2024 Air Quality Annual Status Report (ASR)

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

Date: July 2024

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Executive Summary: Air Quality in Our Area

Air Quality in Fenland

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

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

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

Table ES 1 - Description of Key Pollutants

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

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

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

This report demonstrates how air quality objectives are met in Fenland. Fenland District Council monitored for the pollutant Nitrogen Dioxide (NO_2) throughout the district (41 diffusion tube monitoring sites); the primary source for this pollutant in the district is vehicle emissions. NO_2 diffusion tube monitoring has seen a reduction in levels at a considerable number of the sites monitored around the district. Additional, measured concentrations at all NO_2 diffusion tube monitoring locations were compliant with the annual mean air quality objective for nitrogen dioxide (40 µg/m3).

In 2022 members secured funding for an air quality sensor in the district, with publicly available real time data. This has been in place from January 2023 and the data collected has been included in this report.

Automatic (continuous) Sulphur Dioxide (SO_2) monitoring was undertaken by Whittlesey Brickworks; monitoring data has been provided for the purpose of report. In 2023 Fenland monitoring demonstrated that air quality remains below national air quality objectives.

The report also recognises growth in industry and residential developments in the district relevant to other air quality objectives and a raise in public and political concern for local air quality. This report identifies a way forward to monitor and ensure Fenland maintains good air quality.

Actions to Improve Air Quality

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

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

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

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

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

Fenlands air quality action plan is an annually reviewed document subject to portfolio holder approval and is published as a key corporate document. It's aims are to promote and encourage better development and support continued improvements in air quality locally.

In 2023 a public consultation was undertaken to review the local nitrogen dioxide diffusion tube network. Residents were invited to suggest sites where they felt regular exposure to traffic pollution to help ensure testing is being carried out at the most at-risk areas. This allowed members of the community to have their say on where monitoring tubes should be located and lead to positive press coverage encouraging residents to take part. The tube network was reviewed using this information and data from previous years to relocate a number of tubes. These changes were implemented in January 2024.

Fenland District Council worked with Cambridgeshire & Peterborough Combined Authority (CPCA) to deploy five real-time air quality monitors across two Fenland towns, March and Wisbech. The locations for these five monitors have been chosen by reviewing the NO_2 tube data, along with proposed developments and road changes being taken into consideration. The data from these monitors will be included in the 2025 ASR.

In 2022 Fenland saw a significant increase in dust and air quality complaints regarding transport, environmental permitted installations, and development sites. In light of this, Whittlesey had formed a dedicated residents' action group to raise concerns and issues including air quality to all relevant agencies and industries. Joint working with the Environment Agency, Development team and residents has continued to see a number of joint actions throughout 2023.

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

Air Quality Action Day was acknowledged, and a social media campaign was undertaken promoting national messages of alternative transport and sources of information to improve your local air quality.

March Access redevelopment of Broad Street is now in the construction phase of the project and on target to be completed in October 2024. Work started in early 2023 to change the road layout and open the high street up to pedestrians and businesses, alongside easing the flow of vehicles.

The local transport strategy continues to develop across the district, work to continue to improve the flow of traffic through the district along the A47 continues.

The Cambridgeshire Action on Energy Retrofit partnership is a partnership of Cambridgeshire County, Cambridge City and district councils and has successfully delivered energy saving campaigns and accessed Home Upgrade Grants for residents. Cambridgeshire County Council and Fenland District Council are also working with Cambridge city science to provide energy efficiency improvements to residents.

Conclusions and Priorities

The 2023 Annual Screening Review shows that air quality in Fenland continues to meet the national objectives for NO_2. The report shows Fenlands commitment to increase monitoring and to continue to provide a wide range of initiatives within the district that improves local air quality and includes suggestions from local residents.

Fenland District Council has been working closely with Statutory Consultees for permit and planning applications of air quality significance for developments including road improvements, housing developments, and an Energy from Waste Combined Heat and Power Facility application. Standard planning conditions for air quality have been written and are due to be implemented in 2024 to allow for consistency and ensure the correct measures are in place from planning and development stages onwards.

Fenlands priorities for the coming year are to maintain involvement in planning of major developments and determine their impact whilst reviewing the AQMA's. Fenland will revoke AQMAs where they are not relevant, but in light of these major developments due to be determined in 2024, a review is being undertaken to determine if a variation of the AQMA's is the more appropriate option.

Fenland was able to prioritise funding to widen our range of pollutants monitored to understand the districts background pollution levels in light of new developments in the planning and development stages.

Local Engagement and How to get Involved

Members of the public can also get involved to improve local air quality by participating in active travel, such as walking, cycling, using public transport and car sharing in order to reduce the numbers of single car journeys made. Other methods include switching to energy efficient goods, reducing solid fuel burning and choosing low emission vehicles.

Fenland encourages a buy locally scheme and promotes each of the four market towns that host local markets including greengrocers, butchers, and fishmongers.

Fenland Transport and Access Group published the Walking, Cycling and Mobility Aid Strategy. This included increasing the number of walking and cycling routes between the market towns. More information can be found on our website at; Community Transport - Fenland District Council

Fenland is part of the Action on Energy Retrofit partnership supporting households access grants to install energy efficiency improvements and low carbon heating. For more information see our website at Action on Energy grant scheme - Fenland District Council For other schemes and General information on sustainable living and energy saving ideas can be found on our energy page at Energy - Fenland District Council or the Energy Saving Trust website: https://energysavingtrust.org.uk/.

Information on air quality in Fenland can be found on our website. Fenland publish all their monthly NO_2 data and monitoring reports online at; Air quality - Fenland District Council. Further information on Air Quality and how to improve it can be found on the Clean Air Hub website: https://www.cleanairhub.org.uk/.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Team of Fenland District Council with the support and agreement of the following officers and teams:

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Laura Harwood – Environmental Health

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This ASR has been approved by:

This ASR has been sent for approval by a Director of Public Health and comments will be added in due course.

If you have any comments on this ASR please send them to Alia Johnson at:

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1 Local Air Quality Management

This report provides an overview of air quality in Fenland District Council during 2023. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Fenland 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 18 months. The AQAP should specify how air quality targets will be achieved and maintained and provide dates by which measures will be carried out.

A summary of AQMAs declared by Fenland District Council can be found in Table 2.1. The table presents a description of the four AQMAs that are currently designated within Fenland 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;
• SO2 15-minute mean

We are in the process of reviewing all AQMAs in balance with assessing the likely impact new developments will also have in the district. Fenland has seen changes in sources of pollution, a number of sources have been removed, although new developments and the introduction of new receptors have seen new sources being introduced. Fenland are currently working with local industries and developments to re model the air quality management areas for Whittlesey and establish the impact of a proposed new development for Wisbech. It is a possibility that these areas will need to be varied rather than revoked depending on the outcome of the modelling works being undertaken.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Whittlesey AQMA No. 1	01/09/2006	SO2 15 Minute Mean	Pedestrian transport routes west and northwest and an area of residential and public spaces to the east of Whittlesey brickworks.	NO	15-Minute Mean objective is likely to be breached based on modelling	15-minute mean objective is met	15	Fenland District Council Air Quality Action Plan 2018	https://www.fenland.gov.uk/airquality
AQMA Wisbech No. 1	01/05/2001	SO2 15 Minute Mean	An area in central Wisbech surrounding the canning factory.	NO	Number of 15 minute mean concentrations >266 µg/m3 = 1300	Source of pollution removed	14	Fenland District Council Air Quality Action Plan 2018	https://www.fenland.gov.uk/airquality
AQMA Wisbech No. 2	01/05/2001	PM10 24 Hour Mean	An area in central Wisbech surrounding the canning factory.	NO	Number of daily means > 50 µg/m3 (gravimetric) = 38 (modelled)	Source of pollution removed	14	Fenland District Council Air Quality Action Plan 2018	https://www.fenland.gov.uk/airquality

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
AQMA Wisbech No. 3	01/05/2001	NO2 Annual Mean	An area extending along the B198 Lynn Road between Freedom Bridge Roundabout and Mount Pleasant Road and along the A1101, from Sandylands, along Churchill Road to just past Westmead Avenue.	NO	40.9 µg/m3	33.8 µg/m3	14	Fenland District Council Air Quality Action Plan 2018	https://www.fenland.gov.uk/airquality

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

☒ Fenland District Council **confirm that all current AQAPs have been submitted to Defra.**

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

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

1. For the upcoming year, Fenland's main focus will be on staying actively involved in the planning of significant developments and assessing their impact while examining the AQMAs. Where AQMAs are deemed unnecessary, Fenland will proceed with their revocation. However, considering the major developments set for decision in 2023, a comprehensive review is underway to ascertain whether altering the AQMAs might be a more suitable approach. This initiative is well-received, and a detailed update needs to be provided in the next year's ASR.
2. The Council have robust QA/QC procedures, which were applied appropriately and accurately to the 2022 non-automatic and automatic monitoring data. A link to the public register is available. For the automatic monitors, additional information regarding the calibration of the instruments would be beneficial.
3. Comments from last year's ASR have been mentioned, which is welcomed.
4. All graphs and maps are well presented and are clear to read. The Council have also provided a detailed discussion of the trends.
5. Members of the public can get involved to improve local air quality by participating in active travel, such as walking, cycling, using public transport and car sharing in order to reduce the numbers of single car journeys made. Other methods include switching to energy efficient goods, reducing solid fuel burning and choosing low emission vehicles.
6. The report highlights Fenland's dedication to enhancing its monitoring capabilities. With a strategic allocation of funds, Fenland has expanded the variety of pollutants being monitored. This is to gain a better understanding of the district's ambient pollution levels, especially considering the new projects in planning and development phases. Significantly, FDC has obtained funding for the installation of an air quality sensor in 2023, capable of monitoring particulate matter, which is a very positive development.
7. In March town centre, six new monitors have been recently installed, a development that is positively received. These specific locations were selected to

observe the impact of the town centre's regeneration on alternate routes. These areas are also notable for their large-scale housing developments.

8. In Table A.2, certain data/information is presented in black, while the rest is in red, without a clear explanation for this colour distinction. This formatting could lead to confusion for readers. It is expected that this will be addressed and corrected in future reports for clarity.

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

More detail on these measures can be found in their respective Action. Key completed measures are:

- The installation of an AQ sensor monitor in Whittlesey, monitoring NO_2, SO_2, PM_{10} and $PM_{2.5}$. Informing residents using online live data and participating in a multiagency action group to manage overlapping control and regulation of multiple industrial processes and land uses that impact the air quality in the town.
- Work with the Cambridgeshire & Peterborough Combined Authority (CPCA) to secure five AQ sensor monitors in March and Wisbech.
- Creating air quality standard conditions to use when consulting on planning and development applications, to ensure a thorough and consistent approach is taken.
- Consultation with local residents to decide on the new location on NO_2 diffusion tubes for 2024.
- Improvements to FDC’s refuse fleet by upgrading to Euro 6 engines and electric bin lift. These are now implemented on FDC refuse, recycling and garden waste fleet and they offer better fuel efficiency and reductions in emissions.
- Improvement work to March High Street under the Future Highstreets Fund is in construction and completion is expected in October 2024.
- Continued work contributing to the application process for a Development Consent Order and Environmental Permit for an Energy from Waste development in the Wisbech area.

Fenland District Council's priorities for the coming year are to review the AQMA's with a view to vary or revoke these. The review will be carried out by taking into consideration the new AQ sensor data for 2024 and will be done once a decision has been made on major developments in these areas that have the impact to change the air quality.

Fenland District Council worked to implement these measures in partnership with the following stakeholders during 2023:

- Cambridgeshire County Council, Norfolk County Council, Borough Council Kings Lynn and West Norfolk and Peterborough City Council.
- The Highways Authority
- Environment Agency
- Cambridgeshire & Peterborough Combined Authority

The principal challenges and barriers to implementation that Fenland District Council anticipates facing are in relation to funding, staff resources, and the pressures on existing air quality from the introduction of new development within the district.

Fenland District Council anticipates that the measures stated above and in Table 2.2 will maintain compliance in all of the AQMAs.

Progress on the review of the AQMAs has been slower than anticipated due to waiting for the outcome of pending major infrastructure projects.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Improve traffic management at key junctions - Wisbech Access Strategy	Traffic Management	UTC, Congestion management, traffic reduction	2016	2040	Cambridgeshire & Peterborough Combined Authority (CPCA) Cambridgeshire County Council (CCC)	Government Growth Fund & CPCA	NO	Partially Funded	> £10 million	Planning	Reduced vehicle emissions / Maintain levels below standards	Reduced congestion and increased average speeds through AQMA	There are three phases to this scheme. The initial short-term phase is fully designed and ready to construct. This will commence when construction funding is secured and made available. A range of opportunities are being explored to secure the funding needed.	Funding for infrastructure project. Local development increasing demands on current networks
2	Improve traffic management - March Area Transport Study	Traffic Management	UTC, Congestion management, traffic reduction	2017	2026	Cambridgeshire & Peterborough Combined Authority (CPCA) Cambridgeshire County Council (CCC)	CPCA	NO	Partially Funded	> £10 million	Implementation	Reduced vehicle emissions / Maintain levels below standards	Reduced congestion, Junction improvements, walking and cycling strategy, town centre proposals, new link road	Full Business Case 1 (FBC1) – March High Street/Broad Street is in construction and on target to complete in October 2024. The FB2 schemes at Twenty Foot Road, Peas Hill Roundabout, Hostmoor and St Peters Road have now all completed their detailed design phase. An additional £7 million pound has now been drawn down towards the project. This will see the FBC2 schemes at Twenty Foot Road and St Peters Road procedure to construction. The first phase up to March 2025 being approvals, land acquisition and construction procurement. Construction will commence after this time. The remaining funding will bring forward FBC3 which is the detailed design phase of the Northern Industrial link road.	The project is progressing well, but further funding is needed

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
3	Improve traffic management – March Town Centre Transformation through Future High Streets Fund	Traffic Management	UTC, Congestion management, traffic reduction	2019	2024	FDC, Hatch Regeneris	Future High Streets Fund & CPCA	NO	Funded	> £10 million	Implementation	Reduced vehicle emissions / Maintain levels below standards	Part pedestrianisation of key congested areas (Broad Street), reduced congestion, junction improvements	This project is in construction and is now in the final phases of delivery. The scheme is currently on programme and has not deviated too much from the original plan submitted as part of the Future Highstreets Fund Bid. Completion is expected in October 2024.	Project on track for completion October 2024.
4	Consideration of Air Quality Impacts when providing comments on planning applications within an AQMA or where an AQMA could be impacted or created.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	On-going	On-going	Local Authority Environmental Health	FDC	NO	Funded	£10k - 50k	Implementation	Maintain levels below standards	Planning response time	On-going daily when consulting on planning applications. In 2023 work was undertaken to develop a standard planning conditions document, that includes standard conditions for air quality to ensure consistency across the service. This is in the last stages and should be implemented from 2024 onwards.	Resources
5	Explore Air Quality automatic (continuous) monitoring options	Policy Guidance and Development Control	Other policy	2019	2025	Local Authority Environmental Health and Cambridgeshie & Peterborough Combined Authority (CPCA)	FDC	NO	Funded	< £10k	Completed	Provide real-time Air Quality data for PM and NO2	Purchase and Install sensors	Cambridgeshire and Peterborough Combined Authority procured a network of meters across the County, with meters installed in Wisbech and March. FDC have funded one senor for the Whittlesey area that was installed in Jan 2023.	Project on track. Data for the meters in Wisbech and March to be included in next years ASR.
6	Review and Expand Diffusion Tube network	Policy Guidance and Development Control	Other policy	2019	2024	Local Authority Environmental Health	FDC	NO	Funded	< £10k	Completed	Provide NO2 pollution data	Diffusion tube reviewed and expanded	Community engagement and a consultation period was completed with local residents at the end of 2023, with suggestions of tube locations being considered. Tubes were relocated January 2024.	Protect completed

