2020 Air Quality Annual Status Report (ASR)

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

June 2020

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Executive Summary: Air Quality in Our Area

Local Air Quality Management (LAQM) is a statutory process which was introduced by The Environment Act 1995, it places a duty on Local Authorities to monitor, assess and take action to improve local air quality. This report forms the 2020 Annual Status Report (ASR) for Fenland District Council and is a review of air quality in the district in 2019. The data analysed and discussed in this report was collected from January 1st to December 31st 2019.

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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

The Cambridgeshire Transport and Health Joint Strategic Needs Assessment (JSNA) for Air Pollution (2015) also details the relationship between air pollution and health, and provides a local context when examining air quality in Cambridgeshire. The report can be found using the following link: http://cambridgeshireinsight.org.uk/wp-content/uploads/2017/08/Transport-and-Health-JSNA-2015-Air-Pollution.pdf .

Air Quality in Fenland

The Fenland District is a rural district located in the north of Cambridgeshire, it houses four main market towns; Chatteris, March, Whittlesey and Wisbech, with Wisbech and Whittlesey containing the majority of the industrial and manufacturing processes within Fenland.

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Main pollutants and trends

Fenland District Council currently monitors for Nitrogen Dioxide (NO_2) pollution throughout the district (25 monitoring sites) and the primary source for this pollutant in the district is vehicle emissions. Nearly all of the monitoring sites in Fenland are achieving the national objectives; however there has been one exceedance of the annual objective in Broad Street, March, in 2019. When considering the trends shown by the latest monitoring data as compared to previous years, levels have plateaued with some sites seeing slightly elevated levels.

Automatic (continuous) Sulphur Dioxide (SO_2) monitoring was undertaken at Whittlesey Brickworks, this monitoring is stipulated as a condition of their Part A Environmental Permit. All objectives were met in the year of 2019.

Air Quality Management Areas

Fenland currently have four Air Quality Management Areas (AQMAs); three in Wisbech (SO_2, Particulate Matter with an aerodynamic diameter of 10µm (PM_{10}) and NO_2) and one in Whittlesey for SO_2. The AQMAs can be viewed in Appendix D of this report or on the Defra website via the following link: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=104.

Last year, Fenland District Council proposed to revoke the AQMAs; however, Fenland District Council has been invited to consult on an application submitted to the Secretary of State for Business, Energy and Industrial Strategy for an Energy from Waste Incinerator proposed to be located in the south of Wisbech. Due to this, Fenland District Council has decided to review the timescales for revoking the Wisbech AQMAs.

Fenland District Council has also had focused meetings with neighbouring authorities, the Environment Agency and industry to discuss the revocation of the Whittlesey AQMA, it has been agreed that further modelling is to be undertaken before further decisions are made regarding this AQMA.

Development in Fenland and new sources of emissions

Fenland is a growing district and has highlighted areas for residential growth within its 2014 Adopted Local Plan. As a result Fenland has large scale residential developments either in construction or proposed within the planning process.

Strategic allocations include; West March, South-East March, East and South Chatteris, North and South of Eastrea Road in Whittlesey and East Wisbech. Impact Assessments are normally attached to proposals for large-scale developments which, amongst other factors, assess the impact of the development on the local air quality climate.

In this reporting year, planning permission for a greenhouse boiler in a nursery that combusts waste wood has been granted by Fenland District Council; this will require a Part A Environmental Permit regulated by the Environment Agency.

Actions to Improve Air Quality

In 2019, Officers took a range of different actions in an effort to improve air quality in Fenland.

Firstly, as highlighted in the 2019 ASR, a review of the locations for NO_2 passive monitoring sites was required. Some areas in the district have remained consistently compliant, whilst others showed slightly elevated levels than previous years. The review of the NO_2 passive monitoring network was carried out in 2019, however data from the new monitoring locations will be reported on in 2021. This review resulted in the addition of 7 new monitoring locations in the district, which concentrated on areas where there were elevated levels of NO_2 identified from previous years' data and also to monitor areas of public concern. Once data has been collected and analysed from these new locations, further decisions can be made on how to improve Air Quality in these areas.

Fenland District Council has also been awarded funding from Cambridgeshire County Council's Local Transport Fund in order to purchase two automatic air quality sensors. These will be used to provide real-time data within areas in the district, to support decision making on how to improve Air Quality and provide meaningful data to inform any further action on our AQMAs.

Officers continue to work closely with the Development Services Team through pre-application advice and formal consultation on proposed developments to minimise air pollution impacts. Proactive consultation, awareness, application of good design and

best practise can contribute to improving air quality from the beginning of a development.

As highlighted as a priority from the 2019 ASR, Fenland District Council also participated in national public awareness campaigns such as Clean Air Day 2019. We supported this event by providing information and access to resources on our webpage, as well as posting on our official social media accounts with information about the day and facts about Air Quality.

Fenland District Council also works with partner, Peterborough Environment City Trust (PECT), to provide advice to members of the public on energy saving measures and sustainability in the home. For example, providing support and seeking funding to fit first-time central heating to reduce the use and reliance of solid fuel heating systems.

Progress has also been made with two large pieces of transport planning work concerning Wisbech and March.

Work is being conducted by Cambridgeshire County Council and Cambridgeshire and Peterborough Combined Authority to design traffic schemes in Wisbech with a primary focus to reduce congestion and improve safety. This includes a new roundabout on Broad End Road/A47, a new roundabout at the Elm High Road/Weasenham Lane junction and improvements to the existing A47/Elm High Road roundabout.

The March Area Transport feasibility work is reaching a conclusion and is currently out for public consultation, this is an online consultation due to COVID-19 National Government restrictions on public gatherings. More traditional public consultations will be held at the earliest opportunity when public health guidelines permit. The study itself contains a range of proposals including junction improvements, a walking and cycling strategy, town centre proposals and a northern industrial link road connecting the B1101 with Hostmoor Avenue in an effort to reduce congestion in March.

Lastly, plans are to be submitted to revitalise March town centre through the Future High Streets Fund. Proposals include parts of Broad Street becoming pedestrianised in an effort to reduce traffic, opening up the currently underused riverside area and making March a more attractive place for people to live, work and visit.

This is a £1billion National Government plan for high streets all over the UK and Fenland District Council was notified in July 2019 it had been shortlisted for the final phase of its application process. The deadline for submissions is 5 June 2020, with bidding authorities expected to hear from the Government in late summer. If successful, pedestrianisation of Broad Street may help to improve air quality levels in an area where objectives are currently being exceeded.

Conclusions and Priorities

The 2020 ASR demonstrates that Fenland air meets national objectives, albeit one exceedance in March. As forecasted in the 2019 ASR, monitoring locations have widened and this year, Fenland District Council have reviewed the monitoring locations to further concentrate on areas that have or are likely to exceed the national objective.
All monitoring results within the AQMAs were compliant with objectives.

In 2019, Fenland District Council has encountered challenges when working to revoke our AQMAs. However, work surrounding AQMA revocation has not decreased, Fenland District Council has carried out extensive work to seek funding for air quality sensors and working with partners to ensure detailed modelling is carried out to provide meaningful data to inform further action on our AQMAs.

Fenland District Council's priorities for the coming year are to ensure our newly acquired air quality sensors are installed, in order to start obtaining real-time air quality data as soon as possible.

A review of Fenland District Council's Taxi Licensing Policy is due; part of this review will consider how the trade can work towards better air quality. This is planned to be reviewed in line with new national licensing legislation and guidance due to be published by National Government.

Fenland District Council will continue to work with other statutory consultees and stakeholders as the planning process continues for the Energy from Waste Incinerator proposed in the South of Wisbech. This decision will be determined by the Secretary of State for Business, Energy and Industrial Strategy.

Lastly, Fenland District Council will be updating the Air Quality Action Plan in 2020 to incorporate the new monitoring locations and actions that have been completed in 2019.

Local Engagement and How to get Involved

In December 2019, Cambridgeshire County Council Full Council carried a motion to improve air quality by increasing green canopy, promoting the uptake of low emissions vehicles, improving the alternatives to the private motor car and reducing air pollution at source. Through committing to improving air quality at a County level, Cambridgeshire County Council can enable better partnership working and ensure a coordinated response across the county.

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.

Information on air quality in Fenland can be found on our website: https://fenland.gov.uk/airpollution. Further information on Air Quality and how to improve it can be found on the Clean Air Hub website: https://www.cleanairhub.org.uk/. General information on sustainable living and energy saving ideas can be found on the Energy Saving Trust website: https://energysavingtrust.org.uk/.

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1 Local Air Quality Management

This report provides an overview of air quality in Fenland during 2019. 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 Fenland District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

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 must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Fenland District Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=104 . Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA(s).

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
AQMA Whittlesey	2006	SO_2 15 Minute Mean	Whittlesey	An area along roads and cycle routes to the west and northwest of Whittlesey brickworks and an area covering roads, footpaths, dwellings, schools and public open spaces to the east of Whittlesey brickworks.	NO	15-Minute Mean objective is likely to be breached based on modelling	Exceedances	15-Minute Mean objective is regularly met	Exceedances	Focused liaison meetings with stakeholders, additional Air Quality modelling to be undertaken to determine current SO_2 predictions in AQMA.	N/A	N/A
AQMA Wisbech (1)	2001	SO_2 15 Minute Mean	Wisbech	An area in central Wisbech surrounding the Princes Food site.	NO	Number of 15 minute mean concentrations >266 µg/m3 = 1300	Exceedances	Source of pollution removed	Exceedances	Timescales to revoke AQMA have been reviewed due to scoping report received for an Energy from Waste Incinerator in	N/A	N/A

										a location in the vicinity of AQMA.		
AQMA Wisbech (2)	2001	PM_{10} 24 Hour Mean	Wisbech	An area in central Wisbech surrounding the Princes Food site.	NO	Number of daily means > 50 µg/m3 (gravimetric) = 38 (modelled)	Exceedances	Source of pollution removed	Exceedances	Timescales to revoke AQMA have been reviewed due to scoping report received for an Energy from Waste Incinerator in a location in the vicinity of AQMA.	N/A	N/A
AQMA Wisbech (3)	2006	NO_2 Annual Mean	Wisbech	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	NO	40.9	µg/m3	30.3	µg/m3	Air Quality sensors have been purchased to collect additional data on NO_2 levels in AQMA. Fitting of this equipment is due to commence in 2020.	N/A	N/A

				Westmead Avenue.								

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

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

Defra's appraisal of last year's ASR concluded that monitoring results for all AQMAs continue to be significantly below the objective levels; on this basis Fenland District Council should proceed to revoke AQMA Wisbech (1), AQMA Wisbech (2) AQMA Wisbech (3) and AQMA Whittlesey. In addition, SO_2 monitoring should not cease as this is conducted in line with Forterra Building Products Limited's Environmental Permit.

Fenland District Council has taken forward a number of direct measures during the current reporting year of 2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in **Error! Reference source not found.**.

Key completed measures are:

- The NO_2 diffusion tube network has been reviewed and expanded. Diffusion tube sites that have been compliant for a number of years have been relocated and seven new tubes have been added to the network in areas where the objective has exceeded, is likely to exceed, or in response to public concern.

