Air Quality Annual Status Report (ASR) 2023

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

June 2023

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Executive summary: Air quality in our area

Air quality in West Suffolk

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas (Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017, Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006).

The mortality burden of air pollution within the UK is equivalent to 29,000 to 343,000 deaths at typical ages (Defra. Air quality appraisal: damage cost guidance, January 2023), with a total estimated healthcare cost to the NHS and social care of £157 million in 2017 (Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018). The public health outcomes framework indicator for the fraction of mortality attributable to particulate air pollution for West Suffolk was 4.9 percent, which was lower than the value for England, which is 5.5 percent.

West Suffolk is a mix of market towns (Brandon, Bury St Edmunds, Haverhill, Mildenhall and Newmarket) and more rural village communities. The regionally important strategic road links of the A11 and A14 also cross the area. The north of the area hosts two large air bases operated by the United States air force, whilst many of the districts towns have large industrial areas. Agriculture is also an important part of the district economy, with a both arable farming and pig farming being prevalent.

One of the main sources of pollution in the area is road traffic, which is generally worst in the market towns. We monitor for the pollutant nitrogen dioxide, which is considered the main pollutant of concern for road vehicles and is particularly linked to heavy goods vehicles (HGVs) and other diesel vehicles. Consequently, the majority of our monitoring is adjacent to busy roads within our market towns, with the main exception to this being the village of Great Barton where significant monitoring is also undertaken adjacent to the A143. Monitoring is undertaken using diffusion tubes, which are small plastic test tubes that contain a material that reacts with the air. Diffusion tubes passively monitor the air for approximately a month before being sent to an independent laboratory for analysis and replaced with a new tube to monitor the next month.

Particulates, also known as PM_{10} and $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 10µm (micrometres) or less and 2.5µm or less respectively), are also an important pollutant. Particulates are associated with various sources of pollution including domestic burning, road traffic and industrial processes. Particulates can also be associated with natural sources, such as pollen and sea salt, and international sources. The east and southeast of England have a greater proportion of international particulate pollution than the north and west of England. Secondary particulate pollutants can also form from ammonia, nitrogen dioxide and other gases, with the most significant source of secondary particulate pollution being ammonia from farming activities.

PM_{10} and $PM_{2.5}$ are more difficult to accurately measure than nitrogen dioxide and other gasses and interpretation of the data can also be difficult. Consequently, PM_{10}

and $PM_{2.5}$ are currently not measured in West Suffolk; however, we have been working with colleagues across the county, including other districts and boroughs, Suffolk County Council and the University of Suffolk to identify the best way of affordably and practically monitoring for particulates.

Other pollutants, such as sulphur dioxide and carbon monoxide, have been considered and assessed and confirmed as not being at risk of exceeding their respective air quality objectives based on Department for Environment, Food and Rural Affairs (Defra) modelling data.

Air quality was impacted in 2020, and to a lesser extent in 2021, by the changes to day-to-day life caused by the COVID-19 pandemic. The reduced level of traffic due to lock downs and changes in working patterns caused a drop in levels of nitrogen dioxide at every monitored location in West Suffolk in 2020. 2021 was again impacted by COVID-19 related lockdowns and restrictions, however, this impact was not as significant as the previous year. When comparing levels of nitrogen dioxide recorded in 2022 to previous years it is important to understand that 2020 and 2021 were not typical years and a better appreciation of the long-term trend can be established from comparing 2022 levels to pre-pandemic years.

Nitrogen dioxide pollution in West Suffolk is generally relatively low and is showing a long-term improvement at monitored locations throughout the area. Particulate pollution is, slightly higher than the national average, however, this is not due to local sources, but is a result of the disproportionate impact of international particulate pollution on the eastern region. However, the importance of continuing to improve the local air quality is at a higher profile than ever before as more information on the health impacts of air pollution is discovered.

Despite the generally good air quality, there are two air quality management areas (AQMAs) within West Suffolk, located on the A143 in Great Barton and Sicklesmere Road in Bury St Edmunds. AQMAs are designated areas where the council have identified levels of pollutants above the objectives set by the Government. Further information on these AQMAs is given below.

Each of the five market towns, as well as the village of Great Barton and a small number of other villages, have air quality monitoring, the results of which are summarised below.

- **Brandon, Haverhill, Mildenhall and Newmarket** continue to show concentrations of nitrogen dioxide below (that is compliant with) the air quality objective level. Recorded levels in 2022 were broadly comparable to those measured in 2021, with some sites slightly higher and others slightly lower. However, results from all sites remain lower than those from 2019 and other pre-pandemic years.

- **Bury St Edmunds** is the largest town in West Suffolk and consequently has the most monitoring points. Recorded levels in 2022 were broadly comparable to those measured in 2021, with some sites slightly higher and others slightly lower and some unchanged. All sites remain lower than 2019 and other pre-pandemic years. Concentrations of nitrogen dioxide in the AQMA on Sicklesmere Road continue to be below the air quality objectives and there have been no exceedances for the past five years. Revocation of the AQMA will be considered in the next year.

- **Great Barton** is a village to the northeast of Bury St Edmunds with a main road (A143), which is a designated HGV route, cutting through it. A row of cottages either side of, and including, the Post Office are situated close to this road and are designated as an AQMA, however, nitrogen dioxide levels have been below the objective since 2020. Recorded levels in 2022 were similar to those in 2021, with some monitoring points recording slightly higher values and some slightly lower values. All monitoring points remain below the 2019 levels, which is partly due to the moving of the pedestrian crossing which was completed at the end of 2019. Although the levels are currently below (that is compliant with) the objectives the AQMA remains an area of concern, especially considering proposed development along the A143 corridor.

- The 2022 results from the two monitoring points in the village of **Ixworth** were comparable to the levels recorded in 2021, and both less than half of the annual mean objective for nitrogen dioxide. These points have been discontinued for the 2023 monitoring year. A single monitoring point was introduced in the village of **Tuddenham** at the beginning of 2023 at the request of the parish council; this showed relatively low levels of pollution, being less than half of the annual mean objective. We will undertake a second year's monitoring in Tuddenham. **Lakenheath** has a monitoring point in the centre of the village. The recorded level for 2022 was almost identical to that recorded in 2021, which was lower than all pre-pandemic records.

New monitoring points were introduced in Clare, Exning and additional points in Bury St Edmunds in 2023, the results from which will be presented in the 2024 Annual Status Report.

As most of the nitrogen dioxide pollution within West Suffolk originates from road traffic, West Suffolk works closely with the local highway authority (Suffolk County Council), who have a designated point of contact for air quality matters. We are also working closely with the Suffolk County Council public health team who are developing an engagement plan to increase awareness and understanding of air quality issues within Suffolk.

We also work closely with the local planning authority to ensure new developments are appropriately controlled and mitigation is provided where required. No new significant sources were identified during 2022, however, a large animal feed processing plant (planning reference DC/22/1294/FUL) located to the northeast of Bury St Edmunds is currently going through the planning process which, if approved, will be a new point source of pollution as well as causing additional heavy duty vehicle (HDV) movements. A number of large housing developments and industrial sites are also currently going through the planning process, with a number along the A143 corridor which have the potential to impact the Great Barton AQMA.

More details on the extent of the AQMAs mentioned above can be found at Defra - UK AIR - Air information resources - Local Authority Details - West Suffolk Council.

Actions to improve air quality

While 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 (Defra. Environmental Improvement Plan 2023, January 2023) sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero (Department for Transport. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018) details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

1. Anti-idling campaign

West Suffolk Council has directly engaged with schools on our anti-idling campaign. This has involved going into schools to work directly with pupils and teachers who are then engaging with parents at school collection. The first events proved successful with positive feedback received from teachers, parents, and children. We have worked with Suffolk County Council road safety officers to help distribute anti-idling materials to all schools currently on the road safety scheme. We contacted all schools in West Suffolk during the 2021-2022 school year to try and organise anti-idling event and throughout the 2022-2023 academic year we have continued to distribute anti idling banners and other materials to schools.

Figure 1: Images from the Performance in Education Abbie Ayre and the Shed of Science school productions

In early 2023, in conjunction with Suffolk County Council, we commissioned a number of air quality workshops in schools in primary schools through West Suffolk. Workshop

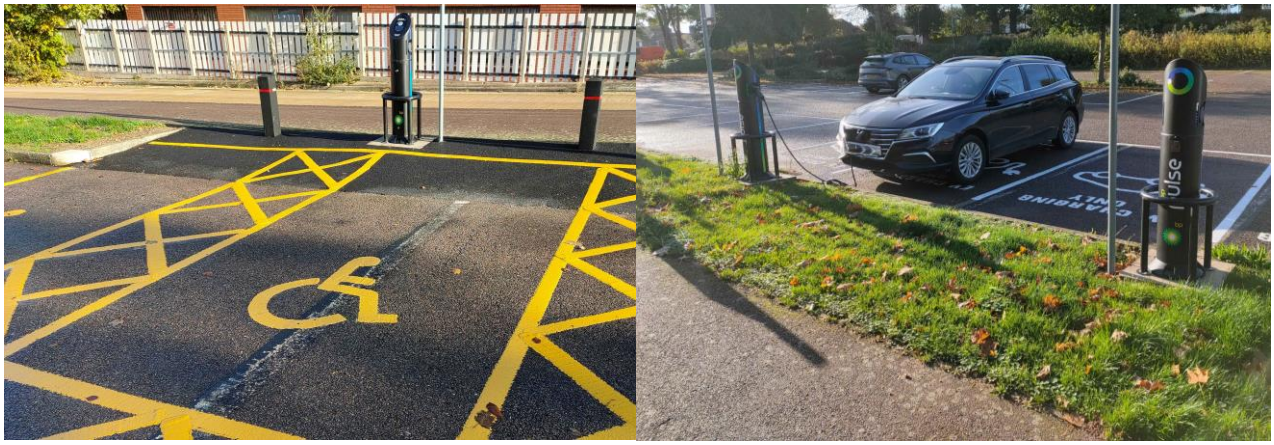
performances were undertaken by Performance in Education, and titled 'Abbie Ayre and the Shed of Science'. This allowed us to further promote the issues of air quality and vehicle idling around schools.

2. Zero emission vehicles

West Suffolk Council has focused on the promotion of electric vehicles (EVs) since undertaking our first EV showcase event in 2016. As growth and awareness in EVs has increased we have switched our focus to the delivery of infrastructure, and during 2022 we delivered our third round of chargepoint installations under the Office for Zero Emission Vehicles (OZEV) on-street residential chargepoint scheme (ORCS). At the end of March 2023, West Suffolk owned sufficient public EV chargepoints to allow 84 vehicles to charge at any one time. At the beginning of 2023 we also announced a deal with charge point operator ubitricity to provide approximately a further 100 bays for electric vehicle charge points during the following year.

At the 1 January 2023, the West Suffolk Council district area was shown on the Department for Transport map of Department for Transport - Electric vehicle charging devices by local authority as being in the top 20 percent of local authority areas for total number of Electric vehicle charging devices; devices per 100,000 of population; and rapid charging devices. West Suffolk is the only local authority in East Anglia (Suffolk, Norfolk, Essex and Cambridgeshire) in the top 20 percent of all three of the Department for Transport categories.

Figure 2: Pictures of newly installed electric vehicle charge points in Haverhill



West Suffolk Council are also working with partners across Suffolk and Norfolk to ensure regional strategies and plans are aligned and complementary. Colleagues at Suffolk County Council are delivering public chargepoints in more rural areas through their Plug-in Suffolk scheme. This has delivered installations in numerous West Suffolk villages including Hundon, Keddington and Risby in the last year with many more planned.

3. Clean air business

West Suffolk Council in conjunction with Suffolk County Council developed a clean air business scheme during 2022, which was launched on clean air day 2022 with an in-person breakfast seminar and a webinar. The scheme is for businesses who want to take action to help to improve local air quality, benefit from healthier employees, a better workplace environment and potentially financial savings. Businesses can

become accredited as either bronze, silver, gold, or platinum clean air businesses. Some of the initiatives that can help a business become accredited are promoting anti-idling to all vehicle drivers; installing plants in office spaces; promoting clean air walking routes; taking advantage of free bike fixing sessions for staff who want to cycle; and providing a free 'Active Travel Breakfast' on a particular day when staff are encouraged to walk or cycle if able to. An anti-idling training video has been produced to support this scheme and is available on West Suffolk Council YouTube Channel - Anti-idling Driver Training.

Although no businesses have yet become accredited, the scheme has successfully raised the awareness of air quality among the local business community.

Figure 3: Clean air business logo

4. Net zero innovation programme

West Suffolk Council are working with the University of Suffolk on a net zero innovation programme project to better understand air quality data collected as part of a planning condition. The aims of the project are to better understand the local sources of $PM_{2.5}$ pollution and to understand how planning conditions can be suitably worded to ensure that local authorities receive maximum benefit from any monitoring undertaken as part of planning requirements.

This project is expected to conclude in summer 2023 with the findings reported in next year's annual status report.

5. Carbon reduction activities

West Suffolk Council undertake a number of carbon reduction activities that will help to reduce our impact on the environment and reduce our reliance on fossil fuels. This includes our solar farm, our solar for business scheme, tree planting, reduction in fuel use and increased recycling rates. Although these are generally not direct air quality improvement measures, they do all have a positive impact on air quality and underline our commitment to sustainability.

Further information on our carbon direction work can be found in the West Suffolk Council Environmental-Statement-2021-2022.

6. Suffolk County Council actions

As a district council, West Suffolk Council works closely with Suffolk County Council (SCC) on air quality. Many of the areas that impact air quality, such as highways and

sustainable transport are the responsibility of Suffolk County Council. Some of the works undertaken by SCC in the past year include:

- Developed a Suffolk Air Quality Strategy, which was signed off in May 2023
- Bikeability courses at schools throughout the district
- Modeshift stars school schemes
- Dedicated section on air quality in the new local transport plan
- Plug-in Suffolk electric vehicle charging infrastructure scheme.

Conclusions and priorities

Air Quality in West Suffolk continues to be relatively good, with all the monitored locations being below (that is compliant with) the air quality objectives. Most monitoring locations in 2022 were relatively similar to 2021 but were below pre-pandemic levels at every location which is consistent with the long-term downward trend in nitrogen dioxide pollution levels. Nitrogen dioxide monitoring will continue throughout the district, including within the AQMAs. Given levels are now below the objectives in both AQMAs, we will start to consider revocation over the next year.

West Suffolk continues to grow, with major developments in Bury St Edmunds and Haverhill both continuing. It is important for West Suffolk to continue to monitor throughout the area and react to any new information that becomes available.

Our main ongoing actions for 2023 are to continue to expand the provision for EV charging infrastructure and continue working with schools and other organisations with our anti-idling campaign. We will also endeavour to continue working with Suffolk County Council in supporting their air quality strategy and air quality engagement plan.

Gaining significant engagement at a local level given the largely rural locality will remain a challenge in West Suffolk.

Local engagement and how to get involved

As an individual there are many actions that you can take to improve the air quality and reduce air pollution. This will improve the quality of life for everyone, including you and your family. Below are a few suggestions of how to get involved:

- Use your car less. Try to walk, cycle, and use the bus or train wherever possible. Conventionally fuelled cars are particularly polluting over short journeys, so aim to cut these out first.
- Consider purchasing an electric vehicle; the costs are reducing, and the technology and infrastructure are making this technology more practical for more people.
- Reduce emissions from your car by ensuring it is regularly serviced and well maintained, ensure you only carry the weight you need, and you drive in a gentle, steady manner.
- Don’t idle your vehicle’s engine when parked. You can contact West Suffolk Council if you would like us to do a presentation about vehicle idling to your school or organisation.
- When buying a traditionally fuelled vehicle consider the most fuel-efficient petrol vehicle rather than buying a diesel vehicle.
- Encourage your employer, school, or college to set up a Green Travel Plan.

- Car share, to reduce emissions and save money. See the Suffolk Car Share website for further details.
- If you own a property with a log burner or open fire, make sure you only burn the cleanest fuels such as well seasoned wood approved under the 'Ready to Burn' scheme. See the Ready to Burn website for further information.
- Avoid having bonfires at home, try to compost instead.
- Make sure your domestic boiler is well serviced to avoid unnecessary nitrogen dioxide or particulate emissions.

Bury St Edmunds resident's associations have formed a group to help raise the profile of air pollution and take action where appropriate. This group continue to meet regularly with both Councillors and officers of the council. You can contact West Suffolk Council if you would like more information on this group.

For up-to-date information on air quality in West Suffolk, please visit our Air quality webpage.

Local responsibilities and commitment

This annual status report (ASR) was prepared by the Environment and Energy Team, Regulatory Services of West Suffolk Council with the support and agreement of the officers and departments as listed on page 1.

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

If you have any comments on this ASR please send them to the West Suffolk Council air quality officer using the details to the front of this report.

