitoring air quality near schools and different areas of concern. Details of these studies are made available via a report after a minimum of 6-months operation.

Further consideration has been given to air quality and its improvement across the district, in line with the Council's key objective to 'Being green to our core'[8]. The supporting actions are summarised here:

- Electric vehicle charging points were installed at our Waterbeach depot. We are currently working on a major retrofit project at our main office, South Cambridgeshire Hall. This will largely replace the need for gas, as heating will be provided from a ground source heat pump. Electric vehicle charge points powered by solar panels will be installed as part of this project.
- Our first electric refuse vehicle was purchased in 2020 and is in operation. In addition to the electric option the service is also investigating other options such as hydrogen as the solution to reducing our CO_2 impact to the environment.
- Our Zero Carbon Action Plan 2020-25 outlines the actions we are taking to reduce carbon emissions from our own estate and operations by 45% on a 2018-19 baseline by 2025 and how we are supporting the district to reach net zero[9].
- Our Zero Carbon Communities Grant[10],scheme funds community initiatives to improve sustainability.

[8] Being green to our core

[9] Zero Carbon Strategy

[10] Zero Carbon Communities Grant

Conclusions and Priorities

The review of the monitoring data in 2021 has identified the following:

- No exceedances of any of the national air quality objectives were reported at any of the monitoring locations.
- A decrease in concentrations was seen at all monitoring locations.
- Overall, a decrease in concentrations was seen at all monitoring locations. However, the concentrations in 2021 are slightly higher than what was recorded in 2020. This is likely to be the result of Covid-19 and its impact on daily traffic when lock down and remote working was introduced in 2020.
- There were no exceedances of any objectives at any of the sites in the AQMA which is now revoked.
- Low data capture was reported for new diffusion tubes and some of those which have been removed from the network. However, sufficient data was available to allow annualisation.
- Data capture was generally good for the automatic continuous monitors except for Girton site which required annualisation.
- No new sources of pollution have been identified.

Local Engagement and How to get Involved

Previous Annual Status Reports and details on air quality monitoring are available on our website[11] and you can share your views via our email address air.quality@scambs.gov.uk and follow our Facebook page[12] for general updates and news. The website contains a link to live data from our continuous monitor locations and a link to data from the Zephyr monitors is due to go live soon. Ways you can help to improve air quality in South Cambridgeshire include:

- Minimise car use wherever possible:
    - Avoid using your car for short trips (under 2 miles) – short trips are very polluting as modern engines needs to reach a very high temperature to work efficiently; on short trips it won't reach that temperature.

[11] SCDC Local Air Quality Management

[12] SCDC Facebook

    - For short journeys try cycling or walking more often – this helps you stay healthy and saves you money in fuels costs.
    - For longer journeys consider public transport options.
    - Use journey-planning apps such as MyBusTrip or MotionMap for travel by bus, train, walking and cycling.
- Switch it off – don't leave your car engine idling if you are stationary e.g. waiting to pick someone up, in a traffic jam or waiting at level crossings.
- When driving, use techniques that help you use less fuel, like driving more slowly and smoothly.
    - You could use 10% less fuel by following the tips on the AA website
    - Like switching your engine off when stationary, this will not only reduce your emissions of air pollution but will save fuel and therefore money too!
- Consider making your next vehicle an electric vehicle.
- Join a car club or car-share regularly.
- Consider working at home where possible – the first Covid-19 lockdown showed widespread improvements in the air quality as the amount people travelled reduced.
- Use less energy at home – consider a smart meter to monitor usage and be aware of boiler standards.
- Opt for 'green energy' tariffs where available or switch to renewable sources of heating or power.
- Reduce the use of solid fuel stoves and open fires – domestic burning is now the single biggest source of particulate matter pollution in the UK (greater than traffic and industry).
    - If you are burning wood or coal ensure any fuel used meets the new standards of moisture content and emissions. Find more information
- Improve indoor air quality by ensuring adequate ventilation through opening windows, especially when cooking or cleaning, as these activities produce pollutants.

Make your children aware of the impact that day to day activities have on air quality.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of South Cambridgeshire District Council. If you have any comments on this ASR please send them to Environmental Health - Air Quality at:

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This ASR has been approved by Head of Greater Cambridge Shared Waste Service

And Head of Climate, Environment & Waste for South Cambridgeshire District Council.

This ASR has been signed off by a Director of Public Health.

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Tables

1 Local Air Quality Management

This report provides an overview of air quality in South Cambridgeshire District Council during 2021. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

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

- NO_2 annual mean;
- PM_{10} 24-hour mean;

We proposed to revoke AQMA 1 in the 2020 ASR. The proposal was following the consistent compliance with the national objectives at all monitoring sites in the AQMA since 2014. This was supported by Defra however the process was delayed, and the revocation order was officially published on 20th January 2022.

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 National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 1	2008	NO_2 Annual Mean	Area along A14 between Bar Hill and Milton	YES	42 µg/m^3	15.4 µg/m^3	Air Quality Action Plan for Cambridgeshire Growth Areas, 2009	https://www.scambs.gov.uk/media/7295/aqma.pdf
AQMA 1	2008	PM_{10} 24 Hour Mean	Area along A14 between Bar Hill and Milton	YES	52 exceedances	0 exceedances	Air Quality Action Plan for Cambridgeshire Growth Areas, 2009	https://www.scambs.gov.uk/media/7295/aqma.pdf

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

☒ **SCDC confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in South Cambridgeshire District Council

Defra's appraisal of last year's ASR concluded that the report was well structured, detailed, and provided the information specified in the Guidance. we will continue to report this information in the same format.

South Cambridgeshire District Council has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. The measures are included within Table 2.2, with the type of measure and the progress South Cambridgeshire District Council have made during the reporting year of 2021 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

Following the revocation of the AQMA, a new Air Quality Strategy[13] has been approved setting out a new approach to monitor air quality across the district. The aim is to ensure both new and existing communities are considered to benefit a better air quality district wide. This strategy outlines three focussed actions to ensure that:

1. air quality is monitored and understood district wide and appropriate measures are introduced to meet air quality objectives,
2. policies are in place to minimise impacts from future developments and
3. public engagement is aimed at increasing local knowledge and supporting better choices in reducing daily impact on air quality.

Additional measures completed in line with our new air quality strategy in 2021 include:

- A review of the monitoring network has been completed, focusing on the areas of future growth and the existing communities with no monitoring record. As the result, the monitoring network has been updated with new diffusion tubes.
- In addition, two new automatic continuous monitors are purchased which will be operational in Northstowe New Town and Hasrton in 2022. These locations are considered as areas of high predicted growth in the district. This will allow the

[13] South Cambridgeshire District Council 2021 Air Quality Strategy

Council to establish a new continuous monitoring network and continue to make changes to the existing network in line with the new Air Quality Strategy.

- A hotspot monitoring initiative is carried out using indicative real-time monitors (Zephyrs). The aim of this initiative is to conduct targeted studies such as monitoring air quality near primary schools and new areas of concern. These studies are discussed in section 2.3.

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	Low Emission Strategies	Policy Guidance and Development Control	Low Emissions Strategy	2019	2022	SCDC Environmental Health, GCP Planning Department	Developer contributions	N/A	N/A	N/A	Implementation	N/A	To be confirmed – May involve ratio of PPs issued with LES	In progress/ongoing - Low Emission Strategies required as per Local Plan and Supplementary Planning Document	-
2	Guided Bus Way	Transport Planning and Infrastructure	Bus route improvements	2009	2011	Cambridgeshire County Council (CCC)	CCC	N/A	N/A	N/A	Completed	N/A	N/A	Completed	-
3	A14 improvement - Junction 31-32 (EB & WB)	Traffic Management	Strategic highway improvements	2015	2015	CCC	CCC	N/A	N/A	N/A	Completed	N/A	-	Completed Autumn 2015	-
4	A14/M11 re-alignment	Traffic Management	Strategic highway improvements	2016	2020	CCC/Highways England	CCC/Highways England	N/A	N/A	N/A	Completed	N/A	Central gov/Highways England Commitment	Completed 2020	-
5	Policy Guidance and Development Control	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2015	2016	SCDC	-	N/A	N/A	N/A	Completed	N/A	-	SPD or Developers Guide for Low Emission Strategy measures	-
6	City Deal	Transport Planning & Infrastructure and Promoting Travel Alternatives	Bus route improvements & Promotion of cycling/Sustainable Transport	2015	2015-2030	CCC/Cambridge City Council	CCC/Cambridge City Council	N/A	N/A	N/A	Implementation	N/A	Connect existing and new residential and employment areas with high quality public transport networks, including new orbital bus routes around Cambridge & comprehensive network of pedestrian and cycle route.	Continually ongoing Proposed scheme for making bus, cycle and walking journeys more convenient and safer from Northstowe announced.	Tranche 1 schemes by 2019

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

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

South Cambridgeshire District Council undertakes monitoring for $PM_{2.5}$ at two sites, one roadside site at Girton and one urban background site at Orchard Park.