Fenland District Council expects the following measures to be completed over the course of the next reporting year:

- A review of Fenland District Council's Taxi Licensing Policy, part of this review will consider how the trade can work towards better air quality. This is planned to be reviewed in line with new national legislation and guidance due to be published by National Government;
- Installation of new air quality sensors to retrieve accurate hourly data of pollutant levels within areas of the District;
- Update Fenland District Council's Air Quality Action Plan to incorporate the new monitoring locations and provide an update on the actions completed in 2019.

Progress on the following measures to review and revoke Fenland District Council's AQMAs has been slower than expected because Fenland District Council have been invited to consult on an Energy from Waste Incinerator Scoping Report submitted to the Secretary of State for Business, Energy and Industrial Strategy which has been proposed in a location in the vicinity of the Wisbech AQMA boundaries. Fenland District Council has decided to review the timescale to revoke Wisbech AQMAs (1), (2) and (3) until further background monitoring has been undertaken to establish accurate pollutant levels in this area.

For AQMA Whittlesey, the revocation has been delayed whilst focused liaison meetings have been conducted with key stakeholders to carry out advanced modelling to determine accurate and current SO_2 predictions within the AQMA boundary.

Table 2.2. Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Improve traffic management at key junctions - Wisbech Access Strategy	Traffic Management	UTC, Congestion management, traffic reduction	2016	Cambridgeshire County Council (CCC)	Government Growth Fund	Reduced congestion and increased average speeds through AQMA	Reduced vehicle emissions / Maintain levels below standards	Continue detailed design stage and implementation of short term schemes	2021	Lengthy Timescale / Funding.
2	Improve traffic management - March Area Transport Study	Traffic Management	UTC, Congestion management, traffic reduction	2017	CCC	CCC	Reduced congestion, Junction improvements, walking and cycling strategy, town centre proposals, new link road	Reduced vehicle emissions / Maintain levels below standards	Feasibility work is reaching conclusion, online public consultation between 15 May and 28 June 2020.	2020	Online consultation due to COVID-19 National Government restrictions on public gatherings. More traditional public consultations will be held at earliest opportunity when public health guidelines permit.
3	Improve traffic management – March Town Centre Transformation through Future High Streets Fund	Traffic Management	UTC, Congestion management, traffic reduction	2019	FDC, Hatch Regeneris	Future High Streets Fund	Part pedestrianisation of key congested areas (Broad Street), reduced congestion, junction improvements	Reduced vehicle emissions / Maintain levels below standards	Fenland District Council bid shortlisted for final phase of application process. Bid submissions due by June 5th 2020. Bidding authorities expected to hear more from Government in late summer.	Dependent on success in acquiring funding	Lengthy Timescale / plans dependent on whether bid is successful.
4	Fletton Liasion Meetings	Environmental Permits	Measures to reduce pollution through PPC Permits going beyond BAT	On-going	Environment Agency / FDC	FDC	Exceedances of emission limits detailed in Environmental Permits	Maintain levels below standards	On-going	On-going	Environmental Health has inspected all permitted sites and no formal compliance actions have been taken in 2019.
5	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	Local Authority Environmental Health	FDC	Planning response time	Maintain levels below standards	On-going	On-going	Environmental Health continues to respond to over 95% of planning applications within 21 days.

6	Explore Air Quality automatic (continuous) monitoring options	Other	Other	2019	Local Authority Environmental Health	Local Transport Fund	Purchase and Install sensors	Provide real-time Air Quality data for PM and NO_2	Funding secured and two air quality sensors purchased.	2020	Considering funding options for sensor installation.
7	Review and Expand Diffusion Tube network	Other	Other	2019	Local Authority Environmental Health	FDC	Diffusion tube reviewed and expanded	Provide NO_2 pollution data	Diffusion tube network successfully reviewed in 2019, diffusion tubes positioned in January 2020 and data from revised network will be reported on in 2021.	Completed (data to be reported in 2021 report)	7 new diffusion tubes positioned in District.
8	Transport & Access Group	Promoting Travel Alternatives	Promotion of walking	2016	FDC	FDC	Reduced vehicle use and increased use of public transport / Active Travel	Reduced vehicle emissions / Maintain levels below standards	53 community champions have been provided with transport training to enable them to assist others access transport and help promote walking and cycling	On-going	Due to limited funding FDC has not been able to hold any additional training sessions and have therefore not recruited any additional transport champions in 2019.
9	Develop Air Quality Action Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	Local Authority Environmental Health	FDC	Update Plan	Maintain levels below standards	Plan published in 2019	2020	Work required to update plan to incorporate new monitoring locations and completed actions.

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.

Fenland District Council does not undertake any monitoring of particulate matter and, as such, no concentration values can be reported or estimated in line with Chapter 7 of Technical Guidance LAQM.TG16.

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

- The measures discussed in Table 2.2, Section 2.2 above will aid in reducing $PM_{2.5}$ as well as other pollutants.
- Highlighting Action 5 of Table 2.2 in Section 2.2 above, Fenland District Council has been successful in acquiring funding from the Local Transport Fund to purchase two automatic air quality sensors. The sensors are due to be installed by the next reporting year and will monitor for $PM_{2.5}$, amongst other pollutants, in areas of the District. This will ensure reliable and informative data to be retrieved on $PM_{2.5}$ levels and enable officers to obtain a clearer picture of the $PM_{2.5}$ climate in Fenland.
- Continuing to provide members of the public with information on the impacts of solid fuel burning and bonfires on air quality and particulate matter.
- Continuing to consult on planning applications to advise planning conditions for Construction Management Plans, in order to manage dust escape from construction and demolition activities. This could also include advice on good design and best practise to mitigate $PM_{2.5}$ pollution.

Key indicators of the state of public health have been developed through the Public Health Outcomes Framework (PHOF) following the Health and Social Care Act 2012. The Public Health Outcomes Framework data tool, compiled by Public Health England, includes two indicators applicable to air pollution, namely; Air pollution: fine particulate matter and fraction of mortality attributable to particulate pollution.

2017 data for fine particulate matter provides a mean (µg/m3) figure for particulate matter in a Local Authority District. For Fenland, this is 9.0µg/m^3 which is 0.7µg/m^3 less than the East of England region as a whole.

Fraction of mortality attributed to particulate air pollution (2018 data) is 5.4% proportion of the population. This has increased by 0.3% from 2017; however it is slightly lower than the East of England region as a whole, which was 5.5% in 2018.

Some of the above measures may help to improve figures for the air quality indicators in Fenland.

There are currently no smoke control areas within the District.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Fenland District Council did not undertake automatic (continuous) monitoring for pollutants during 2019. Monitoring data for SO_2 has been supplied by Forterra Building Products Limited (formally Hanson). As part of their Environmental Permit they monitor at two locations in the vicinity of the brickworks in Whittlesey. Forterra operates continuous ambient monitoring stations (CAMS) to the east-southeast of the former Saxon Works (Park Lane CAMS) and to the north of the Kings Dyke Works (Bradley Fen CAMS).

Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D.

3.1.2 Non-Automatic Monitoring Sites

Fenland District Council undertook non- automatic (passive) monitoring of NO_2 at 25 sites during 2019. Table A.2 in Appendix A shows the details of the sites.

In 2019, Fenland District Council reviewed and updated the diffusion tube network, this involved relocating tubes from locations where NO_2 levels have been compliant for many years and adding monitoring locations in areas that have not been monitored before. Although the review was conducted in 2019, the new diffusion tubes were not positioned until January 2020 and therefore the data from the revised locations will be published in the 2021 Annual Status Report.

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[4], "annualisation" (where the data capture falls below 75%), and distance correction[5]. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. Note that the concentration data presented in Table A.3 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) (see also Figure A.1).

For diffusion tubes, the full 2019 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.

Where the National Bias Adjustment Factor (0.75) has been applied, all monitoring locations were compliant with the annual mean air quality objective for nitrogen dioxide (40µg/m^3). The results for 2019 remain consistent with previous years; however some sites have slightly elevated levels of nitrogen dioxide. Overall, there has been good data capture for all monitoring locations across the district (92% - 100% capture).

Figure A.2 shows trends of nitrogen dioxide levels for each of the market towns (Chatteris, March, Wisbech, Whittlesey) for the past 5 years. Figure A.3 shows trends of nitrogen dioxide levels at monitoring locations within Wisbech AQMA (3) (NO_2) for the past 5 years (see also Figure D.5 for AQMA (3) boundary).

After bias adjustment and distance correction, one exceedance of the annual mean air quality objective (44.6µg/m^3) has been identified in Broad Street, March. This is concurrent with the findings in the 2019 ASR, and as such, Fenland District Council has installed more diffusion tubes in Broad Street as part of the diffusion tube network review.

[4] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html
[5] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

Annual means greater than 60µg/m^3 indicate that an exceedance of the 1-hour mean objective is also likely. One exceedance of the 60µg/m^3 was identified in West End, Whittlesey in January 2019. However, this did not exceed 60µg/m^3 for any other months in 2019 and after all 12 months' data was bias adjusted and distance corrected, the site achieved the annual mean air quality objective of 40µg/m^3.

After bias adjustment and distance correction, no NO_2 monitoring locations in any of Fenland District Council's AQMAs exceeded the annual mean.

3.2.2 Particulate Matter (PM_{10})

Fenland District Council does not currently monitor for this pollutant.

3.2.3 Particulate Matter ($PM_{2.5}$)

Fenland District Council does not currently monitor for this pollutant.

3.2.4 Sulphur Dioxide (SO_2)

Table A.4 in Appendix A compares the ratified continuous monitored SO_2 concentrations for 2019 with the air quality objectives for SO_2.

SO_2 monitoring carried out in Park Lane (AM1) and Bradley Fen (AM2) are achieving 15-minute, hourly and daily air quality objectives. When comparing these results to previous years, the exceedance of the 15-minute objective at Bradley Fen has increased from last year (Figure A.4). Further modelling of this pollutant is due to take place and monitoring will continue.