Contents

Executive summary: Air quality in our area 3
Air quality in West Suffolk 3
Actions to improve air quality 5
1. Anti-idling campaign 6
2. Zero emission vehicles 7
3. Clean air business 7
4. Net zero innovation programme 8
5. Carbon reduction activities 8
6. Suffolk County Council actions 8
Conclusions and priorities 9
Local engagement and how to get involved 9
Local responsibilities and commitment 10
Contents 11
1. Local air quality management 12
2. Actions to improve air quality 13
2.1 Air quality management areas 13
3. Progress and impact of measures to address air quality in West Suffolk 15
4. $PM_{2.5}$ – Local authority approach to reducing emissions and/or concentrations 22
5. Air quality monitoring data and comparison with air quality objectives and national compliance 23
6. Summary of non-automatic monitoring undertaken 23
7. Individual pollutants: Nitrogen dioxide (NO2) 23
7.1 Brandon 23
7.2 Bury St Edmunds 24
7.3 Great Barton 26
7.4 Haverhill 27
7.5 Ixworth 28
7.6 Lakenheath 28
7.7 Mildenhall 28
7.8 Newmarket 29
7.9 Tuddenham 30
Appendix A: Monitoring results 31
Appendix B: Full monthly diffusion tube results for 2022 47
Appendix C: Supporting technical information and air quality monitoring data quality assurance and quality control 50
New or changed sources identified within West Suffolk Council during 2022 ... 50
Additional air quality works undertaken by West Suffolk Council during 2022 . 50
Quality assurance and quality control of diffusion tube monitoring 50
Diffusion tube annualisation 50
Diffusion tube bias adjustment factors 51
NO_2 fall-off with distance from the road 51
Appendix D: Maps of monitoring locations and AQMAs 52
Appendix E: Summary of air quality objectives in England 65
Glossary of terms 66
References 67

1. Local air quality management

This report provides an overview of air quality in West Suffolk during 2022. 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 West Suffolk 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 West Suffolk Council can be found in Table 0.1. The table presents a description of the two AQMAs that are currently designated within West Suffolk. Appendix D provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objective pertinent to both of the current AQMA designations is the NO_2 annual mean objective of 40 micrograms per cubic metre ($\mu g/m^3$).

We do not currently have plans to revoke either of the AQMAs, however, they are both now below the objective and it may be suitable to revoke both AQMAs following the completion of 2023 monitoring.

A major housing development is proposed close to the Sicklesmere Road AQMA and construction may start shortly. Although in the long term the development will provide a relief road and is anticipated to reduce air pollution, the temporary negative impacts from construction activities and properties occupied before the completion of the relief road need to be considered.

The Great Barton AQMA has had three years below the relevant air quality objective, however, two of these years were impact by COVID-19 restrictions and these should not be considered representative. The monitoring from 2023 will help to better establish the basis for revocation (or otherwise) of this AQMA.

Table 0.1 – Declared air quality management areas

AQMA Name	Great Barton AQMA	Sicklesmere Road, Bury St Edmunds, AQMA
Date of declaration	Declared 11 May 2011, Revoked 1 January 2013, Declared 18 April 2017	Declared 13 April 2018
Pollutants and air quality objectives	NO_2 annual mean (40µg/m3)	NO_2 annual mean (40µg/m3)
One line description	An area incorporating Gatehouse Cottage and 1 to 8 The Street (A143), in the Parish of Great Barton.	2 and 7 Sicklesmere Road and 28 Southgate House, Rougham Road, in the Parish of Bury St Edmunds (Southgate Ward)
Is air quality in the AQMA influenced by roads controlled by Highways England?	No	No
Level of exceedance: declaration	48.2 µg/m^3 (2011)	44.7 µg/m^3
Level of exceedance: current year	No exceedance – 35.2 µg/m3	No exceedance – 31.8 µg/m3
Number of years compliant with air quality objective	Three years	Five years
Name and date of AQAP publication	Great Barton AQMA Action Plan – November 2020	Sicklesmere Road AQMA Action Plan – November 2020
Web link to AQAP	Air quality	Air quality

3. Progress and impact of measures to address air quality in West Suffolk

Defra's appraisal of last year's ASR concluded that West Suffolk Council should continue to undertake monitoring for nitrogen dioxide throughout the district and report results in the 2023 ASR.

West Suffolk Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 0.2. 22 measures are included within Table 0.2, with the type of measure and the progress West Suffolk Council or its partners have made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 0.2.

More detail on these measures can be found in their respective action plans for Great Barton and Sicklesmere Road air quality management areas. Key completed measures are the launch of the clean air business scheme, the continued increase of electric vehicle charging infrastructure and the public awareness campaigns that West Suffolk is supporting Suffolk County Council to complete.

West Suffolk Council's priorities for the coming year are to establish which actions can be taken to better tackle particulate pollution.

West Suffolk Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Suffolk County Council
- University of Suffolk

The principal challenges and barriers to implementation that West Suffolk Council anticipates facing are reducing car use in a largely rural area and understanding the various sources of particulate pollution.

Table 0.2 – Progress on measures to improve air quality

Measure number	Measure	Category	Classification	Year measure introduced in AQAP	Estimated or actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding Status	Estimated cost of measure	Measure status	Reduction in pollutant or emission from measure	Key performance indicator	Progress to date	Comments or barriers to implementation
1	Electric vehicle charging points through planning	Promoting low emission transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2016	Ongoing	West Suffolk	Not applicable	No	Funded	< £10k	Implementation	Not possible to directly measure	Number of relevant planning applications with conditions successfully applied	Implemented and conditions being successfully imposed and delivered on new developments	Where building regulations require installation of charge points this action is no longer required
2	Electric vehicle charging infrastructure on council owned land	Promoting low emission transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2017	Jan19	West Suffolk, Babergh Mid Suffolk, Highways England providing funding for Rapid chargers	Highways England	No	Funded	£10k - 50k	Completed	Not possible to directly measure	Number of additional charge points installed	Rapid charge point installed January 2019	Norfolk and Suffolk wide project. Use of charge point has been better than expected since installation in January 2019.
3	Electric vehicle charging infrastructure on council owned land	Promoting low emission transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2016	Ongoing	West Suffolk	Section 106 funds, council investment and private investment	No	Funded	£100k - £500k	Implementation	Not possible to directly measure	Number of additional charge points installed	Fast chargers installed in Brandon, Bury St Edmunds, Haverhill, Mildenhall and Newmarket. Rapid chargers installed in Newmarket and Mildenhall	Charger points installed in 2017, 2020, 2021 and 2022. Strategy for future installations developed.
4	On Street electric vehicle charging infrastructure	Promoting low emission transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2018	Phase 1 completed Q1 2019.	West Suffolk, OLEV and EST	OLEV and West Suffolk Council	No	Funded	£10k - 50k	Completed	Not possible to directly measure	Number of additional charge points installed	22 points installed	Chargepoints being upgraded in 2023

Measure number	Measure	Category	Classification	Year measure introduced in AQAP	Estimated or actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding Status	Estimated cost of measure	Measure status	Reduction in pollutant or emission from measure	Key performance indicator	Progress to date	Comments or barriers to implementation
5	Electric vehicle showcase	Promoting low emission transport	Other	2016	Ongoing	West Suffolk	West Suffolk Council	No	Partially Funded	< £10k	Completed	Not possible to directly measure	Increased uptake in electric vehicles	Showcase undertaken in 2016, 2017 and 2018	Event not undertaken since 2018 as new EVs have long waiting lists and demand is outstripping supply – no need to actively promote.
6	Business Grant Promotions for businesses to move to ULEV including 'Electric Innovation' event as part of the West Suffolk Business Festival.	Promoting low emission transport	Company vehicle procurement - prioritising uptake of low emission vehicles	2016	Ongoing	West Suffolk and BEE Anglia	ongoing	No	Funded	£10k - 50k	Implementation	Not possible to directly measure	Increased uptake in electric vehicles	Numerous grants awarded to companies for the installation of EV chargepoints to enable fleets to become electric. One grant awarded to taxi company.	
7	Taxi licensing conditions making idling in a taxi rank or on the highway a penalty within the taxi handbook, with the potential for penalty points to be added to the drivers council licence.	Promoting Low Emission Transport	Taxi Licensing conditions	2017	Conditions implemented in 2017	West Suffolk Council	Not applicable	No	Funded	< £10k	Completed	12 percent reduction in pollution at taxi rank between 2017 and 2019	Reduction in Nitrogen dioxide at taxi rank locations	Implemented and continue to monitor	Measure was backed up by regular visits to taxi rank by licensing enforcement officer during 2018

Measure number	Measure	Category	Classification	Year measure introduced in AQAP	Estimated or actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding Status	Estimated cost of measure	Measure status	Reduction in pollutant or emission from measure	Key performance indicator	Progress to date	Comments or barriers to implementation
8	Anti-idling campaigns including school anti-idling events	Public information	Via other mechanisms	2018	Jun 19	West Suffolk Council, Suffolk County Council	West Suffolk Council	No	Partially funded	< £10k	Implementation	Not possible to directly measure	Reduction in idling at key locations	Materials completed in June 2019. First school visits completed in January 2020.	Has been difficult to engage schools since COVID-19 pandemic. School theatre productions undertaken in February and March 2023.
9	Eco driving courses for council staff	Vehicle fleet efficiency	Driver training and eco driving aids	2017	Ongoing	West Suffolk Council	Energy Savings Trust	No	Funded	< £10k	Implementation	Not possible to directly measure	Number of staff completing course	Ongoing	Staff mileage has significantly reduced since start of COVID-19 pandemic.
10	Promotion of better domestic solid fuel burning	Public information	Via the Internet	2018	Ongoing	West Suffolk Council	West Suffolk Council	No	Partially funded	< £10k	Implementation	Not possible to directly measure	Lower emissions from private fuel burning (not measurable)	Promoted on West Suffolk website and via West Suffolk and Environmental Health Facebook pages	
11	South-East Bury St Edmunds relief road	Traffic management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high vehicle occupancy lane	2020	2024	West Suffolk Council, Suffolk County Council and Developer	Development	No	Funded	£1 million - £10 million	Planning	To be confirmed closer to opening date	Measured concentration in Nitrogen Dioxide on Sicklesmere Road	Planning permission granted in Spring 2020	Completion of road prior to 400 dwellings completed to be a condition of the planning approval

Measure number	Measure	Category	Classification	Year measure introduced in AQAP	Estimated or actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding Status	Estimated cost of measure	Measure status	Reduction in pollutant or emission from measure	Key performance indicator	Progress to date	Comments or barriers to implementation
12	Haverhill North-West relief road	Traffic management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high vehicle occupancy lane	2018	2024	West Suffolk Council, Suffolk County Council and developer	Development	No	Funded	£1 million - £10 million	Implementation	To be confirmed closer to opening date - likely in the region of 20 percent reduction in NO_2 along Withersfield Road	Measured concentration in Nitrogen Dioxide on Withersfield Road	Development commenced March 2018. Construction underway, estimated completion spring 2024.	
13	Great Barton AQAP - moving of the pedestrian crossing	Traffic management	Urban traffic control, congestion management, traffic reduction	2019	2019	West Suffolk Council, Suffolk County Council	Defra, Suffolk County Council	Yes	Funded	£50k - £100k	Completed	7.8 percent reduction	Reductions in Concentrations to below the objective	Completed December 2019	Scheme successful.
14	Great Barton AQAP - improvement of 'Bunbury Arms' junction to Thurston	Traffic management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high vehicle occupancy lane	2018	2024	Suffolk County Council	Section 106 funds	No	Funded	£100k - £500k	Planning	To be confirmed	Monitoring of queues through Great Barton	Outline design completed	
15	Suffolk Car Share	Alternatives to private vehicle use	Car and lift sharing schemes	Ongoing	Ongoing	Suffolk County Council	Suffolk County Council	No	Funded	< £10k	Implementation	Not possible to directly measure for a single district	Number of scheme participants	Over 3000 members	

Measure number	Measure	Category	Classification	Year measure introduced in AQAP	Estimated or actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding Status	Estimated cost of measure	Measure status	Reduction in pollutant or emission from measure	Key performance indicator	Progress to date	Comments or barriers to implementation
16	West Suffolk Council cycling initiatives	Alternatives to private vehicle use	Other	Ongoing	Ongoing	West Suffolk Council	West Suffolk Council	No	Funded	< £10k	Implementation	Not possible to directly measure	Numbers of employees cycling to work, business miles completed by bike	Pool bikes available at main office, incentives to cycle to work during cycle to work week, free bike servicing at work	
17	Suffolk County Council cycle Lane improvements	Alternatives to private vehicle use	Other	2020	2022	Suffolk County Council	Suffolk County Council and National Government	No	Funded	£50k - £100k	Implementation	Not possible to directly measure	Number of kilometres of cycle lane improvements	Improvements to cycle lanes in various locations throughout West Suffolk (Beetons Way, Risbygate Street in Bury St Edmunds)	A number of the cycle lane improvements (segregating wands) were removed in 2022.
18	Clean air business scheme	Public information	Other	2022	Ongoing	West Suffolk Council, Suffolk County Council	West Suffolk Council	No	Funded	£1,000	Implementation	Not possible to directly measure	Number of business presented with a Clean Air Business award	Scheme launched on clean air day 2022. Good interest from businesses on how to improve air quality but no formal awards presented.	Although businesses are interested, the commitment needed to gain a formal award is not a priority.
19	Bikeability scheme	Promoting travel alternatives	Promotion of cycling	2022	Ongoing	Suffolk County Council	Suffolk County Council	No	Funded	<£10k	Implementation	Not possible to directly measure	Number of children passing	Well established scheme targeting primary schools throughout the county. Bikeability completed at 14 Schools in	Added to the ASR in 2022 but has been ongoing for a number of years

Measure number	Measure	Category	Classification	Year measure introduced in AQAP	Estimated or actual completion date	Organisations involved	Funding source	Defra AQ grant funding	Funding Status	Estimated cost of measure	Measure status	Reduction in pollutant or emission from measure	Key performance indicator	Progress to date	Comments or barriers to implementation
														West Suffolk in 2022	
20	Modeshift stars schools	Promoting travel alternatives	School travel plans	2022	Ongoing	Suffolk County Council	Suffolk County Council	No	Funded	<£10k	Implementation	Not possible to directly measure	Number of schools registered	Well established scheme targeting schools throughout the county. Eight schools currently registered in West Suffolk	Added to the ASR in 2022 but has been ongoing for a number of years
21	Plug-in Suffolk	Promoting low emission transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV recharging, gas fuel recharging	2018	Ongoing	Suffolk County Council	Suffolk County Council	No	Funded	+£200k	Implementation	Not possible to directly measure	Number of charge points installed	Well established scheme funding EV charge points in community locations.	Locations in West Suffolk include Hundon, Ixworth, Kedington, Risby and West Row
22	E-Cargo Bike trial	Promoting travel alternatives	Promotion of cycling	2022	Ongoing	Suffolk County Council	Suffolk County Council	No	Funded	+£10k	Implementation	Not possible to directly measure	Number of businesses that change to E-Cargo bikes	Two business took part in Bury St Edmunds in summer 2022	

4. $PM_{2.5}$ – Local authority approach to reducing emissions and/or concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), 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.

West Suffolk Council is undertaking a number of measures to improve air quality generally, as described above, which we consider will also have a positive impact on PM2.5. Some of these measures, such as the promotion of clean burning, will specifically tackle particulate matter emissions.

During the latter part of 2019 and in 2020, the council, together with all the other local authorities across Suffolk worked with Suffolk County Council's Transport and Public Health colleagues to prepare an 'Air Quality Profile' report for Suffolk. The report maps, at a district and borough level, local air pollution levels and explores evidence-based interventions that can be undertaken by local authorities, businesses, communities and individuals to improve air quality. The report was published in June 2021 following sign-off from the Suffolk Director of Public Health.

As a result of the report, air quality was made a priority by the Suffolk Health and Wellbeing board as part of their duty to "encourage integrated working" between health, care, police and other public services in order to improve wellbeing outcomes for Suffolk. The recommendations from the Suffolk Profile have also informed both the development of a Suffolk-wide Air Quality Strategy due to be published in May 2023 and the Suffolk Community Engagement Plan.

The Air Quality Strategy sets out the range of actions identified as being important to the improvement of air quality, along with who is the lead authority for the work, timescales for implementation, and what measurements or outcomes will be achieved.

The air quality engagement plan sets out the action Suffolk County Council (SCC), working with borough and district partners, will take to raise awareness of the health impacts of air quality in Suffolk. The aim is to increase awareness to enable individuals to make choices that protect both their health and the health of others from the harmful effects of pollution.

We will continue to consult with Suffolk County Council Public Health colleagues and be advised by them, and national guidance, on any relevant measures that will reduce exposure to PM2.5.

5. Air quality monitoring data and comparison with air quality objectives and national compliance

This section sets out the monitoring undertaken within 2022 by West Suffolk Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed

6. Summary of non-automatic monitoring undertaken

West Suffolk Council undertook non-automatic (that is passive) monitoring of NO_2 at 66 sites during 2022. Table A.1 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 (for example annualisation and/or distance correction), are included in Appendix C.

7. Individual pollutants: Nitrogen dioxide (NO2)

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 percent and greater than 25 percent), and distance correction. Further details on adjustments are provided in Appendix C.

Table A.2 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 (that is the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2022 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.