Furthermore, indicative real-time zephyr monitors are used for targeted hotspot monitoring, including monitoring $PM_{2.5}$. The main initiative is to study air quality around primary schools as it is recognised that children are among the most vulnerable to the impacts of air pollution. Studies have been completed at Harston and Newton Community Primary School in Harston, Monkfield Park Primary School in Cambourne and Pathfinder C of E Primary School in Northstowe. The results are made available via a report on the council's website after a minimum of 6-months operation. The details of completed studies will be included in next year's ASR.

Public Health England (PHE) reports the health impacts of Particulate Matter ($PM_{2.5}$) through the fraction of mortality attributable to particulate air pollution. This was reported as 5.4% for Cambridgeshire in 2019[14]. This is very similar to the East of England regional average of 5.5%, which is slightly above the national average for England of 5.1%.

The Council has participated in publicity campaigns both by Defra and locally highlighting the impacts of wood burning stoves on local air quality, which is now recognised as the biggest source of small particulate matter, providing information about what type of wood to burn and how to burn it efficiently[15]. In addition, Greater Cambridgeshire Partnership (GCP) is working on a network of twelve separate routes into Cambridge from surrounding towns and villages to increase the level of safe cycling and walking and to reduce traffic congestion[16]. Cambridgeshire County Council (CCC) elected members have also noted

[14] Public Health Outcome Framework
[15] Wood Burning Stoves Information

[16] Greenways Project information

the impacts of poor air quality and have passed a resolution to work with different councils and other public bodies more collaboratively across Cambridgeshire.

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

This section sets out the monitoring undertaken within 2021 by South Cambridgeshire District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

South Cambridgeshire District Council undertook automatic (continuous) monitoring at 3 sites during 2021. The Automatic Monitoring Stations at Girton and Impington sites are representative of nearby receptors. The Orchard Park monitor is a background site located within the school grounds. Two new automatic monitoring sites will be operational in Northstowe and Harston in 2022.

Table A.1 in Appendix A shows the details of the automatic monitoring sites. The automatic monitoring results also available through the UK-Air website.

The data capture for the automatic monitoring sites are as follows:

- NO_2: Impington site 94%, Orchard Park site 84% and Girton site 58%.
- PM_{10}: Impington site 94%, Orchard Park site 85% and Girton site 53%.
- $PM_{2.5}$: Orchard Park site 95% and Girton site 49%.
  As a result, the Girton site data was annualised.

The monitoring results demonstrate that:

- No exceedances of the annual mean objective for NO_2 or PM_{10} were recorded.
- No exceedances of annual mean objective for $PM_{2.5}$ were recorded.
- The hourly mean objective for NO_2 hourly mean was achieved at all sites.
- The daily mean objective for PM_{10} was achieved at all sites.
- Overall, a decrease in concentrations was seen at all monitoring locations. However, the concentrations in 2021 are higher than what was recorded in 2020. This is likely to be the result of Covid-19 and its impact on daily traffic with introduction of lock down and remote working.

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

South Cambridgeshire District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 31 sites during 2021, two of which were triplicate sites.

The monitoring network was updated with new locations in areas of concern and where no previous monitoring was undertaken. The new locations include Cambourne and Hardwick to the west of Cambridge, Teversham and Cherry Hinton to the East of Cambridge. These locations are listed below.

DT31 located on Church Road, Teversham.

DT32 located on Gazelle Way, Cherry Hinton.

DT33 located on Hudson Road, Upper Cambourne.

DT34 located on Jeavons Lane, Great Cambourne.

DT35 located on Swansley Lane, Lower Cambourne.

DT35 located on St Neots Road, Hardwick

Furthermore, the following locations were removed from the network due to consistent low concentrations.

DT1 located on the Coppice, Impington.

DT7 located on High Street, Tadlow.

DT17 located on Mill Lane, Sawston

DT21 located on Neal Drive, Orchard Park.

DT27 located on Engledow Drive, Orchard Park.

The data capture for the diffusion tubes was generally good. Annualisation was required for the new locations and the ones that were removed from the network. The monitoring results demonstrate:

- No exceedance of any long-term or short-term objective at any monitoring site.
- Overall, a decrease in concentrations was seen at all monitoring locations. However, the concentrations in 2021 are slightly higher than what was recorded in 2020. This

is likely to be the result of Covid-19 and its impact on daily traffic when lock down and remote working was introduced.

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_2)

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

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

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

There were no exceedances of any of the air quality objectives for NO_2 at any monitoring site in 2021. The maximum annual concentration measured was 21.1 µg/m^3, recorded at DT2, High Street, Histon.

Overall, a trend of decreasing concentrations was observed at all monitoring sites.

3.2.2 Particulate Matter (PM_{10})

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

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

There were no exceedances of any of the air quality objectives for PM_{10} at any monitoring site in 2021. The maximum annual concentration measured in 2021 was 15 µg/m^3, recorded at Impington site.

Overall, a trend of decreasing concentrations was observed at all monitoring sites.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

South Cambridgeshire District Council undertakes monitoring for $PM_{2.5}$ at two sites, one roadside site at Girton and one urban background site at Orchard Park. In 2021, these measured annual mean concentrations of 13 and 12 µg/m^3 respectively. This was the second year that data was available at the Orchard Park and it represents a decrease in concentration compared to 2020. At Girton site however, an increase in concentration was recorded compared to 2020. This could be due to the low data capture (less than 50%) at this site and therefore, the annualised data should be treated with care.

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)
IMP	Impington (A14)	Roadside	543739	261625	NO_2, PM_{10}	NO	Chemiluminescent; BAM	12	2	2
ORCH	Orchard Park Primary School (A14)	Urban Background	544558	261579	NO_2, PM_{10}, $PM_{2.5}$	NO	Chemiluminescent; BAM	1	N/A	2
GIRT	Girton	Roadside	542676	260667	NO_2, PM_{10}, $PM_{2.6}$	NO	Chemiluminescent; BAM	5	5	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.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)
DT1	The Coppice, Impington	Urban Background	544230	262048	NO2	N	7.0	0.5	No	2.0
DT2	The Gables, High Street, Histon	Roadside	543770	263678	NO2	N	1.0	1.0	No	2.0
DT-28N	73 Cambridge Road, Milton	Roadside	547436	262295	NO2	N	15.0	2.0	No	2.0
DT4	96 High Street, Sawston	Urban Background	548600	249136	NO2	N	5.0	1.0	No	2.0
DT5	Rhadegund Farm Cottage, Bar Hill, A14	Roadside	538744	263640	NO2	N	1.0	18.0	No	2.0
DT-6N	22 High Street, Linton	Roadside	555942	246680	NO2	N	1.0	2.0	No	2.0
DT7	20 High Street, Tadlow	Roadside	528131	247399	NO2	N	10.0	1.0	No	2.0
DT-8N	47 High Street, Harston	Roadside	542555	251001	NO2	N	5.0	2.0	No	2.0
DT9	3 Garner Close, Milton	Urban Background	547452	263175	NO2	N	5.0	1.0	No	2.0
DT10	1A Weavers Field, opp. Co-op, Girton	Urban Background	542537	261467	NO2	N	20.0	1.0	No	2.0
DT11	Heath House, A505, Thriplow	Urban Background	544034	244585	NO2	N	15.0	2.0	No	2.0
DT12	Lone Tree Avenue, Impington	Roadside	544119	261862	NO2	N	7.0	1.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT13	1 Brook Close, Histon	Urban Background	543955	263588	NO2	N	2.0	1.0	No	2.0
DT14	22 Water Lane, Histon	Roadside	544050	263306	NO2	N	2.0	2.0	No	2.0
DT15	72 Cambridge Road, Impington	Urban Background	544243	261819	NO2	N	7.0	1.0	No	2.0
DT17	5 Mill Lane, Sawston	Roadside	548545	249366	NO2	N	6.0	1.0	No	2.0
DT-32N	Banworth Lodge, Ely Road, A10	Roadside	548742	264698	NO2	N	8.0	7.0	No	2.0
DT20	Chieftain Way, Orchard Park	Roadside	544828	261738	NO2	N	4.0	0.5	No	2.0
DT21	Neal Drive, Orchard Park	Roadside	545056	261784	NO2	N	7.0	0.5	No	2.0
DT22	Flack End, Orchard Park	Roadside	545435	261906	NO2	N	7.0	35.0	No	2.0
DT23a, DT23b, DT23c	Orchard Park Primary School	Urban Background	544557	261571	NO2	N	1.0	50.0	Yes	2.0
DT26	Co-op, High Street, Histon	Roadside	543768	263708	NO2	N	1.0	4.5	No	2.0
DT27	Engledow Drive, Orchard Park	Urban Background	545259	261873	NO2	N	2.0	4.5	No	2.0
DT28	22 Topper Street, Orchard Park	Roadside	545169	261764	NO2	N	4.0	0.5	No	2.0
DT29	Church Lane, Little Abington	Urban Background	552961	249251	NO2	N	14.0	2.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT-30N	63 Denny End Road,Waterbeach	Roadside	549154	266006	NO2	N	7.0	2.0	No	2.0
DT-LN1	Old Railway Tavern, Station Road	Roadside	539847	268169	NO2	N	5.0	2.0	No	2.0
DT-LN2	75 High Street, Longstanton	Roadside	539570	266842	NO2	N	2.0	2.0	No	2.0
DT-LN3	1 Rampton Drift, Longstanton	Roadside	540553	266869	NO2	N	17.0	1.0	No	2.0
DT-LN4	37 Longstanton Road, Oakington	Roadside	540963	264474	NO2	N	5.0	1.0	No	2.0
DT-LN5a-5c	Longstanton bypass	Roadside	539614	267484	NO2	N	60.0	1.0	No	2.0
DT31	Church Road, Teversham	Roadside	549457	258573	NO2	N	14.0	1.5	No	2.0
DT32	Gazelle Way, Cherry Hinton	Roadside	549406	257551	NO2	N	18.0	2.0	No	2.0
DT33	Hudson Road, Upper Cambourne	Urban Background	533359	259765	NO2	N	7.0	2.0	No	2.0
DT34	Jeavons Lane, Great Cambourne	Roadside	532092	259086	NO2	N	6.0	1.0	No	2.0
DT35	Swansley Lane, Lower Cambourne	Roadside	531247	259475	NO2	N	17.0	1.0	No	2.0
DT36	55 St Neots Road	Roadside	538122	259523	NO2	N	20.0	3.0	No	2.0