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
7	Transport & Access Group	Promoting Travel Alternatives	Promotion of walking	2016	On-going	FDC	FDC & Hereward Community Rail Partnership	NO	Partially Funded	£10k - 50k	Implementation	Reduced vehicle emissions / Maintain levels below standards	Reduced vehicle use and increased use of public transport / Active Travel	53 community champions have been provided with transport training to enable them to assist others access transport and help promote walking and cycling. In late 2020 FDC approved the development of a Walking, Cycling and Mobility Strategy to support infrastructure for non-motorised transport. This strategy was adopted in 2022. Work is ongoing to source funding for walking and cycling improvements recommended in the strategy.	Funding
8	Develop Air Quality Action Plan	Policy Guidance and Development	Control Air Quality Planning and Policy Guidance	2018	2025	Local Authority Environmental Health	FDC	NO	Funded	< £10k	Planning	Maintain levels below standards	Update Plan	Review Air Quality Action Plan and publish online.	Resources and skills available, costs of outsourcing.
9	Treescapes fund	Other	Other	2018	2024	FDC, Peterborough Environment City Trust, Forestry Commision, Groundworks East	Forestry Commision	NO	Funded	£10k - 50k	Implementation	Maintain levels below standards	Number of trees planted	Benwick Street Pride was provided £600 worth of ferns for stumpery creation	Public engagement
10	S106 Funding	Promoting Low Emission Plant	Other measure for low emission fuels for stationary and mobile sources	2022	2022	FDC, Glassmore fund	FDC and Town Councils	NO	Funded	< £10k	Completed	Maintain levels below standards	Reduce energy use	Fenland Light Railway was provided £3,800 for a composting toilet. Lattersey Nature Reserve was given £1,140 for the restoration of grassland / meadow. Ramsey Mereside Association provided £16,000 for a decked accessible outdoor area. Coates Village Hall were given £2000 for upgrades to efficient windows and doors.	Public engagement

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
11	FDC Fleet improvement	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes		On-going	FDC		NO	Funded	£10k - 50k	Completed	Reduced vehicle emissions / Maintain levels below standards	Reduce emissions	Upgrades made to Euro 6 engines and electric bin lift. These are implemented on FDC refuse, recycling and garden waste fleet and they offer better fuel efficiency and reductions in emissions.	Protect completed

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

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

As of January 2023, Fenland has one sensor monitoring particulates located on Hallcroft Road in Whittlesey. This data has been assessed to determine the current levels and the annual hourly mean for 2023 was 9 µg/m^3. Further details of the data captured can be found on the following link: Hallcroft Road (sensor) Exceedences - Air Quality monitoring service (airqualityengland.co.uk)

Fenland District Council is taking the following measures to address $PM_{2.5}$:

- Funding for five more air quality sensors has been agreed and these were installed in March and Wisbech in December 2023 and this $PM_{2.5}$ data will be included in the 2024 ASR.
- Improvement works and pedestrianisation of March High Street and other measures in the Transport Strategy discussed in Table 2.2, Section 2 and 3, above will contribute to reducing traffic related $PM_{2.5}$.
- To participate in a multi authority initiatives across Cambridgeshire and Peterborough to provide members of the public with information on the impacts of solid fuel burning and bonfires on air quality and particulate matter through the Joint Cambridgeshire and Peterborough Pollution Group task force; and
- Continuing to consult on planning applications to recommend planning conditions to control the introduction of sources of air quality emissions. This will include requirements for Construction Management Plans, in order to manage dust from construction and demolition activities, and Traffic Management data to determine the impact on local air quality management. For large developments Health Impact Assessments will be requested.

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

- To support the Action on Energy campaigns to support residents on solid fuels to move to more sustainable and efficient fuels.
- To use the Environmental Permitting regime to ensure that industrial processes are working towards best available technology and monitoring the rise in use of small-scale incinerators in manufacturing premises.

There are currently no smoke control areas within the district.

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

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Fenland District Council undertook automatic (continuous) monitoring at one site during 2023. The Hallcroft Road (sensor) Latest Data - Air Quality monitoring service (airqualityengland.co.uk) page on the UK-Air website presents automatic monitoring results for Fenland District Council. In addition to this, as part of a Part A Environmental Permit at Whittlesey brick pits, two MCerts continuous monitors are maintained, and a yearly summary of air quality objectives is provided by the Environment Agency.

Table A.1 in Appendix A shows the details of the automatic monitoring sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the FDC monitor is calibrated and how the data has been adjusted are included in Appendix C and further details on how the Whittlesey brick pit monitors are calibrated are available through the Environment Agency public register.

3.1.2 Non-Automatic Monitoring Sites

Fenland District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 42 sites during 2023. 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 2023 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.

Measured concentrations at all monitoring locations were compliant with the annual mean air quality objective for nitrogen dioxide (40 µg/m3).

As all annual mean nitrogen dioxide concentrations were well below 60 µg/m3, it is unlikely there were any exceedances of the 1-hour mean nitrogen dioxide objective at any of the monitoring sites in 2023.

Overall, there has been good data capture at most monitoring locations across the district (>75%). Two sites did see tubes missing on a number of occasions, these were both situated on Broad Street in March, and this was due to the ongoing work that is being completed there as part of the Future Highstreet Fund. Therefore, we made the decision to move the location of one of these to be collocated with the sensor on Hallcroft Road, Whittlesey in July 2023.

The overall results show that NO_2 levels were recorded typically at levels lower than 2022. Five-year trends have been shown for the overall district and also for each of Fenlands four market towns.

This data was analysed as part of the NO_2 tube network consultation and areas where we have seen continuous reductions in levels the locations have been assessed and relocated where the results support this decision.

3.2.2 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results shows the ratified and adjusted monitored PM_{10} annual mean concentrations with the air quality objective of 40µg/m^3. In 2023 the sensor in Fenland, located at Hallcroft Road, Whittlesey, was operational for over 91% of the year. The PM_{10} annual mean was 14 µg/m^3, demonstrating the objectives have been met for this monitoring period.

Table A.7 in Appendix A shows the ratified continuous monitored PM_{10} daily mean concentrations with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year. In 2023 in Fenland the Hallcroft Road sensor reported there were no exceedances of the PM_{10} daily mean, demonstrating the objectives have been met for this monitoring period. The sensor was situated at this location due to industrial activity and resident concerns and will stay in place for 2024 and the location will continue to be reviewed on a 12-month basis.

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 2023 only, as this is the first year this sensor has been in place. The $PM_{2.5}$ annual mean concentration was 9 µg/m^3, demonstrating the objectives have been met for this monitoring period. The sensor will stay in place for 2024 and the location will continue to be reviewed on a 12-month basis.

3.2.4 Sulphur Dioxide (SO_2)

Table A.9 in Appendix A compares the ratified continuous monitored SO_2 concentrations for 2023 with the air quality objectives for SO_2. At all three locations monitoring SO_2 concentrations in Fenland there were no exceedances of the 24-hour, 1-hour and 15-minute objectives, demonstrating the sulphur dioxide objectives have been met for this monitoring period.

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)
FEN001	Hallcroft Road	Urban Background	526463	297061	SO2, NO, NO2, PM10, PM2.5	NO	Sensor	5	1.75	3.25
AM1	Park Lane	Urban Background	526382	296859	SO2	YES AQMA 1 Whittlesey	UV Fluorescence	0	N/A	1.5
AM2	Bradley Fen	Industrial	523924	297974	SO2	YES AQMA 1 Whittlesey	UV Fluorescence	0	N/A	1.5

Notes:

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

(2) 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)
S1	Syers Lane, Whittlesey [A605]	Kerbside	527059	297205	NO2	No	3.0	1.0	No	2.3
S2	Station Road, March [B1101]	Roadside	541980	297864	NO2	No	4.0	1.7	No	2.4
S3	Ramnoth Road, Wisbech [A1101]	Roadside	546860	308532	NO2	Yes, AQMA 3	4.0	1.1	No	2.4
S4	Orchard Street Roundabout, Whittlesey [A605]	Roadside	526849	297246	NO2	No	6.0	2.0	No	2.3
S5	Churchill Road, Wisbech (Bowthorpe) [A1101]	Roadside	546415	309602	NO2	Yes, AQMA1,2&3	3.0	2.0	No	2.4
S6	Kings Dyke, Whittlesey [A605]	Roadside	525293	297406	NO2	No	10.0	1.6	No	2.4
S7	Cemetery Road Roundabout, Whittlesey [A605]	Roadside	527291	297159	NO2	No	5.0	2.0	No	2.3
S8	Westmead Ave, Wisbech [A1101]	Kerbside	546890	308368	NO2	Yes, AQMA 3	12.0	0.8	No	2.4
S9	Thorney Toll [A47]	Roadside	534526	303907	NO2	No	1.0	1.9	No	2.9
S10	Coates [A605]	Kerbside	530615	297705	NO2	No	3.0	1.0	No	2.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
S11	St Peters Church, March [B1101]	Roadside	541653	296457	NO2	No	12.0	1.9	No	2.4
S12	Lynn Road AWSTW, Wisbech [B198]	Urban Background	546592	310191	NO2	Yes, AQMA 1&2	10.0	N/A	No	2.4
S13	Lynn Road / Mnt Pleasant, Wisbech [B198]	Roadside	546664	310342	NO2	Yes, AQMA 1&2	3.0	1.4	No	2.6
S14	Bridge Street, Chatteris	Roadside	538976	287094	NO2	No	5.0	2.1	No	2.2
S15	Weasenham Lane, Wisbech [A1101]	Roadside	546818	308568	NO2	Yes, AQMA 3	4.0	1.4	No	2.4
S16	Lynn Road Roundabout, Wisbech [B198]	Kerbside	546238	309981	NO2	Yes, AQMA1,2&3	1.0	1.0	No	2.4
S17	Weasenham Lane / Cromwell Road [B198]	Roadside	545509	308735	NO2	No	2.0	2.0	No	2.3
S18	New Road, Chatteris [B1098]	Roadside	539475	286275	NO2	No	2.0	2.7	No	2.3
S19	Broad Street, March [B1101]	Roadside	541662	296814	NO2	No	1.0	2.1	No	2.4
S20	Napier Court, Churchill Road, Wisbech [A1101]	Roadside	546481	309387	NO2	Yes AQMA 1& 3	3.0	1.8	No	2.5
S21	Norfolk Court, March [B1101]	Roadside	541838	296987	NO2	No	2.0	1.2	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
S22	Wildboar / Station Road, Whittlesey [B1093]	Roadside	527357	296554	NO2	No	5.0	1.4	No	2.3
S23	West End, Whittlesey [A605]	Roadside	526348	297468	NO2	No	1.0	3.0	No	2.3
S24	Hocking Court, March [B1101]	Roadside	541779	296864	NO2	No	1.0	1.7	No	2.4
S25	Gildenburgh Crescent, Whittlesey [A605]	Roadside	528091	297183	NO2	No	4.0	4.8	No	2.3
S26	Peas Hill Roundabout, March [A141]	Kerbside	540245	297613	NO2	No	5.0	1.0	No	2.1
S27	Dartford Road, March [B1099]	Roadside	541562	296920	NO2	No	6.0	1.1	No	2.4
S28	Broad Street, March [B1101]	Roadside	541692	296840	NO2	No	1.0	2.1	No	2.3
S29	The Causeway, March [B1101].	Roadside	541654	296055	NO2	No	3.0	1.8	No	2.3
S30	High Street, Chatteris [B1050]	Roadside	539332	286176	NO2	No	1.0	1.4	No	2.3
S31	South Brink, Wisbech [B198]	Roadside	545986	309618	NO2	Yes AQMA 1	1.0	1.8	No	2.2
S32	North End, Wisbech [A1101]	Roadside	545997	310092	NO2	Yes AQMA 1	5.0	2.5	No	2.4
S33	Weasenham Lane/New Drove, Wisbech [B198]	Roadside	546567	308374	NO2	No	5.0	1.7	No	2.2

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)
S34	Weasenham Lane AQY, Wisbech	Roadside	546756	308522	NO2	Yes AQMA 3	1.0	1.5	No	2.2
S35	Broad Street AQY, March [B1101]	Roadside	541672	296801	NO2	No	1.0	2.0	No	2.0
S36	Gaul Road, March	Roadside	450918	296641	NO2	No	1.0	1.7	No	2.2
S37	Burrowmoor Road (East), March	Roadside	540718	296148	NO2	No	1.0	1.7	No	2.2
S38	Burrowmoor Road (West), March	Roadside	541545	296392	NO2	No	1.0	1.9	No	2.0
S39	The Causeway/Avenue, March [B1101]	Roadside	541519	295564	NO2	No	5.0	1.7	No	2.2
S40	Job's Lane, March	Roadside	541551	295083	NO2	No	1.0	1.3	No	2.2
S41	Knights End Road, March	Roadside	540578	294878	NO2	No	1.0	1.1	No	2.2
S42	Hallcroft Road, Whittlesey	Urban Background	526463	297061	NO2	No	5.0	1.8	Yes	2.4

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
FEN001	526463	297061	Urban Background	89	89					12

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

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

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

Notes:

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

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

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

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

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

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

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 2023 (%) [2]	2019	2020	2021	2022	2023
S1	527059	297205	Kerbside	100	99.2	21.3	15.8	17.8	17.6	14.8
S2	541980	297864	Roadside	100	89.6	20.3	15.7	16.6	14.3	13.9
S3	546860	308532	Roadside	100	99.2	21.6	17.7	18.1	17.4	16.6
S4	526849	297246	Roadside	100	99.2	22.1	17.2	16.9	18.2	16.3
S5	546415	309602	Roadside	100	91.6	30.1	23.7	26.8	23.7	23.5
S6	525293	297406	Roadside	100	99.2	19.0	15.1	15.4	12.8	13.3
S7	527291	297159	Roadside	100	89.6	18.3	16.2	16.1	16.4	14.2
S8	546890	308368	Kerbside	100	99.2	28.7	23.4	23.9	23.1	21.5
S9	534526	303907	Roadside	100	99.2	19.9	15.0	17.0	17.4	16.8
S10	530615	297705	Kerbside	100	99.2	18.6	13.9	14.9	15.2	13.2
S11	541653	296457	Roadside	100	82.0	19.4	15.5	17.1	17.4	14.5
S12	546592	310191	Urban Background	100	99.2	16.6	14.3	13.3	12.4	11.7

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 2023 (%) [2]	2019	2020	2021	2022	2023
S13	546664	310342	Roadside	100	99.2	25.5	26.9	28.7	27.1	24.0
S14	538976	287094	Roadside	100	80.1	17.9	16.0	27.8	16.2	15.4
S15	546818	308568	Roadside	100	99.2	30.3	24.4	25.5	25.1	23.5
S16	546238	309981	Kerbside	100	99.2	29.6	23.5	24.6	23.1	22.2
S17	545509	308735	Roadside	100	99.2	18.9	15.2	18.6	15.7	14.2
S18	539475	286275	Roadside	100	99.2	14.0	11.6	11.2	11.1	9.3
S19	541662	296814	Roadside	100	0.0	28.7	25.4	28.5	24.6	24.7
S20	546481	309387	Roadside	100	99.2	26.9	21.8	24.5	23.3	21.6
S21	541838	296987	Roadside	100	99.2	20.2	15.6	15.3	14.7	13.1
S22	527357	296554	Roadside	100	99.2	15.9	14.2	13.7	13.3	11.4
S23	526348	297468	Roadside	100	91.6	22.9	16.3	17.4	17.1	17.3
S24	541779	296864	Roadside	100	91.6	26.5	19.3	19.3	19.6	18.5
S25	528091	297183	Roadside	100	89.6	16.8	15.7	15.1	16.0	13.2
S26	540245	297613	Kerbside	100	99.2	-	27.7	30.8	27.1	28.1