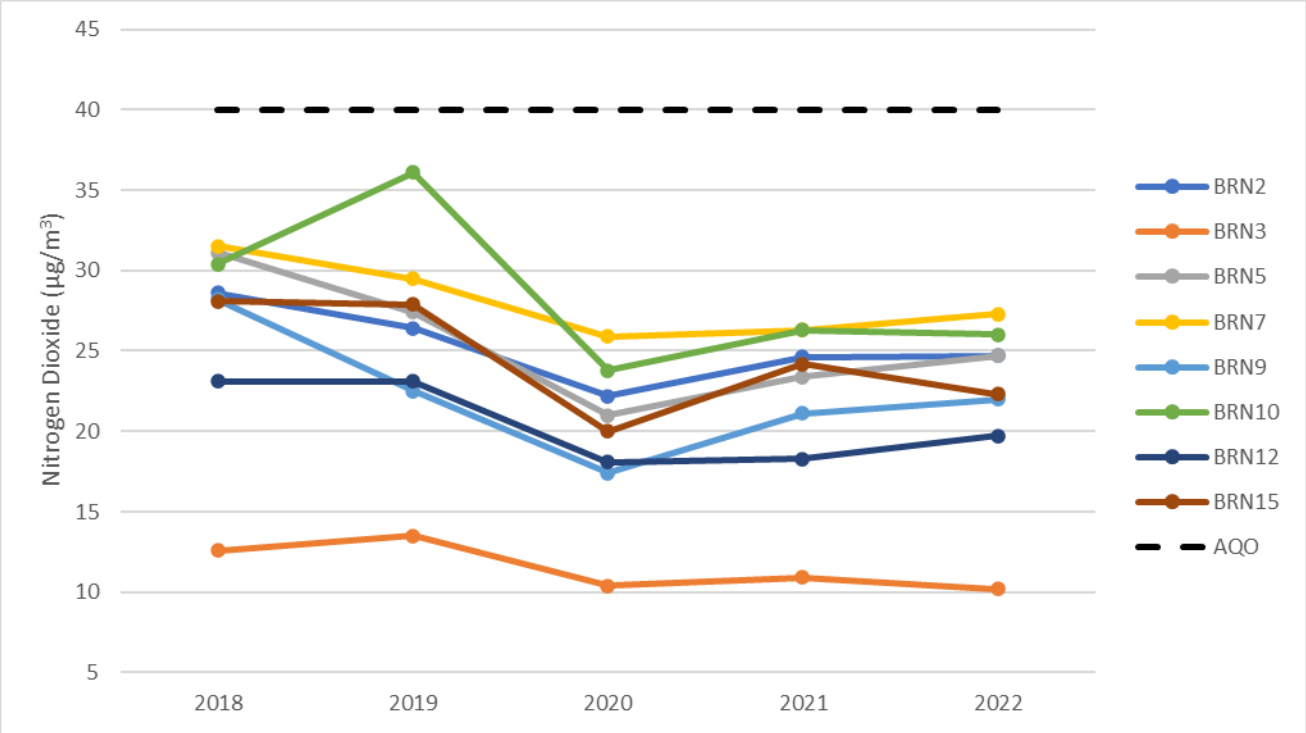
Details from each of the monitoring areas is provided below.

7.1 Brandon

The town of Brandon continues to show concentrations of nitrogen dioxide below (that is compliant with) the air quality objective level of 40µg/m^3. Recorded levels in 2022 were broadly comparable to those measured in 2021, with some sites slightly higher and others slightly lower. However, results from all sites remain lower than those from 2019 and other pre-pandemic years.

The highest concentration (27.3µg/m^3) was recorded at monitoring point BRN7 located at the junction of London Road and Church Road, with the monitoring site at BRN10 on the High Street recording the second highest concentration (26.0µg/m^3). Figure 3.1 shows the trend for all monitoring sites where data has been collected for all of the past five years and compares them to the air quality objective (AQO).

Figure 3.1: Five-year trend data for nitrogen dioxide in Brandon



7.2 Bury St Edmunds

Bury St Edmunds is the largest town in West Suffolk and consequently has the most monitoring points. Recorded levels in 2022 were broadly comparable to those measured in 2021, with some sites slightly higher and others slightly lower and some unchanged. All sites remain lower than 2019 and other pre-pandemic years.

Concentrations of nitrogen dioxide in the AQMA on Sicklesmere Road continue to be below the air quality objectives and there have been no exceedances for the past five years. The two monitoring points in the AQMA recorded 31.3µg/m^3 and 27.4µg/m^3 compared to the objective level of 40µg/m^3. Revocation of the AQMA will be considered in the next year when it has been better established whether a nearby major housing development will impact on the AQMA.

Figure 3.2 shows the five-year trend of nitrogen dioxide from monitoring locations on Sicklesmere Road, both inside and outside of the AQMA.

The highest recorded concentration of nitrogen dioxide in Bury St Edmunds away from the AQMA was recorded at the junction of Parkway and Kings Road and was 27.9µg/m^3, with the next highest being 26.7µg/m^3 at the Northgate Lodge roundabout, although it should be appreciated that these values are well below the objective level of 40µg/m^3.

Although most sites are slightly higher than the COVID-19 pandemic impacted year of 2020, monitoring point BSE17 at the junction of Tayfen Road and Ipswich Street has shown a significant decrease in nitrogen dioxide levels, dropping from 28.4µg/m^3 in 2020 to 23.5µg/m^3 in 2022. This is most likely due to numerous partial road closures in 2020 on Tayfen Road associated with new developments.

Figure 3.2 Five-year trend data for nitrogen dioxide along Sicklesmere Road, Bury St Edmunds

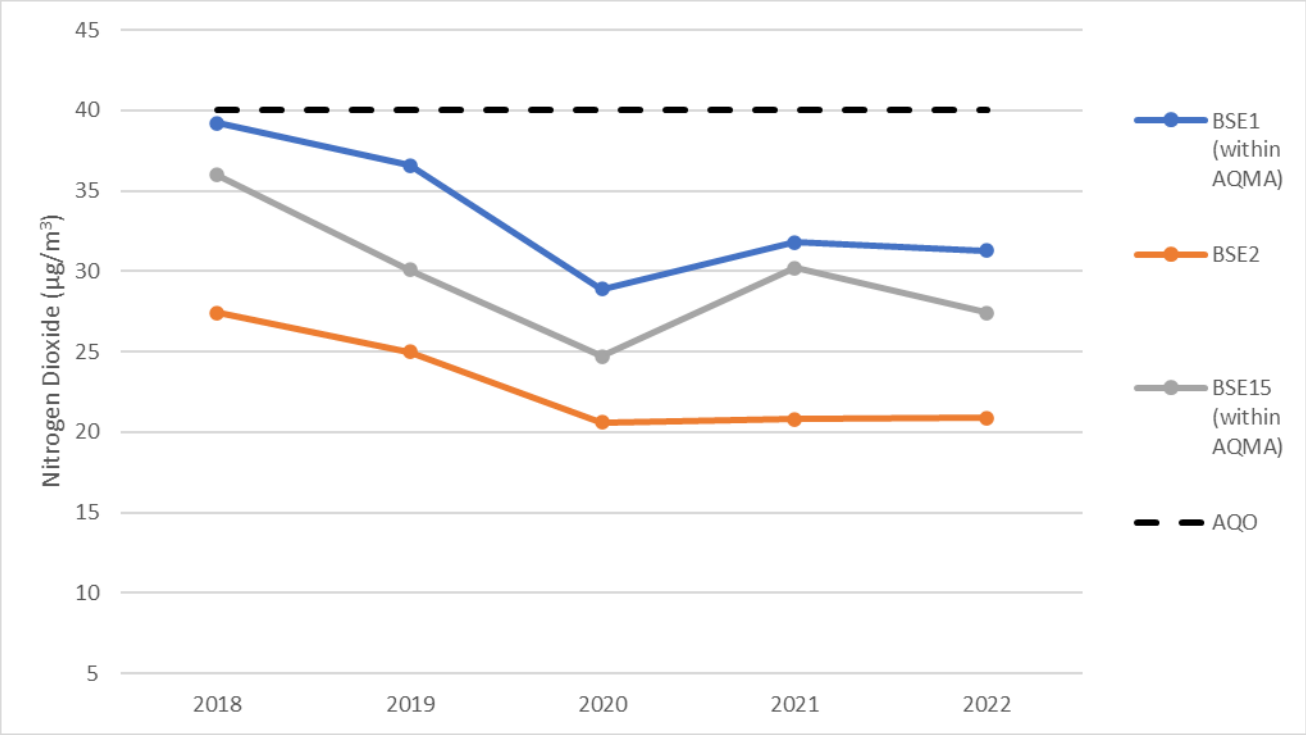
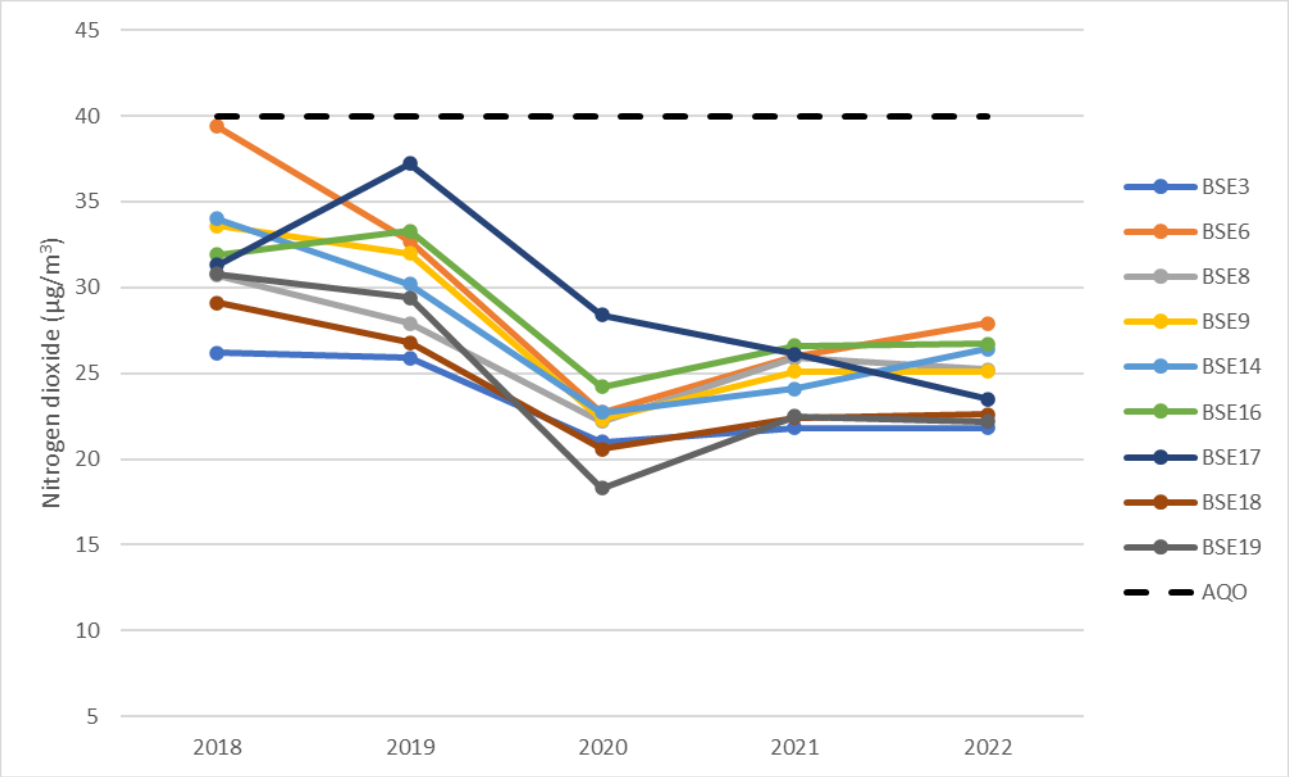


Figure 3.3 shows the five-year trend of nitrogen dioxide from monitoring locations within Bury St Edmunds. Sites with less than five-years of monitoring data have not been included.

Figure 3.3 Five-year trend data for nitrogen dioxide at Bury St Edmunds monitoring sites



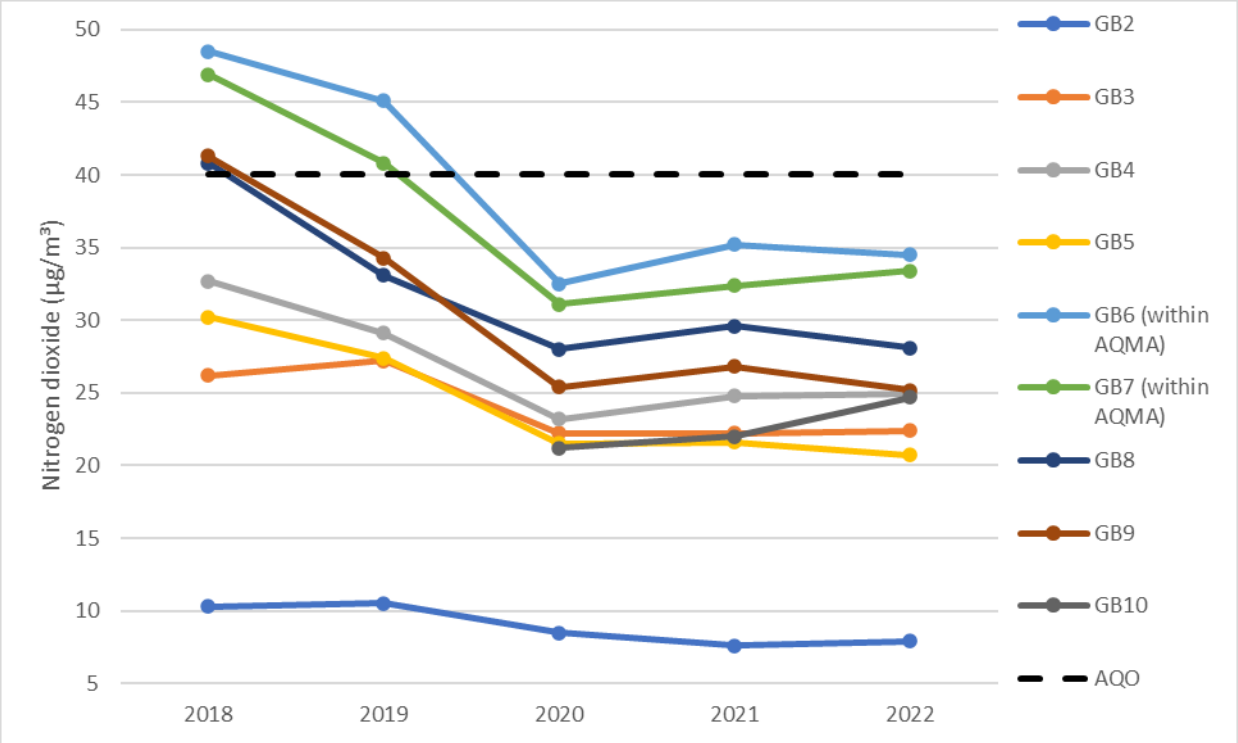
7.3 Great Barton

Great Barton is a village to the northeast of Bury St Edmunds with a main road (A143), which is a designated HGV route, cutting through it. A row of cottages either side of, and including, the Post Office are situated close to this road and are designated as an AQMA, however, nitrogen dioxide levels have been below the objective since 2020. Recorded levels in 2022 were similar to those in 2021, with some monitoring points recording slightly higher values and some slightly lower values, with the highest recorded value being within the AQMA at monitoring point GB6 was 34.5µg/m^3.

All monitoring points remain below the 2019 levels, which is partly due to the moving of the pedestrian crossing which was completed at the end of 2019 and was estimated to have resulted in a 7.8 percent reduction in concentrations between 2019 and 2020. This reduction was in addition to the reductions caused by the COVID-19 pandemic. Although the levels are currently below (that is compliant with) the objectives the AQMA remains an area of concern, especially considering proposed development along the A143 corridor.

Figure 3.4 shows the five-year trend of nitrogen dioxide from monitoring locations within Great Barton, showing a significant drop for the monitoring locations within and immediately adjacent to the AQMA.

Figure 3.4 Five-year trend data for nitrogen dioxide at Great Barton monitoring sites



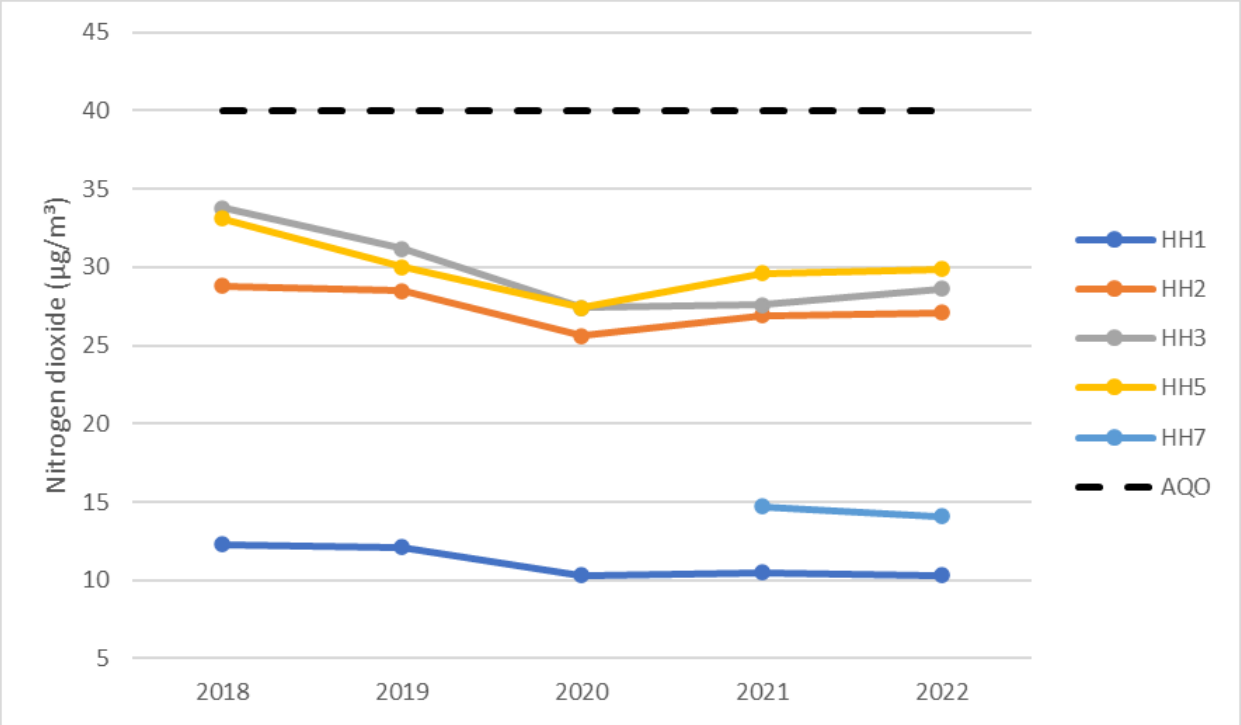
7.4 Haverhill

Monitoring points in Haverhill continue to show concentrations of nitrogen dioxide below (that is compliant with) the air quality objective level. Recorded levels in 2022 were broadly comparable to those measured in 2021, with some sites slightly higher and others slightly lower. However, results from all sites remain lower than those from 2019 and other pre-pandemic years. The highest recorded concentration was along Withersfield Road at monitoring point HH5 with a value of 29.9µg/m^3.