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?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
AM1	Park Lane	Urban Background	526382	296859	SO2	YES	UV Fluorescence	0	N/A	1.5
AM2	Bradley Fen	Industrial	523924	297974	SO2	YES	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

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
S1	A605	Kerbside	527059	297205	NO2	NO	3	1	NO	2.1
S2	March Station Road	Roadside	541951	297762	NO2	NO	9	2	NO	2.3
S3	Ramnoth	Kerbside	546857	308553	NO2	YES	4	1	NO	2.2
S4	Orchard R'About	Roadside	526852	297244	NO2	NO	6	2	NO	2.2
S5	Bowthorpe	Roadside	546414	309585	NO2	YES	3	2	NO	2.2
S6	Kings Dyke	Roadside	525287	297404	NO2	NO	7	2	NO	2.1
S7	Cemetary Road	Roadside	527287	297156	NO2	NO	5	2	NO	2.2
S8	Westmead Avenue	Kerbside	546886	308366	NO2	YES	12	1	NO	2.2
S9	Thorney Toll	Kerbside	534132	303969	NO2	NO	1	1	NO	2.9
S10	Coates	Kerbside	530613	297702	NO2	NO	0	1	NO	2.5
S11	High Street March	Roadside	541658	296190	NO2	NO	1	2	NO	2.1
S12	AWS Lynn Road	Industrial	546588	310192	NO2	YES	10	N/A	NO	2.3
S13	Lynn Road / Mt Pleasant	Kerbside	546661	310396	NO2	YES	4	1	NO	2.2
S14	Clare St / A141	Kerbside	538728	285743	NO2	NO	5	1	NO	2.1
S15	Weasenham Lane JCN	Roadside	546828	308543	NO2	YES	4	2	NO	2.2
S16	Lynn Road R'about	Roadside	546260	309987	NO2	YES	0	2	NO	2.2

S17	Weasenham / Cromwell	Roadside	545509	308731	NO2	NO	2	2	NO	2.2
S18	New Road	Roadside	540391	286415	NO2	NO	9	4	NO	2.3
S19	Broad St March	Roadside	541653	296769	NO2	NO	0	3	NO	2.1
S20	Napier	Roadside	546485	309389	NO2	YES	2	2	NO	2.2
S21	Norfolk Court	Kerbside	541833	296985	NO2	NO	1	1	NO	2.1
S22	Station Road / Wild Boar	Roadside	527357	296550	NO2	NO	1	6	NO	2.1
S23	West End	Kerbside	526351	297454	NO2	NO	1	1	NO	2.1
S24	Hocking Court	Kerbside	541777	296872	NO2	NO	1	1	NO	2.1
S25	Gildenburgh Crescent	Roadside	528089	297173	NO2	NO	3	9	NO	2.1

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3) (4)				
							2015	2016	2017	2018	2019
S1	527059	297205	Kerbside	Diffusion Tube	100	100	22.6	24.4	23.3	21.7	21.3
S2	541951	297762	Roadside	Diffusion Tube	100	100	17.2	21.4	22.8	19.99	20.3
S3	546857	308553	Kerbside	Diffusion Tube	100	100	27.8	24.4	25.7	21.06	21.6
S4	526852	297244	Roadside	Diffusion Tube	100	100	23.5	23.1	24.7	22.21	22.1
S5	546414	309585	Roadside	Diffusion Tube	100	100	33.4	35.4	35.7	28.2	30.1
S6	525287	297404	Roadside	Diffusion Tube	100	100	20.2	19.4	20.6	16.1	19.0
S7	527287	297156	Roadside	Diffusion Tube	92	92	21.9	22.4	23.3	20.61	18.3
S8	546886	308366	Kerbside	Diffusion Tube	92	92	18.4	18.5	20.3	29.09	28.7
S9	534132	303969	Kerbside	Diffusion Tube	100	100	21.5	20.3	20.8	19.29	19.9
S10	530613	297702	Kerbside	Diffusion Tube	100	100	21.5	21	22.7	18.57	18.6
S11	541658	296190	Roadside	Diffusion Tube	100	100	22.6	21.4	19.9	20.5	19.4
S12	546588	310192	Industrial	Diffusion Tube	100	100	16.7	16.1	16.1	14.81	16.6
S13	546661	310396	Kerbside	Diffusion Tube	100	100	29.8	27.1	26.3	27.24	25.5
S14	538728	285743	Kerbside	Diffusion Tube	100	100	21.6	19.5	18.9	17.2	17.9

S15	546828	308543	Roadside	Diffusion Tube	100	100	34.9	34.4	33.7	29.65	30.3
S16	546260	309987	Roadside	Diffusion Tube	92	92	32.1	30.5	29.7	30.57	29.6
S17	545509	308731	Roadside	Diffusion Tube	92	92	19.2	20.3	20.4	17.56	18.9
S18	540391	286415	Roadside	Diffusion Tube	100	100	15.3	15.3	14.8	13.65	14.0
S19	541653	296769	Roadside	Diffusion Tube	100	100	34	33.3	35.8	30.09	28.7
S20	546485	309389	Roadside	Diffusion Tube	100	100	31.4	31.8	29	27.26	26.9
S21	541833	296985	Kerbside	Diffusion Tube	92	92	-	-	-	19.06	20.2
S22	527357	296550	Roadside	Diffusion Tube	100	100	-	-	-	16.1	15.9
S23	526351	297454	Kerbside	Diffusion Tube	100	100	-	-	-	22.37	22.9
S24	541777	296872	Kerbside	Diffusion Tube	100	100	-	-	-	26.19	26.5
S25	528089	297173	Roadside	Diffusion Tube	92	92	-	-	-	16.65	16.8

☒ **Diffusion tube data has been bias corrected**

☒ **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 adjustment**

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.**

(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%).

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations

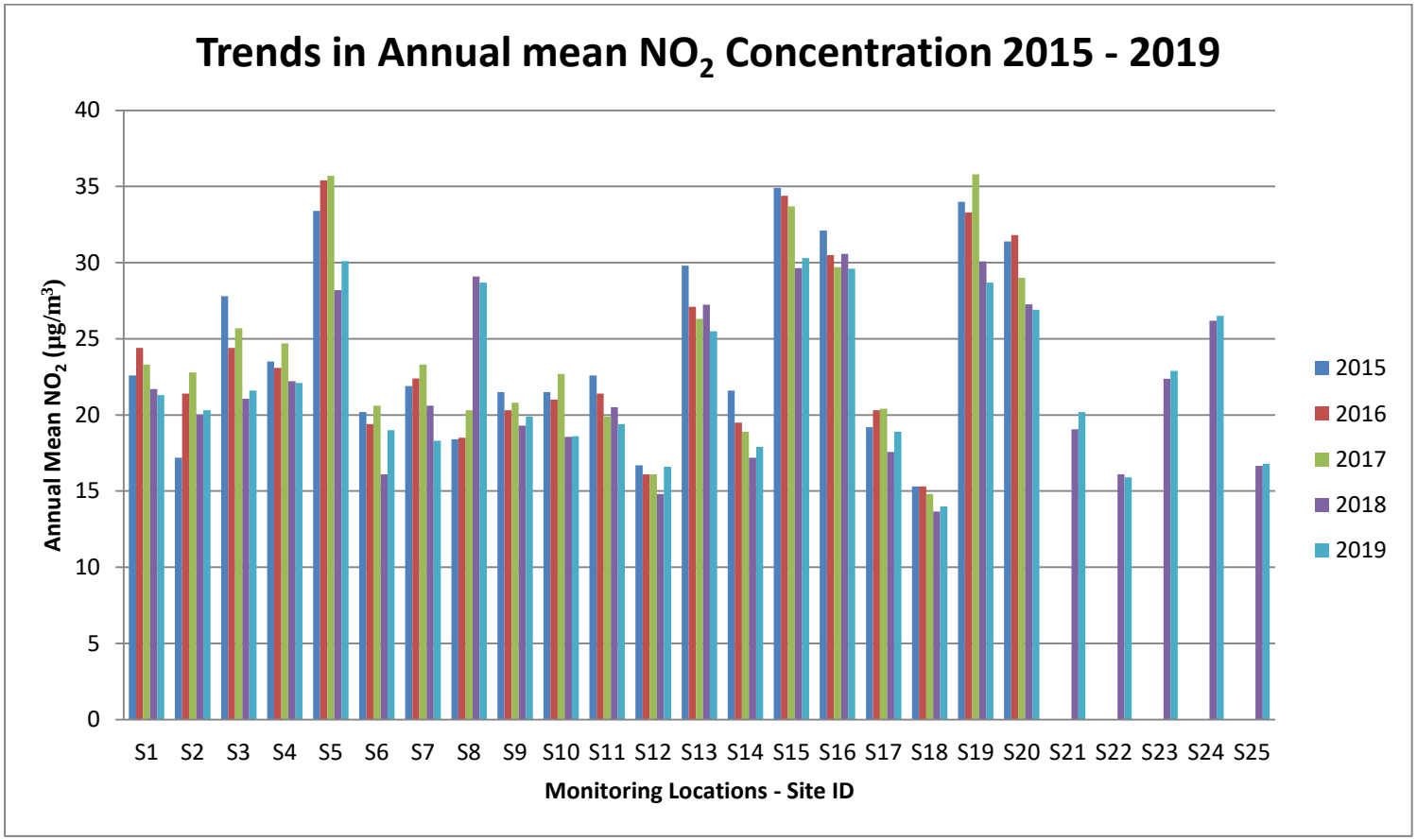


Figure A.2 – A graph to show the NO_2 Annual Mean in Fenland's Market Towns

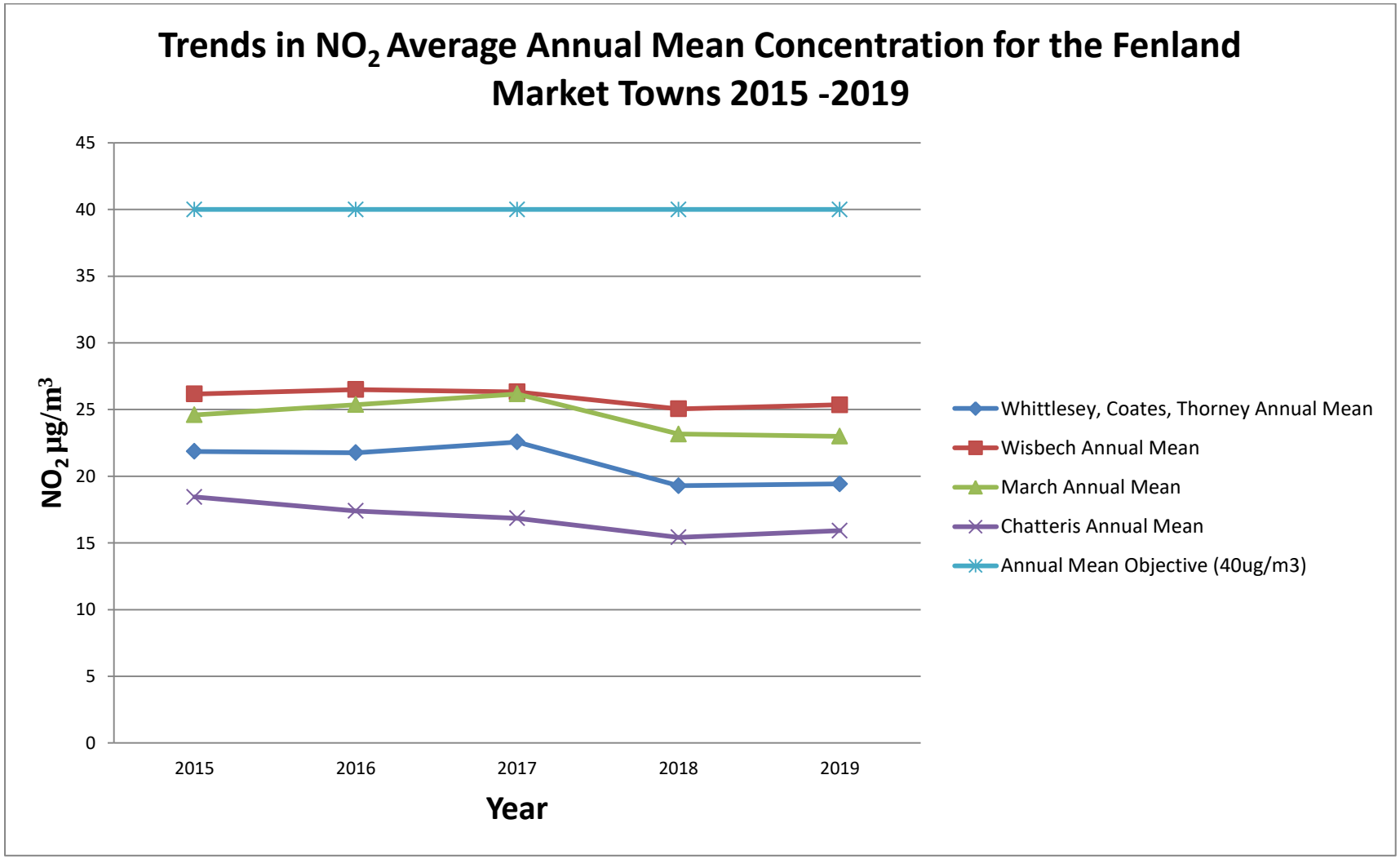


Figure A.3 – A graph to show the NO_2 average annual mean at monitoring locations within Wisbech AQMA (3) (NO_2)