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 2023 (%) [2]	2019	2020	2021	2022	2023
S27	541562	296920	Roadside	100	99.2	-	17.1	18.6	17.6	16.1
S28	541692	296840	Roadside	100	0.0	-	21.9	23.0	22.6	16.3
S29	541654	296055	Roadside	100	99.2	-	17.7	18.3	15.4	16.0
S30	539332	286176	Roadside	100	99.2	-	17.1	17.1	17.5	16.1
S31	545986	309618	Roadside	100	99.2	-	30.7	34.7	33.1	33.8
S32	545997	310092	Roadside	100	99.2	-	17.2	18.2	17.8	17.1
S33	546567	308374	Roadside	100	99.2	-	-	-	13.9	14.3
S34	546756	308522	Roadside	100	99.2	-	-	-	19.9	18.8
S35	541672	296801	Roadside	100	83.9	-	-	-	25.4	21.3
S36	450918	296641	Roadside	100	99.2	-	-	-	13.2	10.5
S37	540718	296148	Roadside	100	89.6	-	-	-	14.8	14.5
S38	541545	296392	Roadside	100	99.2	-	-	-	10.0	8.8
S39	541519	295564	Roadside	100	99.2	-	-	-	12.9	11.1
S40	541551	295083	Roadside	100	99.2	-	-	-	10.5	9.6

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 2023 (%) (2)	2019	2020	2021	2022	2023
S41	540578	294878	Roadside	100	99.2	-	-	-	11.0	9.8
S42	526463	297061	Urban Background	100	0.0	-	-	-	-	9.9

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

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

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

Notes:

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

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

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

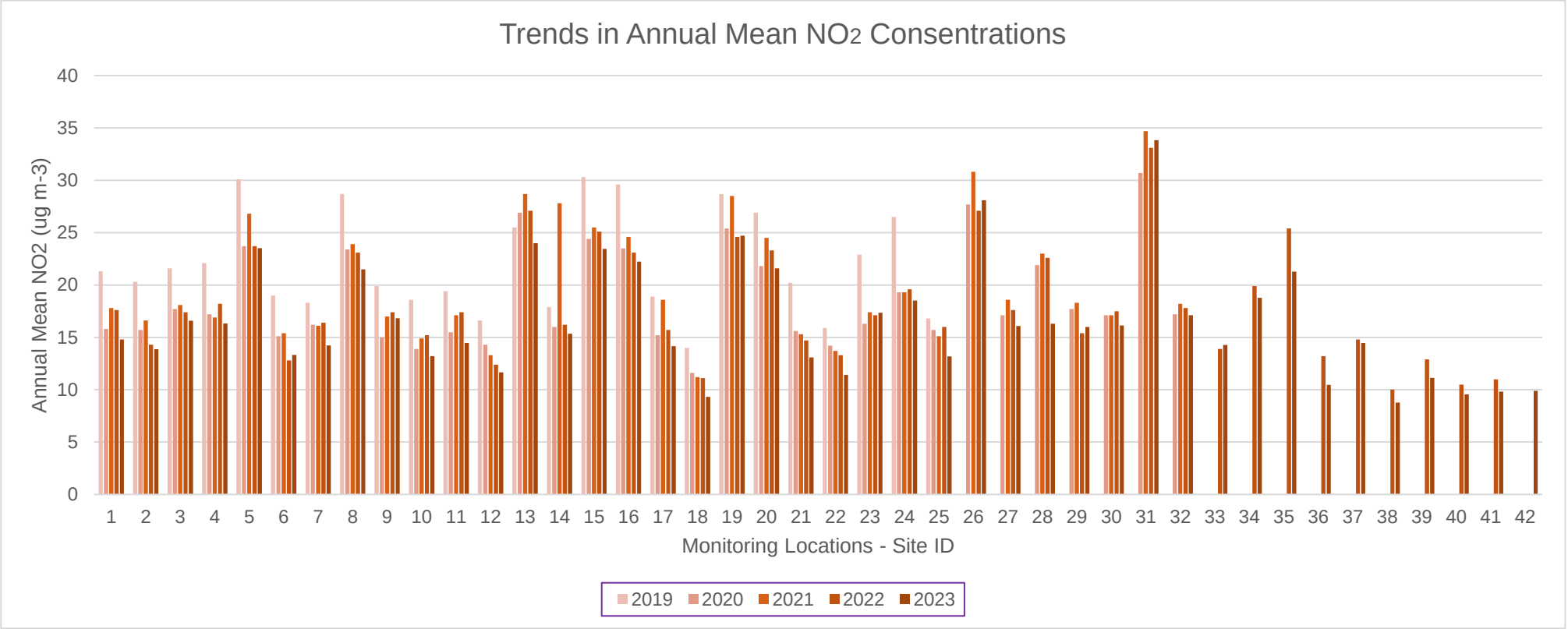
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

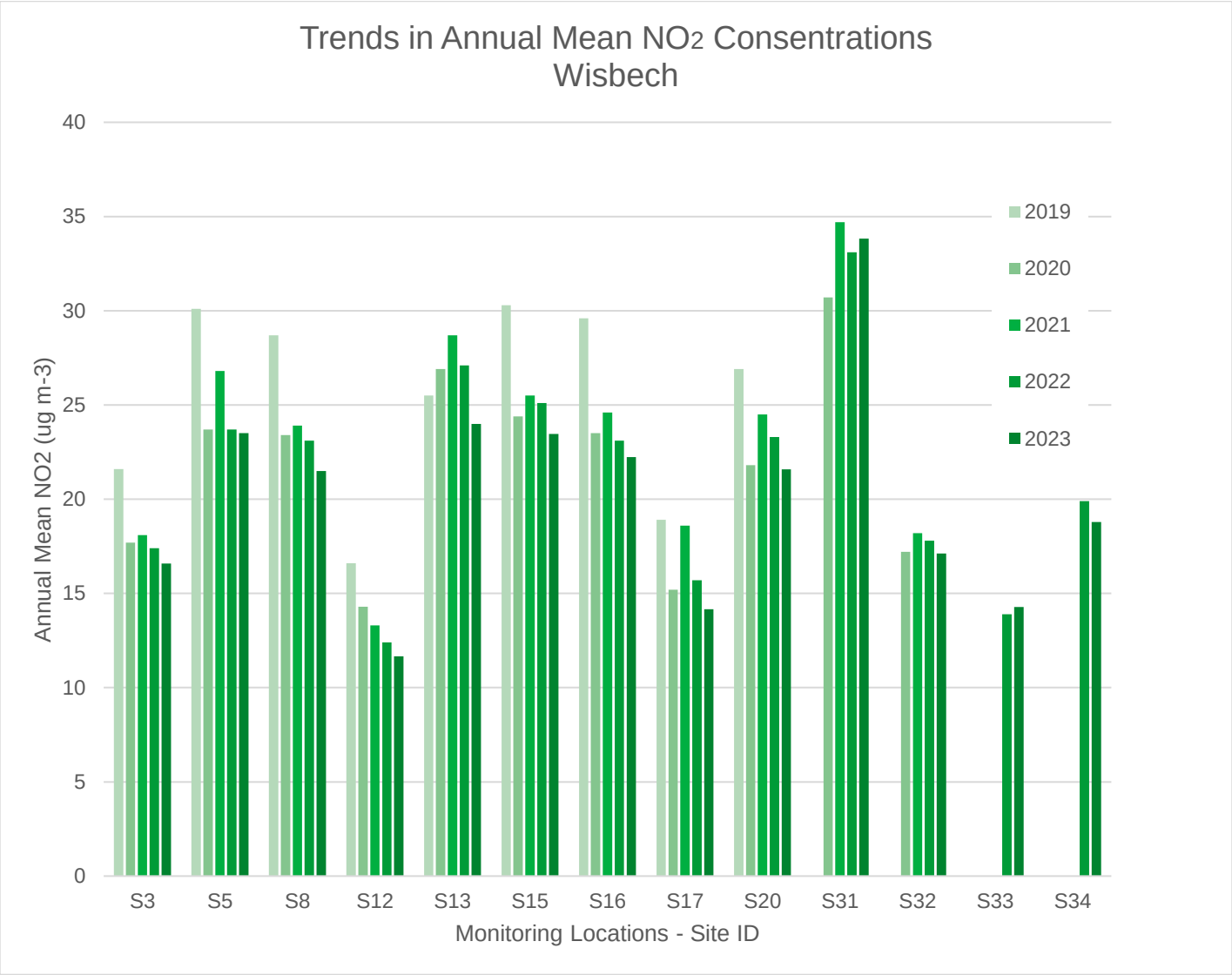
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

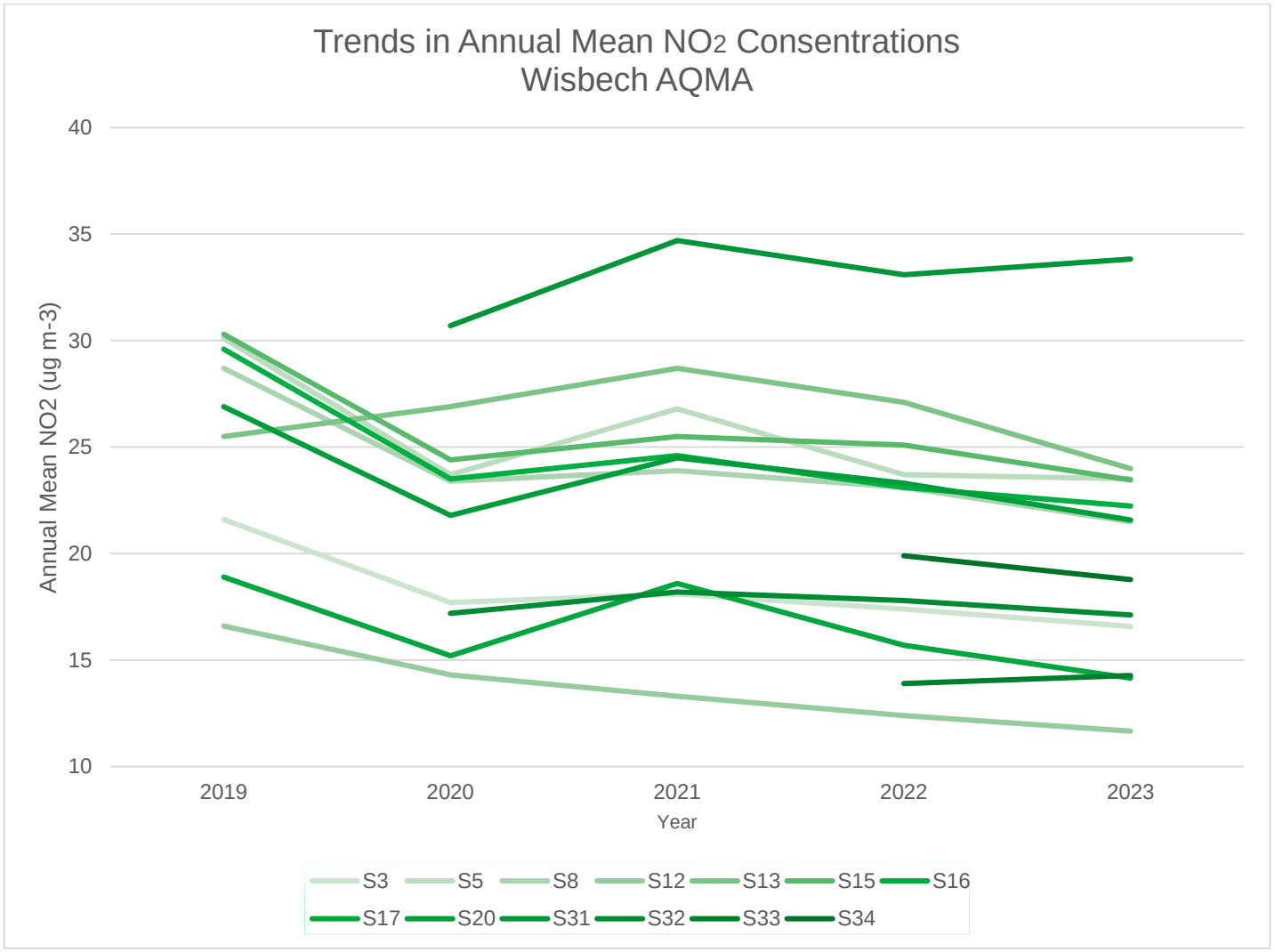
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

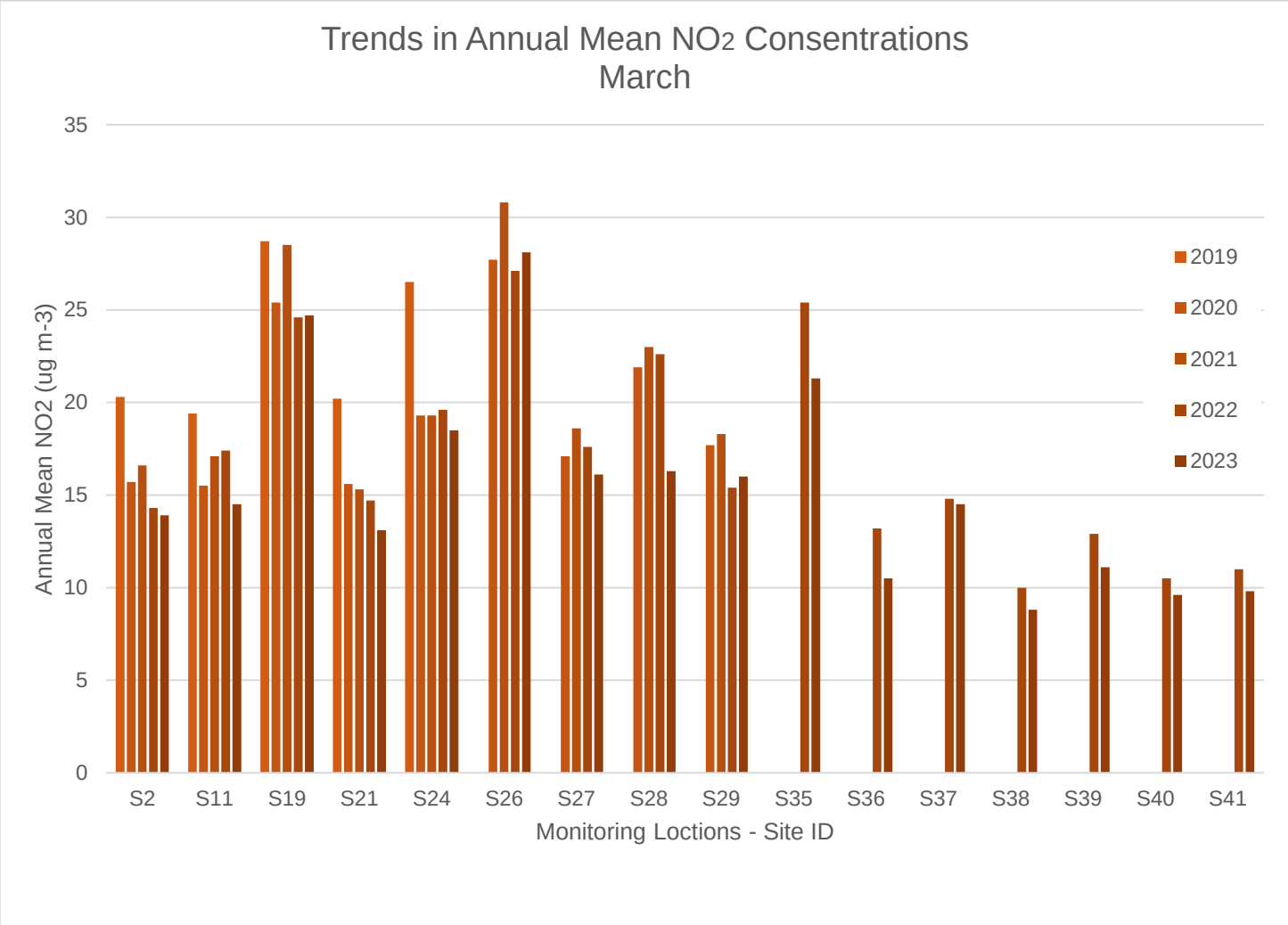
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