Haverhill north-west relief road is due to open in Spring 2024 and will have a positive impact on the monitoring locations on Withersfield Road and Wratting Road (HH2, HH3 and HH5). Further information will be presented in future ASRs.

Figure 3.5 shows the five-year trend of nitrogen dioxide from monitoring locations within Haverhill, showing a slight drop in concentrations over the monitoring period.

Figure 3.5 Five-year trend data for nitrogen dioxide at Haverhill monitoring sites



7.5 Ixworth

The 2022 results from the two monitoring points in the village of Ixworth were comparable to the levels recorded in 2021, and both less than half of the annual mean objective for nitrogen dioxide being 16.6µg/m^3 (IXW1) and 17.5µg/m^3 (IXW2). These points have been discontinued for the 2023 monitoring year.

7.6 Lakenheath

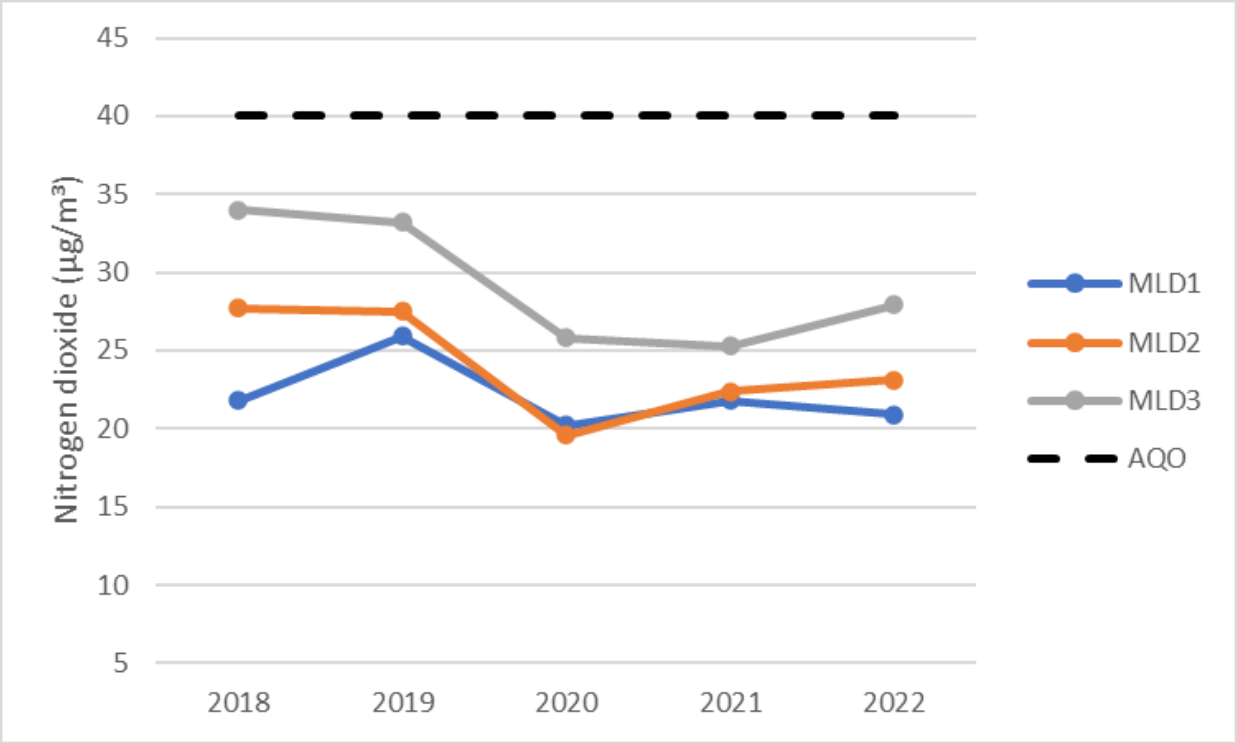
Lakenheath has a monitoring point in the centre of the village. The recorded level for 2022 (16.0µg/m^3) was almost identical to that recorded in 2021 (16.1µg/m^3), which was lower than pre-pandemic records (19.7µg/m^3 in 2019).

7.7 Mildenhall

Mildenhall continue to show concentrations of nitrogen dioxide below (that is compliant with) the air quality objective level of 40µg/m^3 with a high of 27.9µg/m^3 recorded on Kingsway. Recorded levels in 2022 were broadly comparable to those measured in 2021, with some sites slightly higher and others slightly lower. However, results from all sites remain lower than those from 2019 and other pre-pandemic years.

Figure 3.6 shows the five-year trend of nitrogen dioxide from monitoring locations within Mildenhall, showing a drop in concentrations over the monitoring period.

Figure 3.6 Five-year trend data for nitrogen dioxide at Mildenhall monitoring sites



7.8 Newmarket

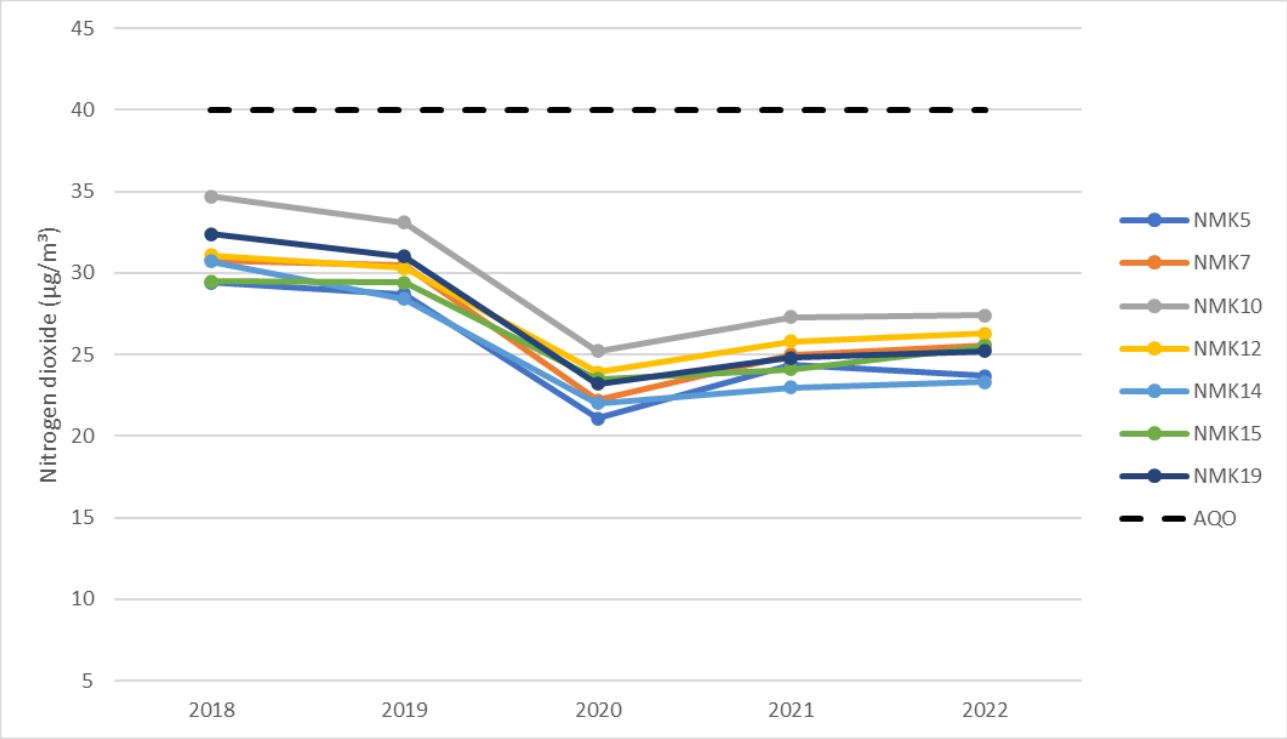
Newmarket continues to show concentrations of nitrogen dioxide below (that is compliant with) the air quality objective level, with the highest concentration of nitrogen dioxide recorded at monitoring point NMK10 (adjacent to the taxi rank on the High Street) as 27.4µg/m^3, although this has reduced from 34.7µg/m^3 in 2018.

All the monitoring locations within the former Newmarket AQMA, which was revoked in September 2021, remain well below the objective level.

Recorded levels in 2022 were broadly comparable to those measured in 2021, with some sites slightly higher and others slightly lower. However, results from all sites remain lower than those from 2019 and other pre-pandemic years.

Figure 3.7 shows the five-year trend of nitrogen dioxide from the seven monitoring locations in Newmarket with the highest records of nitrogen dioxide in 2022.

Figure 3.7 Five-year trend data for nitrogen dioxide at selected Newmarket monitoring sites



7.9 Tuddenham

A single monitoring point was introduced in the village of Tuddenham at the beginning of 2023 at the request of the p arish council; this showed relatively low levels of pollution at 15.8µg/m^3, being less than half of the annual mean objective of 40µg/m^3. We will undertake a second year's monitoring in Tuddenham.

Appendix A: Monitoring results

Table A.1 – 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)	Distance to kerb of nearest road (m)	Tube height (m)
BRN2	Brandon – 104 London Road	Roadside	577993	286163	NO_2	Not in AQMA	3.3	1.7	2.2
BRN3	Brandon - Town Hall	Urban centre	578406	286460	NO_2	Not in AQMA	0 - hourly Not applicable - annual	Not applicable	2.4
BRN5	Brandon - 52 London Road	Roadside	578206	286407	NO_2	Not in AQMA	7.0	1.1	2.2
BRN7	Brandon - London Road and Church Road	Kerbside	578073	286254	NO_2	Not in AQMA	8.0	1.0	2.1
BRN9	Brandon - Riverside Lodge, High Street	Kerbside	578372	286867	NO_2	Not in AQMA	3.3	0.3	2.2
BRN10	Brandon - 'Boots', High Street	Roadside	578395	286633	NO_2	Not in AQMA	0 - hourly 0.5 -annual	2.5	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)	Distance to kerb of nearest road (m)	Tube height (m)
BRN12	Brandon - 1 Thetford Road	Roadside	578486	286558	NO_2	Not in AQMA	0.0	1.7	2.1
BRN15	Brandon - 92B High Street	Roadside	578317	287103	NO_2	Not in AQMA	3.6	1.5	2.2
BRN17	Brandon - 25 London Road	Roadside	578297	286469	NO_2	Not in AQMA	0.0	1.2	2.1
LAK1	Lakenheath - Zebra Crossing	Kerbside	571378	282855	NO_2	Not in AQMA	3.5	1.0	2.1
MLD1	Mildenhall – 8 North Terrace	Roadside	571136	274878	NO_2	Not in AQMA	1.5	1.9	2.1
MLD2	Mildenhall – 2 Queensway	Roadside	571092	274785	NO_2	Not in AQMA	0.0	1.8	2.3
MLD3	Mildenhall - 14 Kingsway	Roadside	571326	274780	NO_2	Not in AQMA	0.5	2.0	2.1
NMK1	Newmarket – 23 Old Station Road	Roadside	564716	263502	NO_2	Not in AQMA	0.0	2.0	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)	Distance to kerb of nearest road (m)	Tube height (m)
NMK3	Newmarket - Old Station Road and Rous Road	Roadside	564707	263493	NO_2	Not in AQMA	2.0	1.7	2.2
NMK5	Newmarket - 'Café Nero' crossing	Kerbside	564337	263343	NO_2	Not in AQMA	0 – hourly Not applicable - annual	<1.0	2.2
NMK6	Newmarket - 'KFC' downpipe	Roadside	564307	263338	NO_2	Not in AQMA	0 – hourly 0 - annual	6.5	2.3
NMK7	Newmarket - 'White Hart' crossing	Kerbside	564233	263274	NO_2	Not in AQMA	0 – hourly 5.9 - annual	1.0	2.3
NMK8	Newmarket - Park area	Urban background	564138	263301	NO_2	Not in AQMA	0 – hourly Not applicable - annual	not applicable	2.2
NMK9	Newmarket - Blackbear Lane and High Street	Kerbside	564043	263159	NO_2	Not in AQMA	3.0	0.6	2.3

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)	Distance to kerb of nearest road (m)	Tube height (m)
NMK10	Newmarket - Taxi rank	Roadside	564362	263381	NO_2	Not in AQMA	0 – hourly Not applicable - annual	<1.0	2.3
NMK11	Newmarket - Market St 'EE'	Urban centre	564380	263407	NO_2	Not in AQMA	0 – hourly Not applicable - annual	11.0	2.0
NMK12	Newmarket - Clock tower crossing	Roadside	564550	263544	NO_2	Not in AQMA	0 – hourly 0.3 - annual	2.5	2.1
NMK14	Newmarket - 'Rutland Arms' crossing	Kerbside	564480	263464	NO_2	Not in AQMA	0 – hourly Not applicable - annual	<1.0	2.3
NMK15	Newmarket - 'Savers' lamppost	Roadside	564383	263381	NO_2	Not in AQMA	0 – hourly 5.5 annual	2.5	2.3
NMK17	Newmarket – Exning Road and Depot Road	Roadside	563397	264498	NO_2	Not in AQMA	6.1	1.8	2.1

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)	Distance to kerb of nearest road (m)	Tube height (m)
NMK19	Newmarket - Old Station Road, Nancy's Tearoom	Kerbside	564626	263525	NO_2	Not in AQMA	1.9	0.5	2.1
TUD1	Tuddenham - 37 High Street	Roadside	573521	271656	NO_2	Not in AQMA	0.3	1.5	2.0
IXW1	Ixworth Micklesmere Drive	Roadside	593655	270127	NO_2	Not in AQMA	0.0	3.0	2.1
IXW2	Ixworth High Street	Roadside	593281	270545	NO_2	Not in AQMA	0.0	1.8	2.1
BSE1	BSE - 2 Sicklesmere Road	Roadside	586253	263147	NO_2	Yes - Sicklesmere Road, Bury St Edmunds, AQMA	0.0	1.7	2.1
BSE2	BSE - 14 Sicklesmere Road	Roadside	586320	263053	NO_2	Not in AQMA	0.0	4.0	2.0
BSE3	BSE - Cullum Road roundabout	Roadside	585236	263746	NO_2	Not in AQMA	0.0	3.4	2.0

Diffusion tube ID	Site name	Site type	X OS Grid ref (easting)	Y OS Grid ref (northing)	Pollutants monitored	In AQMA? Which AQMA?	Distance to relevant exposure (m)	Distance to kerb of nearest road (m)	Tube height (m)
BSE6	BSE - Kings Road roundabout	Roadside	584905	264171	NO_2	Not in AQMA	2.4	2.4	2.2
BSE8	BSE - Fornham Road (Northgate roundabout)	Roadside	585461	265050	NO_2	Not in AQMA	6.0	1.5	2.0
BSE9	BSE - Fornham Road (Tollgate)	Roadside	585085	265924	NO_2	Not in AQMA	2.8	1.5	2.2
BSE14	BSE - 19F Mustow Street	Roadside	585624	264334	NO_2	Not in AQMA	0.2	2.3	2.2
BSE15	BSE - 7 Sicklesmere Road	Roadside	586273	263135	NO_2	Yes - Sicklesmere Road, Bury St Edmunds, AQMA	0.0	1.2	2.0
BSE16	BSE - Northgate Lodge Roundabout	Roadside	585424	264977	NO_2	Not in AQMA	0.4	1.2	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)	Distance to kerb of nearest road (m)	Tube height (m)
BSE17	BSE - Tayfen Road (Ipswich Street Junction)	Roadside	585264	264921	NO_2	Not in AQMA	Not applicable	2.1	1.9
BSE18	BSE – 68-69 Southgate Street	Roadside	586126	263328	NO_2	Not in AQMA	0.2	1.6	1.9
BSE19	BSE - Out Risbygate	Roadside	584618	264471	NO_2	Not in AQMA	0.5	1.5	2.0
BSE20	BSE - Risbygate Street	Roadside	585031	264466	NO_2	Not in AQMA	0.0	3.4	2.0
BSE21	BSE - Northgate Street	Roadside	585555	264494	NO_2	Not in AQMA	0.0	2.6	2.0
BSE23	BSE - Guildhall Street	Roadside	585285	263841	NO_2	Not in AQMA	0.3	1.0	2.0
BSE25	BSE - Orttewell Road	Roadside	587454	264216	NO_2	Not in AQMA	10 – hourly Not applicable annual	1.0	2.0

