2022 Air Quality Annual Status Report (ASR)

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

June 2022

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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 28,000 to 36,000 deaths at typical ages (Defra. Air quality appraisal: damage cost guidance, July 2021), 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).

West Suffolk Council was newly formed on the 1 April 2019 and covers the administrative area formally covered by Forest Heath District Council (FHDC) and St Edmundsbury Borough Council (SEBC). 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.

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.

Particulates, also known as PM_{10} and $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 10µm or less and 2.5µm or less respectively), are also an important pollutant. Particulates are associated with various sources of pollution including road traffic, industrial processes, and domestic burning, but can also be associated with natural sources and international sources. Secondary particulate pollutants can also form from ammonia, nitrogen dioxide and other gases. PM_{10} and $PM_{2.5}$ are more difficult to accurately measure than nitrogen dioxide and other gasses. 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 & Rural Affairs (Defra) modelling data.

Air quality was impacted in 2020 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. 2021 was again impacted by COVID-19 related lockdowns and restrictions, however, this impact was not as significant as the previous year. This should be considered when comparing results from 2021 to 2020, which should be considered as an outlier, and previous (pre-pandemic) years.

Air quality in West Suffolk is generally good and pre-pandemic was showing a long-term improvement at monitored locations throughout the area. 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, have their own unique air quality issues, which are summarised below. Monitoring was also undertaken in the village of Ixworth at the request of the parish and results are also summarised below.

- Brandon continues to record levels of pollution below (that is compliant with) the national air quality objectives at all monitored locations. Long term (that is over the last five years) improvement in air quality remains evident and levels recorded during 2021, are consistently lower than 2019 and previous years. However, the level of HGV traffic travelling through the town on the A1065 are still a concern to the residents and their representatives. West Suffolk Council continue to monitor the situation and liaise with the regulators of the sites outside the West Suffolk administrative area.

- Bury St Edmunds is the largest town in West Suffolk and has several large residential (Marham Park, Moreton Hall, and Tayfen Meadows) and commercial (Suffolk Business Park) developments currently progressing that will increase its size and population. Despite this ongoing growth, recorded levels of pollution were lower in 2021 than in 2019 at all but one of the 18 locations measured during both of those years. Pollution levels within the AQMA on Sicklesmere Road were well below (that is compliant with) the objective levels and have been for four years and consideration could be given to the removal of the AQMA, however, it is considered appropriate to assess the impact of Bury St Edmunds southeast development prior to removing this designation.

- 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, pollution levels have been below the objective during both 2020 and 2021. Although levels will have been impacted by the COVID-19 restrictions, the moving of a Puffin crossing away from the AQMA has also contributed to this improvement in air quality. Monitored locations away from the AQMA remain lower than those within the AQMA and continue to show a clear downward trend.

- Haverhill monitoring continues to show compliance with the annual air quality objectives in all locations. The main area of concern is Withersfield Road (A1307) where historically levels were close to the objectives. However, steady decreases in pollution over the past decade have resulted in pollution levels being well below the objectives. A new monitoring point was introduced on Mount Road, with recorded levels being significantly below the objective. Haverhill northwest strategic housing development and associated relief road are under construction. The relief road will allow for further improvements in pollution levels on Withersfield Road. Haverhill northeast strategic housing development is also under construction, and together with Haverhill northwest will cause growth of the town.

- Ixworth is a village to the northeast of Bury St Edmunds. The A143 bypasses the village, but some dwellings are close to this bypass. Two monitoring locations, one close to the A143 and one on the High Street were introduced in 2021. Both locations were well below the objectives, with the monitoring point on the High Street recording a slightly higher level of pollution due to the 'canyon' effective of the High Street, despite the lower number of passing vehicles.

- Mildenhall and Lakenheath continue to show concentrations of pollutants below (that is compliant with) the air quality objective levels. Prior to 2020, monitoring sites in Mildenhall and Lakenheath had not shown the same long term downward trend in pollution levels as other areas of West Suffolk. However, these sites did record a significant drop in pollution levels in 2020 in line with the rest of West Suffolk and the pollution levels in 2021 remain lower than pre-pandemic levels.