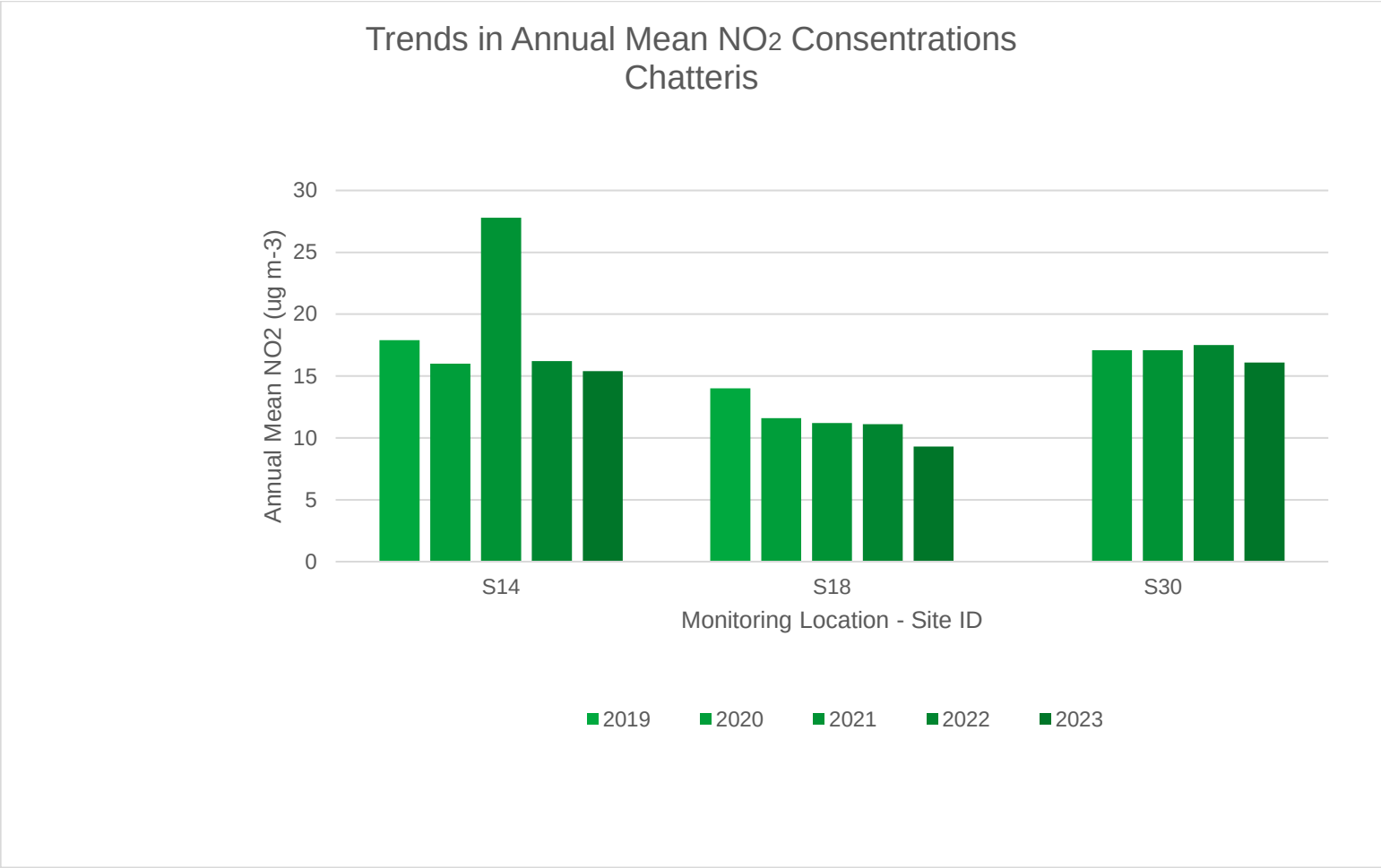
Figure A.1 – Trends in Annual Mean NO_2 Concentrations




Trends in Annual Mean NO2 Consentrations
Wisbech
Annual Mean NO2 (ug m-3)
40
35
30
25
20
15
10
5
0
2019
2020
2021
2022
2023
S3
S5
S8
S12
S13
S15
S16
S17
S20
S31
S32
S33
S34
Monitoring Locations - Site ID


Trends in Annual Mean NO2 Consentrations
Wisbech AQMA
Annual Mean NO2 (ug m-3)
40
35
30
25
20
15
10
2019
2020
2021
2022
2023
Year
S3
S5
S8
S12
S13
S15
S16
S17
S20
S31
S32
S33
S34


Trends in Annual Mean NO2 Consentrations
March
Annual Mean NO2 (ug m-3)
35
30
25
20
15
10
5
0
2019
2020
2021
2022
2023
S2
S11
S19
S21
S24
S26
S27
S28
S29
S35
S36
S37
S38
S39
S40
S41
Monitoring Loctions - Site ID


Trends in Annual Mean NO2 Consentrations
Chatteris
Annual Mean NO2 (ug m-3)
30
25
20
15
10
5
0
S14
S18
S30
Monitoring Location - Site ID
2019
2020
2021
2022
2023

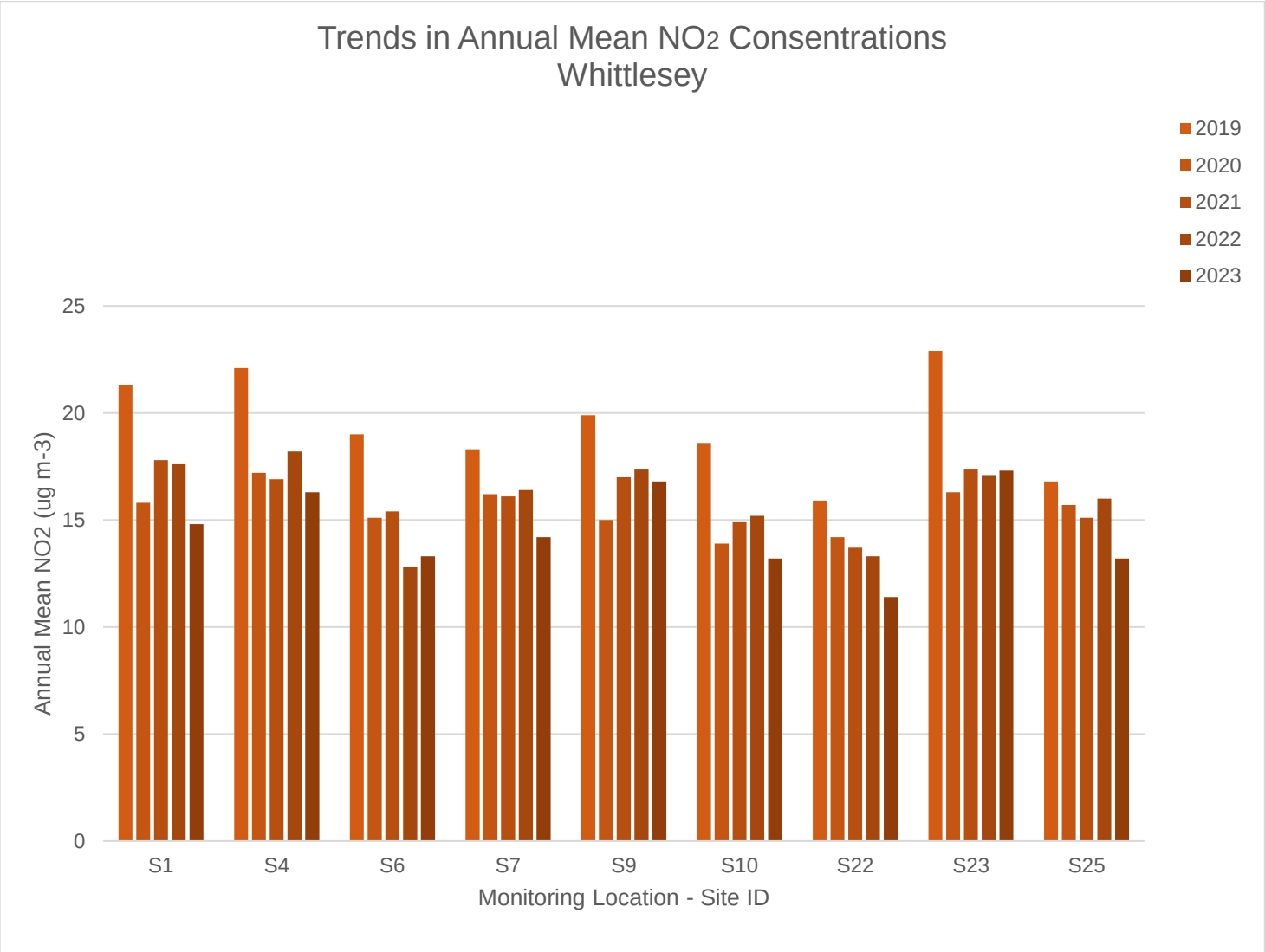

Trends in Annual Mean NO2 Consentrations
Whittlesey
2019
2020
2021
2022
2023
25
20
15
10
5
0
Annual Mean NO2 (ug m-3)
S1
S4
S6
S7
S9
S10
S22
S23
S25
Monitoring Location - Site ID

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 2022 (%) (2)	2018	2019	2020	2021	2022
FEN001	526463	297061	Urban Background	89	89					0

Notes:

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

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

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

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

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

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
FEN001	526463	297061	Urban Background	91	91					14

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

Notes:

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

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

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

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

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

Figure A.2 – Trends in Annual Mean PM_{10} Concentrations

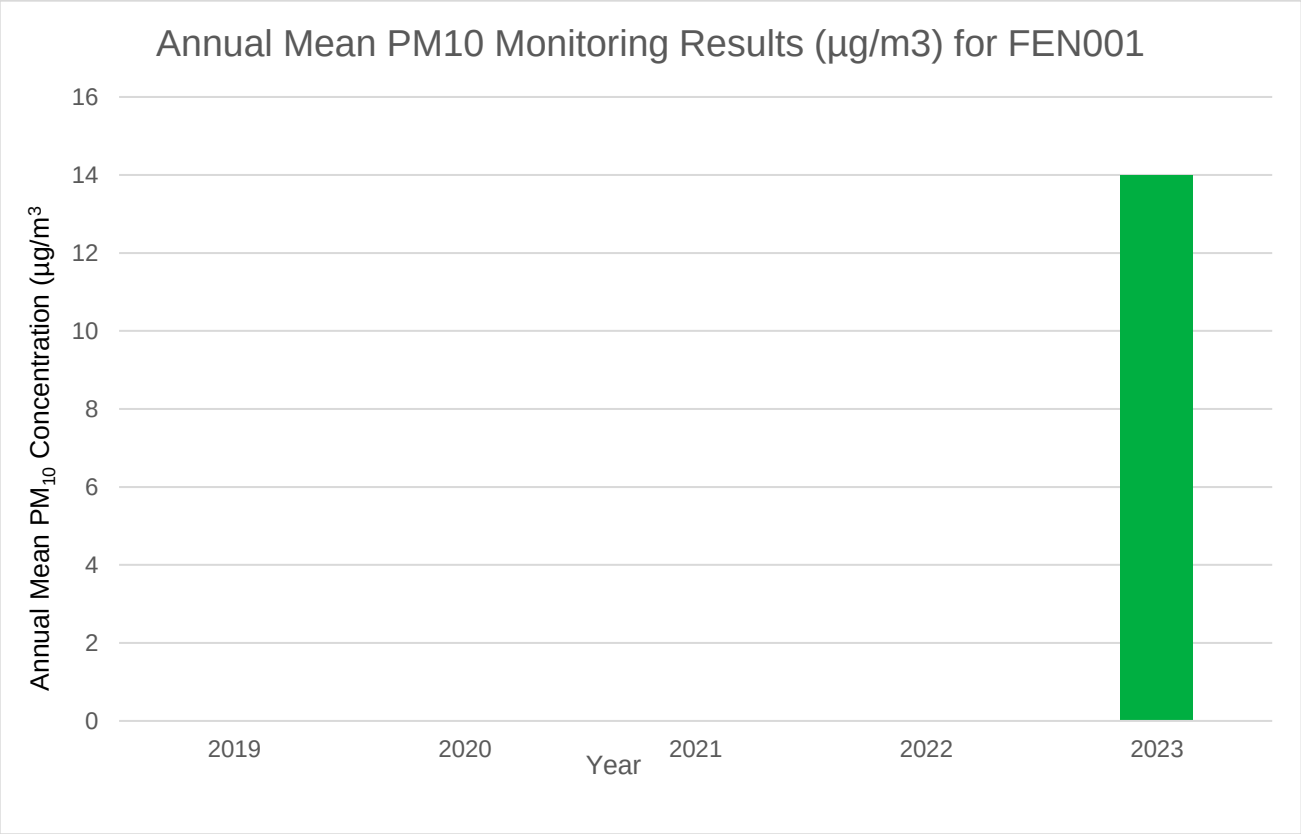


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
FEN001	526463	297061	Urban Background	91	91					0

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 2023 (%) (2)	2019	2020	2021	2022	2023
FEN001	526463	297061	Urban Background	91	91					9

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

Notes:

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

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

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

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

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

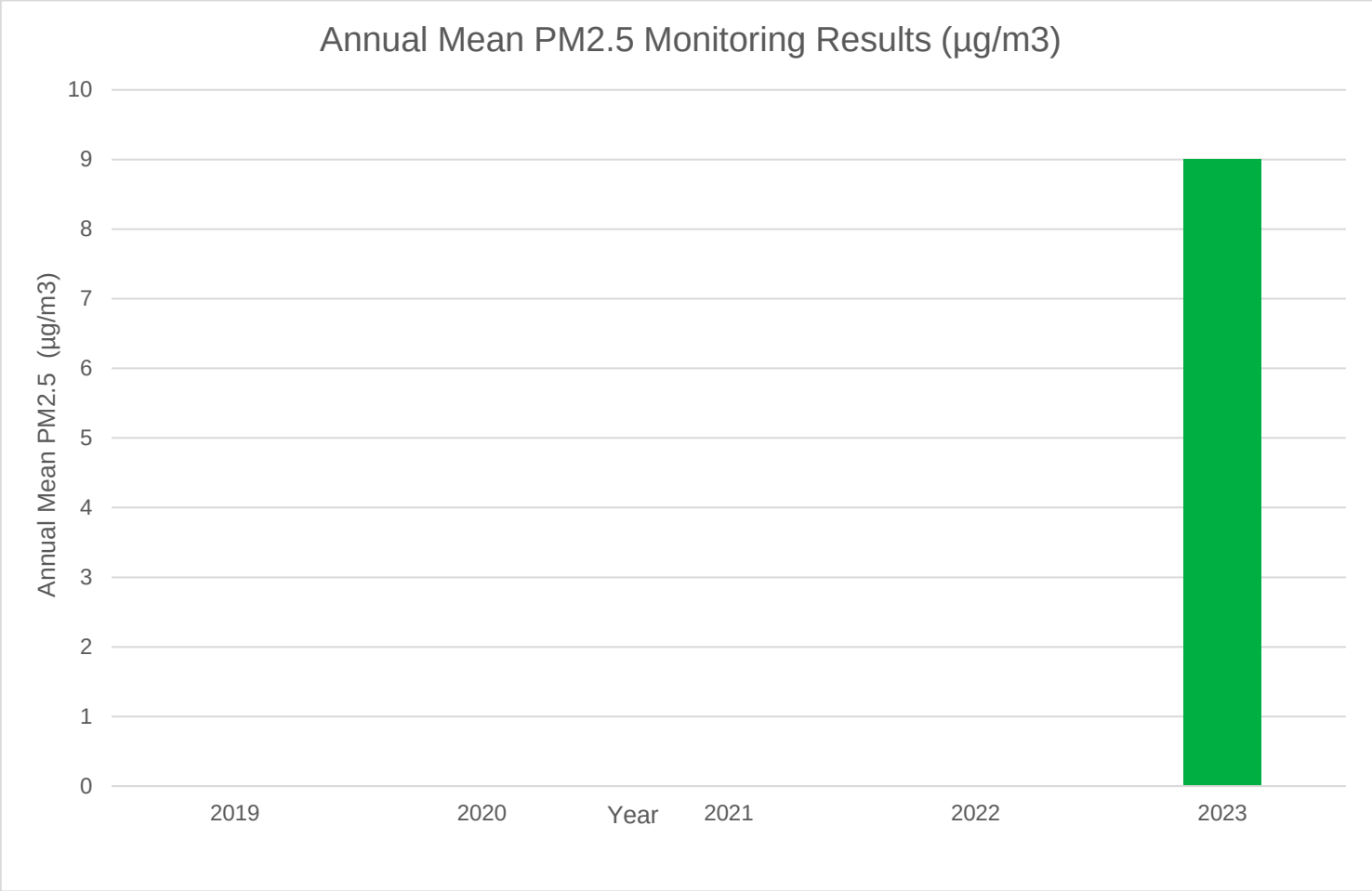


Table A.9 – SO_2 2023 Monitoring Results, Number of Relevant Instances

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	Number of 15-minute Means > 266µg/m^3	Number of 1-hour Means > 350µg/m^3	Number of 24-hour Means > 125µg/m^3
AM1	526382	2962859	Urban Background	95	95	0	0	0
AM2	523924	297974	Industrial	98	98	0	0	0
FEN001	526463	297061	Urban Background	91	91	0	0	0

Notes:

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

Exceedances of the SO_2 objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year).