Diffusion tube ID	Site name	Site type	X OS Grid ref (easting)	Y OS Grid ref (northing)	Pollutants monitored	In AQMA? Which AQMA?	Distance to relevant exposure (m)	Distance to kerb of nearest road (m)	Tube height (m)
BSE26	BSE - 24 Kings Road	Roadside	584957	264164	NO_2	Not in AQMA	0.0	1.2	2.0
BSE27	BSE - Westgate Street	Roadside	585349	263781	NO_2	Not in AQMA	0.0	1.6	2.0
BSE28	BSE - Tayfen Road – New Havebury Housing	Roadside	585314	264960	NO_2	Not in AQMA	0.0	1.4	2.2
BSE29	BSE - 7 Southgate Street	Roadside	585845	263730	NO_2	Not in AQMA	0.2	1.1	2.0
BSE30	BSE - St Andrews Street South	Urban centre	585185	264285	NO_2	Not in AQMA	0 – hourly Not applicable annual	1.5	2.3
BSE31	BSE - Newmarket Road/Western Way	Roadside	583648	264767	NO_2	Not in AQMA	2.0	1.2	2.0
GB2	Downing Drive	Suburban	588917	267370	NO_2	Not in AQMA	Not applicable	1.5	1.9
GB3	The Forge Bungalows	Roadside	589163	267013	NO_2	Not in AQMA	4.0	1.4	2.3

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)	Distance to kerb of nearest road (m)	Tube height (m)
GB4a,GB4b, GB4c	Post Office (lamppost)	Roadside	589130	266969	NO_2	Not in AQMA	0.0	1.4	2.4
GB5	Church Road junction	Roadside	588993	266838	NO_2	Not in AQMA	22.0	1.3	2.2
GB6	Post Office 2, Telegraph Pole	Roadside	589120	266960	NO_2	Yes - Great Barton AQMA	0.3	1.0	2.4
GB7a, GB7b, GB7c	The Drift, 8 The Street	Roadside	589100	266941	NO_2	Yes - Great Barton AQMA	0.0	1.1	2.2
GB8	Opposite AQMA 1	Roadside	589093	266949	NO_2	Not in AQMA	Not applicable	1.3	2.1
GB9	Opposite AQMA 2	Roadside	589117	266970	NO_2	Not in AQMA	Not applicable	1.3	2.1
GB10	Between Crossing and Garage	Roadside	589228	267071	NO_2	Not in AQMA	5.0	1.3	2.1
HH1	Shetland Road	Suburban	568609	245575	NO_2	Not in AQMA	Not applicable	1.7	2.3
HH2	Wratting Road	Roadside	567270	245981	NO_2	Not in AQMA	3.0	1.8	2.1

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)	Distance to kerb of nearest road (m)	Tube height (m)
HH3	29 Withersfield Road	Roadside	566891	245892	NO_2	Not in AQMA	2.4	1.7	2.2
HH5	22 Withersfield Road	Roadside	566941	245850	NO_2	Not in AQMA	0.3	1.4	2.1
HH7	Mount Road	Kerbside	567553	245289	NO_2	Not in AQMA	1.6	0.1	2.1

Table A.2 – Annual mean NO_2 monitoring results: Non-automatic monitoring (µg/m^3)

Note: The annual mean concentrations are presented as µg/m3 and have been corrected for bias. All annual means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75 per cent. See Appendix C for details. Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment. Exceedances of the NO2 annual mean objective of 40µg/m3 are shown in bold. All diffusion tube locations were monitored for the full calendar year.

Diffusion tube ID	X OS grid reference (easting)	Y OS grid reference (northing)	Site type	Valid data capture 2022 (per cent)	2018	2019	2020	2021	2022
BRN2	577993	286163	Roadside	92.3 per cent	28.6	26.4	22.2	24.6	24.7
BRN3	578406	286460	Urban centre	92.3 per cent	12.6	13.5	10.4	10.9	10.2
BRN5	578206	286407	Roadside	75.0 per cent	31.1	27.4	21.0	23.4	24.7
BRN7	578073	286254	Kerbside	82.7 per cent	31.5	29.5	25.9	26.3	27.3
BRN9	578372	286867	Kerbside	82.7 per cent	28.2	22.5	17.4	21.1	22.0
BRN10	578395	286633	Roadside	75.0 per cent	30.4	36.1	23.8	26.3	26.0
BRN12	578486	286558	Roadside	92.3 per cent	23.1	23.1	18.1	18.3	19.7
BRN15	578317	287103	Roadside	84.6 per cent	28.1	27.9	20.0	24.2	22.3
BRN17	578297	286469	Roadside	59.6 per cent				19.3	17.7
LAK1	571378	282855	Kerbside	82.7 per cent	18.4	19.7	15.4	16.1	16.0
MLD1	571136	274878	Roadside	82.7 per cent	21.8	25.9	20.2	21.8	20.9
MLD2	571092	274785	Roadside	92.3 per cent	27.7	27.5	19.6	22.4	23.1
MLD3	571326	274780	Roadside	75.0 per cent	34.0	33.2	25.8	25.3	27.9
NMK1	564716	263502	Roadside	76.9 per cent	24.3	23.9	19.5	20.9	20.2
NMK3	564707	263493	Roadside	92.3 per cent	26.6	27.1	21.3	20.9	20.8
NMK5	564337	263343	Kerbside	92.3 per cent	29.4	28.7	21.1	24.4	23.7

Diffusion tube ID	X OS grid reference (easting)	Y OS grid reference (northing)	Site type	Valid data capture 2022 (per cent)	2018	2019	2020	2021	2022
NMK6	564307	263338	Roadside	92.3 per cent	26.5	24.6	18.9	22.6	22.0
NMK7	564233	263274	Kerbside	92.3 per cent	30.8	30.5	22.2	25.0	25.6
NMK8	564138	263301	Urban background	82.7 per cent	13.8	14.0	11.6	10.6	11.1
NMK9	564043	263159	Kerbside	75.0 percent	24.0	24.2	18.7	21.5	22.4
NMK10	564362	263381	Roadside	82.7 percent	34.7	33.1	25.2	27.3	27.4
NMK11	564380	263407	Urban centre	92.3 percent	17.1	17.2	12.9	13.9	14.0
NMK12	564550	263544	Roadside	92.3 percent	31.1	30.3	23.9	25.8	26.3
NMK14	564480	263464	Kerbside	92.3 percent	30.7	28.4	22.0	23.0	23.3
NMK15	564383	263381	Roadside	82.7 percent	29.5	29.4	23.5	24.1	25.5
NMK17	563397	264498	Roadside	82.7 percent	20.3	21.4	16.1	16.6	16.2
NMK19	564626	263525	Kerbside	92.3 percent	32.4	31.0	23.2	24.8	25.2
TUD1	573521	271656	Roadside	92.3 percent					15.8
IXW1	593655	270127	Roadside	92.3 percent				16.3	16.6
IXW2	593281	270545	Roadside	92.3 percent				18.3	17.5
BSE1	586253	263147	Roadside	75.0 percent	39.2	36.6	28.9	31.8	31.3
BSE2	586320	263053	Roadside	92.3 percent	27.4	25.0	20.6	20.8	20.9
BSE3	585236	263746	Roadside	82.7 percent	26.2	25.9	21.0	21.8	21.8
BSE6	584905	264171	Roadside	82.7 percent	39.4	32.7	22.7	26.0	27.9
BSE8	585461	265050	Roadside	75.0 percent	30.7	27.9	22.2	25.9	25.2
BSE9	585085	265924	Roadside	82.7 percent	33.6	32.0	22.3	25.1	25.1
BSE14	585624	264334	Roadside	84.6 percent	34.0	30.2	22.7	24.1	26.4
BSE15	586273	263135	Roadside	92.3 percent	36.0	30.1	24.7	30.2	27.4

Diffusion tube ID	X OS grid reference (easting)	Y OS grid reference (northing)	Site type	Valid data capture 2022 (per cent)	2018	2019	2020	2021	2022
BSE16	585424	264977	Roadside	82.7 percent	31.9	33.3	24.2	26.6	26.7
BSE17	585264	264921	Roadside	84.6 percent	31.3	37.2	28.4	26.1	23.5
BSE18	586126	263328	Roadside	92.3 percent	29.1	26.8	20.6	22.4	22.6
BSE19	584618	264471	Roadside	69.2 percent	30.8	29.4	18.3	22.5	22.2
BSE20	585031	264466	Roadside	75.0 percent		18.1	13.4	16.8	14.5
BSE21	585555	264494	Roadside	76.9 percent		26.7	20.7	23.4	22.6
BSE23	585285	263841	Roadside	82.7 percent		18.4	13.8	15.1	14.4
BSE25	587454	264216	Roadside	92.3 percent		16.3			16.2
BSE26	584957	264164	Roadside	92.3 percent		26.7	18.8	21.2	22.3
BSE27	585349	263781	Roadside	82.7 percent		23.1	16.7	21.5	20.0
BSE28	585314	264960	Roadside	82.7 percent			20.6	26.3	26.1
BSE29	585845	263730	Roadside	92.3 percent			13.6	13.9	13.4
BSE30	585185	264285	Urban centre	82.7 percent			16.3	17.8	20.2
BSE31	583648	264767	Roadside	92.3 percent			22.5	24.0	24.5
GB2	588917	267370	Suburban	92.3 percent	10.3	10.5	8.5	7.6	7.9
GB3	589163	267013	Roadside	92.3 percent	26.2	27.2	22.2	22.2	22.4
GB4a, GB4b, GB4c	589130	266969	Roadside	92.3 percent	32.7	29.1	23.2	24.8	24.9
GB5	588993	266838	Roadside	84.6 percent	30.2	27.4	21.5	21.6	20.7
GB6	589120	266960	Roadside	92.3 percent	**48.5**	**45.1**	32.5	35.2	34.5
GB7a, GB7b, GB7c	589100	266941	Roadside	92.3 percent	**46.9**	**40.8**	31.1	32.4	33.4

Diffusion tube ID	X OS grid reference (easting)	Y OS grid reference (northing)	Site type	Valid data capture 2022 (per cent)	2018	2019	2020	2021	2022
GB8	589093	266949	Roadside	92.3 percent	**40.8**	33.1	28.0	29.6	28.1
GB9	589117	266970	Roadside	92.3 percent	**41.3**	34.3	25.4	26.8	25.2
GB10	589228	267071	Roadside	92.3 percent			21.2	22.0	24.7
HH1	568609	245575	Suburban	92.3 percent	12.3	12.1	10.3	10.5	10.3
HH2	567270	245981	Roadside	92.3 percent	28.8	28.5	25.6	26.9	27.1
HH3	566891	245892	Roadside	92.3 percent	33.8	31.2	27.4	27.6	28.6
HH5	566941	245850	Roadside	92.3 percent	33.1	30.0	27.4	29.6	29.9
HH7	567553	245289	Kerbside	92.3 percent				14.7	14.1

West Suffolk Council can confirm that:

- annualisation has been conducted where data capture is less than 75 percent and greater than 25 percent in line with LAQM.TG16
- diffusion tube data has been bias adjusted.
- reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), that is, prior to any fall-off with distance correction.

Table A.3 – Annual mean NO2 monitoring results for sites monitored in last five years but not during 2022: non-automatic monitoring (µg/m3)

Note: The annual mean concentrations are presented as µg/m^3 and have been corrected for bias. All annual means have been 'annualised' as per LAQM.TG16 if valid data capture for the full calendar year is less than 75 percent. Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment. Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in bold.

Diffusion tube ID	Site name	X OS Grid ref (Easting)	Y OS Grid ref (Northing)	Site type	2018	2019	2020	2021	2022
BRN1	Brandon – 6 Church Road	578044	286249	Roadside	19.7	21.0	17.1		
BRN4	Brandon – London Road - Stores Street	578351	286503	Roadside	27.2				
BRN6	Brandon - London Rd - Coulson Lane	578270	286467	Roadside	22.4	22.5			
BRN8	Brandon - Hellesdon House, High Street	578372	286774	Roadside	22.6	23.0	20.2	21.1	
BRN13	Brandon - 25 George Street	578502	286484	Roadside	18.0	18.7			
BRN14	Brandon - 28 Bury Road	578479	286320	Roadside	19.5	18.8			
BRN16	Brandon – 83 / 85 London Road	578176	286357	Roadside			24.3		
LAK2	Lakenheath - Albert Rolph Drive	572071	281607	Suburban	10.6				

Diffusion tube ID	Site name	X OS Grid ref (Easting)	Y OS Grid ref (Northing)	Site type	2018	2019	2020	2021	2022
NMK2	Newmarket – 36 Old Station Road	564689	263500	kerbside	27.7	28.5	23.2		
BSE5	BSE - Horringer Road lights	584703	263483	Roadside	21.7	20.8			
BSE7	BSE - Northgate Lodge Roundabout	585446	264956	Roadside	25.9	24.2			
BSE10	BSE - Samson Close	584498	266084	Suburban	12.6				
BSE22	BSE - Churchgate Street	585508	264072	Roadside		19.4			
BSE24	BSE - Hollow Road Bridge	586418	265179	Roadside		30.2	25.2	26.6	

Appendix B: Full monthly diffusion tube results for 2022

Table B.1 – NO_2 2022 diffusion tube results (µg/m^3)

Notes: No sites required distance correction. See Appendix C for details on bias adjustment and annualisation. Data received from the laboratory for November 2022 contained a number of significant errors and has therefore been excluded.

Diffusion tube 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 (0.76)	Comment
BRN2	577993	286163	43.2	34.2	38.8	32.8	27.6	30.6	30.8	31.2	28.2	31.1		28.7	32.5	24.7	
BRN3	578406	286460	23.4	17.4	15.9	12.2	10.3	8.8	9.9	8.8	11.2	12.9		16.3	13.4	10.2	
BRN5	578206	286407	47.8	36.2	35.6	25.9	25.8	26.6	27.8		30.1			37.1	32.5	24.7	
BRN7	578073	286254	42.1	35.9	45.5	34.1	31.4	31.8	33.7	35.7	33.7	35.3			35.9	27.3	
BRN9	578372	286867	35.0	26.1	37.9	29.1	21.4	22.6	28.5	32.8	28.3			28.0	29.0	22.0	
BRN10	578395	286633	35.6	28.2	53.6	36.4		24.2	33.9		33.1	32.2		30.7	34.2	26.0	
BRN12	578486	286558	41.0	27.7	25.2	23.0	23.8	23.2	23.8	23.0	23.5	20.4		30.3	25.9	19.7	
BRN15	578317	287103	36.1	26.8		32.4	24.8	23.5	29.5	31.7	32.4	27.3		29.0	29.4	22.3	
BRN17	578297	286469	32.0	26.1	31.5	24.8	23.9		20.0			24.5			26.1	17.7	
LAK1	571378	282855	31.1	21.0	30.6	19.4	15.7	14.4	17.8	18.9	19.1	22.9			21.1	16.0	
MLD1	571136	274878	36.4	21.9	35.5	25.9	24.5	24.3	23.6	26.6	30.5	26.2			27.5	20.9	
MLD2	571092	274785	37.6	33.8	34.2	27.1	29.4	30.0	28.8	27.0	25.8	30.9		29.8	30.4	23.1	
MLD3	571326	274780	50.2	38.8	51.2	30.7		29.0	30.3		29.0	32.2		38.5	36.7	27.9	
NMK1	564716	263502	39.3	24.5		29.6	21.8	19.4	22.4	27.7		24.3		30.8	26.6	20.2	
NMK3	564707	263493	39.2	32.0	30.1	24.0	27.0	22.9	23.4	23.0	21.2	26.4		31.8	27.4	20.8	
NMK5	564337	263343	37.6	32.1	37.8	27.6	26.4	29.2	27.5	31.1	30.9	31.0		31.9	31.2	23.7	
NMK6	564307	263338	38.1	27.7	31.0	30.7	25.8	25.5	26.9	29.0	28.6	28.7		26.0	28.9	22.0	
NMK7	564233	263274	41.5	35.6	36.1	36.1	31.8	29.1	30.5	33.4	33.5	31.6		31.6	33.7	25.6	
NMK8	564138	263301	26.8	15.9	22.8	10.8	9.4	9.6	8.6	10.6	11.6			20.5	14.7	11.1	
NMK9	564043	263159	37.4	26.2	35.9	31.2	23.5	26.1	23.8	30.1		30.7			29.4	22.4	
NMK10	564362	263381	55.7	38.9	33.3	40.4		30.1	30.5	32.5	32.8	30.7		35.8	36.1	27.4	
NMK11	564380	263407	29.1	17.6	25.4	17.6	13.4	13.8	12.8	15.9	15.1	19.7		21.8	18.4	14.0	
NMK12	564550	263544	51.4	37.4	36.3	35.3	33.7	30.2	26.8	32.1	30.8	31.3		34.9	34.6	26.3	
NMK14	564480	263464	42.6	24.6	33.9	29.4	23.3	28.8	27.0	29.3	28.7	34.1		35.0	30.6	23.3	
NMK15	564383	263381	45.0	33.2	42.3	31.3	27.6	30.4	26.9	30.9	29.2	38.5			33.5	25.5	
NMK17	563397	264498	35.7	23.8	29.5	18.3	16.1	15.7	16.2	17.4	19.1	21.7			21.4	16.2	
NMK19	564626	263525	46.0	31.9	40.1	28.9	28.8	31.5	31.8	29.5	30.7	34.6		31.5	33.2	25.2	
TUD1	573521	271656	30.6	21.2	26.5	19.2	20.7	16.0	16.5	19.0	20.2	17.5		22.0	20.9	15.8	
IXW1	593655	270127	25.4	15.2	41.5	21.9	18.3	16.2	19.7	23.5	15.7	23.7		19.8	21.9	16.6	