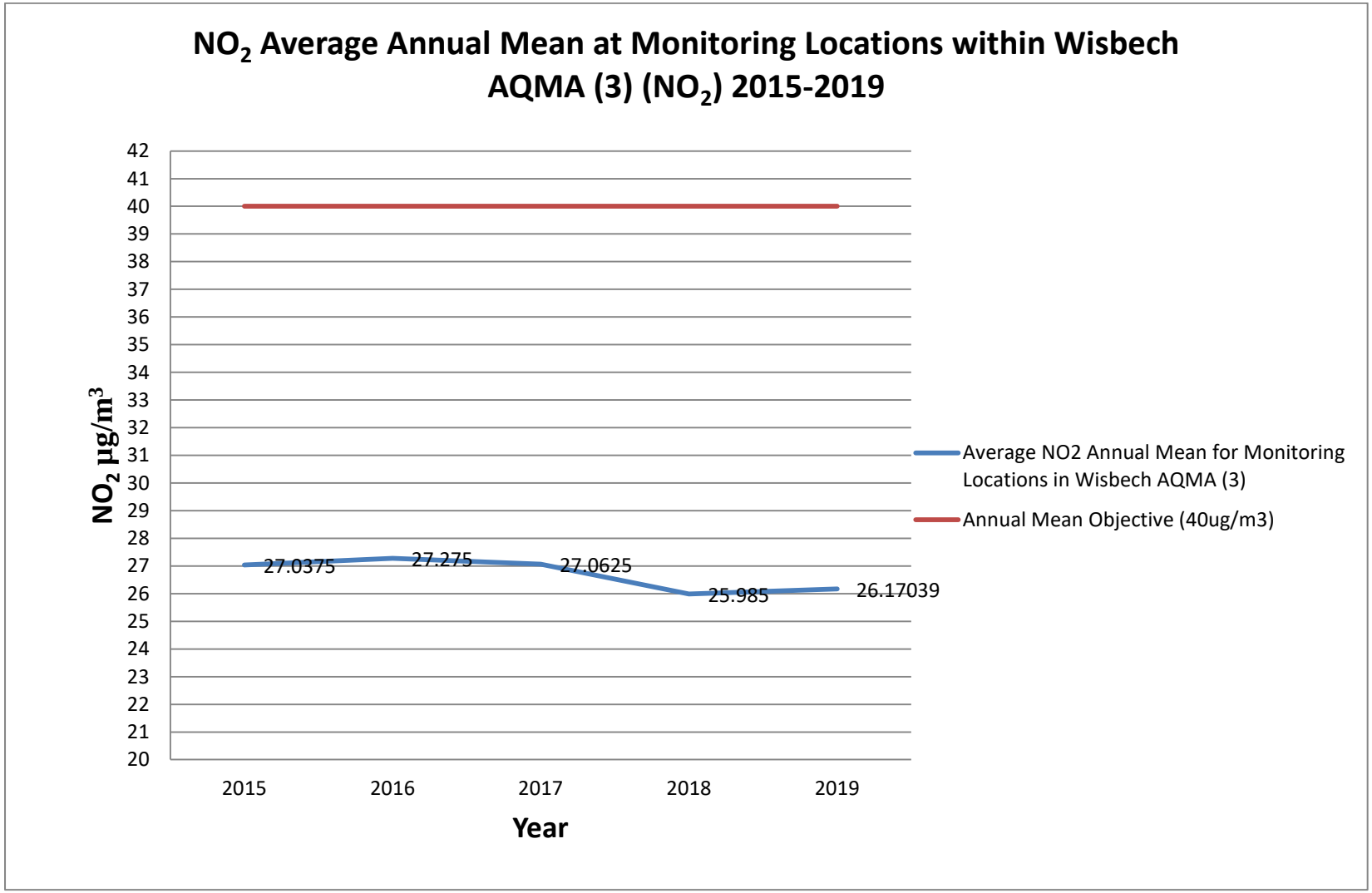


Table A.4 – SO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	Number of Exceedances 2019 (percentile in bracket) [3]		
						15-minute Objective (266 µg/m^3)	1-hour Objective (350 µg/m^3)	24-hour Objective (125 µg/m^3)
AM1	526382	296859	Urban Background	98.07	98.07	1	0	0
AM2	523924	297974	Industrial	97.55	97.55	17	1	0

Notes:

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)

(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%).

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

Figure A.4 – Trends in SO_2 Concentrations

	2013	2014	2015	2016	2017	2018	2019	National Objectives
AM1 - Park Lane CAMS								
Number of 15 minute means exceeding 266 (µg/m^3)	4	4	1	1	4	0	1	35
Number of hourly means exceeding 350 (µg/m^3)	0	0	0	0	0	0	0	24
Number of daily means exceeding 125 (µg/m^3)	0	0	0	0	0	0	0	3
% Data Capture	99	99	99	100	99	99	98	90
AM2 - Bradley Fen CAMS								
Number of 15 minute means exceeding 266 (µg/m3)	1	2	0	8	2	9	17	35
Number of hourly means exceeding 350 (µg/m^3)	0	0	0	0	0	0	1	24
Number of daily means exceeding 125 (µg/m^3)	0	0	0	0	0	0	0	3
% Data Capture	99	99	99	99	98	100	98	90

Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 - NO_2 Monthly Diffusion Tube Results - 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations ($\mu g/m^3$)														
															Annual Mean		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.75) and Annualised [1]	Distance Corrected to Nearest Exposure [2]
S1	527059	297205	39.9	30.4	27.5	29.4	24.4	22.5	22.2	17.8	25.6	30.6	39.5	31.1	28.4	21.3	19.2
S2	541951	297762	33.8	31.3	28.7	18.1	22.2	18.0	19.3	18.7	25.8	30.2	39.0	39.7	27.1	20.3	17.2
S3	546857	308553	35.526	**42.02**	32.852	23.875	21.01	21.583	21.583	21.01	26.931	31.515	35.144	32.279	28.8	21.6	20.2
S4	526852	297244	38.582	**41.065**	29.796	26.931	13.752	22.347	21.01	22.347	28.077	34.953	35.335	39.155	29.4	22.1	19.5
S5	546414	309585	**58.637**	**49.469**	**43.93**	28.841	18.145	34.38	31.324	32.661	**40.683**	**41.256**	**53.671**	**48.896**	**40.2**	30.1	28.7
S6	525287	297404	32.279	23.493	23.493	18.145	23.875	17.381	21.774	17.954	22.92	32.47	39.346	31.324	25.4	19.0	16.9
S7	527287	297156	39.919	31.133		19.482	20.246	18.527	19.482	20.628	21.774	27.695	37.436	36.672	24.4	18.3	16.9
S8	546886	308366	**49.469**	**49.851**	**45.84**	35.908	11.46	30.178	33.616	31.897	39.537		**48.132**	**45.267**	38.3	28.7	22.6
S9	534132	303969	31.706	30.369	25.976	19.864	26.358	19.291	21.392	22.729	26.358	30.369	34.38	29.796	26.5	19.9	19.9
S10	530613	297702	34.38	30.56	28.268	20.819	15.853	19.1	18.527	19.482	22.729	26.74	28.65	32.661	24.8	18.6	22.6
S11	541658	296190	33.234	30.178	22.538	31.133	21.201	20.628	18.336	16.044	19.864	30.56	35.908	30.369	25.8	19.4	20.8
S12	546588	310192	28.841	28.268	17.572	16.617	33.234	14.325	14.325	15.471	17.381	22.92	28.268	27.886	22.1	16.6	
S13	546661	310396	**55.581**	26.167	37.436	**42.02**	24.257	27.886	28.077	30.178	31.133	34.38	34.953	36.29	34.0	25.5	22.5
S14	538728	285743	26.358	27.122	24.066	24.639	21.774	19.291	20.246	19.864	23.302	22.347	32.47	24.448	23.8	17.9	15.0
S15	546828	308543	**51.379**	**42.211**	**44.312**	32.661	32.852	31.706	33.234	36.29	**42.593**	**48.514**	**45.649**	**44.121**	**40.5**	30.3	28.1

S16	546260	309987	**44.312**	**53.289**	37.436	38.964	32.47	33.234		30.178	33.234	**42.975**	**42.784**	**45.649**	39.5	29.6	39.5
S17	545509	308731	27.695	20.437	20.437	30.178	17.572		21.01	20.628	28.459	29.032	30.942	30.369	25.2	18.9	18.9
S18	540391	286415	27.122	16.426	15.471	21.01	16.999	13.561	14.516	9.359	23.684	20.055	25.021	20.246	18.6	14.0	12.8
S19	541653	296769	**40.683**	**40.874**	35.908	37.436	34.38	33.425	32.279	32.279	37.054	**43.548**	**47.559**	**43.548**	38.2	28.7	**44.6**
S20	546485	309389	38.391	**41.829**	33.234	32.279	33.616	34.189	31.324	30.751	39.155	39.537	35.335	**40.492**	35.8	26.9	26.9
S21	541833	296985		32.47	28.268	20.819	18.145	19.482	20.819	20.055	29.796	30.178	37.436	38.2	26.9	20.2	20.2
S22	527357	296550	33.234	26.931	18.145	17.954	14.516	14.898	15.853	12.988	21.01	22.538	26.931	29.032	21.2	15.9	18.6
S23	526351	297454	**63.412**	30.178	33.807	19.291	20.246	20.628	21.201	20.246	30.178	31.133	**41.638**	34.571	30.5	22.9	22.9
S24	541777	296872	**48.132**	**44.503**	34.189	29.987	24.639	26.358	29.605	31.515	36.099	38.2	**40.683**	39.919	35.3	26.5	26.5
S25	528089	297173	36.863	29.032	21.201	17.572	15.471	14.134	15.471	8.404		25.785	32.279	29.796	22.4	16.8	19.2

☒ **National bias adjustment factor used**

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

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.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

Diffusion Tube Bias Adjustment Factors

Diffusion tube values have been multiplied by a bias correction factor of 0.75 obtained from the DEFRA LAQM Helpdesk national bias adjustment database (version 03/20).