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2023

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

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
S1	527059	297205	5.9	30.0	19.5	17.8	19.9	18.7	12.2	14.7	22.0	21.4	28.0	20.7	19.2	14.8	-	
S2	541980	297864	27.3	24.8	19.7	16.0	14.4		14.1	12.8	19.1	9.2	23.6	17.3	18.0	13.9	-	
S3	546860	308532	34.8	31.3	23.5	19.8	17.6	15.9	17.2	14.2	22.3	20.7	23.8	17.3	21.5	16.6	-	
S4	526849	297246	26.1	26.5	22.3	18.5	16.7	16.5	15.9	16.8	22.9	25.2	25.5	21.4	21.2	16.3	-	
S5	546415	309602	43.4	44.1	31.0	25.3	26.3	27.4	21.6	23.3		29.0	36.3	28.2	30.5	23.5	-	
S6	525293	297406	22.3	27.8	16.2	17.1	14.0	14.0	13.3	13.1	18.1	20.1	23.5	8.3	17.3	13.3	-	
S7	527291	297159	25.4	29.7	19.5	14.5	13.6	12.1	14.4	13.6	19.9	19.9		20.5	18.5	14.2	-	
S8	546890	308368	39.3	40.0	30.2	24.3	23.8	18.7	21.7	21.3	29.5	25.3	32.1	28.8	27.9	21.5	-	
S9	534526	303907	28.1	26.7	19.2	21.3	16.6	16.8	18.0	19.0	24.1	23.8	27.4	21.4	21.9	16.8	-	
S10	530615	297705	19.0	24.9	17.8	12.9	14.2	15.2	13.8	7.7	18.3	19.4	23.0	19.5	17.1	13.2	-	
S11	541653	296457	21.1	29.8	17.2	19.5	16.8			7.6	18.2	15.7	22.1	19.9	18.8	14.5	-	
S12	546592	310191	23.3	22.8	14.9	11.1	10.0	9.9	10.9	6.6	15.6	16.3	21.7	18.7	15.2	11.7	-	
S13	546664	310342	39.0	46.0	33.5	31.7	28.2	23.2	26.5	13.4	38.1	34.7	30.1	29.5	31.2	24.0	-	
S14	538976	287094	24.1	28.0	20.7	13.7	19.6		12.3		21.9	18.0	25.6	15.5	19.9	15.4	-	
S15	546818	308568	38.1	42.0	31.4	27.3	24.4	26.3	26.4	14.4	33.8	27.8	41.0	32.7	30.5	23.5	-	
S16	546238	309981	39.5	44.1	31.1	30.8	22.4	29.5	23.3	12.7	31.7	25.9	25.6	29.9	28.9	22.2	-	
S17	545509	308735	19.1	24.3	20.5	19.5	16.5	17.1	11.8	8.3	22.9	23.3	18.4	18.9	18.4	14.2	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
S18	539475	286275	19.2	19.3	13.3	9.1	8.4	9.3	6.6	4.9	13.2	12.0	18.5	11.5	12.1	9.3	-	
S19	541662	296814	43.6	43.8	38.6	31.5	23.3								36.2	24.7	-	
S20	546481	309387	34.2	35.6	30.9	27.7	26.2	23.7	19.9	24.4	31.1	29.0	28.7	24.9	28.0	21.6	-	
S21	541838	296987	22.1	27.4	18.0	14.8	12.1	12.2	11.6	13.4	18.8	18.2	22.6	12.8	17.0	13.1	-	
S22	527357	296554	21.5	22.9	13.6	12.3	12.7	12.2	8.8	10.8	15.9	14.3	18.3	14.8	14.8	11.4	-	
S23	526348	297468	30.9	32.3	21.1	16.8	15.0	11.6	13.9	32.7		19.5	30.6	23.3	22.5	17.3	-	
S24	541779	296864	33.9	33.0	26.6	22.8	17.4	17.5	18.7	17.8		24.2	28.2	24.5	24.1	18.5	-	
S25	528091	297183	26.3	28.7	17.2	13.4	10.3		10.6	11.9	16.9	12.5	22.4	18.1	17.1	13.2	-	
S26	540245	297613	37.4	43.0	40.1	38.5	32.2	40.7	26.6	33.2	46.5	39.0	34.9	25.7	36.5	28.1	-	
S27	541562	296920	28.1	33.2	22.6	17.9	16.4	17.2	12.7	14.0	22.5	21.9	25.9	18.3	20.9	16.1	-	
S28	541692	296840	31.1	19.9	16.2	14.6	16.4	13.5		20					20.5	16.3	-	
S29	541654	296055	29.9	31.1	22.2	17.4	16.5	14.9	13.5	17.8	21.3	21.6	26.7	16.5	20.8	16.0	-	
S30	539332	286176	25.7	30.7	21.9	18.4	17.8	16.7	13.3	16.3	21.7	23.9	25.9	19.1	21.0	16.1	-	
S31	545986	309618	53.2	53.2	43.9	37.6	33.4	35.7	36.1	41.0	60.2	48.5	46.6	37.8	43.9	33.8	-	
S32	545997	310092	28.3	29.8	24.1	20.0	19.7	17.0	13.5	18.8	26.5	28.0	24.1	17.0	22.2	17.1	-	
S33	546567	308374	24.5	25.0	19.1	16.4	17.1	15.6	10.8	15.2	18.2	19.3	23.8	17.5	18.5	14.3	-	
S34	546756	308522	27.7	25.0	25.9	25.2	23.9	22.4	15.9	20.7	27.6	34.4	22.9	21.1	24.4	18.8	-	
S35	541672	296801	38.1	40.5	30.0	27.5	24.2	26.0	25.5	28.0			21.1	15.5	27.6	21.3	-	
S36	450918	296641	20.3	12.5	15.3	12.6	11.5	9.8	7.9	11.6	15.6	20.7	12.4	12.7	13.6	10.5	-	
S37	540718	296148	23.2	29.3		16.9	15.7	15.0	11.7	13.5	19.7	19.9	21.7	20.2	18.8	14.5	-	
S38	541545	296392	18.4	14.6	12.6	10.5	7.7	7.4	6.1	8.0	11.7	14.6	14.2	11.0	11.4	8.8	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
S39	541519	295564	12.5	25.2	17.0	13.5	12.9	11.0	6.8	9.6	14.4	17.7	19.0	13.7	14.4	11.1	-	
S40	541551	295083	20.2	23.6	12.7	10.5	10.2	7.8	6.0	8.1	11.8	15.6	8.1	14.3	12.4	9.6	-	
S41	540578	294878	15.6	19.6	13.5	10.4	9.6	8.1	7.7	10.4	14.0	13.8	16.4	14.0	12.8	9.8	-	
S42	526463	297061							7.0	9.1	13.2	12.0	18.7	13.7	12.3	9.9	-	

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

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

☒ **National bias adjustment factor used.**

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

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

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Fenland District Council During 2023

There has been a number of changes identified in Fenland during 2023. This includes one Part B site that received an environmental permit in the town of March for crushing and screening activities. Two other Part B environmental permitted sites had variations made to the permits in 2023. A wood shredding and recycling plant has surrendered their permit and ceased operation in the district. Locally Fenland has seen a rise in housing and industrial development applications and further details of these proposals are listed below in the planning development section.

Additional Air Quality Works Undertaken by Fenland District Council During 2023

NO_2 Diffusion Tube Network Consultation

A public consultation was undertaken to review the local nitrogen dioxide diffusion tube network. Residents were invited to suggest sites where they felt regular exposure to traffic pollution to help ensure testing is being carried out at the most at-risk areas and any issues are highlighted and can be tackled. This allowed members of the community to have their say on where monitoring tubes should be located and has led to change in locations that was implemented in January 2024 and the results will be reported in next years ASR.

Environmental Permitting

- One new application was received for a Part B process of crushing and screening in 2023.
- There were two variations to current Part B Processes in the district in 2023. These were for combustion of waste wood and a maggot breeding process.
- The risk rating for all Part B permitted processes remained the same in 2023.

March Future High Street Fund (Broad Street update)

The enhancement scheme is underway and within the construction stage. Works to utilities have commenced with the scheme currently on programme to be completed October 2024. Details of the scheme can be found at March Future High Streets Fund - Fenland District Council

Planning Development

Fenland has seen an increase in the number of developments across the district. These applications have been considered for the impact on air quality, mainly through the introduction of new receptors to areas, but also through new pollutants being introduced to the district. In 2023 a document was developed with standard conditions to ensure consistency from Environmental Health consultations on planning developments. This included a number of air quality conditions to be placed on proposed developments, for both the construction and completion phases. These include detailed air quality assessments, air quality protection plans, and method statements for the control of dust and emissions arising from the demolition and construction, all in line with relevant policies.

The most significant application is for national infrastructure for an energy from waste plant in Wisbech. The application proposes to transport and incinerate 500,000 tonnes of waste a year to create 50MV of electricity. Planning permission and an environmental permit has now been approved for this proposal, but this is currently under judicial review. The development consent order has been issued and available on the website. This information, and further information on the proposal, can be found on the Planning Inspector website at Medworth Energy from Waste Combined Heat and Power Facility - Project information (planninginspectorate.gov.uk).

Locally Fenland has seen a rise in housing, industrial and haulage development applications, below details the major applications received in 2023.

Application	Proposal	Location
F/YR23/0053/F	Erect a Grain Store	Building West Of 2 White Fen Farm Floods Ferry Road, Doddington
F/YR23/0101/F	Erect 26 x dwellings	Land North Of 156 - 158 Stonald Road, Whittlesey

F/YR23/0155/F	Erect 31 x dwellings	Land South Of Caravan Site, Fenland Way, Chatteris
F/YR23/0201/F	Erect 48 x dwellings	Wimblington Road, March
F/YR23/0211/F	Erect a store/distribution building and associated works	Land North Of Frans House Fenton Way, Chatteris
F/YR23/0206/F	Erect 45 dwellings	Eaton Estate, Wimblington
F/YR23/0245/O	Erect up to 175 x dwellings	Land South Of 250 Drybread Road, Whittlesey
F/YR23/0266/F	Erect 26 x dwellings	Land South Of 107 Upwell Road, March
F/YR23/0329/F	Installation of 968 kw solar ground mounted solar farm	Land East Of 178 Gosmoor Lane, Elm
F/YR23/0370/O	Erect up to 130no dwellings	Land To The South Of Barkers Lane, March
F/YR23/0375/F	Erect a chilled storage/packing building	Land South West Of Del Monte UK Ltd, Weasenham Lane, Wisbech
F/YR23/0477/O	Outline application to erect 250 x dwellings, and Full application to erect 103 x dwellings	Land East Of Halfpenny Lane, Wisbech
F/YR23/0500/F	Erect 14 x dwellings	North Of 43 - 53 High Street, Doddington
F/YR23/0525/O	Commercial business park, delivering a mix of potential floorspace options	Land At Junction Of A47Cromwell Road, Wisbech
F/YR23/0534/F	Change of use of land to an HGV Trailer storage area	Land North East Of New Saxon Works, Peterborough Road, Whittlesey
F/YR23/0546/F	Change of use of existing paddock land to B8 Open Storage	Churchfield Farm Kings Dyke, Whittlesey
F/YR23/0550/F	Erect 18 x dwellings	Land East Of Berryfield, March

F/YR23/0044/F	Erect 2 x units Class B8 Storage and/or Self Storage unit	Site Of Former Parkside Nurseries Cromwell Road, Wisbech
F/YR23/0573/F	Change of use of 6 x agricultural units to B2 and/or B8 use	Nightlayer Leek Company Ltd, Dean Drove, Chatteris
F/YR23/0696/O	Outline planning permission for up to 425 dwellings	Land South Of Barkers Lane And East Of Wimblington Road, March,
F/YR23/0697/FDL	Erect 152 x dwellings	Land South Of The Elms, Chatteris
F/YR23/0700/F	Erect a building for use as a sitting area/store and change of use of land to dog exercise area	Land North Of Six Acres Bar Drove, Friday Bridge
F/YR23/0751/F	Formation of an artificial grass pitch (AGP)	Land North Of Playing Field Station Road, Wisbech St Mary
F/YR23/0705/O	Erect up to 249 x dwellings	Land North Of 271 - 311 Eastrea Road, Whittlesey
F/YR23/0762/F	Erect 4 x Buildings (B8 use) and associated works and the formation of 1 x balancing pond	Land North Of Fenton Way Business Park, Chatteris
F/YR23/0648/F	Full planning permission to erect 18 x dwellings and Outline application with to erect 2 x self-build dwellings	Land South Of 127-141 Coates Road, Coates
F/YR23/0819/F	Erect a storage building for the storage of fertilisers	Land East Of 22 Eastwood Industrial Estate, Eastwood End Wimblington
F/YR23/0942/F	Erect 5 x industrial units	Land South Of March Trading Estate Westry Avenue, March
F/YR23/0940/F	Erect 70 x dwellings	Land West And South Of 74 West Street, Chatteris

F/YR23/1021/F	Erect 12x dwellings	Land South Of Selwyn Farm 71 South Brink Accessed Via Ellerby Drive, Wisbech
F/YR23/1033/F	Erect 22 x dwellings	Land South Of 88 West Street, Chatteris
F/YR23/1032/F	Erect 19 x dwellings	Site Of Old British Gas Depot, Chase Street, Wisbech

QA/QC of Diffusion Tube Monitoring

Socotec Didcot supplies and analyses the diffusion tubes for Fenland. 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 auto-analyser with ultraviolet detection.