Diffusion tube 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 (0.76)	Comment
IXW2	593281	270545	35.4	22.4	27.4	20.5	21.0	20.0	17.7	18.5	21.0	21.8		27.5	23.0	17.5	
BSE1	586253	263147	56.6		46.7	37.6	39.9	36.7	39.7	37.0	42.5	33.7			41.2	31.3	
BSE2	586320	263053	39.2	28.9	31.6	23.7	25.1	23.8	22.8	22.4	26.4	25.3		32.6	27.4	20.9	
BSE3	585236	263746	40.3	32.1	33.4	28.8	27.0	25.4	23.9	24.7	24.8	26.1			28.7	21.8	
BSE6	584905	264171	46.5	34.3	52.0	34.3	28.8	31.3	32.5	35.1	36.9	34.8			36.7	27.9	
BSE8	585461	265050	38.8	30.9	47.6	33.8	26.4		26.6	30.4	29.4	34.0			33.1	25.2	
BSE9	585085	265924	39.0	28.5	45.6	28.3	30.3	30.5	28.1	35.1	31.2	33.7			33.0	25.1	
BSE14	585624	264334	44.0	34.5		29.1	30.2	33.4	31.9	34.6	35.1	37.7		37.1	34.8	26.4	
BSE15	586273	263135	49.0	33.0	50.6	30.6	27.4	28.2	33.3	32.6	35.4	36.5		39.9	36.0	27.4	
BSE16	585424	264977	50.7	37.4	45.7	31.1	28.9	28.9	28.4	32.3	32.3	35.0			35.1	26.7	
BSE17	585264	264921		28.5	43.4	27.8	25.5	29.5	25.1	30.4	29.5	36.1		33.1	30.9	23.5	
BSE18	586126	263328	43.5	26.4	42.7	29.8	21.8	20.9	26.5	26.3	30.3	27.1		31.1	29.7	22.6	
BSE19	584618	264471		32.1	43.3	28.1	26.6	27.1	25.2			29.2		32.7	30.5	22.2	
BSE20	585031	264466	29.8	21.7		19.2	14.1	15.6	14.9	16.9	18.7	20.3			19.0	14.5	
BSE21	585555	264494	41.4			24.2	26.0	28.1	24.2	26.3	29.6	32.7		35.5	29.8	22.6	
BSE23	585285	263841	30.8	20.1	28.7	17.6		12.7	12.2	14.6	15.9	19.3		17.6	19.0	14.4	
BSE25	587454	264216	31.6	18.4	32.5	20.0	15.1	17.5	19.0	17.7	23.1	22.1		17.5	21.3	16.2	
BSE26	584957	264164	38.4	28.4	38.2	23.4	25.9	24.7	23.4	27.6	24.3	30.6		37.5	29.3	22.3	
BSE27	585349	263781	33.7	24.8	33.0	29.1		19.6	23.3	23.1	26.1	22.5		27.3	26.3	20.0	
BSE28	585314	264960	39.2	26.8	44.1	31.2	32.8	27.4	32.7	35.3	33.6	40.1			34.3	26.1	
BSE29	585845	263730	29.6	19.8	25.0	15.2	13.0	11.7	12.8	12.7	14.2	16.4		22.9	17.6	13.4	
BSE30	585185	264285	31.2	19.7	38.8	24.5	16.7	20.8	20.3	20.6	21.7	51.2			26.6	20.2	
BSE31	583648	264767	43.4	30.0	43.9	28.2	24.3	29.9	31.9	29.2	28.2	32.7		33.2	32.3	24.5	
GB2	588917	267370	17.2	14.2	15.2	8.4	8.0	7.0	6.0	8.0	6.6	10.5		12.7	10.3	7.9	
GB3	589163	267013	43.0	35.2	32.8	22.1	25.2	29.9	24.7	22.3	23.1	30.5		35.0	29.4	22.4	
GB4a	589130	266969	44.8	33.2	41.0	30.1	29.4	30.4	31.1	31.1	33.5	32.8			32.8	24.9	Triplicate site GB4a, GB4b and GB4c - Annual data provided as a single value for the triplicate
GB4b	589130	266969	43.1	33.0	39.4	29.9	26.9	27.8	27.2	30.6	32.7	31.9					
GB4c	589130	266969	44.4	32.2	41.1	29.9		25.7	27.7	32.3	33.0	32.1		31.9			
GB5	588993	266838		28.8	33.8	23.6	11.1	29.5	25.3	29.4	25.0	33.3		32.6	27.2	20.7	
GB6	589120	266960	55.9	41.0	53.6	36.9	42.1	44.2	42.3	40.9	45.6	46.4		50.2	45.4	34.5	
GB7a	589100	266941	42.1	39.8	55.2	38.5	40.5	43.1	41.9	42.5	41.6	45.1		45.6	43.9	33.4	

Diffusion tube 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 (0.76)	Comment
GB7b	589100	266941	47.6	39.9	53.1	39.3	41.8	44.7	40.7	46.7	42.5	43.1					Triplicate site GB7a, GB7b and GB7c - Annual data provided as a single value for triplicate
GB7c	589100	266941	51.1	34.7	56.1	40.6	41.0	42.2	42.1	44.5	43.6	42.9		48.8			
GB8	589093	266949	50.9	40.7	41.0	34.5	33.8	33.1	31.5	34.1	33.6	34.8		38.1	36.9	28.1	
GB9	589117	266970	43.3	36.1	37.1	31.0	30.7	31.4	28.9	29.2	28.3	32.7		35.8	33.1	25.2	
GB10	589228	267071	43.7	33.6	38.9	26.8	29.0	28.7	28.7	32.1	32.0	34.5		29.9	32.5	24.7	
HH1	568609	245575	26.7	20.2	16.2	10.8	9.4	8.9	8.6	8.6	8.3	15.3		15.5	13.5	10.3	
HH2	567270	245981	43.9	39.2	45.3	33.4	27.9	30.9	31.1	33.9	28.2	38.6		39.5	35.6	27.1	
HH3	566891	245892	52.2	43.3	39.5	29.3	33.0	34.1	32.1	31.1	34.9	41.7		42.9	37.6	28.6	
HH5	566941	245850	50.5	34.1	49.6	39.4	34.7	32.8	37.7	39.4	38.1	36.2		39.9	39.3	29.9	
HH7	567553	245289	19.5	23.9	23.9	15.5	15.1	16.1	13.5	16.5	16.2	20.6		23.9	18.6	14.1	

West Suffolk Council confirm that:

- 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 per cent and >25 per cent in line with LAQM.TG22
- The national bias adjustment factor has been used
- All 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System

Appendix C: Supporting technical information and air quality monitoring data quality assurance and quality control

New or changed sources identified within West Suffolk Council during 2022

West Suffolk Council has not identified any significant new sources relating to air quality within the reporting year of 2021.

Additional air quality works undertaken by West Suffolk Council during 2022

West Suffolk Council has not completed any additional modelling or monitoring works within the reporting year of 2021.

Quality assurance and quality control of diffusion tube monitoring

During 2022, West Suffolk Council used Socotec, based in Didcot, for the supply and processing of diffusion tubes. 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. This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of our UKAS schedule. In the AIR PT intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a satisfactory laboratory.

All monitoring has taken place in line with the 2022 diffusion tube monitoring calendar as published by Defra.

Diffusion tube annualisation

Annualisation is required for any site with data capture less than 75 percent but greater than 25 percent where results may not be reflective of the yearly average. Annualisation ensures that these sites are more reflective of a whole year's data rather than just the months where data was collected.

Annualisation was required for two diffusion tube monitoring locations in West Suffolk, BRN17 and BSE19, where data collection was 59.6 percent and 69.2 percent respectively. Annualisation was completed using the DEFRA diffusion tube data processing tool using data from automatic monitoring sites in Cambridgeshire (Wicken Fen) and Essex (St Osyth). Details of the annualisation process is included in Table C.1.

Table C.1 - Annualisation summary (concentrations presented in µg/m^3)

Site ID	Annualisation factor Wicken Fen	Annualisation factor St Osthys	Average Annualisation factor	Raw data annual mean	Annualised annual mean
BRN17	0.9568	0.8316	0.8942	26.1	23.4
BSE19	1.0121	0.9032	0.9576	30.5	29.2

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.

West Suffolk Council have applied a national bias adjustment factor of 0.76 to the 2022 monitoring data. A summary of bias adjustment factors used by West Suffolk Council over the past five years is presented in Table C.2.

Table C.2 – Bias adjustment factors from 2018 to 2022

Monitoring year	Local or national	If national, version of national spreadsheet	Adjustment factor
2022	National	03/23	0.76
2021	National	03/22	0.78
2020	National	03/21	0.77
2019	National	03/20	0.75
2018	National	03/19	0.76

NO_2 fall-off with distance from the road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website.

Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36µg/m^3 and the monitoring site is not located at a point of relevant exposure (taking the limitations of the calculator into account).

No diffusion tube NO_2 monitoring locations within West Suffolk met the above requirements distance correction during 2022.

Appendix D: Maps of monitoring locations and AQMAs

Figure D.1 – Map of non-automatic monitoring sites: Brandon

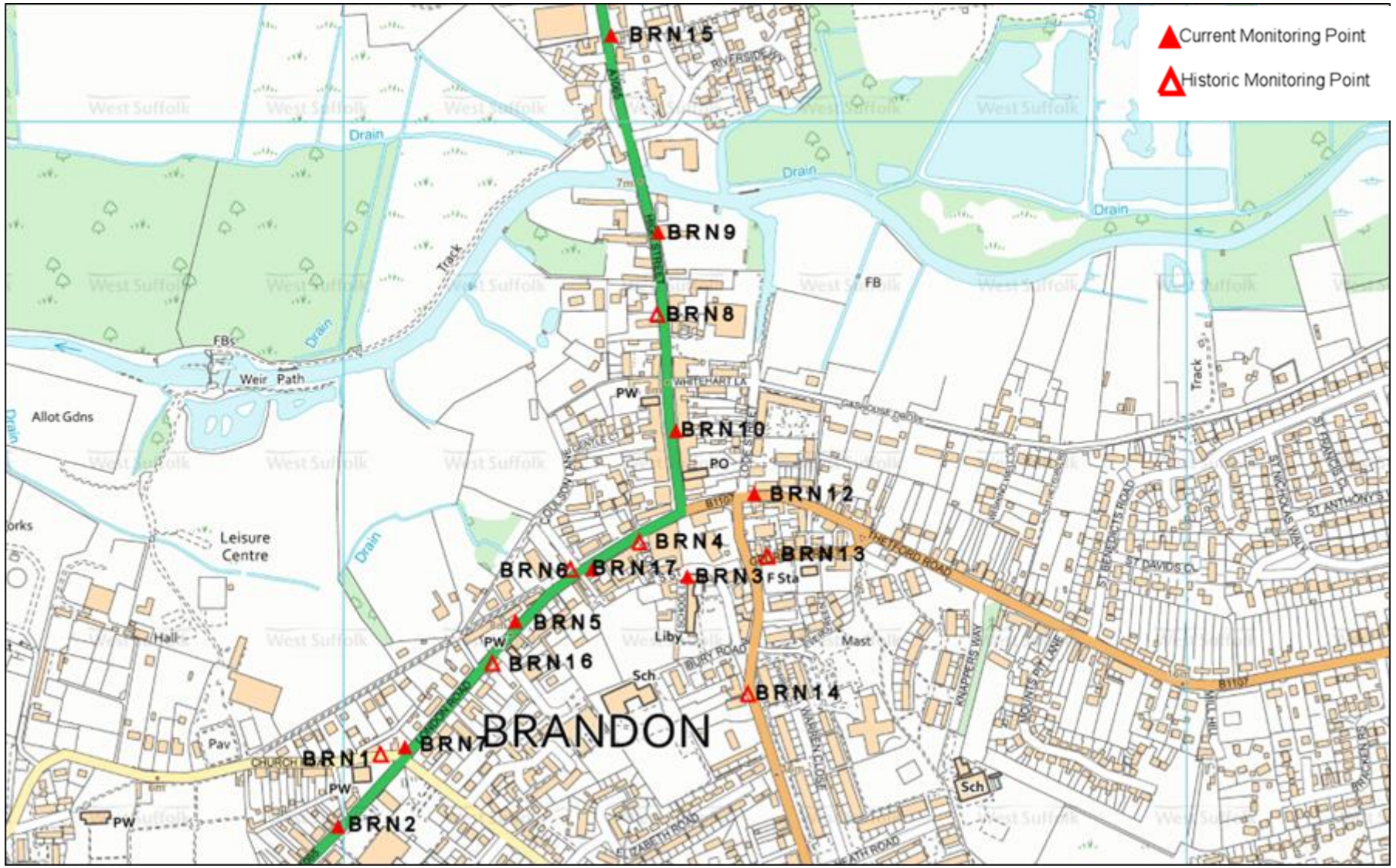


Figure D.2 – Map of non-automatic monitoring sites: Bury St Edmunds (north)

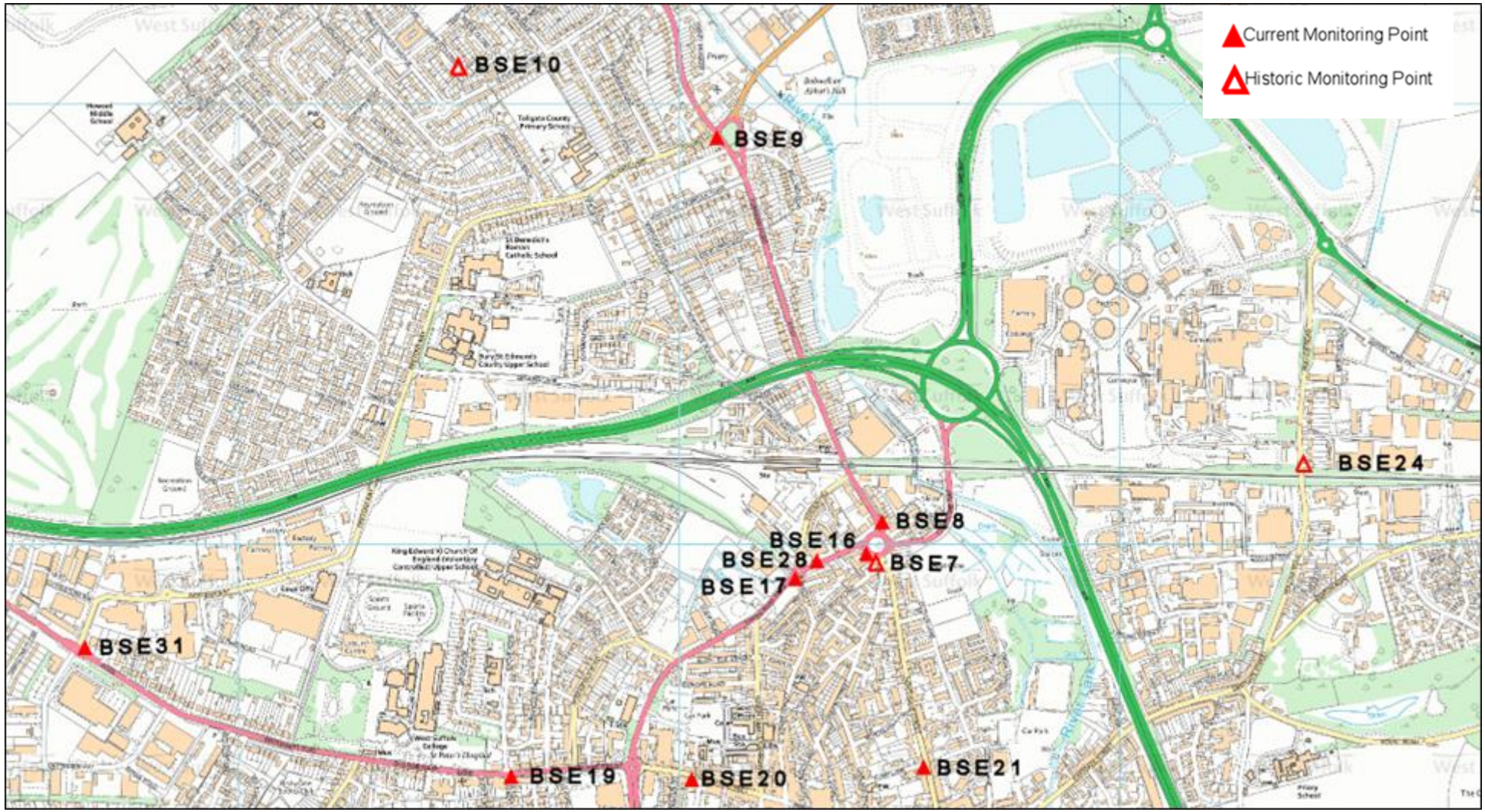
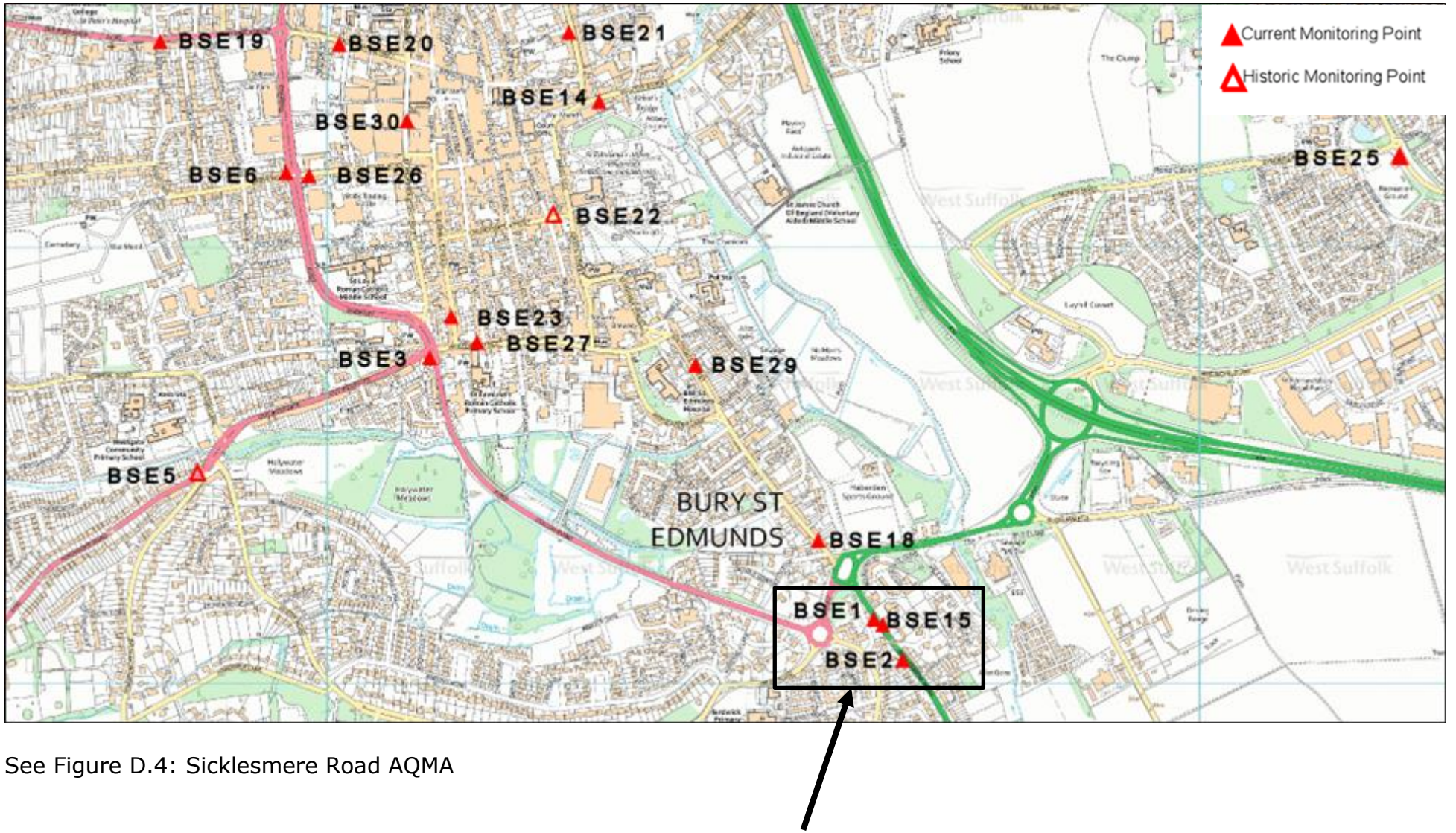