Discussion of Choice of Factor to Use

No local co-location information was available so 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.

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.

In the WASP intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC (formerly ESG) currently holds the highest rank of a Satisfactory laboratory. Entering the parameters for ESG Didcot, and a 50% triethanolamine (TEA) in acetone preparation method for 2019 gave an adjustment factor of 0.75 which has been applied to the Fenland data.

Distance Correction

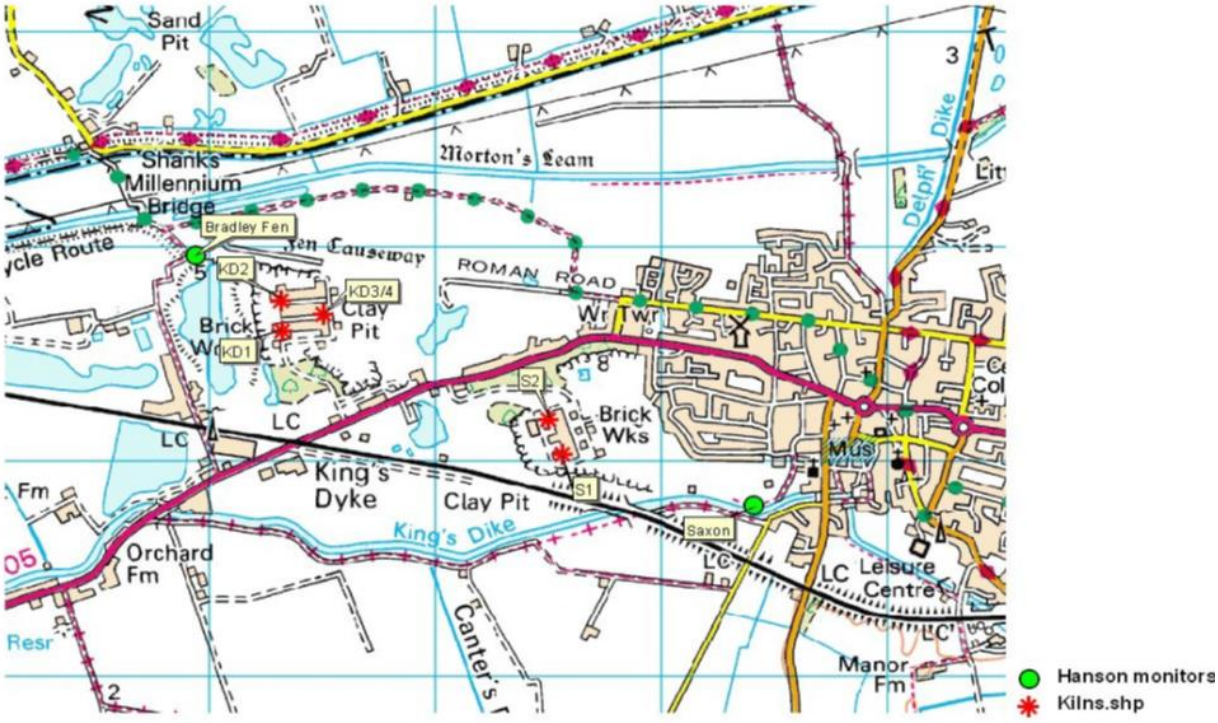
Distance correction was carried out in accordance with the LAQM Technical Guidance (TG16). The LAQM Distance correction calculator was used to calculate NO_2 fall off with distance at the appropriate monitoring locations.

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

Automatic Monitoring Sites

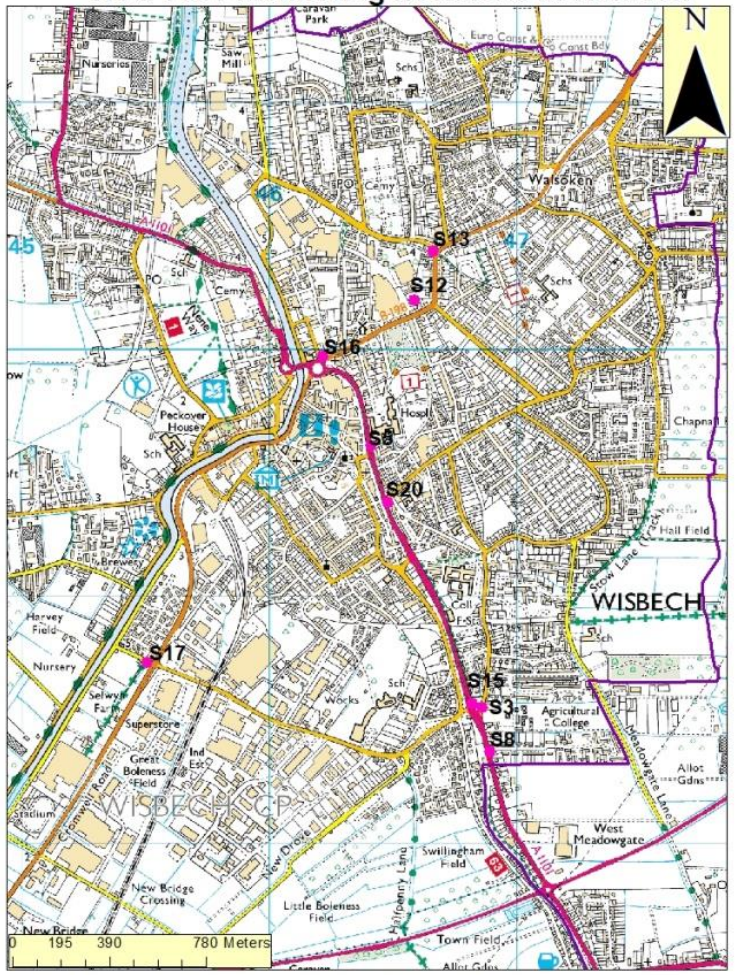
Fenland District Council does not currently operate any automatic monitoring sites. Monitoring of SO_2 is undertaken by Forterra Building Products Limited (formerly Hanson) at two locations in the vicinity of the brickworks in Whittlesey. As part of their environmental permit Forterra operate a continuous 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).

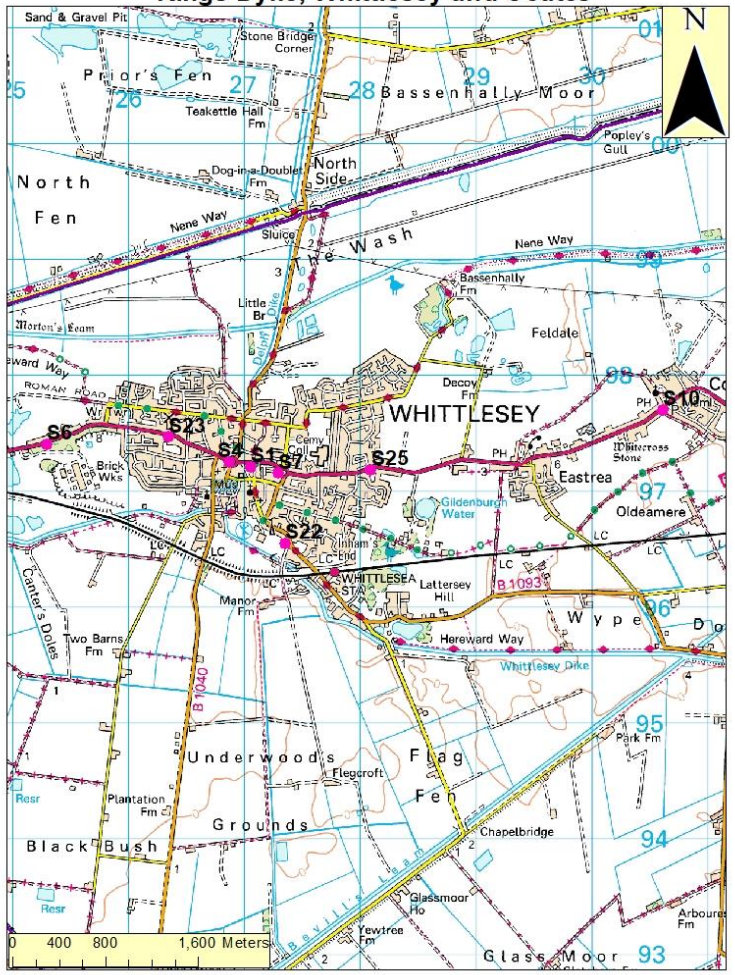
Figure D.1 Map of Automatic Monitoring Sites run by Forterra in Whittlesey



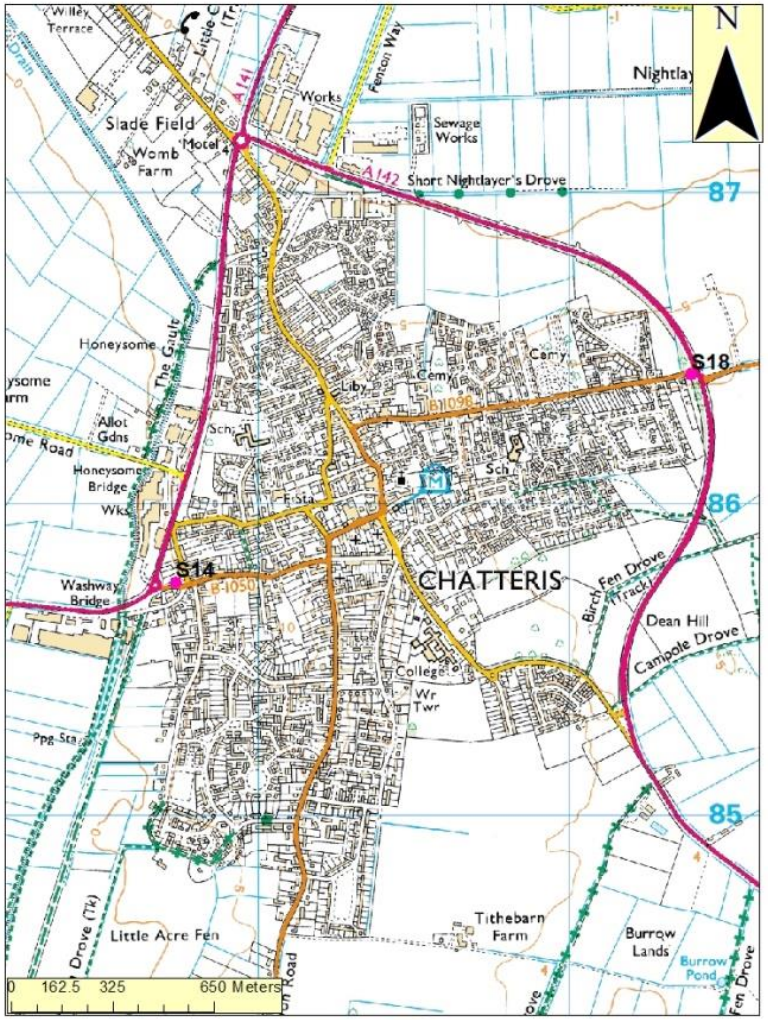
Note: Kilns S1 and S2 no longer operate and the permit for this site has been surrendered.