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
IMP	543739	261625	Roadside	94.1	94.1	23	19	16	13	16
ORCH	544558	261579	Urban Background	84.4	84.4	18	14	15	11	11
GIRT	542676	260667	Roadside	58.6	58.6	23	18	17	12	12

☒ **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^3.

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

All means have been "annualised" as per LAQM.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_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

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 2021 (%) (2)	2017	2018	2019	2020	2021
DT1	544230	262048	Urban Background	100	57.6	17.2	14.7	14.7	11.4	10.5
DT2	543770	263678	Roadside	100	100.0	27.4	27.1	27.2	19.7	21.1
DT-28N	547436	262295	Roadside	92.3	92.3	-	22.8	23.0	18.8	17.3
DT4	548600	249136	Urban Background	100	100.0	26.1	24.7	23.0	16.5	17.0
DT5	538744	263640	Roadside	100	100.0	16.2	19.4	13.4	10.8	12.2
DT-6N	555942	246680	Roadside	100	100.0	-	20.2	21.0	15.1	16.5
DT7	528131	247399	Roadside	100	57.6	12.1	8.6	10.2	8.5	7.8
DT-8N	542555	251001	Roadside	100	100.0	-	17.3	15.3	12.3	13.1
DT9	547452	263175	Urban Background	100	100.0	17.5	14.4	15.5	13.3	12.0
DT10	542537	261467	Urban Background	82.4	82.4	26.3	25.8	19.0	15.4	16.5
DT11	544034	244585	Urban Background	84.3	84.3	24.6	24.9	22.5	15.0	16.9
DT12	544119	261862	Roadside	100	100.0	18.8	15.1	16.3	12.7	12.2
DT13	543955	263588	Urban Background	100	100.0	18.5	17.2	16.3	11.5	12.1

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 2021 (%) [2]	2017	2018	2019	2020	2021
DT14	544050	263306	Roadside	100	100.0	26.4	23.6	22.3	20.2	17.1
DT15	544243	261819	Urban Background	100	100.0	19.4	17.5	18.5	13.4	11.9
DT17	548545	249366	Roadside	42.9	25.3	14.1	13.1	13.8	10.4	12.2
DT-32N	548742	264698	Roadside	84.8	84.8	-	23.4	21.6	19.0	15.3
DT20	544828	261738	Roadside	100	100.0	18.2	23.2	14.7	13.9	13.6
DT21	545056	261784	Roadside	100	57.6	18.8	16.7	15.8	12.9	13.1
DT22	545435	261906	Roadside	100	100.0	21.2	17.5	15.9	13.3	13.5
DT23a, DT23b, DT23c	544557	261571	Urban Background	100	100.0	16.3	16.3	-	10.6	10.5
DT26	543768	263708	Roadside	100	100.0	18.9	17.8	17.1	13.2	13.2
DT27	545259	261873	Urban Background	57.1	34.2	21.2	17.9	16.8	13.5	13.3
DT28	545169	261764	Roadside	100	100.0	21.3	16.6	16.7	14.1	13.9
DT29	552961	249251	Urban Background	100	100.0	11.0	10.0	10.9	8.4	7.8
DT-30N	549154	266006	Roadside	100	100.0	-	16.0	-	12.2	12.1
DT-LN1	539847	268169	Roadside	90.4	90.4	18.5	18.6	17.4	13.9	14.5

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 2021 (%) [2]	2017	2018	2019	2020	2021
DT-LN2	539570	266842	Roadside	92.3	92.3	16.6	14.5	14.6	11.9	10.7
DT-LN3	540553	266869	Roadside	100	100.0	12.7	11.8	11.1	9.0	8.0
DT-LN4	540963	264474	Roadside	92.6	92.6	14.6	12.1	-	9.9	9.5
DT-LN5a-5C	539614	267484	Roadside	100	100.0	26.8	24.3	23.5	16.3	20.4
DT31	549457	258573	Roadside	100	42.4	-	-	-	-	14.0
DT32	549406	257551	Roadside	80	34.7	-	-	-	-	14.6
DT33	533359	259765	Urban Background	100	42.4	-	-	-	-	10.7
DT34	532092	259086	Roadside	100	42.4	-	-	-	-	12.3
DT35	531247	259475	Roadside	100	42.4	-	-	-	-	11.5
DT36	538122	259523	Roadside	100	42.4	-	-	-	-	12.3

☒ **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 µg/m^3.

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

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

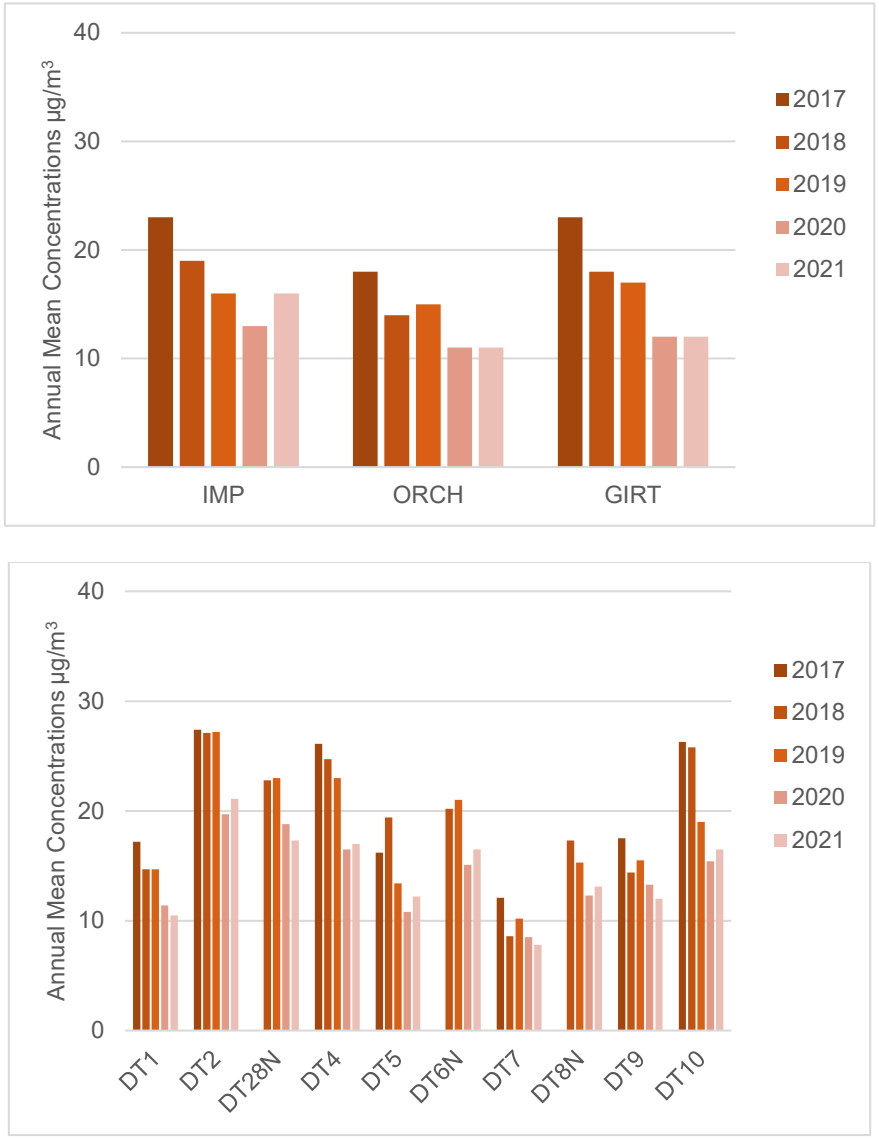
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