Fenland District Council does not have a full set of data for 2023 for the automatic analysers with which a collocation study could be undertaken, therefore a bias adjustment factor was obtained from the national bias adjustment database which is available at: http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html. Adjustment factors are derived from data from diffusion tubes which were co-located with real-time analysers. Socotec, 50% triethanolamine (TEA) in acetone for 2023 gave an adjustment factor of 0.77 which has been applied to the Fenland data (see spreadsheet below).

The monitoring has been undertaken in adherence with the 2023 Diffusion Tube Monitoring Calendar.

Diffusion Tube Performance Summary 2023:

Tube Type: 50% TEA : 50% Acetone/ 20% TEA : 80% Water

Uncertainty: "Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance" categorises diffusion tubes as an indicative method, and as such the uncertainty is defined as ± 25%.

During in field intercomparisons, SOCOTEC's diffusion tubes perform at ±10% uncertainty.

Quality Control: A quality control (QC) sample of known concentration is run with the samples. The data generated is then assessed

using a Shewhart control chart to determine the process is under statistical control.

Analytical Repeatability: In 2023 ~8100 QC samples were analysed, achieving a relative standard deviation of 0.98%

Confidence Intervals: 2σ ±2.18%

3σ ±3.27%

Limit of Detection: The analytical limit of detection is 0.03µg NO_2.

Over a 4-week exposure this would equate to 0.6µg/m^3, or 0.3ppb

Quality Assurance:

The manufacture and analysis of NO_2 diffusion tubes is covered by our UKAS accreditation.

The laboratory has taken part in the AIR (previously WASP) proficiency scheme since its inception. To achieve the highest ranking of "Satisfactory" a laboratory must achieve a z-score of <2. For 2023, SOCOTEC had an average z-score of 0.20.

Bought in ISO Guide 34 and ISO/IEC 17025 certified standards are used to prepare calibration and QC standards.

2% of tubes are checked for blankness during manufacture, to ensure there is no contamination introduced during the manufacturing process.

The method meets the requirements laid out in DEFRA's "Diffusion Tubes for Ambient NO2 Monitoring: A Practical Guidance."

Diffusion Tube Annualisation

Annualisation is required for any diffusion tube site with data capture less than 75%. Across Fenland we had three sites that required annulisation in 2023. This was due to the ongoing regeneration work at Broad Street, March that disrupted the tube location sites. The decision was then made to move one of these tubes to a new location of Hallcroft Road, Whittlesey to collocate with the sensor in place there.

The Diffusion Tube Data Processing Tool was used to calculate the annulisation and the details of the sites requiring annualisation, along with details of the calculation method undertaken, are provided below in Table C.1.

Table C.1 – 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
S19	0.8383	0.9363	0.8873	36.2	32.1
S28	0.9979	1.0718	1.0348	20.5	21.2
S42	1.1203	0.9764	1.0483	12.3	12.9

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Fenland District Council have applied a national bias adjustment factor of 0.77 to the 2023 monitoring data. A summary of bias adjustment factors used by Fenland District Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	03/24	0.77
2022	National	03/23	0.76
2021	National	06/22	0.78
2020	National	09/19	0.76
2019	National	06/18	0.75

QA/QC of Automatic Monitoring

The two automatic monitors (AM1 and AM2) situated in Kings Dyke, Whittlesey, are owned and operated by Forterra Building Products Ltd Whittlesey Brickworks, Kings Dyke Works, Peterborough Road, Whittlesey, Cambridgeshire, PE7 1PD. The monitors have been installed to demonstrate compliance with their EA Environmental Permit for manufacturing ceramic products (bricks) under registered permit EPR/GP3435WX. As part of their permitting requirements a yearly summary of compliance with Local Air Quality Objectives is provided to the Local Authority for reporting. The data is not published live, but further information is available from the public register at View registration EPR/GP3435WX (data.gov.uk). With regards to the QA, SLR visit both monitoring sites each month to collect the raw data from the analysers. Whilst on site they check the analyser zero reading by calibrating it against the known value of the concentrated So2 cylinder at 450ppb.

For the sensor situated in Hallcroft Road, Whittlesey (FEN001), data management and Local Site Operator (LSO) duties are completed by Ricardo. The Hallcroft Road (sensor) Latest Data - Air Quality monitoring service (airqualityengland.co.uk) page on the UK-Air website presents automatic monitoring results for Fenland District Council. The following information details how the sensors quality control is maintained by Ricardo.

Sensor dataset correction using UK MCERTS reference measurements

Sensor responses for a given pollutant are known to vary widely, even across the same make and model when run side by side, as such data correction is required. For each sensor Ricardo achieve this via a characterisation and co-location task, undertaken pre-deployment of the senor and annually thereafter.

Sensor Unit Characterisation

Characterisation of each sensor pollutant is essentially the first stage in the sensor unit calibration process. Sensor units usually take circa 2-3 days to settle once installed at the MCERTS reference monitoring station. Following this, comparison of the sensor and reference datasets take place, the sensor software for each pollutant will be reset (zero and r2 regression) to mirror the reference measurements. Each sensor species (NO, NO2, PM10, PM2.5) requires characterising for each unit as each sensor cartridge responds differently to ambient concentrations –it's not possible to characterise and co-

locate one sensor unit and apply the same correction factor to other sensors (even if it's the same make, model, and age).

Co-location Correction

The co-location correction processing is crucial to establish that sensor responses mirror reference instrument measurements under current meteorological conditions, and to assess changes in responses across time. During the co-location phase the sensors remain in situ following characterisation. The provisional datasets from the sensors and reference instruments are compared, the difference in response is then calculated, and a provisional correction factor is applied to the provisional datasets. This process is repeated following ratification of the reference datasets, and the sensor datasets are then corrected again. Best practice guidance suggests co-location is required every 3-months in the UK to account for changes in meteorological conditions, however many local authorities undertake this annually due to budget constraints and/or to meet data capture requirements. Following the co-location tasks, Ricardo use the results as part of the quality control and ratification process for each pollutant. This essentially involves screening out any suspicious looking or faulty data and applying the necessary correction factors and baseline adjustments during ratification.

Quarterly QA/QC and Ratification

Following ratification of the reference monitoring station datasets, Ricardo reprocess the sensor datasets for each pollutant, from each sensor, using an updated co-location correction factor. This can increase or decrease the resulting datasets significantly, by up to 25% if not applied correctly. We then compare the measurements to other similar datasets to evaluate and address any inconsistencies. Where evidence supports, we screen out inconsistencies and faulty data. The data are then re-checked by an independent team member prior to being marked as ratified. At this point the datasets are suitable to feed into longer term policy decision making, and LAQM reporting.

Automatic Monitoring Annualisation

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

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO_2 concentrations corrected for distance are presented in Table A.3.

No automatic NO_2 monitoring locations within Fenland District Council required distance correction during 2023.

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

Automatic Monitoring Sites

Fenland District Council has one automatic monitoring site located on Hallcroft Road, Whittlesey.

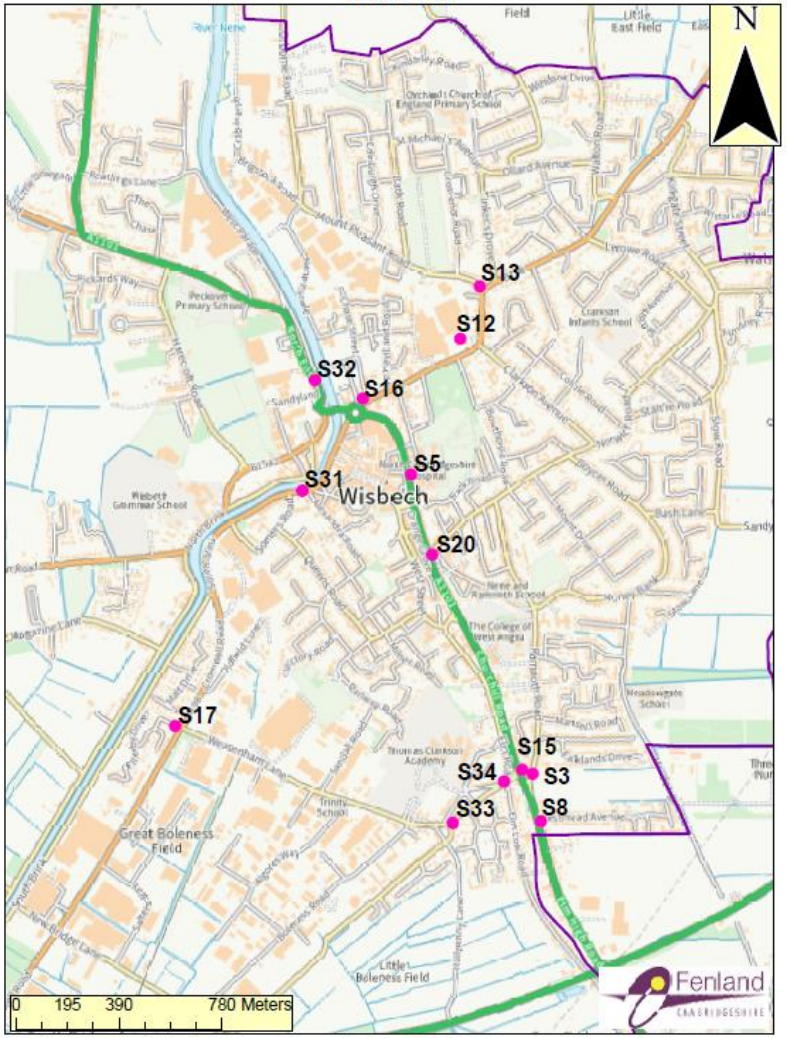
Monitoring of SO_2 is undertaken by Forterra Building Products Limited (formerly Hanson) at two locations in the vicinity of the brickworks in Whittlesey. As part of their environmental permit Forterra operate a continuous ambient monitoring station (CAMS) to the east-southeast of the former Saxon Works (Park Lane CAMS (formerly Saxon) and a second CAMS to the north of the Kings Dyke Works (Bradley Fen CAMS).

Figure D.1 – Map of Automatic Monitoring Site

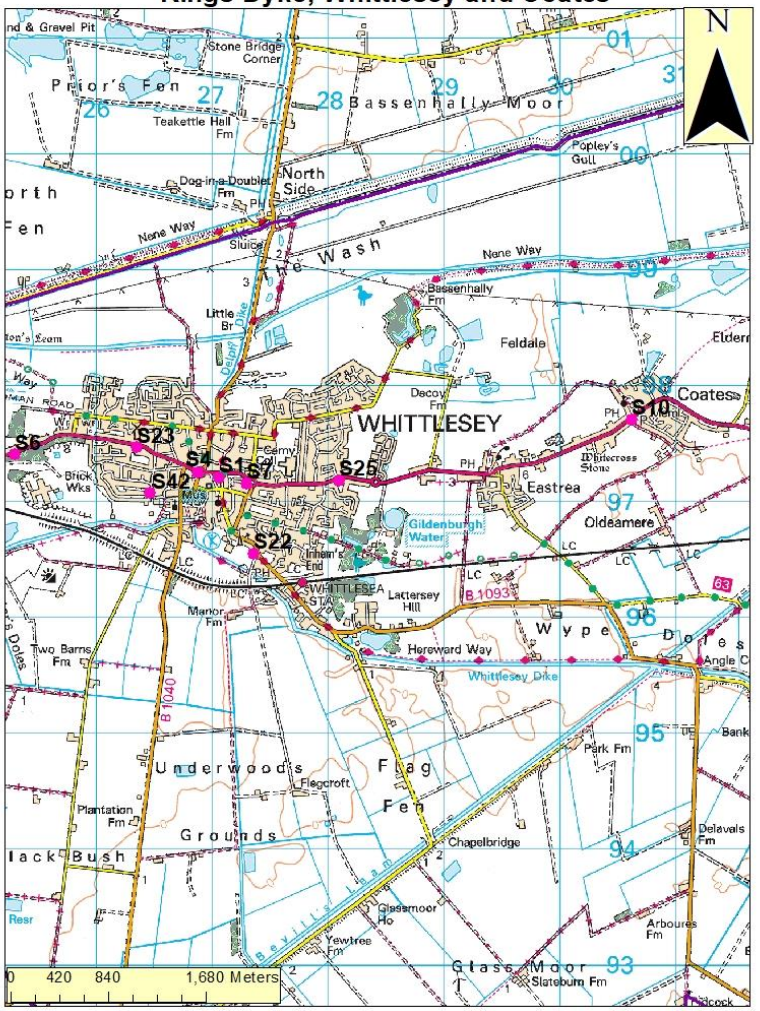
Figure D.2 – Map of Automatic Monitoring Sites run by the brick works in Whittlesey

Figure D.2 – Map Non-Automatic Monitoring Sites

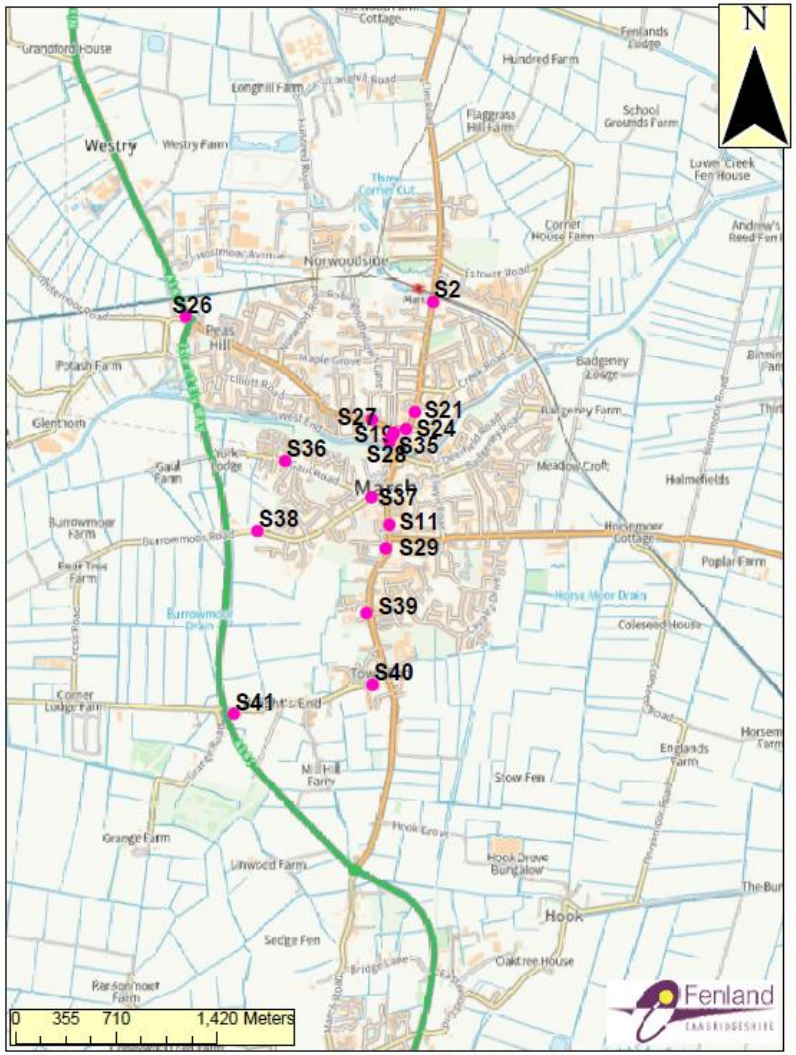
NO2 Tube Monitoring Locations in Wisbech