Figure D.2 Map(s) of Non-Automatic Monitoring Sites

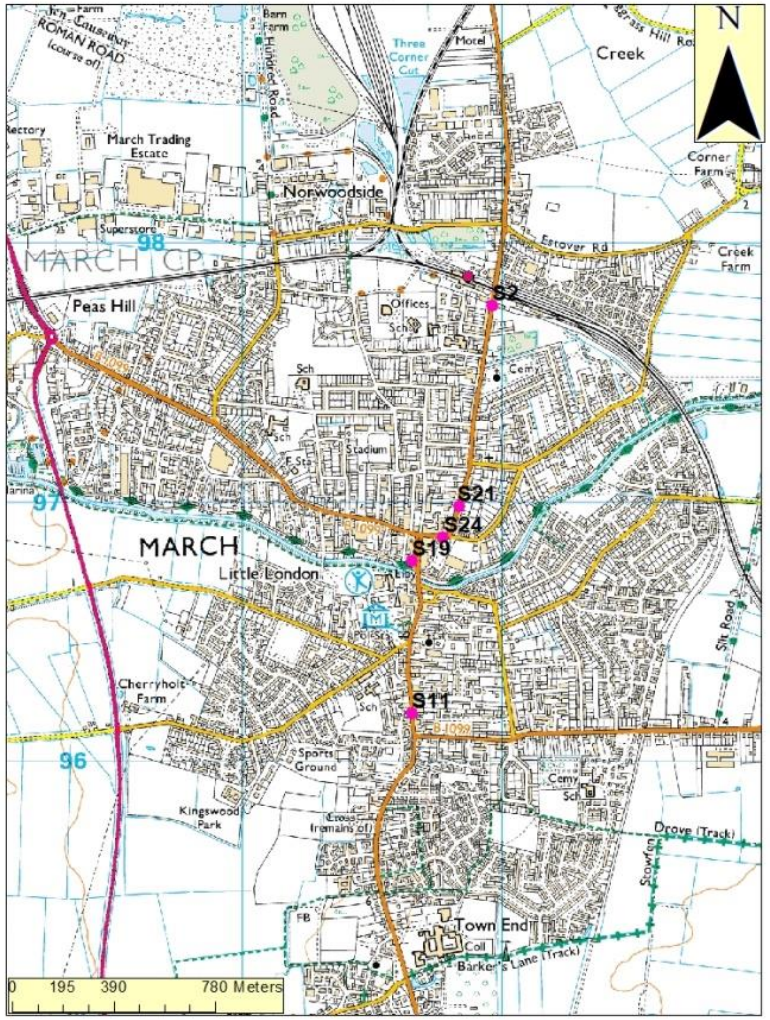




NO2 Tube Monitoring Locations in Chatteris

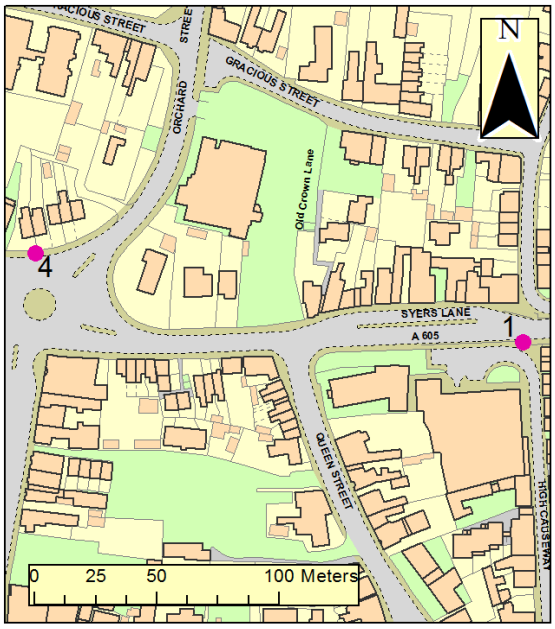


NO2 Tube Monitoring Locations in March

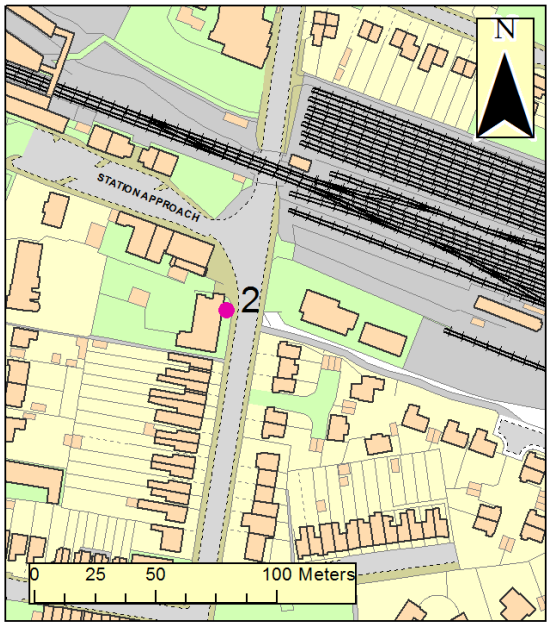


N.B. Diffusion Tube locations presented on maps below may not be displayed in numerical order.