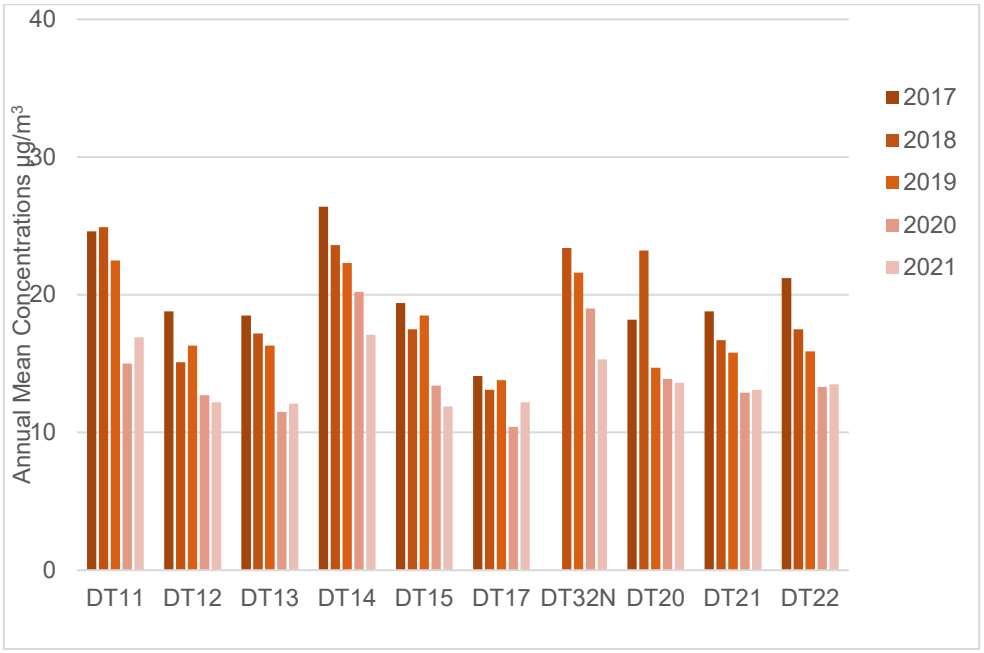
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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_2 Concentrations




40
30
20
10
0
Annual Mean Concentrations µg/m³
2017
2018
2019
2020
2021
DT11
DT12
DT13
DT14
DT15
DT17
DT32N
DT20
DT21
DT22

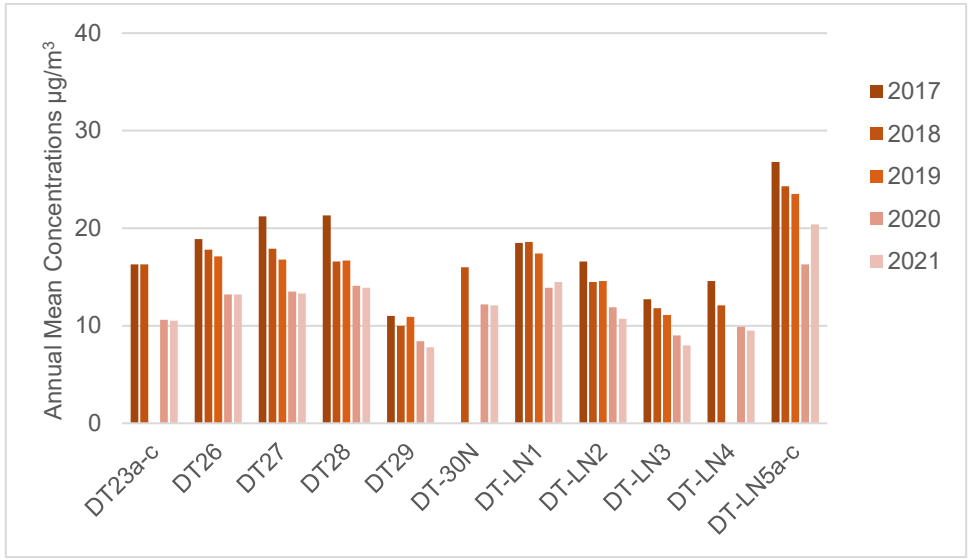

40
30
20
10
0
Annual Mean Concentrations µg/m³
2017
2018
2019
2020
2021
DT23a-c
DT26
DT27
DT28
DT29
DT-30N
DT-LN1
DT-LN2
DT-LN3
DT-LN4
DT-LN5a-c

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
IMP	543739	261625	Roadside	94.1	94.1	0	0	0	0	0
ORCH	544558	261579	Urban Background	84.4	84.4	0	0	0	0	0
GIRT	542676	260667	Roadside	58.6	58.6	0	0	0	0	0

Notes:

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

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

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

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

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

Table A.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
IMP	543739	261625	Roadside	94.7	94.7	16	17	16	15	15
ORCH	544558	261579	Urban Background	85	85	14	14	14	12	12
GIRT	542676	260667	Roadside	53.5	53.5	17	17	17	14	15

☒ **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^3.

Exceedances of the PM_{10} annual mean objective of 40µg/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.

(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_{10} Concentrations

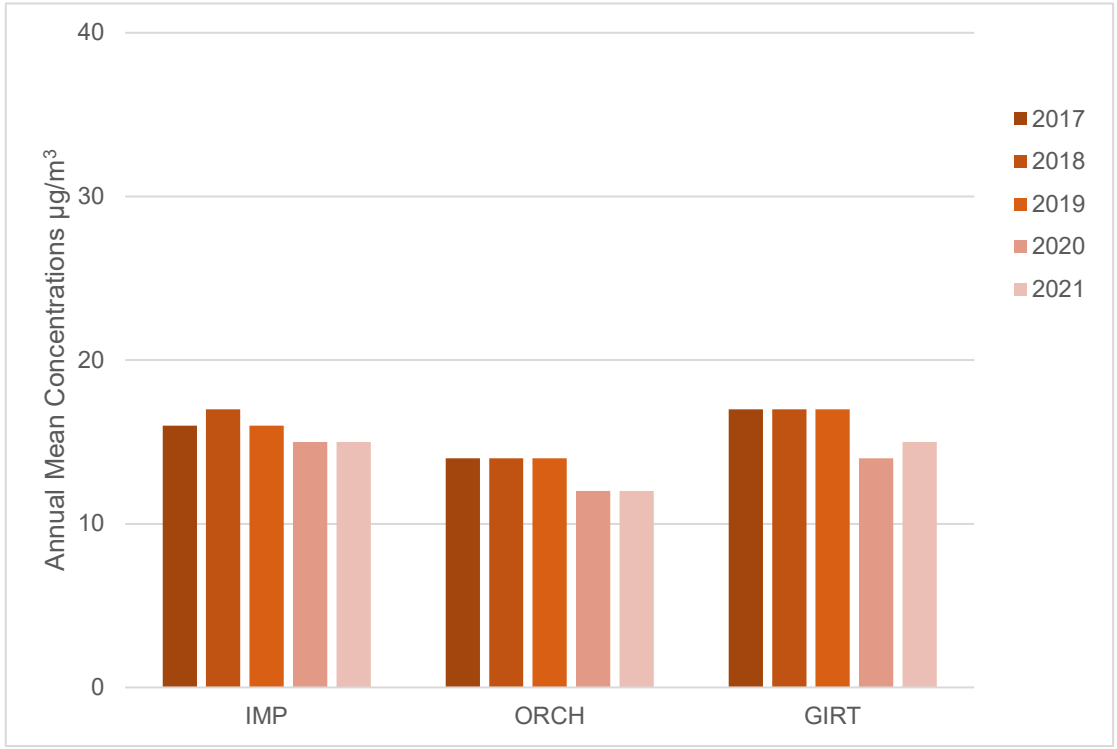


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
IMP	543739	261625	Roadside	94.7	94.7	2	1	2	0 (22)	0
ORCH	544558	261579	Urban Background	85	85	1	1	1	0	0
GIRT	542676	260667	Roadside	53.5	53.5	1	1	3	0	0 (22)

Notes:

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

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

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

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

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

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	2017	2018	2019	2020	2021
ORCH	544558	261579	Urban Background	95.1	95.1	-	-	-	13	12
GIRT	542676	260667	Roadside	49.7	49.7	11	11	11	10	13

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

Notes:

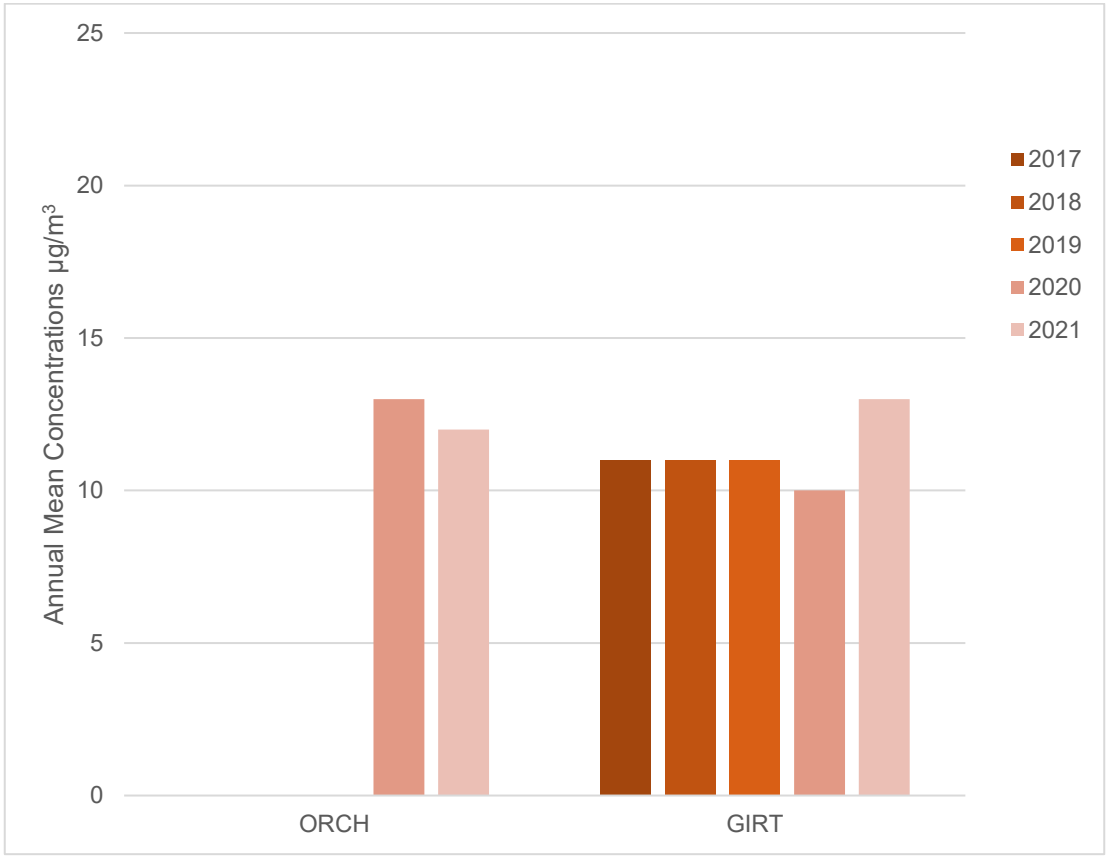
The annual mean concentrations are presented as $\mu g/m^3$.

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.3 – Trends in Annual Mean $PM_{2.5}$ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO_2 2021 Diffusion Tube Results (µg/m^3)

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	Comment
DT1	544230	262048	18.8	15.3	12.1	12.0	12.1	9.8	11.3	-	-	-	-	-	13.1	10.5	-	-
DT2	543770	263678	28.3	28.9	25.2	23.4	26.1	21.2	23.3	19.6	32.9	30.6	33.0	31.7	27.0	21.1	-	-
DT-28N	547436	262295	30.1	26.2	23.2	16.9	-	14.6	13.3	14.9	22.4	23.4	33.9	24.9	22.2	17.3	-	-
DT4	548600	249136	22.4	22.2	24.7	23.0	16.4	17.7	18.0	17.7	26.0	21.9	27.7	23.7	21.8	17.0	-	-
DT5	538744	263640	18.2	20.6	13.5	22.0	14.0	15.0	15.4	7.0	19.1	11.2	18.9	12.6	15.6	12.2	-	-
DT-6N	555942	246680	26.5	25.8	22.3	19.8	19.9	13.6	17.0	14.1	24.5	23.3	24.7	21.6	21.1	16.5	-	-
DT7	528131	247399	14.2	13.3	11.2	7.7	9.2	5.3	6.6	-	-	-	-	-	9.6	7.8	-	-
DT-8N	542555	251001	18.6	21.1	16.3	16.0	14.5	12.0	13.8	11.3	18.9	17.4	25.4	16.5	16.8	13.1	-	-
DT9	547452	263175	24.3	19.6	16.3	12.8	12.9	9.3	9.0	10.9	16.9	18.0	17.2	17.0	15.4	12.0	-	-
DT10	542537	261467	22.9	24.2	19.3	18.9	18.9	-	-	18.5	28.5	19.5	21.0	20.0	21.2	16.5	-	-
DT11	544034	244585	21.3	17.2	21.8	18.7	-	-	20.3	16.6	26.5	20.2	26.7	27.6	21.7	16.9	-	-
DT12	544119	261862	20.1	20.9	14.6	13.2	10.9	9.9	11.2	9.7	18.6	18.7	20.5	19.2	15.6	12.2	-	-
DT13	543955	263588	22.8	18.2	14.0	14.7	16.5	11.9	11.3	8.4	13.1	16.7	20.9	17.3	15.5	12.1	-	-
DT14	544050	263306	31.4	23.4	21.0	20.9	18.9	14.5	15.5	15.4	22.9	24.1	28.5	27.1	22.0	17.1	-	-
DT15	544243	261819	19.5	18.2	15.2	12.4	13.8	8.1	11.2	10.1	17.8	16.8	18.7	20.6	15.2	11.9	-	-
DT17	548545	249366	-	-	-	-	10.5	11.6	10.1	-	-	-	-	-	10.7	12.2	-	-
DT-32N	548742	264698	-	-	27.3	21.6	17.3	15.1	17.2	15.5	20.0	20.5	17.0	24.1	19.6	15.3	-	-
DT20	544828	261738	23.9	17.4	18.5	16.1	15.4	13.7	13.7	8.5	19.5	18.1	23.3	21.4	17.5	13.6	-	-

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	Comment
DT21	545056	261784	24.3	19.7	15.7	17.4	14.0	10.8	11.9	-	-	-	-	-	16.3	13.1	-	-
DT22	545435	261906	24.2	19.6	17.3	19.1	12.5	14.6	14.1	11.4	19.7	14.2	21.4	19.8	17.3	13.5	-	-
DT23a	544557	261571	18.1	15.0	13.5	12.8	11.5	8.4	9.1	8.7	15.8	13.3	19.4	17.4	-	-	-	Triplicate Site Annual data for DT23c only
DT23b	544557	261571	-	16.7	12.2	14.1	10.6	8.5	9.3	8.2	15.7	14.8	19.1	16.7	-	-	-	Triplicate Site Annual data for DT23c only
DT23c	544557	261571	17.9	15.1	13.3	12.9	11.9	8.0	7.5	7.8	15.6	13.9	19.1	14.8	13.5	10.5	-	Triplicate Site Annual data for DT23c only
DT26	543768	263708	24.1	19.9	14.8	15.8	16.4	12.2	12.9	10.3	19.5	17.5	20.1	19.6	16.9	13.2	-	-
DT27	545259	261873	-	21.8	10.3	19.3	-	-	12.0	-	-	-	-	-	15.9	13.3	-	-
DT28	545169	261764	25.0	20.9	18.0	16.1	13.6	10.8	10.9	10.8	17.9	19.2	28.8	21.6	17.8	13.9	-	-
DT29	552961	249251	15.1	11.5	10.8	10.2	5.6	6.0	6.7	6.8	10.6	9.9	13.3	12.9	10.0	7.8	-	-
DT-30N	549154	266006	22.6	18.9	7.6	13.6	11.1	10.4	13.6	10.3	18.5	16.9	22.0	20.1	15.5	12.1	-	-
DT-LN1	539847	268169	18.4	16.5	16.0	19.1	18.6	16.5	-	11.9	24.0	20.0	22.8	21.2	18.6	14.5	-	-
DT-LN2	539570	266842	-	9.2	14.6	13.5	13.2	6.9	11.0	9.8	16.3	16.8	20.9	19.1	13.8	10.7	-	-
DT-LN3	540553	266869	16.7	10.7	8.3	7.9	7.9	7.3	7.0	6.5	12.8	11.8	13.9	12.9	10.3	8.0	-	-
DT-LN4	540963	264474	20.7	13.2	-	9.5	10.7	7.9	7.7	6.8	13.6	13.0	16.4	14.6	12.2	9.5	-	-
DT-LN5a	539614	267484	22.3	21.4	18.8	28.0	31.7	29.5	28.1	23.5	34.5	23.5	29.3	24.0	-	-	-	Triplicate Site Annual data for DT-LN5c only
DT-LN5b	539614	267484	24.2	23.0	22.1	25.9	28.7	28.9	28.4	22.1	36.0	27.2	29.0	18.1	-	-	-	Triplicate Site Annual data for DT-LN5c only
DT-LN5c	539614	267484	18.6	21.9	21.4	24.9	28.6	26.9	28.2	26.0	36.4	26.9	29.4	23.8	26.1	20.4	-	Triplicate Site Annual data for DT-LN5c only
DT31	549457	258573	-	-	-	-	-	-	-	9.7	17.0	20.3	27.2	19.2	18.7	14.0	-	-
DT32	549406	257551	-	-	-	-	-	-	-	13.2	20.0	16.6	-	22.4	18.1	14.6	-	-
DT33	533359	259765	-	-	-	-	-	-	-	6.9	13.5	12.7	19.4	18.7	14.2	10.7	-	-
DT34	532092	259086	-	-	-	-	-	-	-	9.3	17.0	15.4	20.2	20.0	16.4	12.3	-	-

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	Comment
DT35	531247	259475	-	-	-	-	-	-	-	8.6	14.9	13.5	20.1	19.3	15.3	11.5	-	-
DT36	538122	259523	-	-	-	-	-	-	-	10.4	15.5	13.9	21.7	20.7	16.4	12.3	-	-

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

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

☒ **National bias adjustment factor used**

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

☒ **SCDC confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within South Cambridgeshire District Council During 2021

South Cambridgeshire District Council has not identified any new sources relating to air quality within the reporting year of 2021.