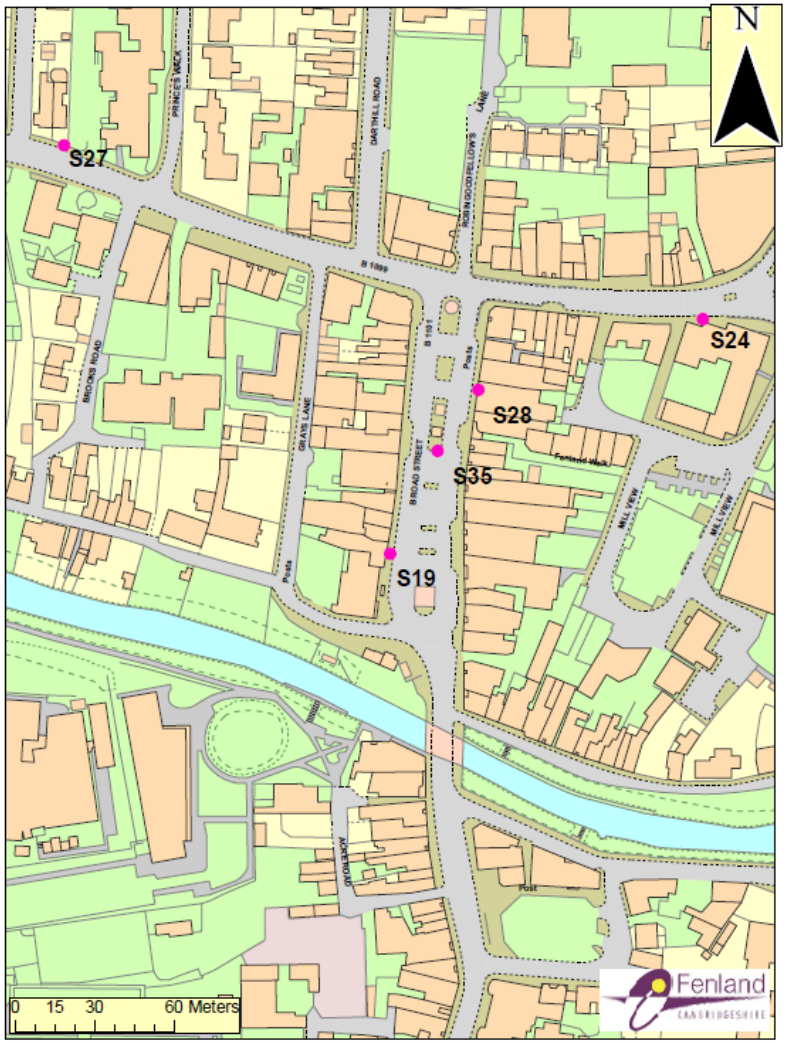
NO2 Tube Monitoring Locations in Kings Dyke, Whittlesey and Coates



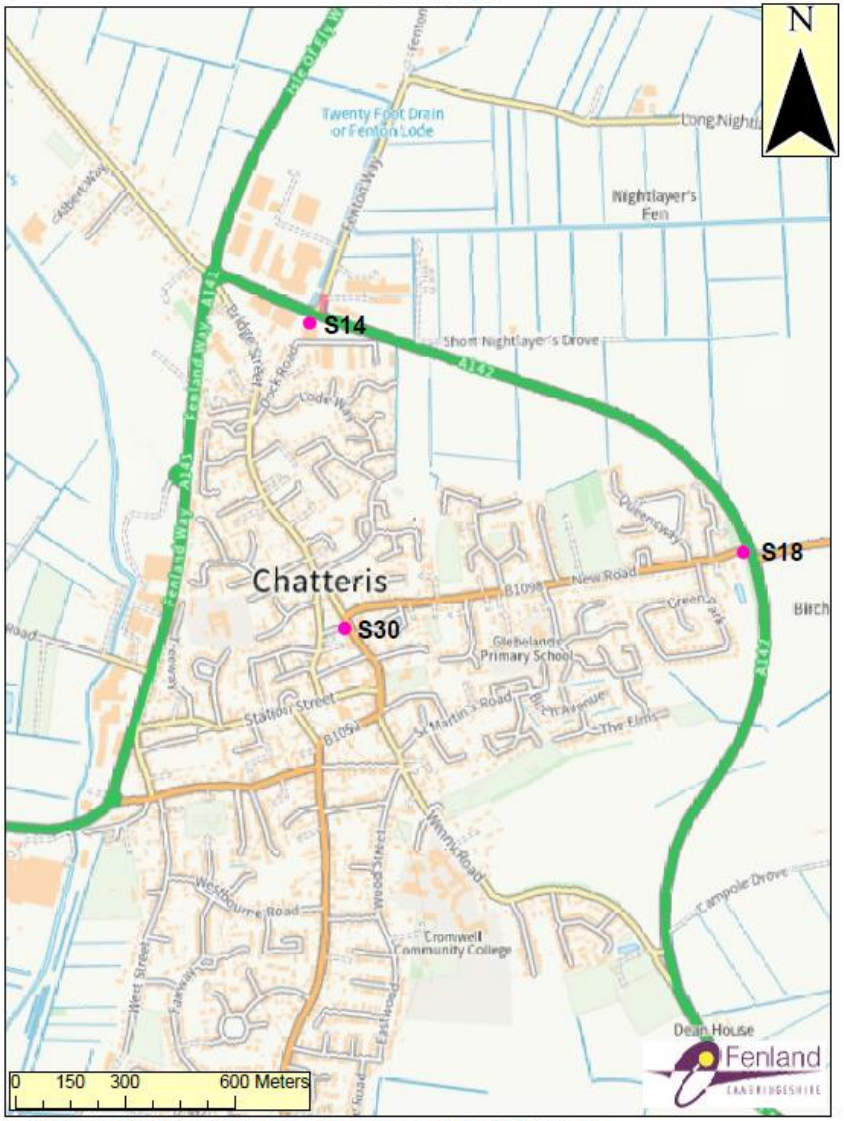
NO2 Tube Monitoring Locations in March



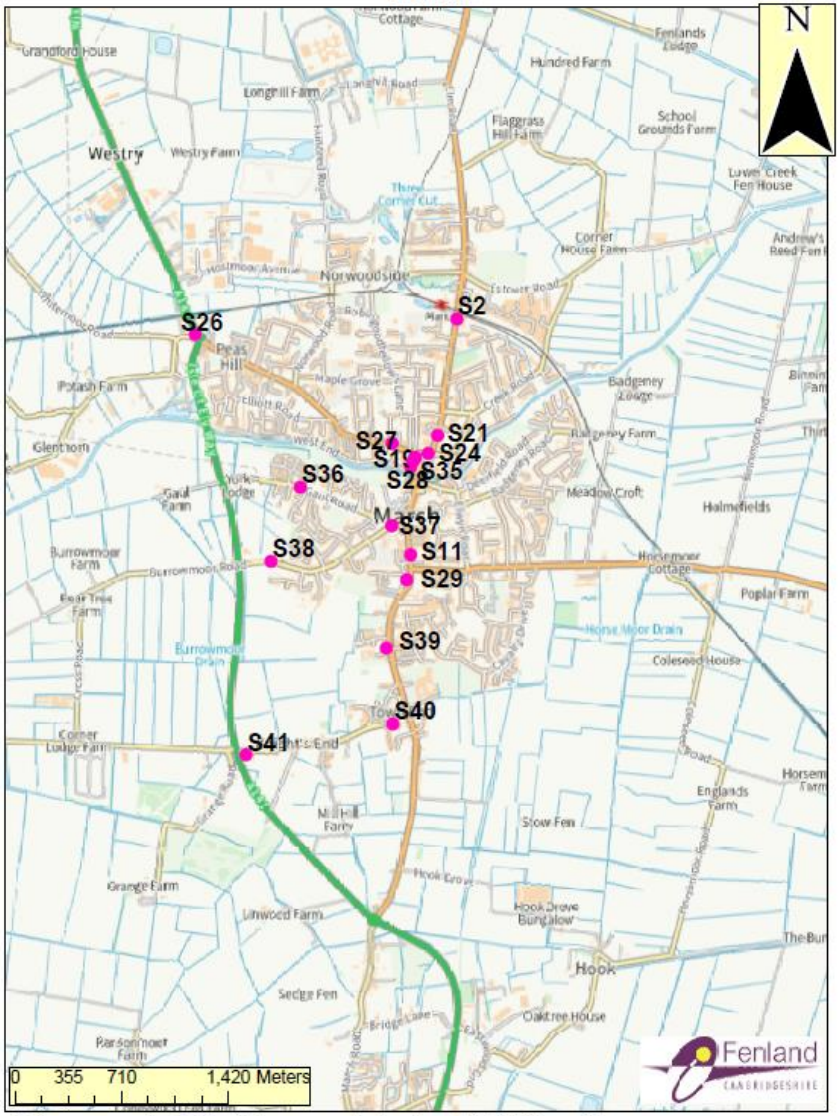
NO2 Tube Monitoring Locations in March Town Centre



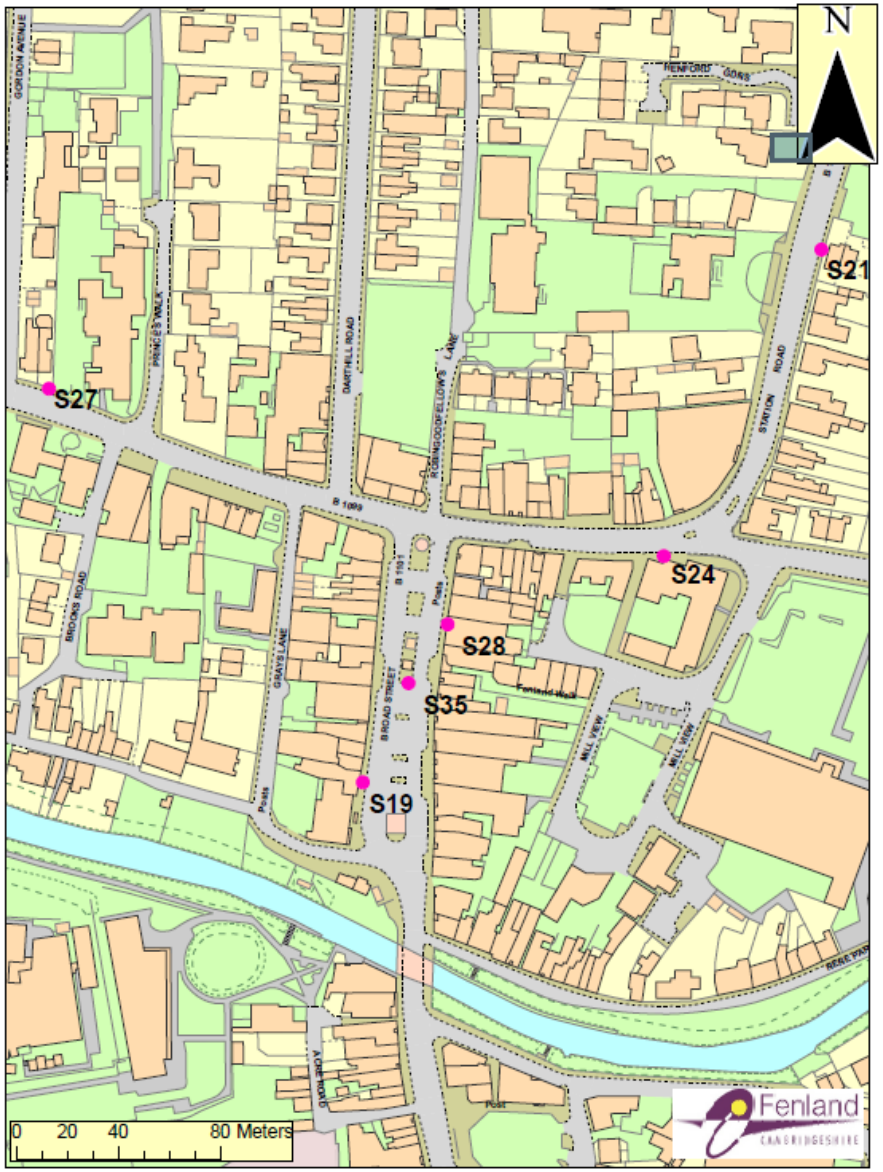
NO2 Tube Monitoring Locations in Chatteris