- Newmarket has shown steady air quality improvements over the last decade and the final part of the Newmarket AQMA (on Old Station Road) was revoked in 2021. All locations remain below the air quality objective levels, and although generally recorded higher pollution than 2020 (as expected), all fourteen monitoring locations recorded lower pollution in 2021 than in all pre-pandemic years.

As most of the 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 also work closely with the local planning authority to ensure new developments are appropriately controlled and mitigation is provided where required. 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

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy (Defra. Clean Air Strategy, 2019) sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero (DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018) sets out the approach to reduce exhaust emissions

from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

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 and although we have not been able to run any in person sessions this year we have continued to distribute leaflets and place banners outside schools, where requested. We've also had stalls at eco-markets in Bury St Edmunds distributed materials and continued with online promotion.

Figure 1: Picture of anti-idling banner outside a school in West Suffolk

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 we are currently delivering our third round of chargepoint installations under the Office for Zero Emission Vehicles (OZEV) on-street residential chargepoint scheme (ORCS). At the end of the 2021, West Suffolk owned sufficient public EV chargepoints to allow 67 vehicles to charge at any one time. This includes 12 EV chargepoint sockets at our new Mildenhall Hub, which includes new leisure facilities and public services such as a library.

Figure 2: Picture of newly installed electric vehicle charge points at Mildenhall Hub

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 the villages of West Row, Ixworth and Hundon with many more planned.

Suffolk air quality summit

West Suffolk Council presented a session on air quality across Suffolk at the Suffolk air quality summit which aimed to raise the awareness of air pollution in Suffolk among stakeholders and decision makers. The summit was organised by partners at Suffolk County Council public health. Other presentations included an introduction to air quality; air pollution and health; education and anti-idling; and home wood burning.

Clean air business

West Suffolk Council in conjunction with Suffolk County Council have developed a clean air business scheme. 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 the West Suffolk Council YouTube channel. This scheme will launch on clean air day 2022.

Further details will be provided in the 2023 annual status report.

Figure 3: Clean air business logo

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. Although most monitoring locations indicated slightly higher pollution in 2021 than in 2020, as expected, levels were still recorded to be below pre-pandemic levels. Prior to the COVID-19 pandemic, most locations had been showing a long-term downward trend in pollution; 2022 results will be important in establishing whether the long-term trends are continuing following the atypical results of 2020 and 2021. Monitoring will continue within the AQMAs to establish whether the results remain below the objectives moving forward.

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 2021 are to continue to expand the provision for EV charging infrastructure and continue working with schools and other organisations with our anti-idling campaign. 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 has met on a number of occasions and helped to run a market stall to promote the anti-idling campaign in the town. Churchgate Area Association have launched a social media campaign to increase the awareness of pollution from cars and pollution caused by vehicle idling. 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 ASR was prepared by the Environment & Energy Team within the Environmental Health Service of West Suffolk Council with the support and agreement of the following officers and departments listed on page 1.

This ASR has been signed off by the Director of Public Health at Suffolk County Council.

If you have any comments on this ASR please send them to the report author using the contact details on Page 1.

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1 Local air quality management

This report provides an overview of air quality in West Suffolk during 2021. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant policy and technical guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This annual status report (ASR) is an annual requirement showing the strategies employed by 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 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by West Suffolk Council can be found in Table 2.1. The table presents a description of the two AQMAs that are currently designated within West Suffolk. Appendix D: Maps of monitoring locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations is the annual mean concentration for nitrogen dioxide (NO_2).

All measurements are in micrograms per meter cubed (µg/m3).

West Suffolk Council confirm the information on UK-Air regarding their AQMAs is up to date and that all current AQAPs have been submitted to Defra.

Table 2.1 – Declared air quality management areas

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

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

Defra's appraisal of last year's ASR concluded that the West Suffolk should continue to undertake actions to improve air quality and that the monitoring was acceptable. The only recommendation was that the West Suffolk Council should submit an annual status report in 2022.

West Suffolk Council has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 18 measures are included within Table 2.2, with the type of measure and the progress West Suffolk Council have made during the reporting year of 2021 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on the measures related to the AQMAs can be found in their respective action plans.

Key completed measures are:

- continued increase of the number of publicly accessible electric vehicle charge points
- anti-idling promotional work and school visits
- development of clean air business scheme
- raising awareness of air pollution with key stakeholders and decision makers at the Suffolk air quality summit.