Figure D.3 – Map of non-automatic monitoring sites: Bury St Edmunds (south)



See Figure D.4: Sicklesmere Road AQMA

Figure D.4 – Map of Sicklesmere Road AQMA

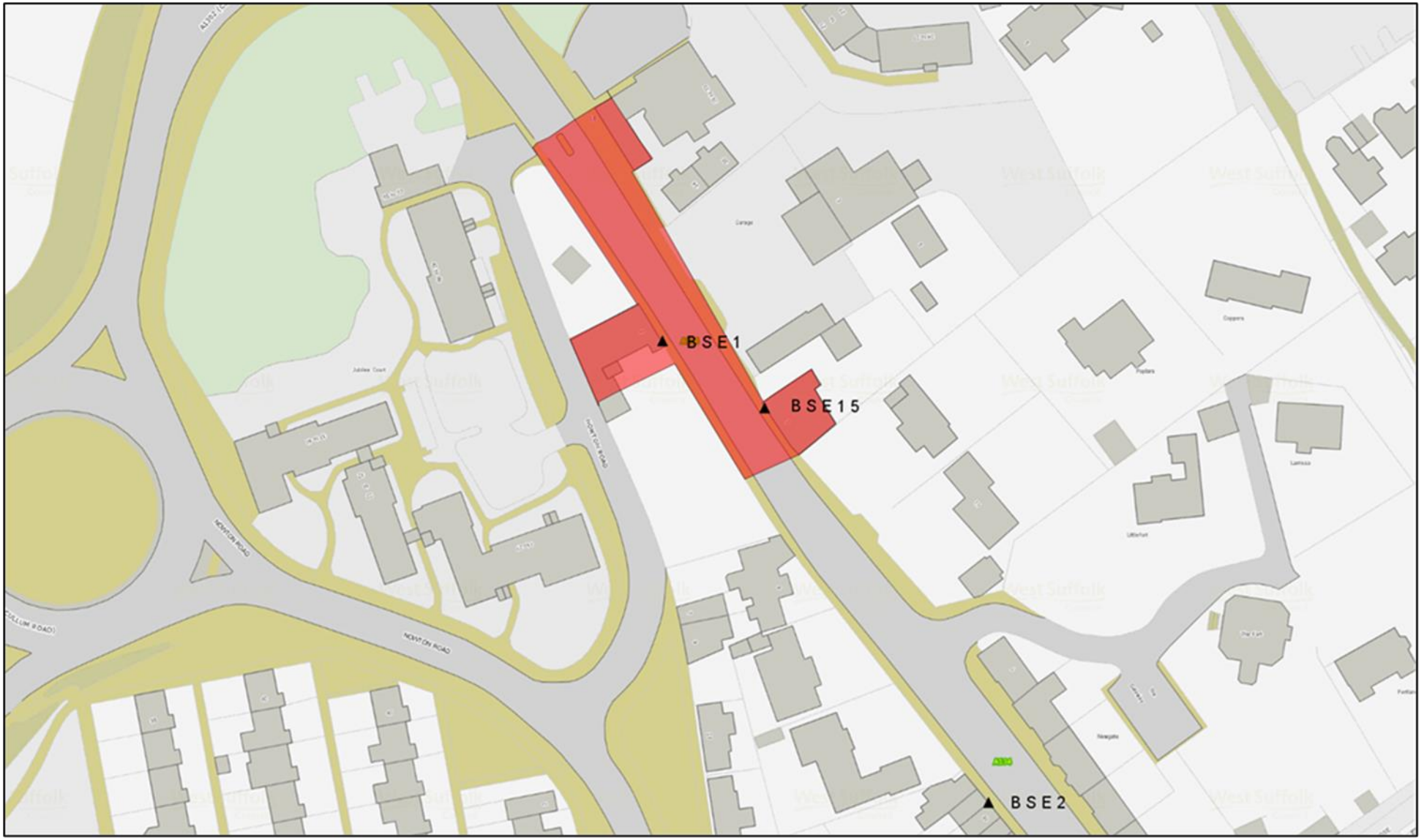


Figure D.5 – Map of non-automatic monitoring sites: Great Barton

See Figure D.6: Great Barton AQMA

Figure D.6 – Map of Great Barton AQMA

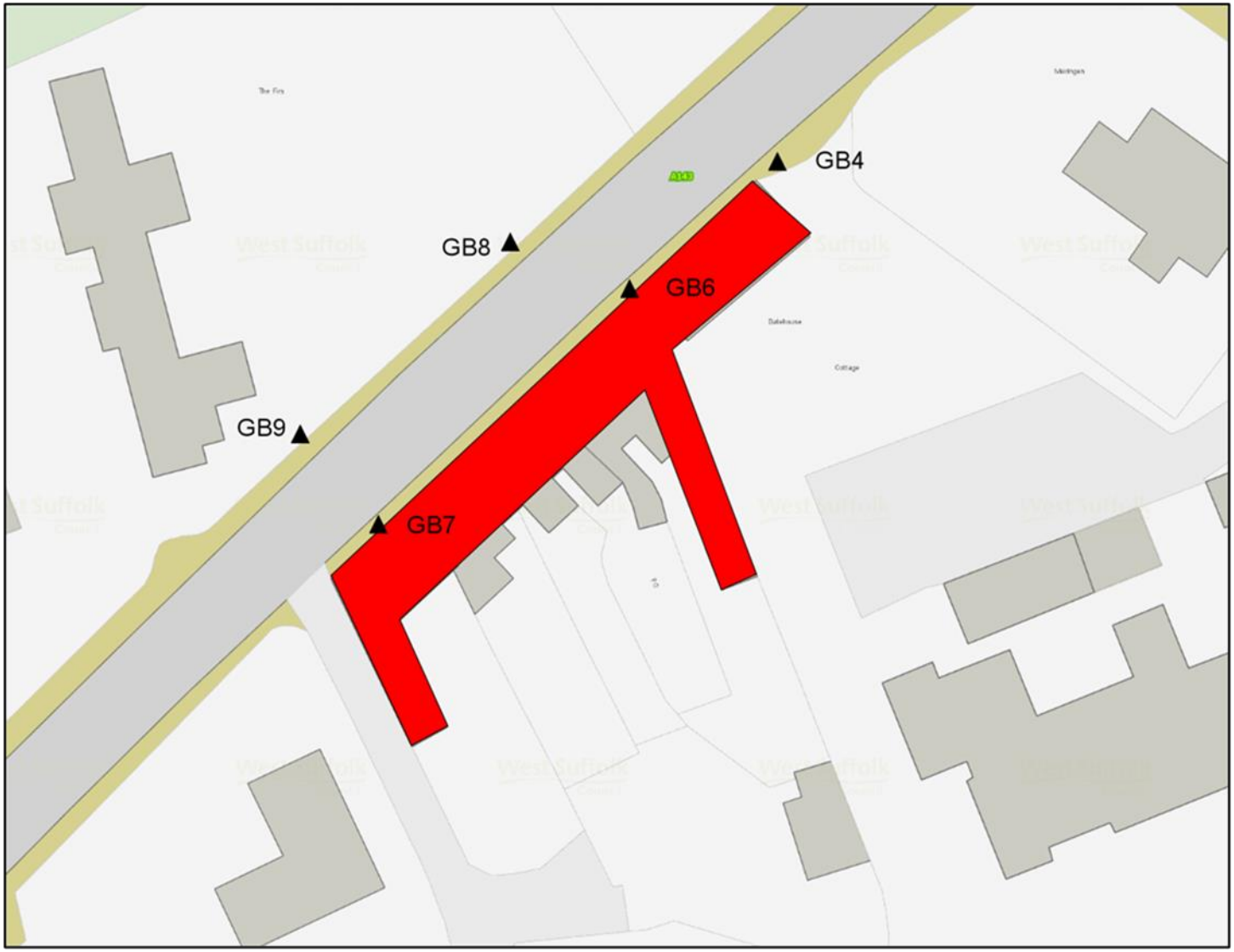


Figure D.7 – Map of non-automatic monitoring sites: Haverhill

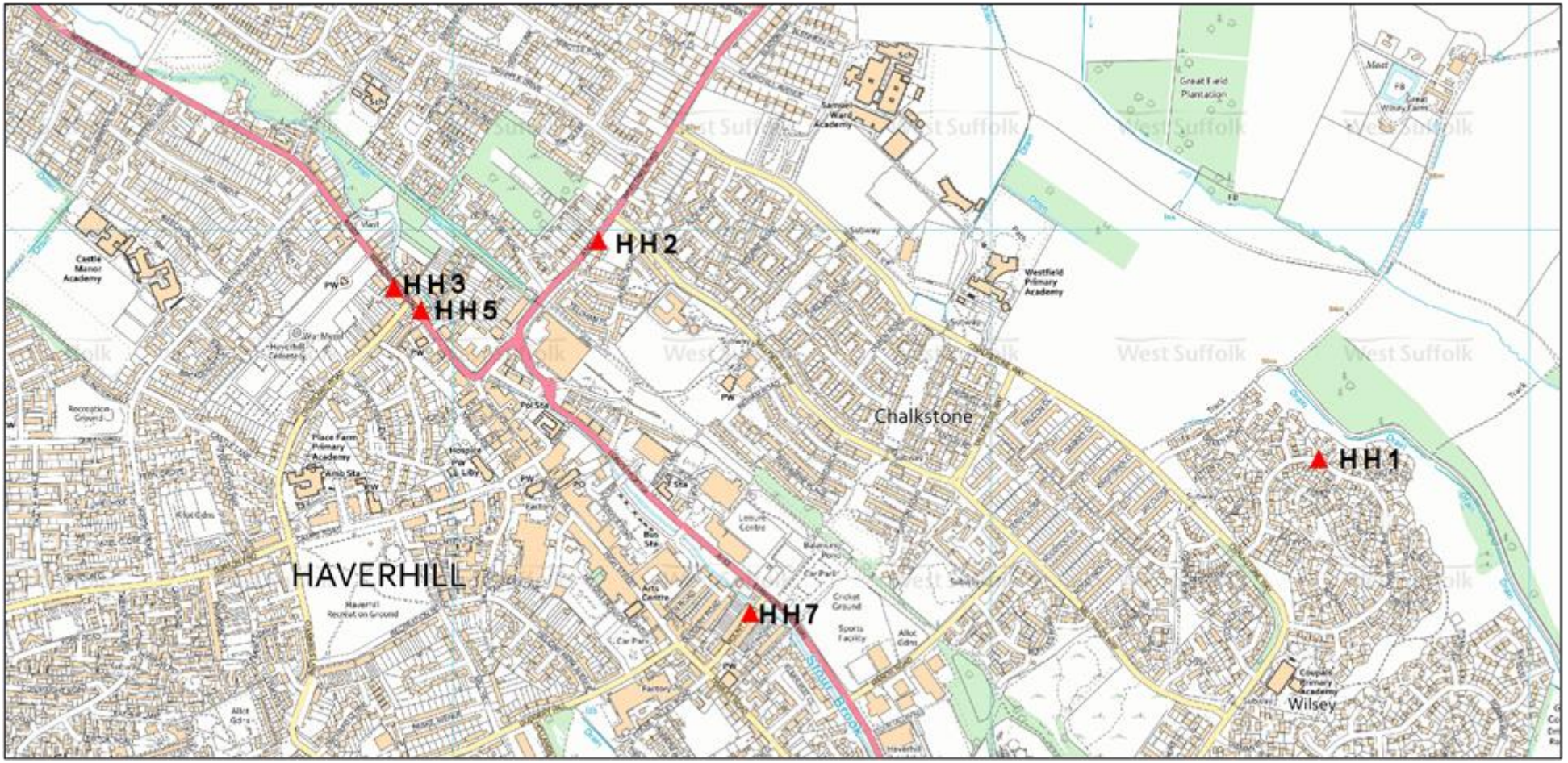


Figure D.8 – Map of non-automatic monitoring sites: Ixworth

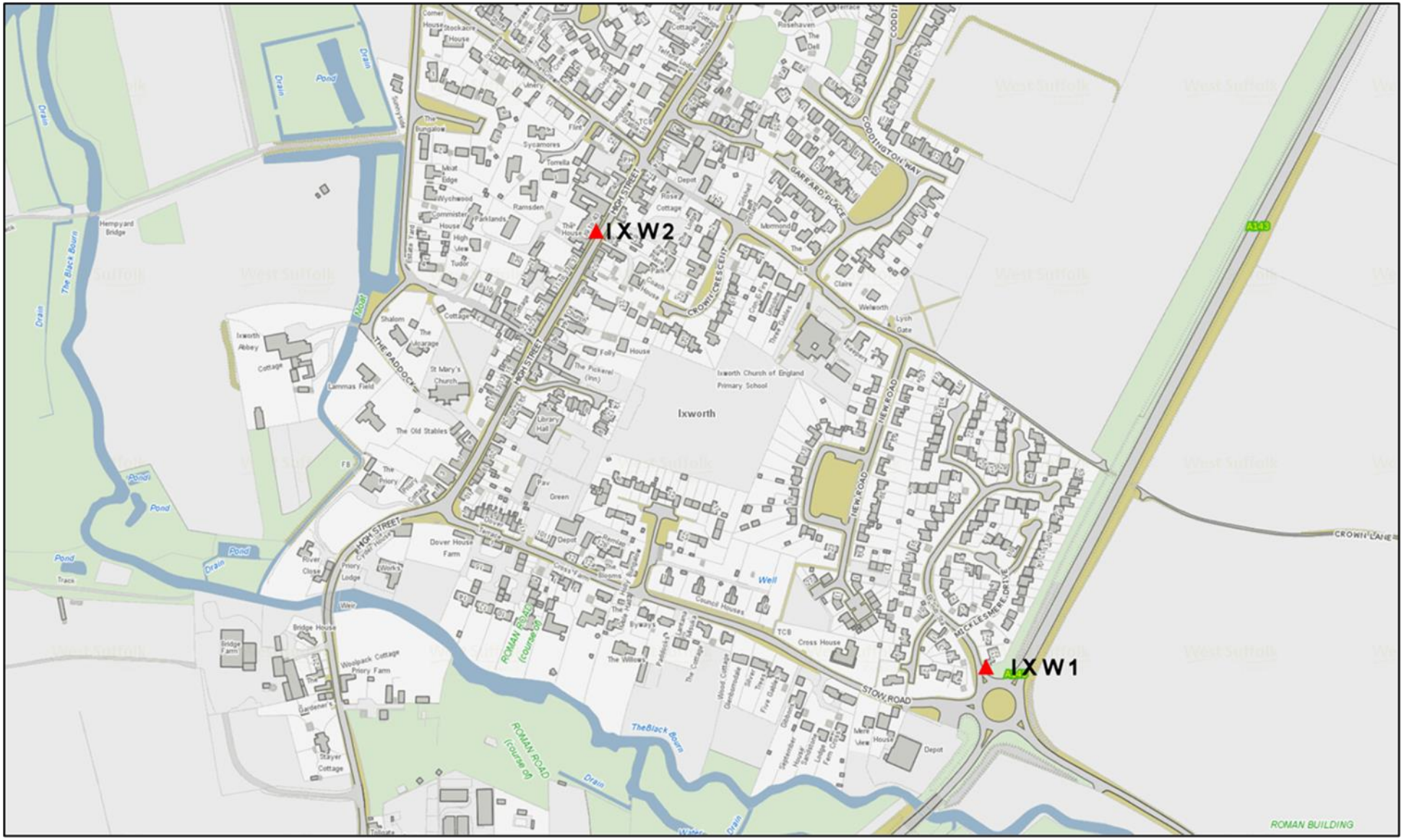


Figure D.9 – Map of non-automatic monitoring sites: Lakenheath

Figure D.10 – Map of non-automatic monitoring sites: Mildenhall