Additional Air Quality Works Undertaken by South Cambridgeshire District Council During 2021

South Cambridgeshire District Council has not completed any additional works within the reporting year of 2021.

QA/QC of Diffusion Tube Monitoring

NO_2 monitoring was undertaken at 31 sites within the district using passive diffusion tubes. The tubes were supplied and processed by SOCOTEC Didcot, who supplied the following information. 'The samples have been analysed in accordance with SOCOTEC's standard operating procedure ANU/SOP/1015. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance.' The tubes were prepared by spiking acetone:triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection. Please note:

(i) As set out in the practical guidance, the results were initially calculated assuming an ambient temperature of 11°C, the reported values have been adjusted to 20°C to allow for direct comparison with EU limits.

(ii) The reported results have not been bias adjusted.

This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of our UKAS schedule. Any further calculations and assessments requiring exposure details and conditions fall outside the scope of our

accreditation. In the AIR PT inter-comparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a Satisfactory laboratory.

Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%. All diffusion tube monitoring locations within South Cambridgeshire District Council recorded data capture of 75% except for the newly added locations and some of the ones that have been removed from the network. Therefore these sites were annualised. Annualisation was carried out using the Diffusion Tube Data Processing Tool, with details provided 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/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

South Cambridgeshire District Council have applied a national bias adjustment factor of 0.78 to the 2021 monitoring data. A summary of bias adjustment factors used by South Cambridgeshire District Council over the past five years is presented in Table C.1.

The national bias adjustment factor was used due to no local co-location studies being available in 2020 that meet the criteria for applying a local bias adjustment factor over a national factor, as per Box 7.11 of LAQM.TG16.

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/22

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2022

LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List. If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List. If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List. If a year is not shown, we have no data[2]

Step 4: **Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.**

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method	Year[5]	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
SOCOTEC Didcot	50% TEA in acetone	2021	UB	City of York Council	11	17	13	38.2%	G	**0.72**
SOCOTEC Didcot	50% TEA in acetone	2021	R	City of York Council	12	25	20	27.0%	G	**0.79**
SOCOTEC Didcot	50% TEA in acetone	2021	R	City of York Council	12	22	17	29.0%	G	**0.77**
SOCOTEC Didcot	50% TEA in acetone	2021	R	City of York Council	12	37	25	45.5%	G	**0.69**
SOCOTEC Didcot	50% TEA in acetone	2021	UI	North Lincolnshire Council	12	17	14	19.3%	G	**0.83**
Socotec Didcot	50% TEA in acetone	2021	R	Bridgend Borough County Council / Shared Regulat	12	36	25	42.3%	G	**0.70**
Socotec Didcot	50% TEA in acetone	2021	UB	Derry City and Strabane District Council	12	11	9	28.4%	G	**0.78**
Socotec Didcot	50% TEA in acetone	2021	R	Derry City and Strabane District Council	12	30	30	2.4%	G	**0.98**
Socotec Didcot	50% TEA in acetone	2021	R	East Suffolk Council	11	30	25	22.3%	P	**0.82**
Socotec Didcot	50% TEA in acetone	2021	KS	Marylebone Road Intercomparison	10	56	42	32.3%	P	**0.75**
Socotec Didcot	50% TEA in acetone	2021	R	North East Lincolnshire Council	10	27	29	-7.6%	G	**1.08**
Socotec Didcot	50% TEA in acetone	2021	R	North East Lincolnshire Council	9	45	33	34.5%	P	**0.74**
Socotec Didcot	50% TEA in acetone	2021	R	Leeds City Council	13	40	29	35.5%	G	**0.74**
Socotec Didcot	50% TEA in acetone	2021	KS	Leeds City Council	12	34	25	37.9%	G	**0.73**
Socotec Didcot	50% TEA in acetone	2021	R	Leeds City Council	9	43	31	40.8%	G	**0.71**
Socotec Didcot	50% TEA in acetone	2021	UC	Leeds City Council	12	31	23	37.4%	G	**0.73**
SOCOTEC Didcot	50% TEA in acetone	2021		**Overall Factor[3] (23 studies)**				**Use**		**0.78**

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.78
2020	National	03/21	0.77
2019	National	03/20	0.75
2018	National	-	0.76
2017	National	-	0.77

NO_2 Fall-off with Distance from the Road

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

No diffusion tube NO_2 monitoring locations within South Cambridgeshire required distance correction during 2021.

QA/QC of Automatic Monitoring

South Cambridgeshire District Council is a member of the Calibration Club, operated by AEAT now Ricardo – AEA. All NOx analysers are chemiluminescence analysers. All particulate matter analysers are BAMs. In line with current guidance, BAM data is multiplied by 1.3 to give the gravimetric equivalent. QA/QC of automatic monitoring data is carried out by Ricardo. Tri-annual audits of the monitoring stations are carried out by Ricardo. Services of all the three AQ monitoring stations i.e. Impington, Girton and Orchard Park are carried out bi-annually by the appointed Equipment Support Unit (ESU) – ACOEM (Air Monitors). The sites are manually calibrated on a monthly basis by a Council Officer serving as Local Site Operative (LSO). The output from the calibrations is forwarded to Ricardo – AEA for QA/QC and ratification purposes. The monitoring data in the ASR has been ratified. Live and historic data is available at https://scambs-airquality.ricardo-aea.com/.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The type of PM_{10}/$PM_{2.5}$ monitor(s) utilised within South Cambridgeshire District Council do not required the application of a correction factor.

Automatic Monitoring Annualisation

Annualisation was required for all data recorded at Girton site with data capture of 58% for NO_2, 53% for PM_{10} and 49% for $PM_{2.5}$. Data is presented in Table C.2. Annualisation is required for any site with data capture less than 75% but greater than 25%.

NO_2 Fall-off with Distance from the Road

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

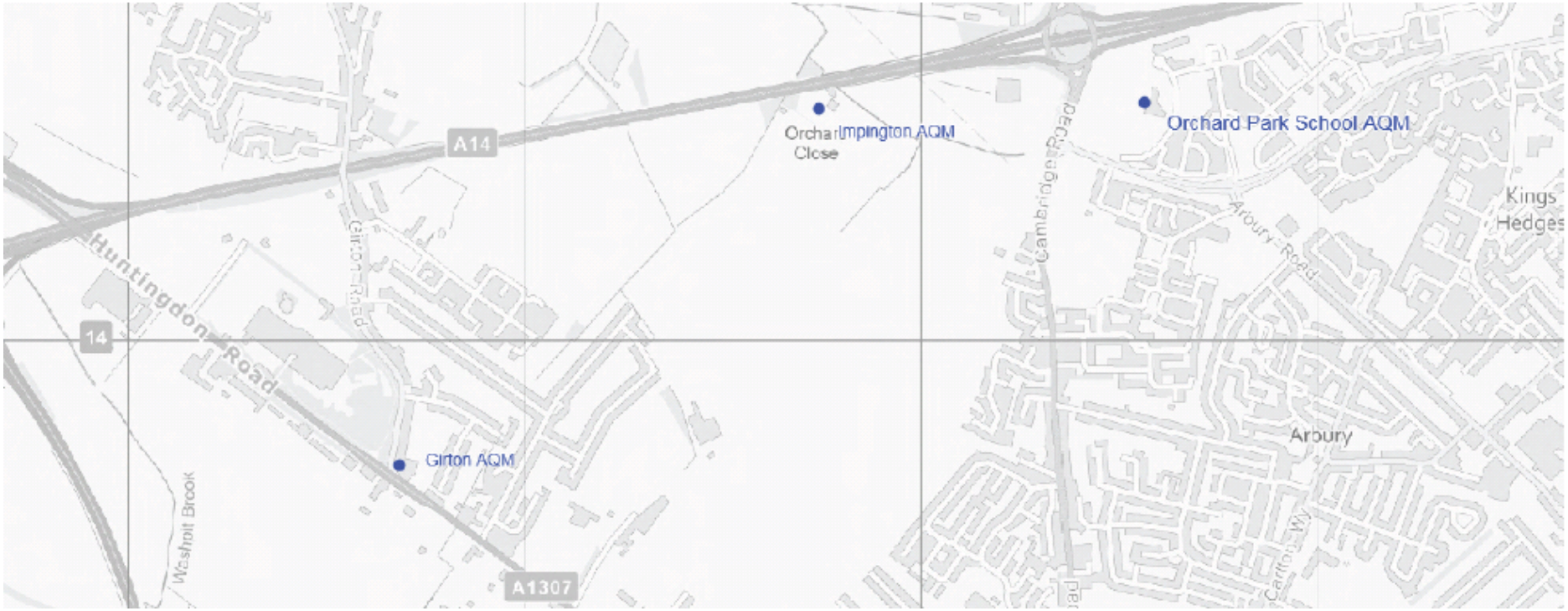
No automatic NO_2 monitoring locations within South Cambridgeshire District Council required distance correction during 2021.

Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Wicken Fen	Annualisation Factor Northampton Spring Park	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DT1	1.0135	1.0548	1.0342	13.1	13.5	-
DT7	1.0135	1.0548	1.0342	9.6	10.0	-
DT17	1.4611	1.4579	1.4595	10.7	15.7	-
DT21	1.0135	1.0548	1.0342	16.3	16.8	-
DT27	1.0410	1.1065	1.0738	15.9	17.0	-
DT31	0.9821	0.9400	0.9610	18.7	18.0	-
DT32	1.0731	0.9986	1.0358	18.1	18.7	-
DT33	0.9821	0.9400	0.9610	14.2	13.7	-
DT34	0.9821	0.9400	0.9610	16.4	15.7	-
DT35	0.9821	0.9400	0.9610	15.3	14.7	-
DT36	0.9821	0.9400	0.9610	16.4	15.8	-
Girton AQM (NO2)	0.94	0.98	0.96	13	12.4	*Rounded to 12 for reporting purposes to match other continuous monitors*
Girton AQM (PM_{10})	0.94	0.98	0.96	16	15.3	*Rounded to 15 for reporting purposes to match other continuous monitors*
Girton AQM ($PM_{2.5}$)	0.94	0.98	0.96	14	13.4	*Rounded to 13 for reporting purposes to match other continuous monitors*

Appendix D: Map(s) of Monitoring Locations

Figure D.1 – Map of Automatic Monitoring Sites



Note: Impington and Orchard Park sites are located in the AQMA.

Figure D.2 – Map of AQMA

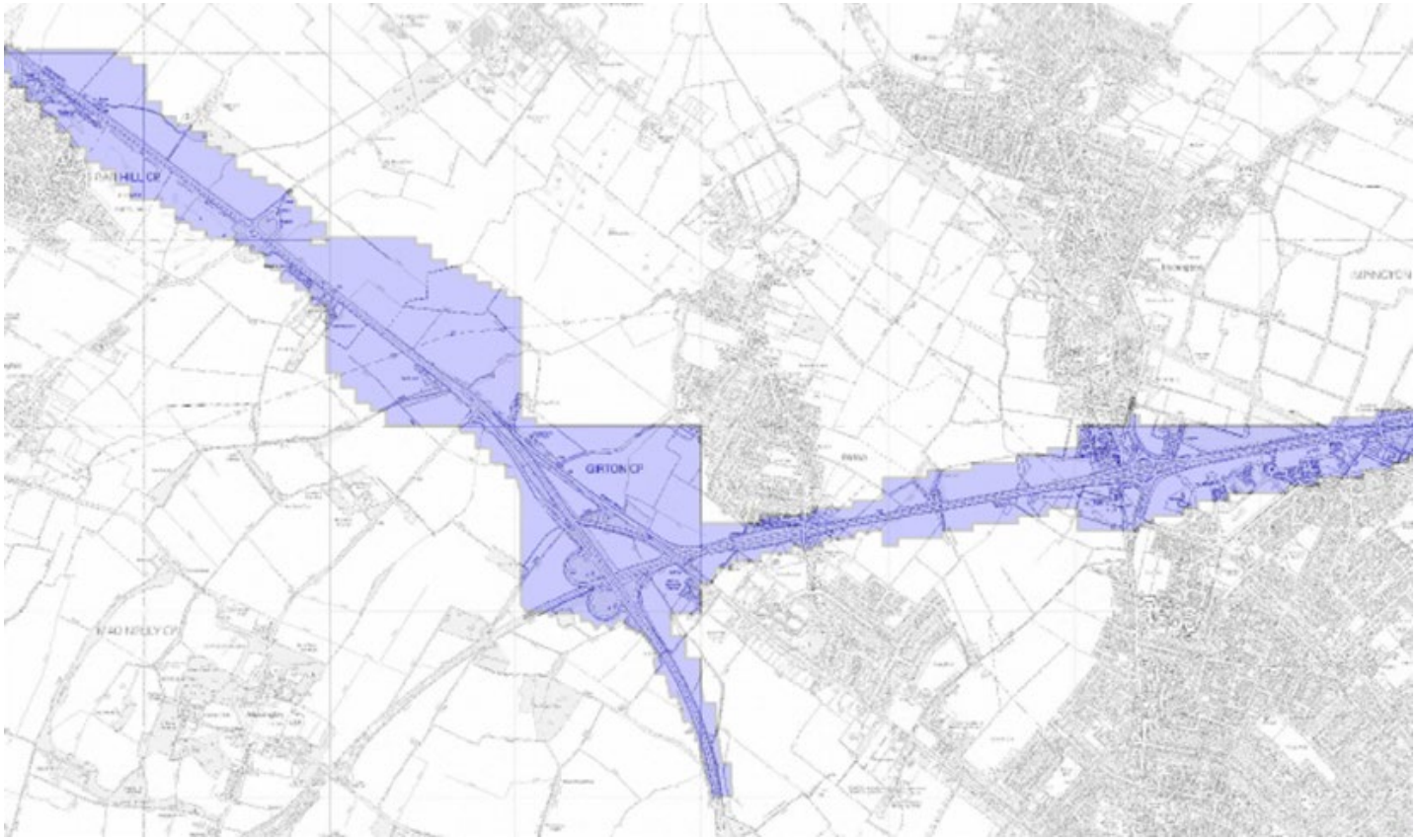
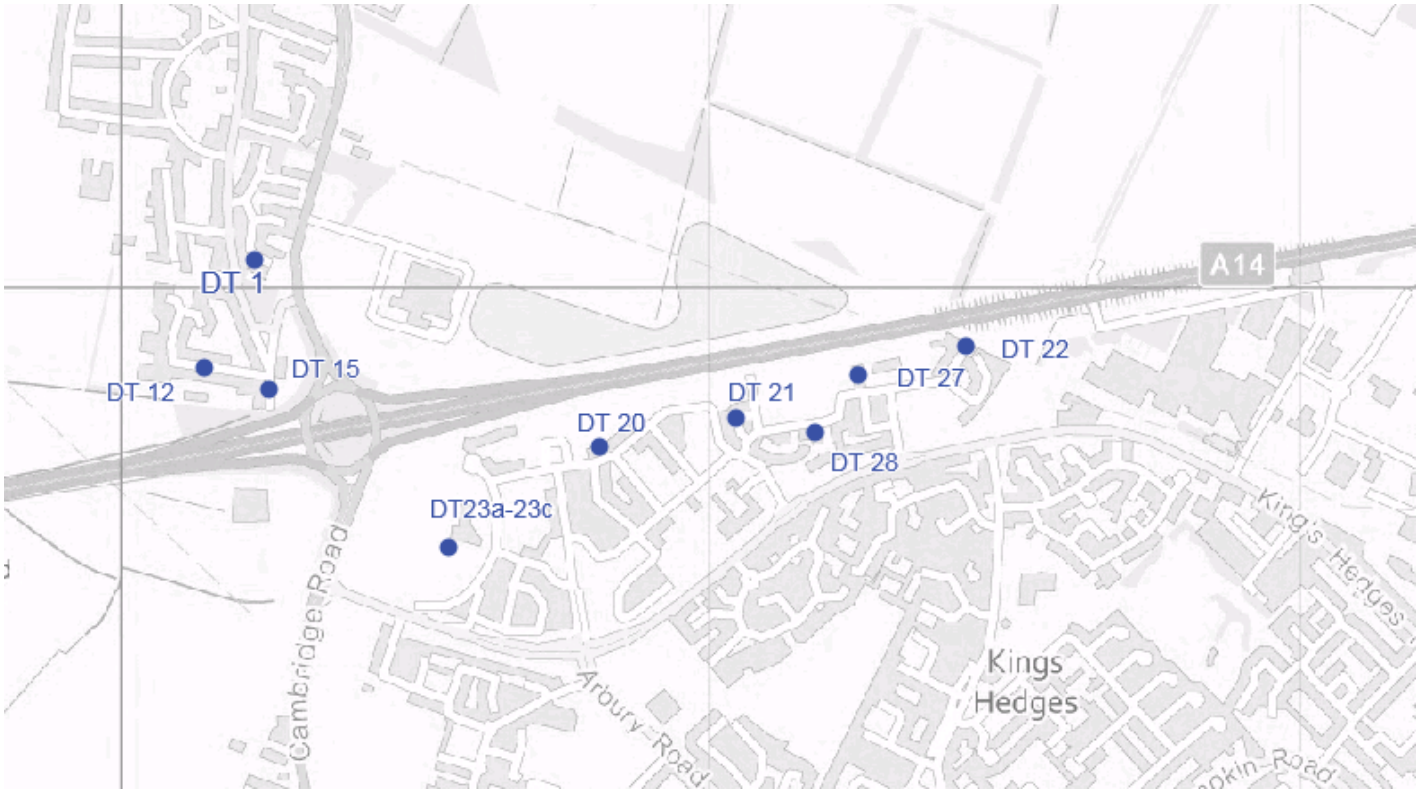