West Suffolk Council expects the following measures to be completed over the course of the next reporting year:

- further anti-idling promotional work and school visits to increase the awareness of air quality in West Suffolk
- further increase of locally available electric vehicle charge points
- progress on the clean air business scheme and first awards granted

West Suffolk Council worked to implement these measures in partnership with the following stakeholders during 2021:

- Suffolk County Council
- district and borough councils in Suffolk

The principal challenges and barriers to implementation that West Suffolk Council anticipates facing are engagement with the wider public and schools in a largely rural district.

Progress on the school anti-idling promotional work has been slower than expected due to difficulty in engaging with schools post the COVID-19 pandemic.

West Suffolk Council anticipates that the measures stated above and in Table 2.2 will ensure compliance remains in our AQMAs which will allow for revocation of the AQMAs within the next two to three years.

Table 2.2 – Progress on measures to improve air quality

Measure number	Measure	Category	Classification	Year measure introduced	Estimated or actual completion year	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	All relevant commercial and residential developments are now being approved with conditions requiring chargepoints.
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	Jan-19	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 and council 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 & 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	

Measure number	Measure	Category	Classification	Year measure introduced	Estimated or actual completion year	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.	

Measure number	Measure	Category	Classification	Year measure introduced	Estimated or actual completion year	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
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% 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
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.	Further school visits planned but COVID-19 pandemic has prevented this continuing. Visits expected to recommence in September 2022
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 - yearly courses.	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	

Measure number	Measure	Category	Classification	Year measure introduced	Estimated or actual completion year	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
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	2023	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
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	2023	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% reduction in NO_2 along Withersfield Road	Measured concentration in Nitrogen Dioxide on Withersfield Road	Development commenced March 2018	Condition of planning requires completion within 5 years of commencement of development
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	4µg/m3 to 6µg/m3 within the AQMA	Reductions in Concentrations to below the objective	Completed December 2019	COVID-19 pandemic has made it difficult to establish the improvements in air quality

Measure number	Measure	Category	Classification	Year measure introduced	Estimated or actual completion year	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
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	2022	Suffolk County Council	Section 106 funds	No	Funded	£100k - £500k	Planning	To be confirmed	Monitoring of queues through Great Barton	Outline design completed	Section 106 funding has been secured from developments in Thurston (within Mid Suffolk District Council). This will be the second scheme delivered through this funding.
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	Car sharing has been discouraged throughout the COVID-19 Pandemic
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)	

Measure number	Measure	Category	Classification	Year measure introduced	Estimated or actual completion year	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
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 developed, materials produced and ready to launch on Clean Air Day 2022	

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.

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 $PM_{2.5}$. Some of these measures, such as the promotion of clean burning, will specifically tackle particulate matter emissions. We are also supporting Suffolk County Council and University of Suffolk with a county wide trial of low-cost particulate matter monitors, which we hope will give us a better understanding of the local and regional sources and distribution of particulate pollution. With better understanding we hope to be able to make targeted progress on $PM_{2.5}$ in future years.

However, it should be noted that a large proportion of the $PM_{2.5}$ in Suffolk is derived from intercontinental sources over which the local authority has no control.

3 Air quality monitoring data and comparison with air quality objectives and national compliance

This section sets out the monitoring undertaken within 2021 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 2017 and 2021 to allow monitoring trends to be identified and discussed.

3.1 Summary of monitoring undertaken

3.1.1 Automatic monitoring sites

West Suffolk Council did not undertake any automatic (continuous) monitoring during 2021. National modelling based on the national monitoring network is available on the Defra – Interactive map.

3.1.2 Non-automatic monitoring sites

West Suffolk Council undertook non-automatic (that is passive) monitoring of NO_2 at 66 sites during 2021. 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.