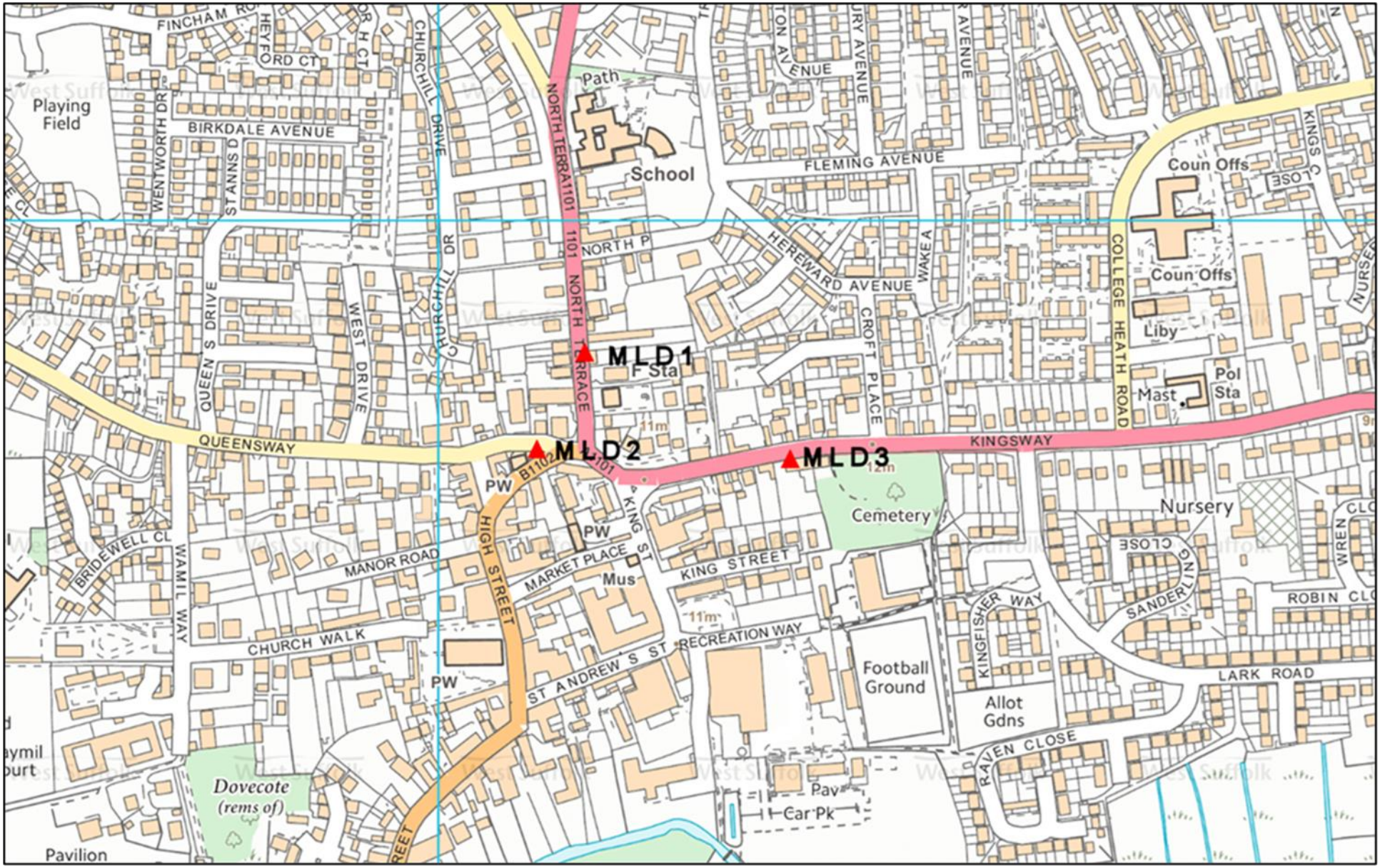


Figure D.11 – Map of non-automatic monitoring sites: Newmarket town centre

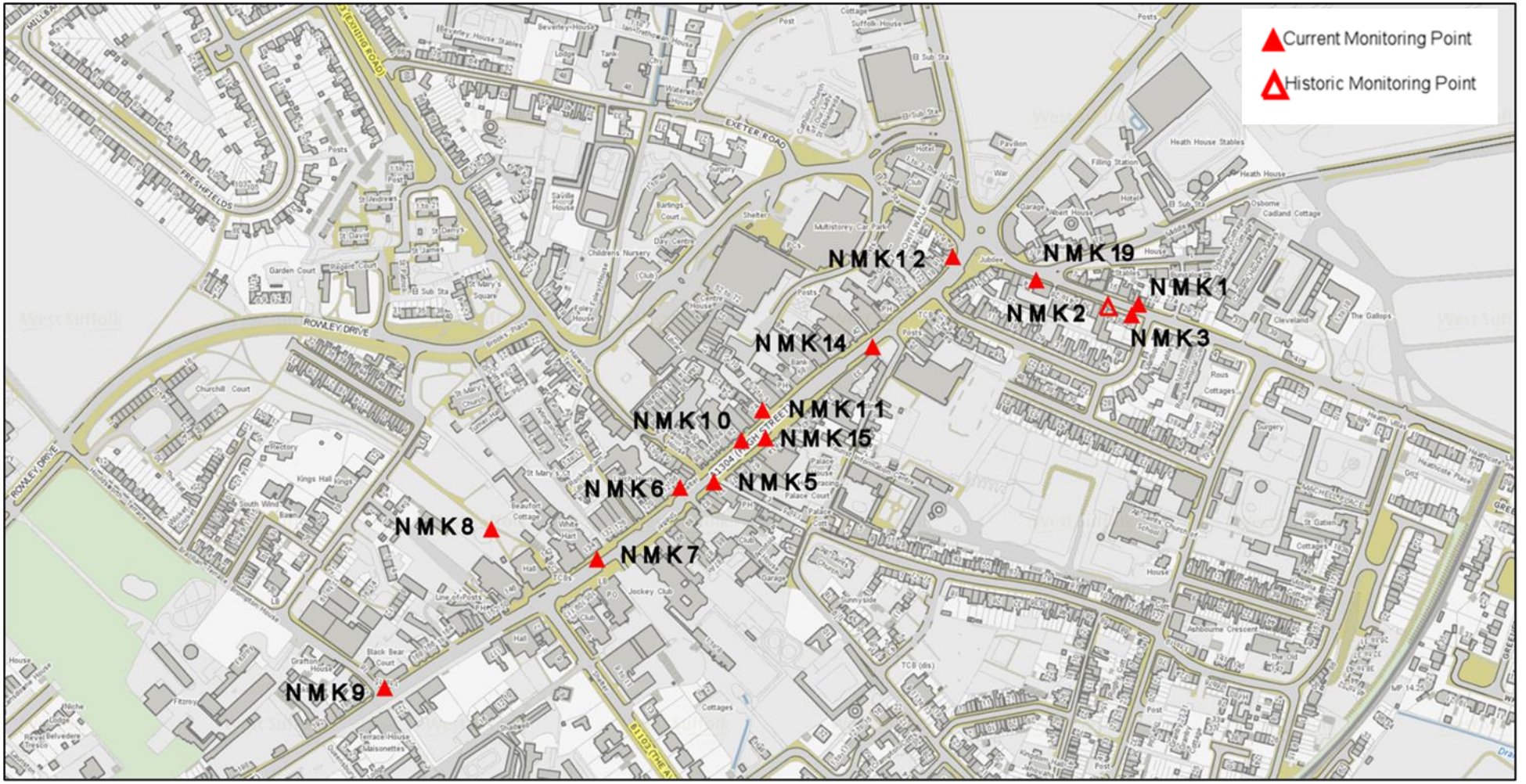


Figure D.12 – Map of non-automatic monitoring sites: Newmarket (north)

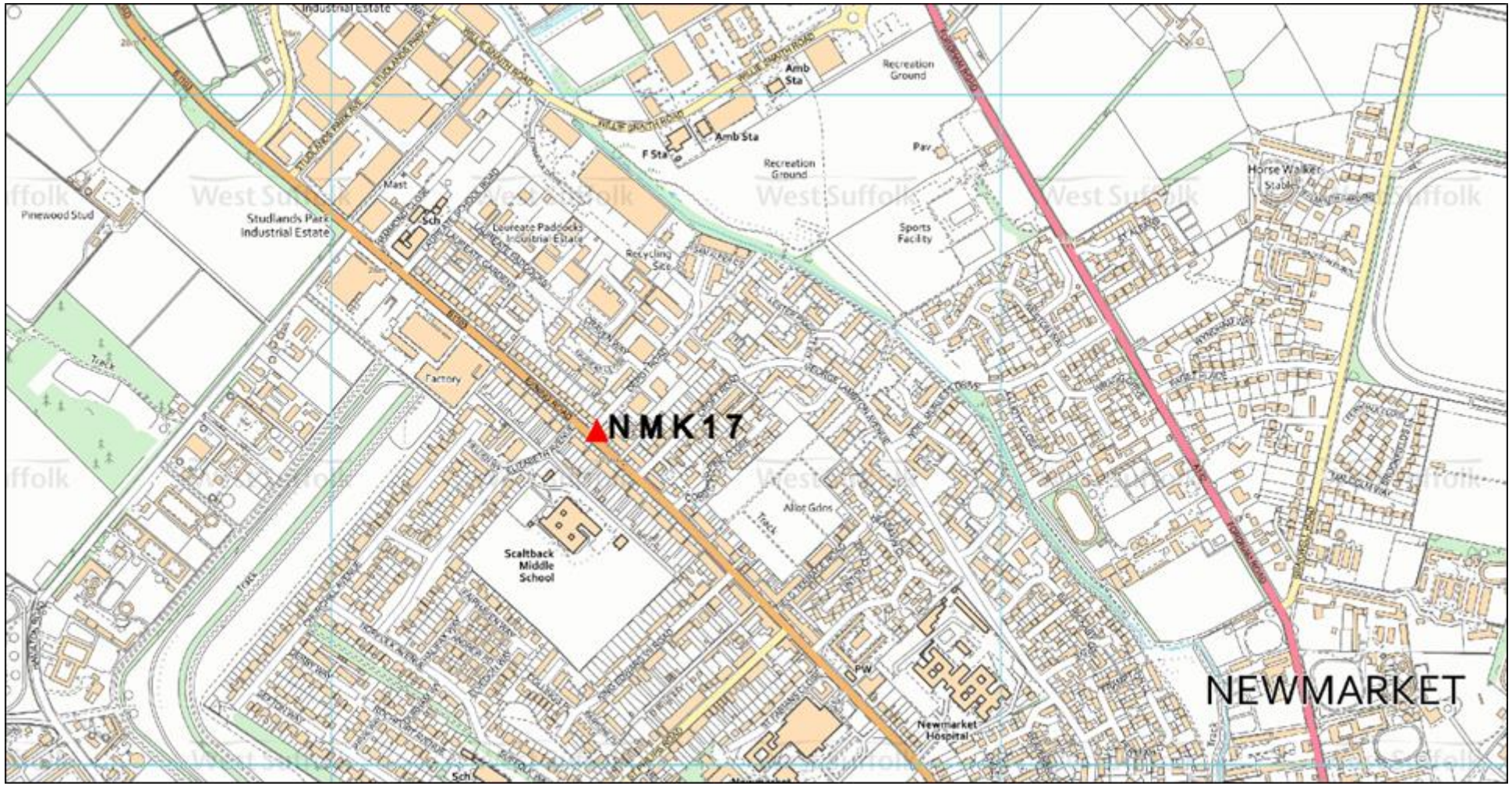
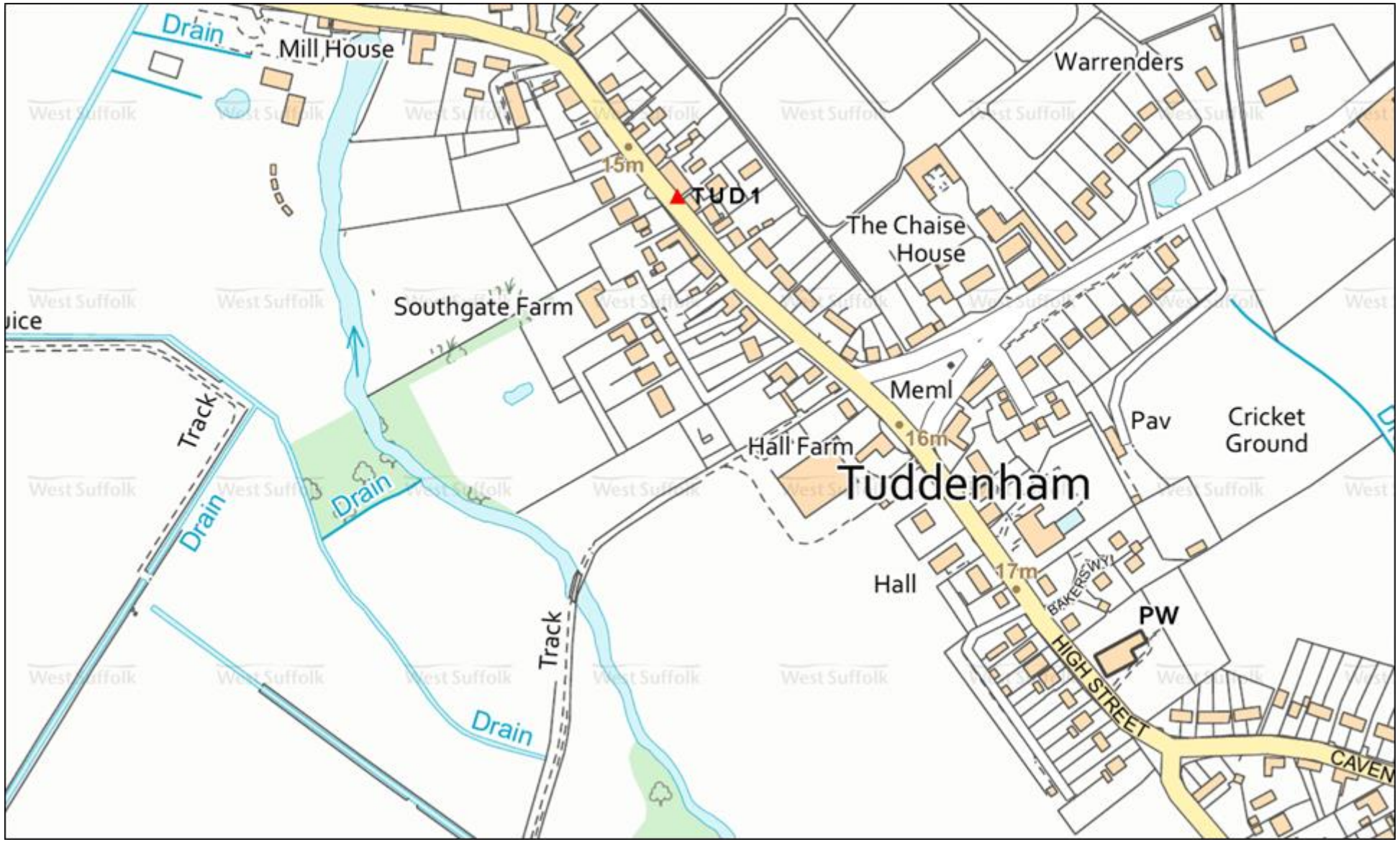


Figure D.13 – Map of non-automatic monitoring sites: Tuddenham



Appendix E: Summary of air quality objectives in England

Table E.1 – Air quality objectives in England

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

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 or 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 and 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.