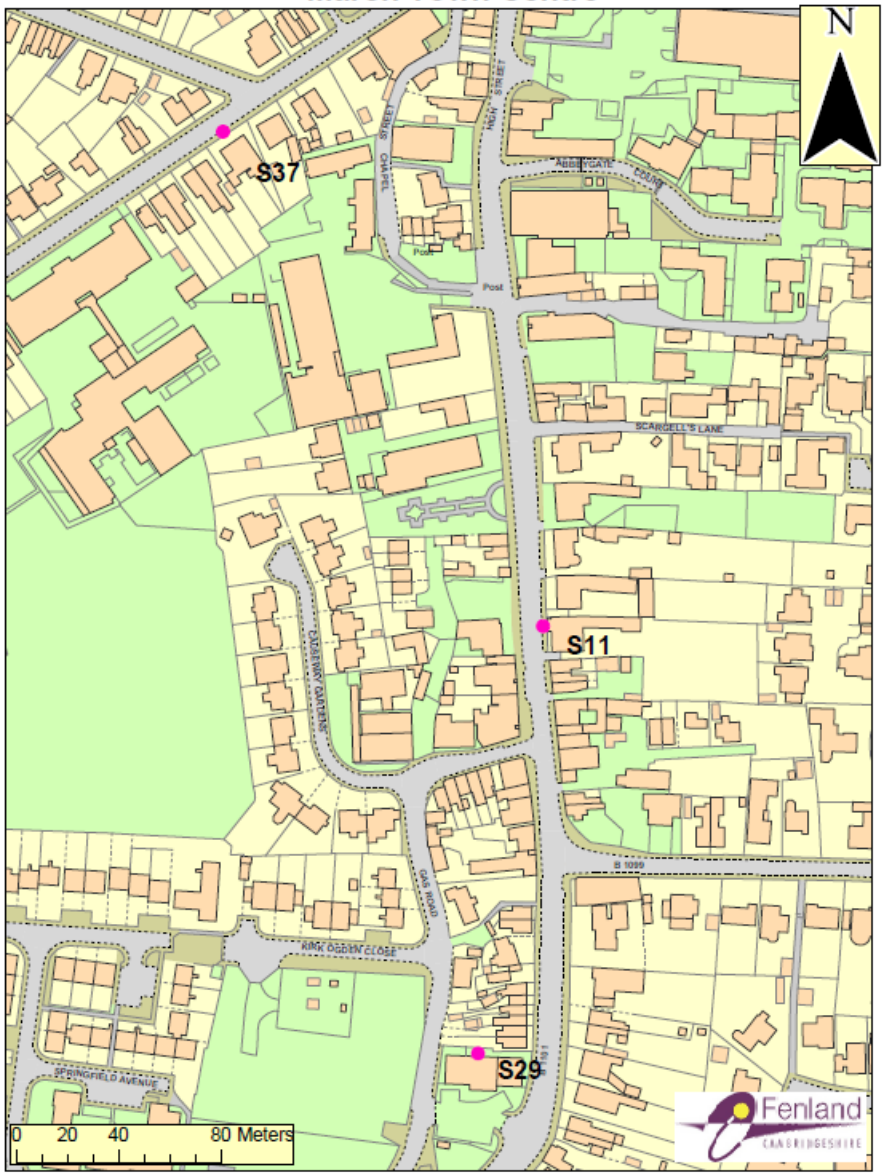
NO2 Tube Monitoring Locations in March



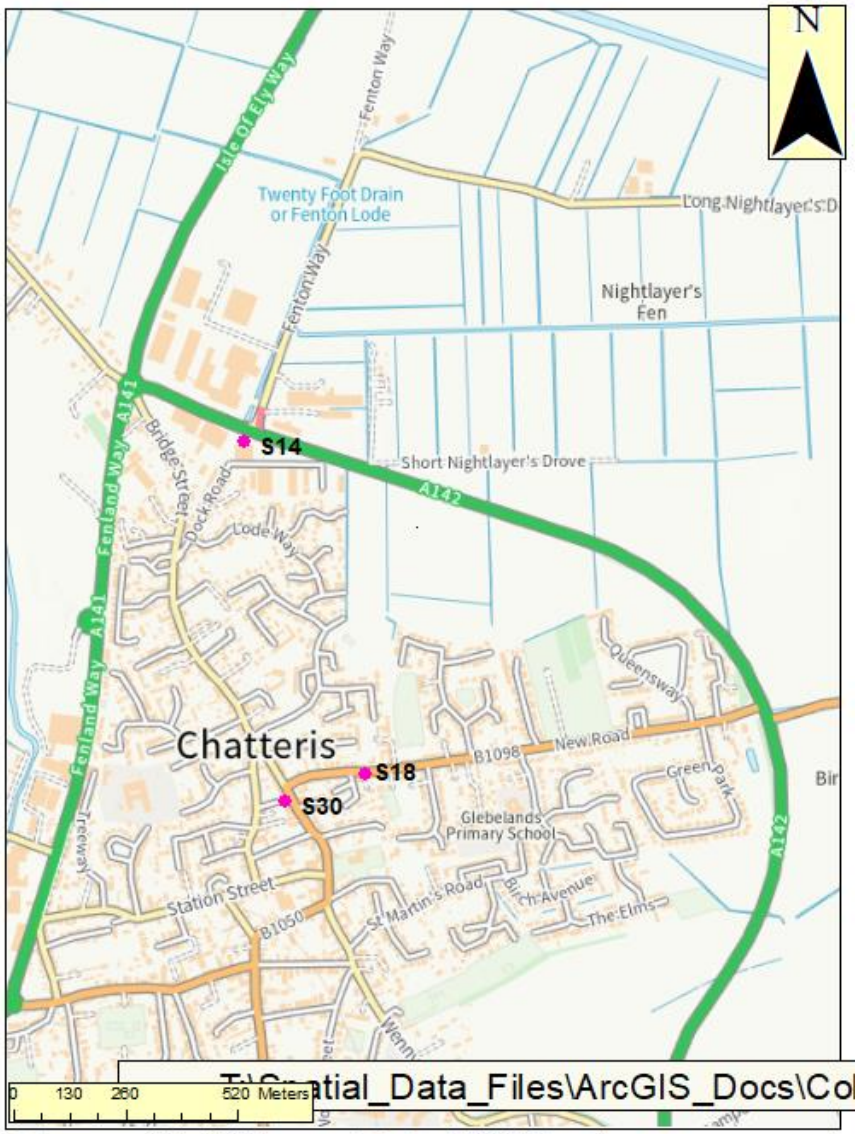
NO2 Tube Monitoring Locations in March Town Centre



NO2 Tube Monitoring Locations in March Town Centre



NO2 Tube Monitoring Locations in Chatteris



NO2 Tube Monitoring Locations in Thorney Toll

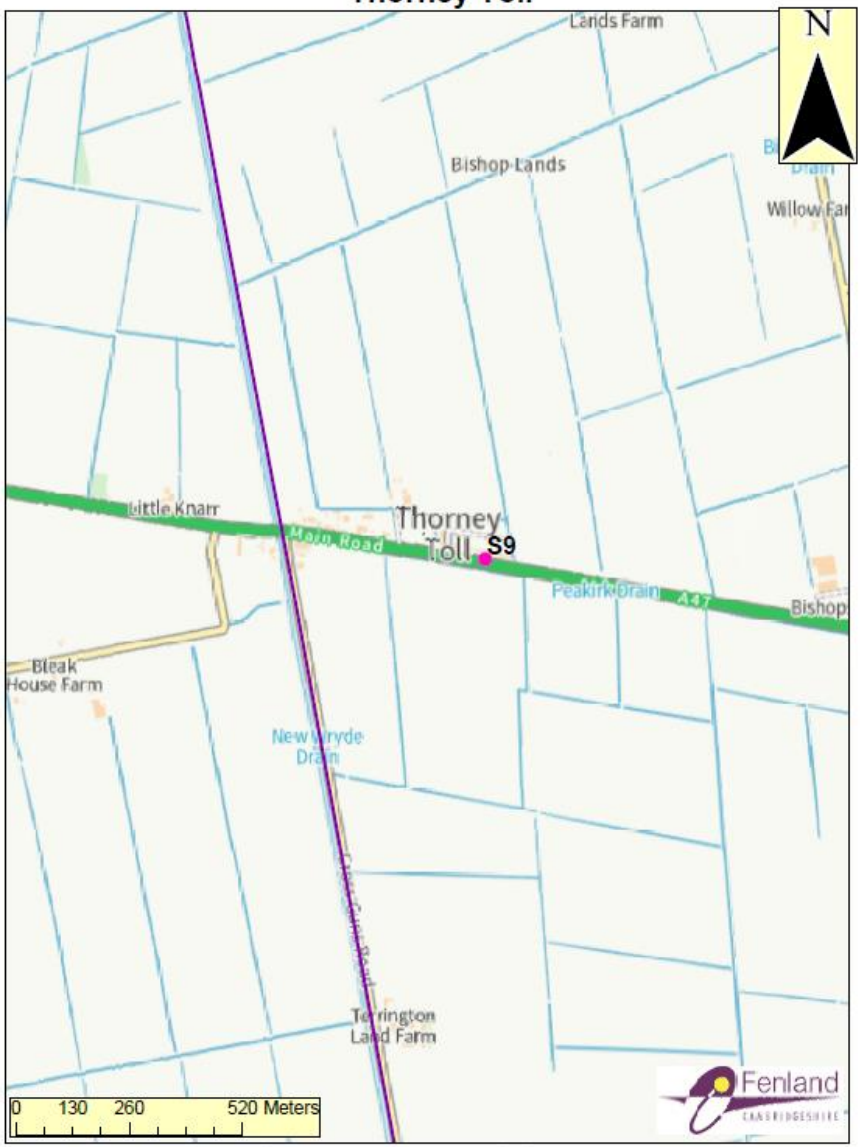
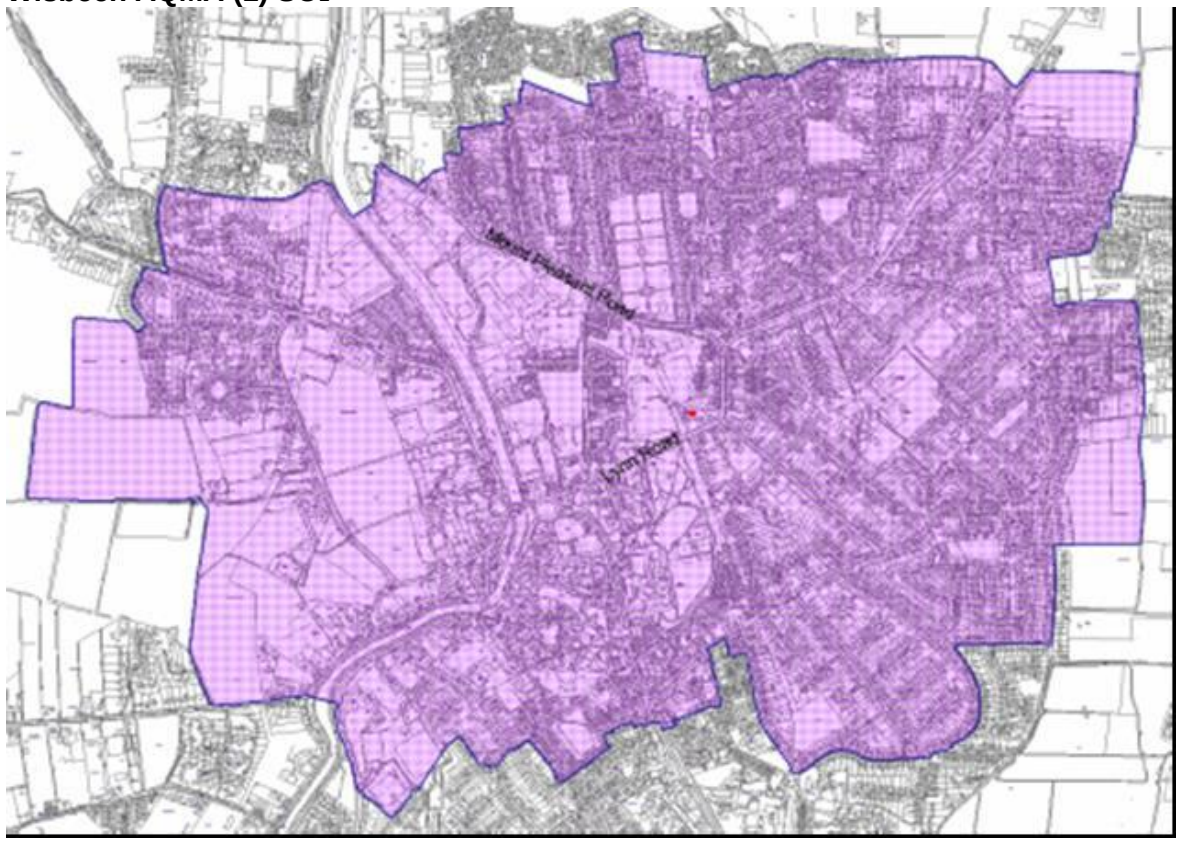
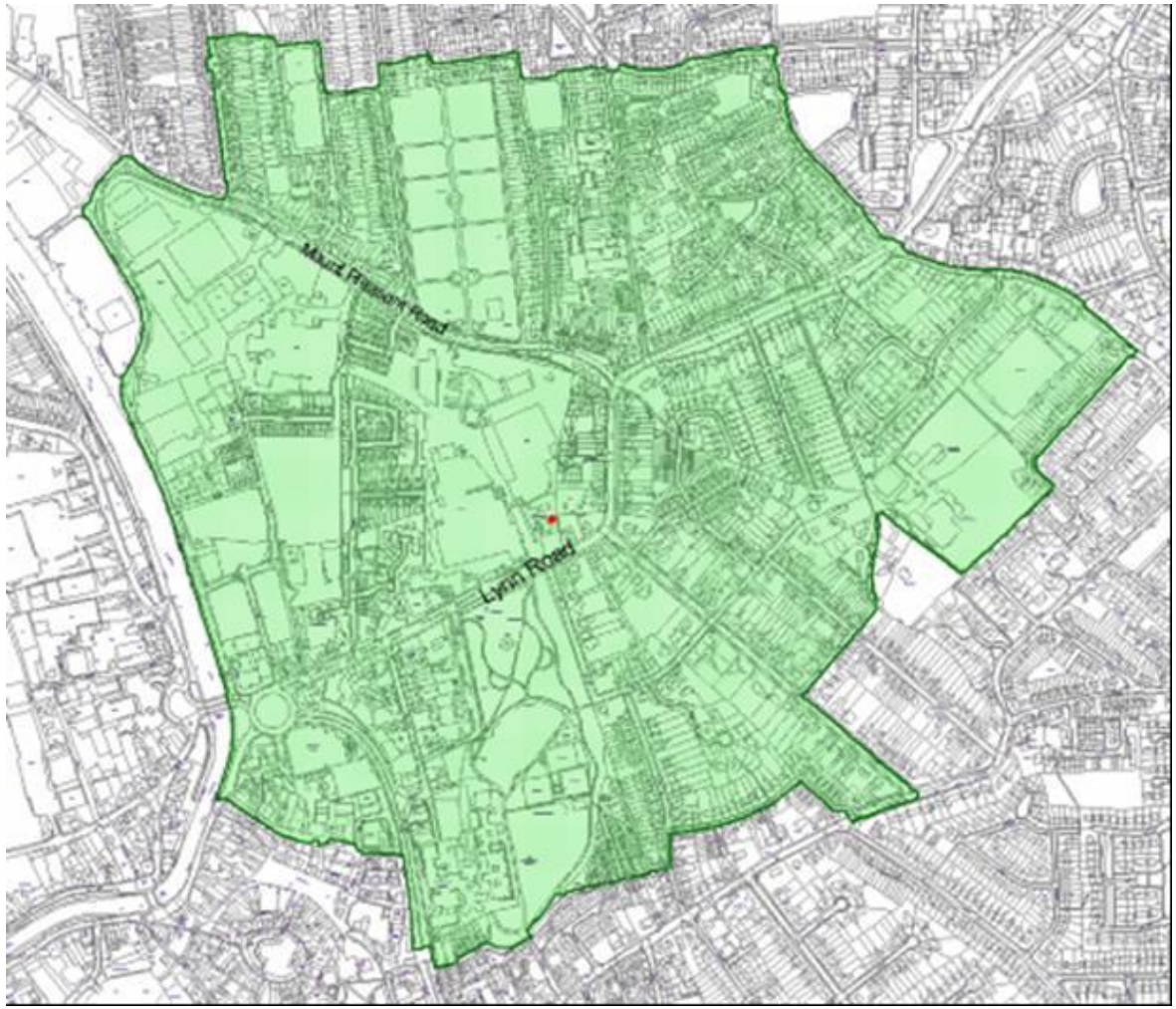


Figure D.2 – Map Air Quality Management Areas

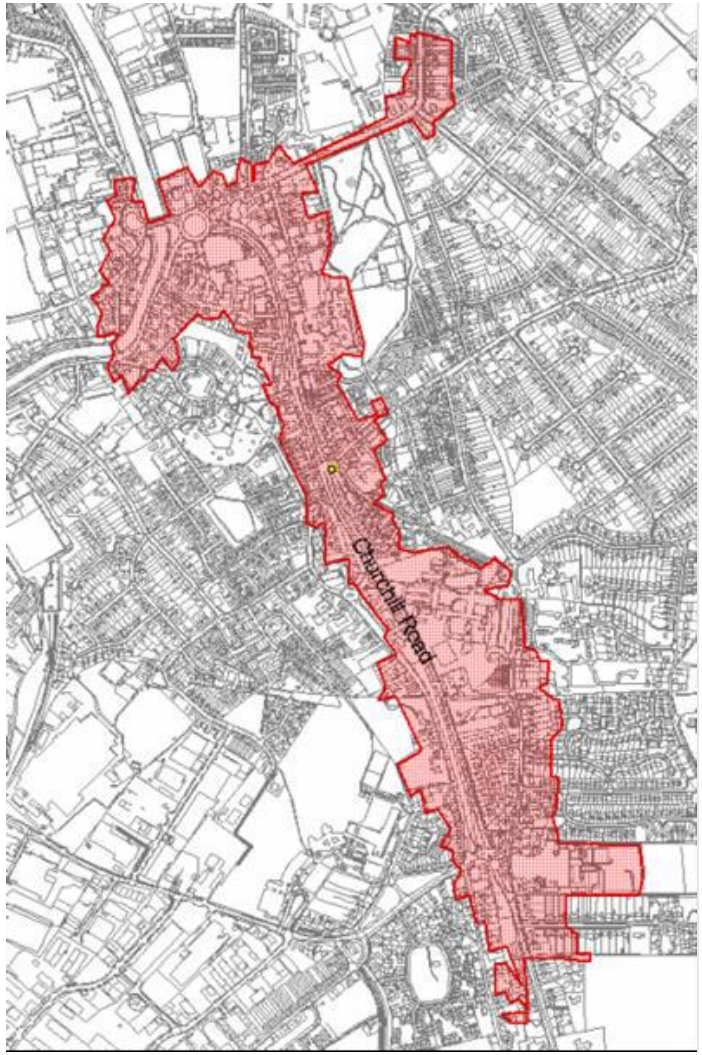
Wisbech AQMA (1) SO_2



Wisbech AQMA (2) PM_{10}



Wisbech AQMA (3) NO_2



Whittlesey AQMA SO_2

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

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

[7] 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.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.