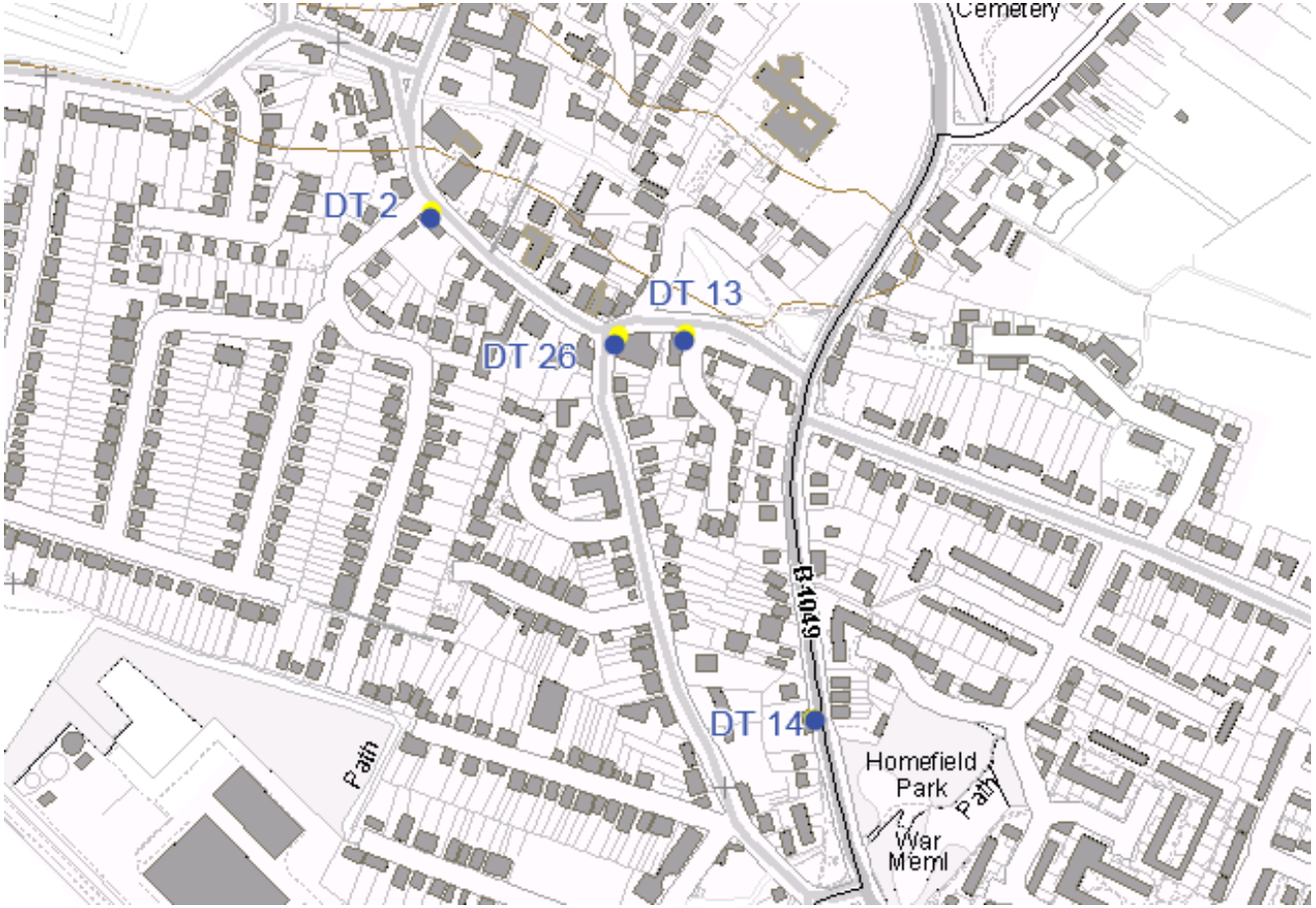
Figure D.3 - Map of Non-Automatic Monitoring Site

Diffusion Tube Locations – Orchard Park and Impington (AQMA)



Diffusion Tube Locations – A14 and Bar Hill (AQMA)

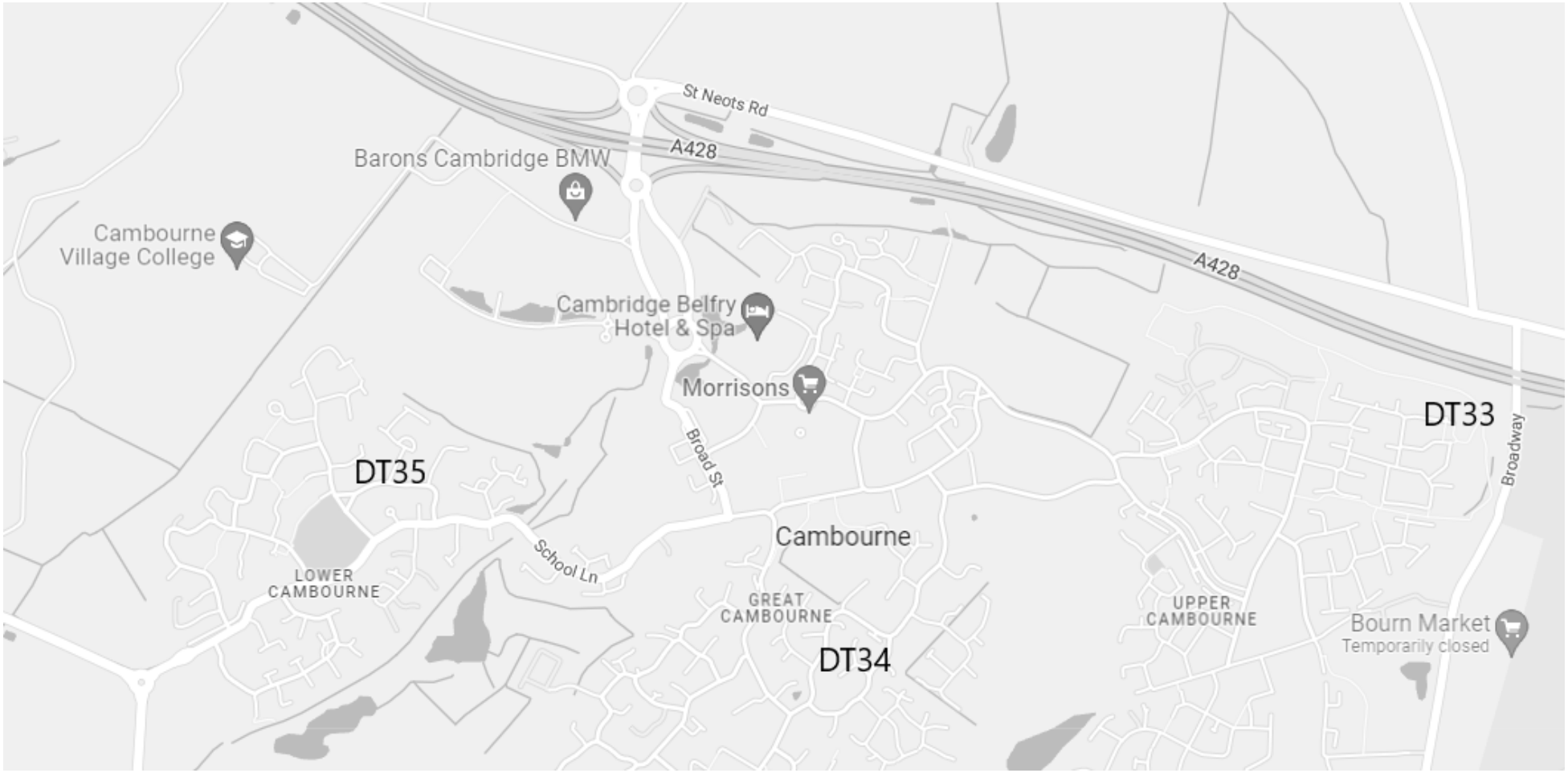
Diffusion Tube Locations – Histon



Diffusion Tube Locations – Waterbeach, Milton and A10

Diffusion Tube Locations – Northstowe

New Tubes Location – Cambourne



New Tubes Location – Hardwick

New Tubes Location - Teversham and Cherry Hinton

Diffusion Tube Locations South of District - Harston, Sawston, A505, Great Abington and Linton

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[17]

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

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

Glossary of Terms

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

References

- Local Air Quality Management Technical Guidance LAQM.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.
- Cambridgeshire County Council - The Local transport Plan 3 (2011 – 2031)
- Air Quality Regulations 2000 and (Amendment) regulations 2002
- Air Quality Action Plan for the Cambridgeshire Growth Areas (2010)
- Deriving NO_2 from NO_x for Air Quality Assessments of Roads – Updated to 2006
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2000)
- The SCDC Detailed Assessment of Nitrogen Dioxide along the A14 Corridor (2006)
- The SCDC Detailed Assessment of PM_{10} along the A14 Corridor (2008)
- The SCDC Further Assessment of NO_2 and PM_{10} along the A14 Corridor (2008)