Tubes 4 Orchard Road & 1 A605 Whittlesey

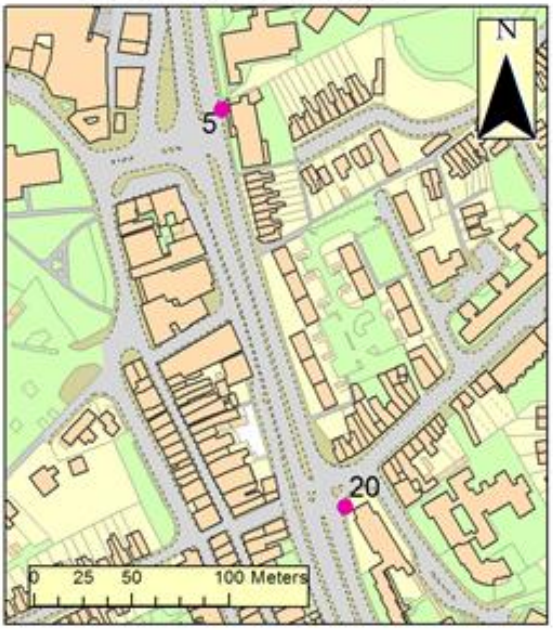


Tube 2 - Station Road March

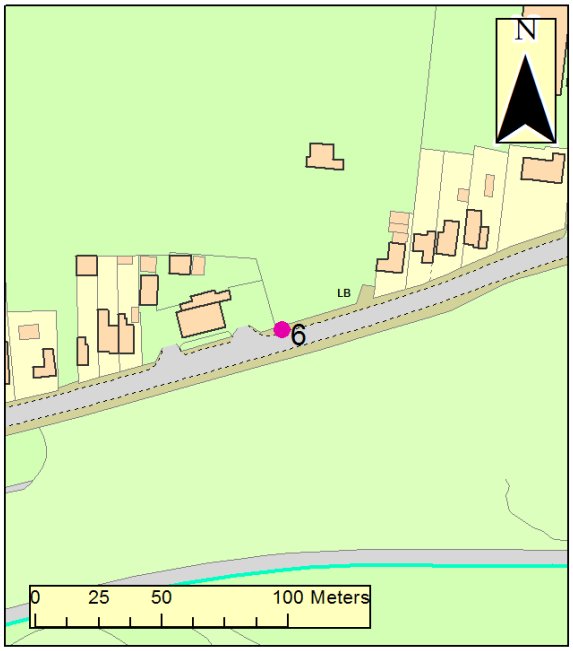


Tubes 3 Ramnoth, 8 Westmead & 15 Weasenham Wisbech

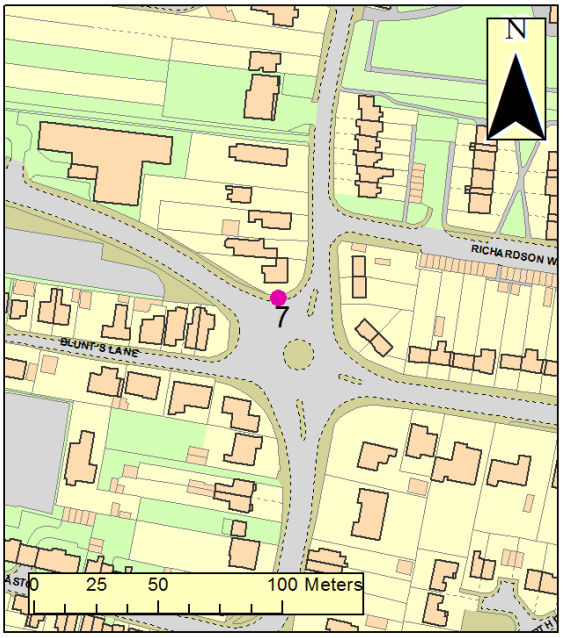
Tubes 5 Bowthorpe & 20 Naiper Wisbech



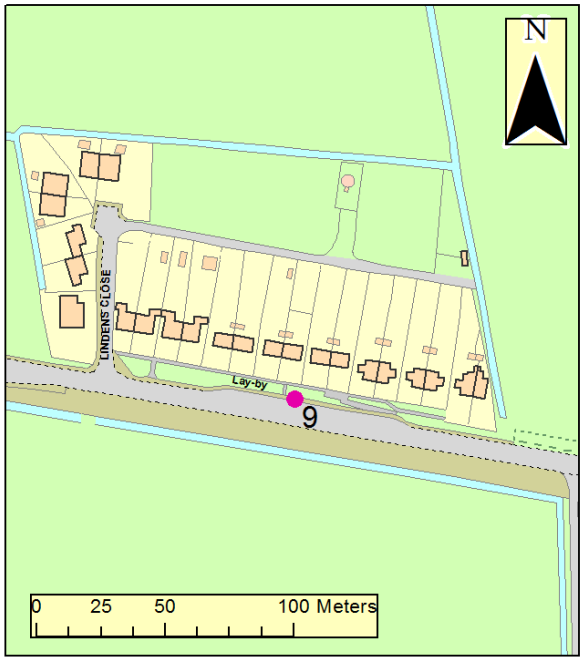
Tube 6 Kings Dyke Whittlesey



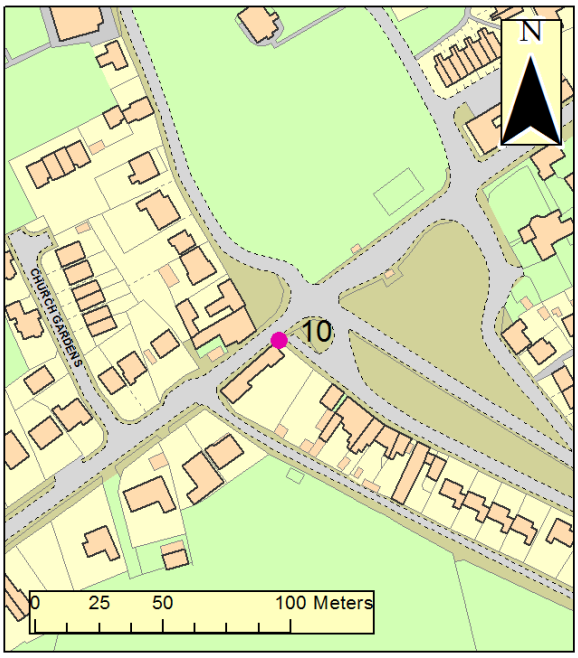
Tube 7 Cemetary Road Whittlesey



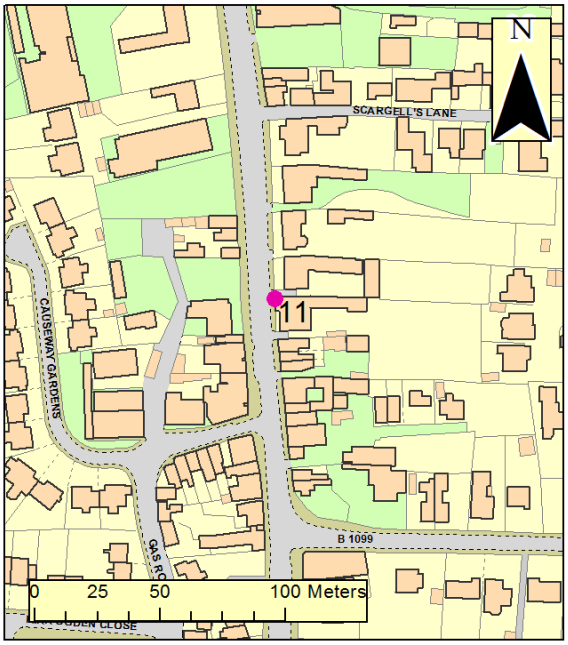
Tube 9 A47 Thorney Toll



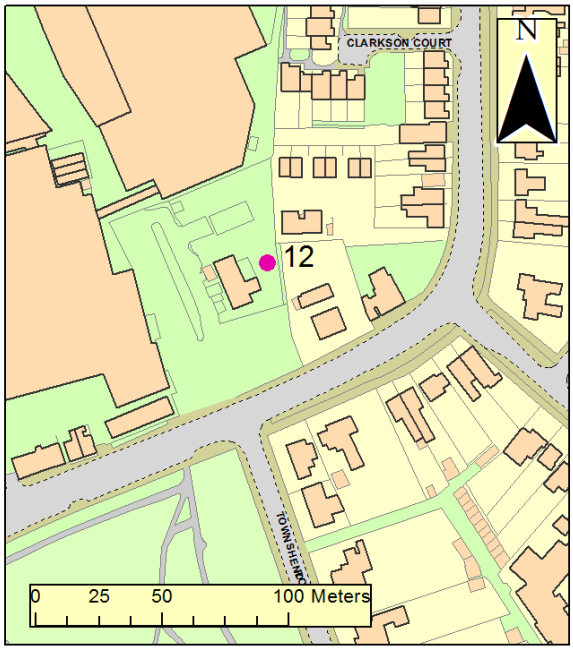
Tube 10 - (A605) Coates



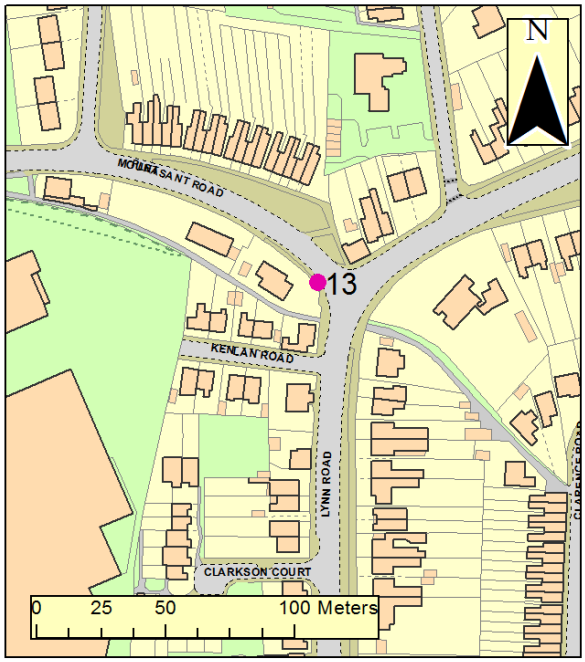
Tube 11 - High Street March



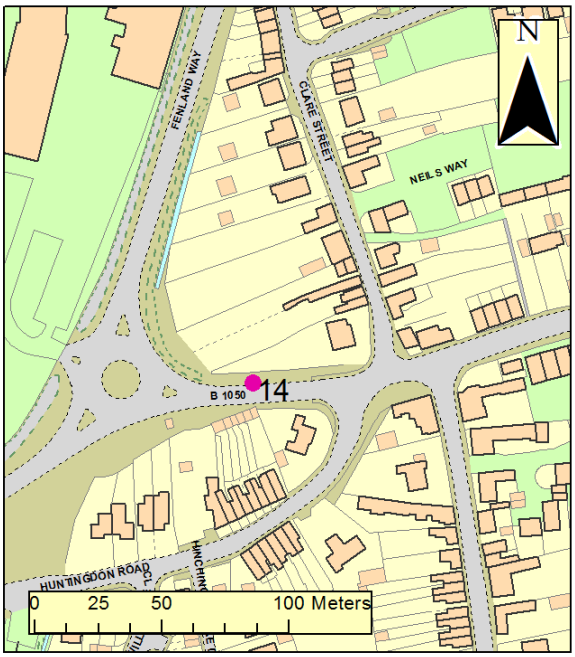
Tube 12 AWS Lynn Road Background Site Wisbech



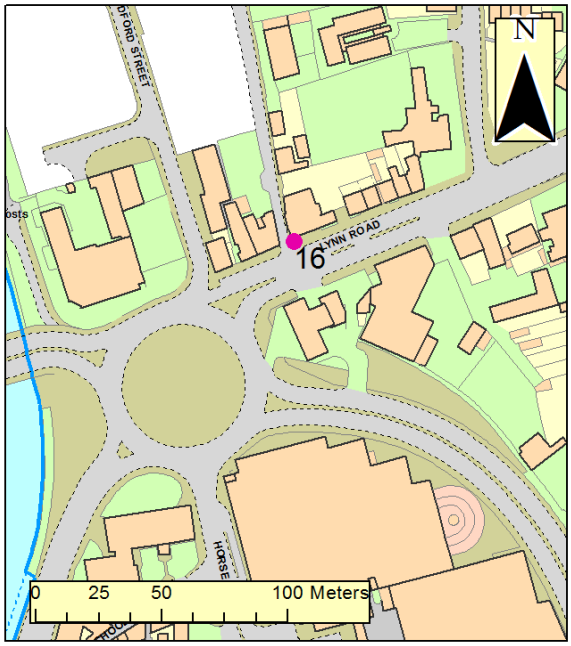
Tube 13 Lynn Road / Mount Pleasant Wisbech



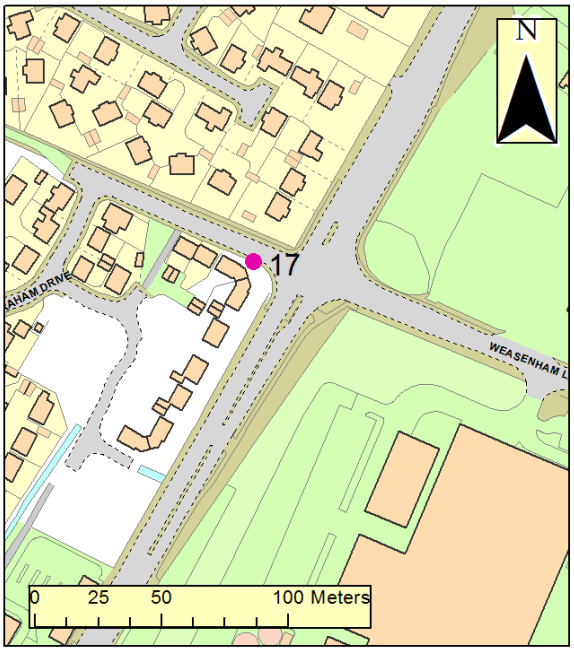
Tube 14 - Clare Steet / A141 Chatteris



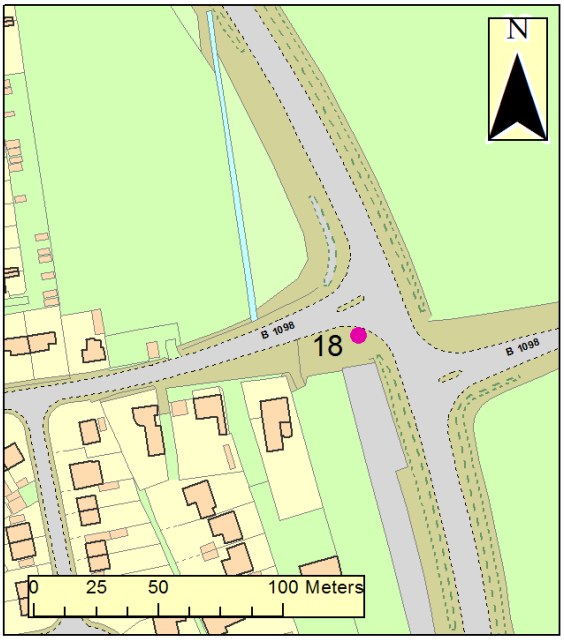
Tube 16 Lynn Road Wisbech



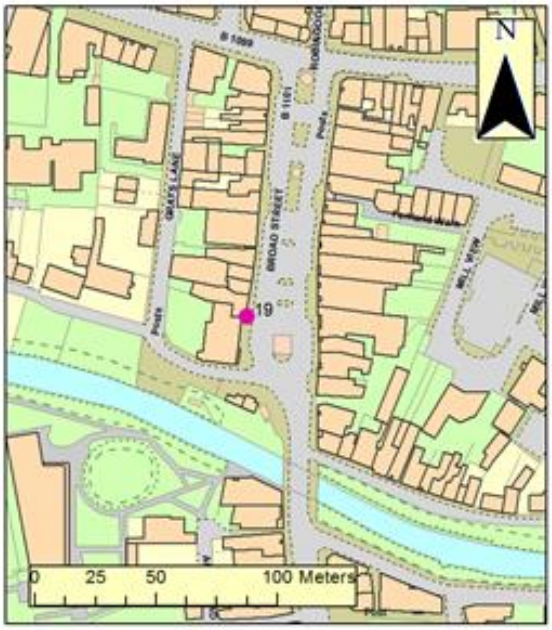
Tube 17 Cromwell Road / Weasenham Lane Wisbech



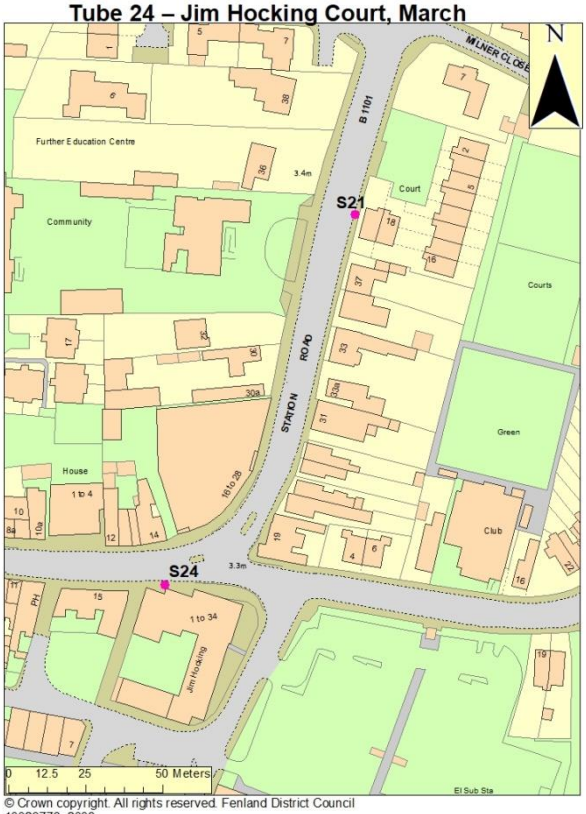
Tube 18 - New Road Chatteris



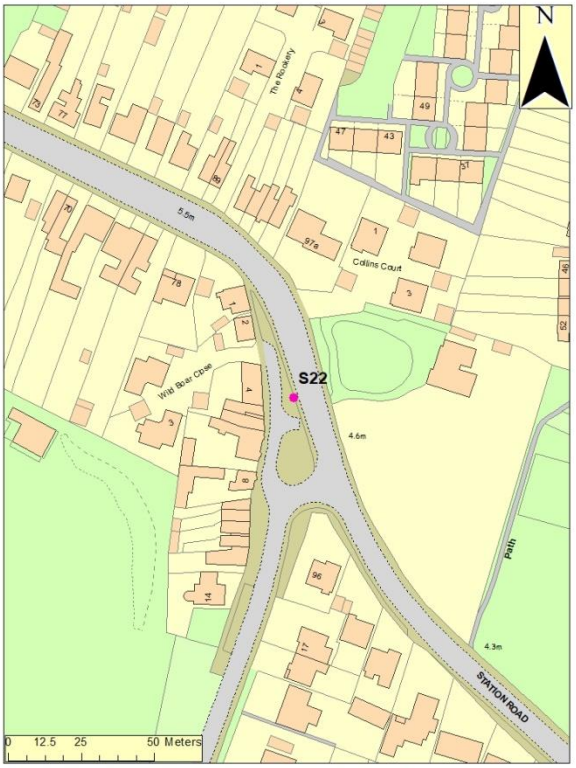
Tube 19 - Broad Street March



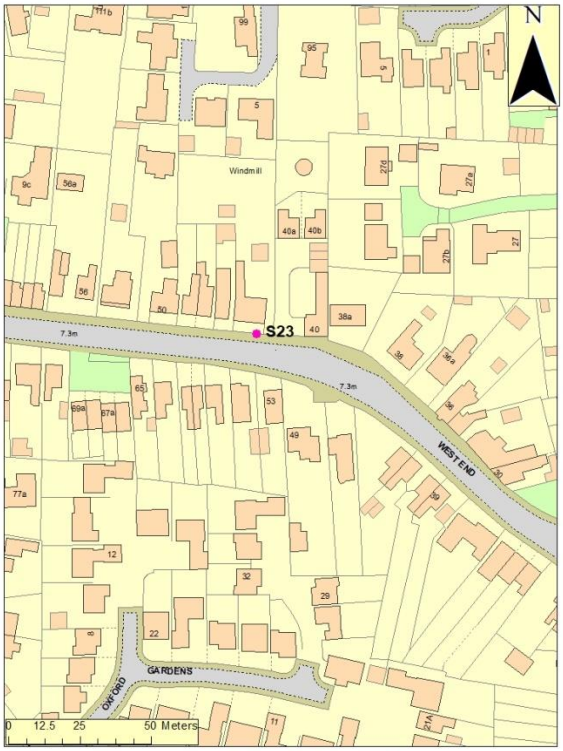
Tube 21 – Station Road, March
Tube 24 – Jim Hocking Court, March



Tube 22 – Station Road / Wild Boar Close, Whittlesey



Tube 23 – West End, Whittlesey



Tube 25 – Guildenburgh Crescent / Eastrea Road, Whittlesey

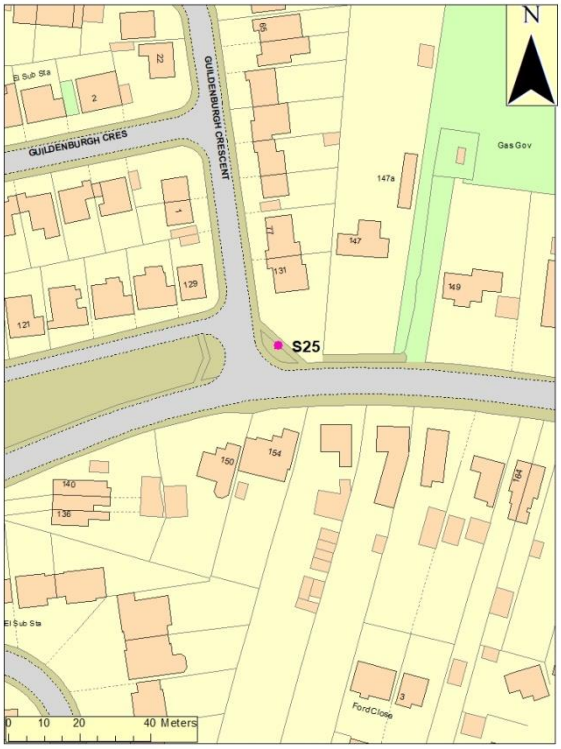


Figure D.3 Wisbech AQMA (1) SO_2

Purple area: SO_2 AQMA

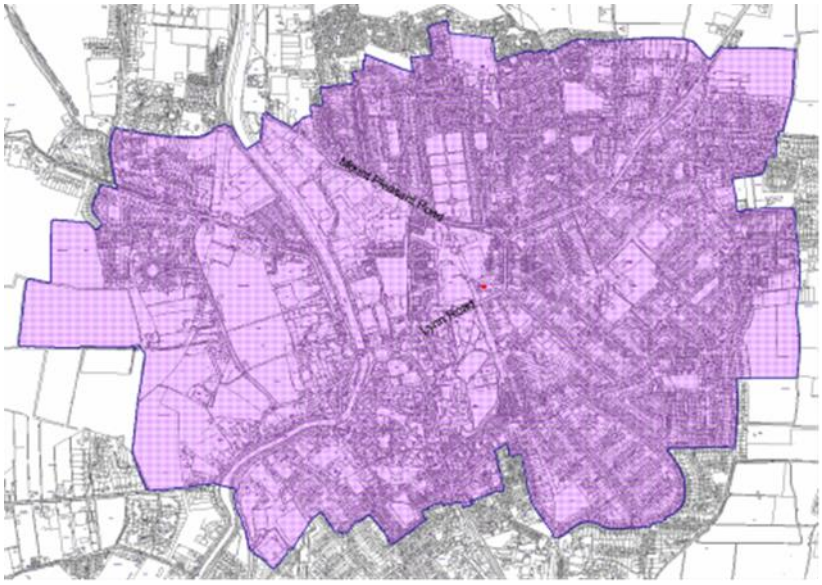


Figure D.4 Wisbech AQMA (2) PM_{10}

Green area: PM_{10} AQMA

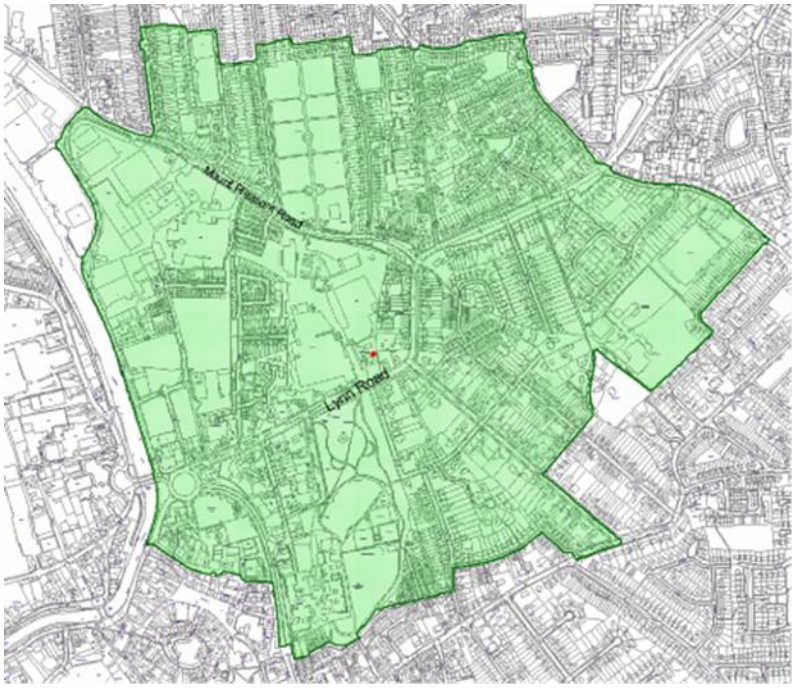


Figure D.5 Wisbech AQMA (3) NO_2

Red area: NO_2 AQMA

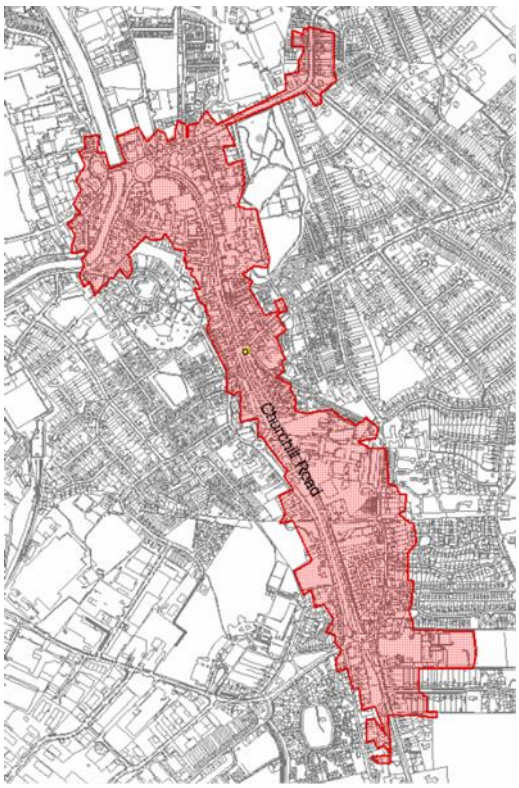


Figure D.6 Whittlesey AQMA SO_2

Blue areas: SO_2 AQMA

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[6]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[6] The units are in micrograms 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	Air quality Annual Status Report
CAMS	Continuous Ambient Monitoring Station
CCC	Cambridgeshire County Council
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
FDC	Fenland District Council
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) 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

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