3.2 Individual pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen dioxide (NO_2)

Table A.2 and Table A.3 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 2021 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Each of the five market towns, as well as the village of Great Barton, have their own unique air quality issues, which are summarised below. Monitoring was also

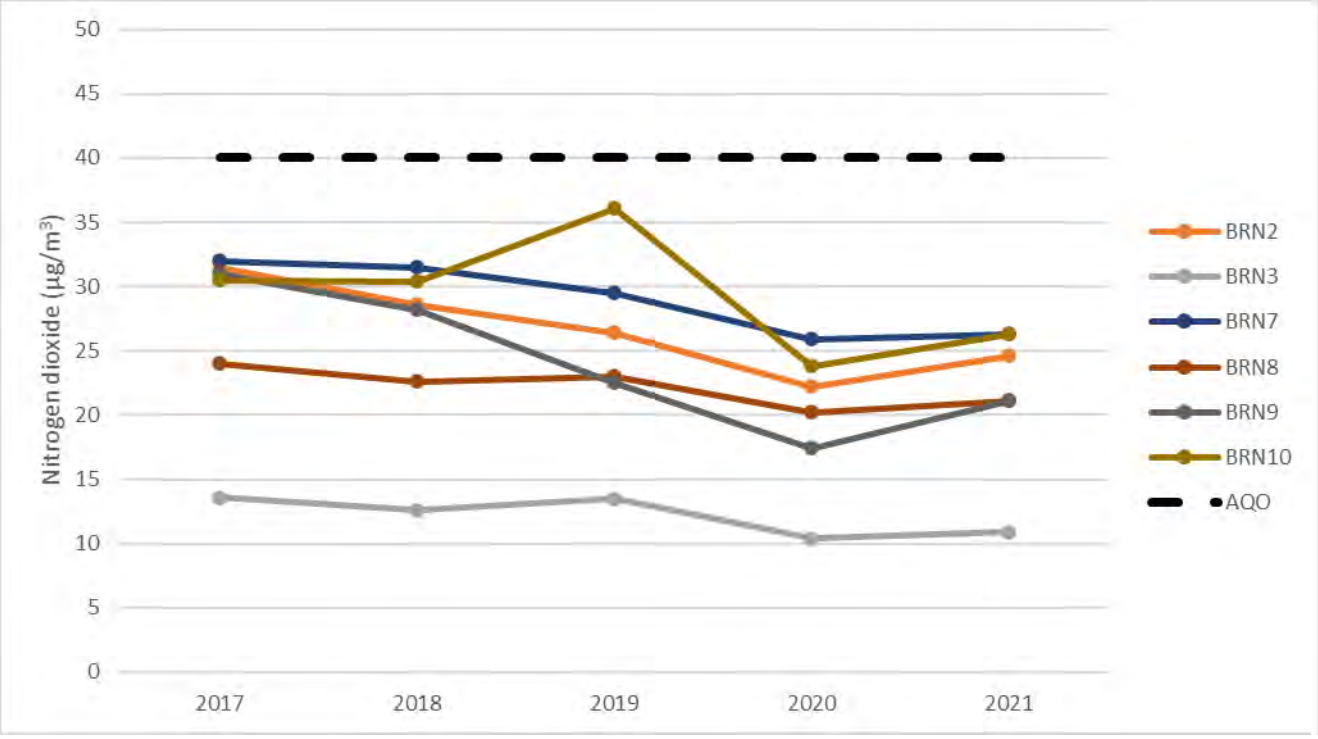
undertaken in the village of Ixworth at the request of the parish and results are also summarised below.

Brandon

Brandon continues to record levels of pollution below (that is compliant with) the national air quality objectives at all monitored locations. Long term (that is over the last five years) improvement in air quality remains evident and levels recorded during 2021, are consistently lower than 2019 and previous years. A new monitoring location (BRN17) was introduced on London Road at the beginning of 2021 to allow monitoring at a relevant location as some of the existing sites are not on the façade of residential buildings. This new location was less than half the objective value (40µg/m^3) at 19.3µg/m^3.

The highest recorded level of nitrogen dioxide was 26.3µg/m^3 recorded on both London Road (BRN7) and the High Street (BRN10), although both of these sites were above 30µg/m^3 within the last five years, with BRN10 being as high as 36.1µg/m^3 in 2019 (although this may have been partly due to poor data collection for BRN10 in 2019). 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



However, the level of HGV traffic travelling through the town on the A1065 are still a concern to the residents and their representatives. West Suffolk Council continue to monitor the situation and liaise with the regulators of the sites outside the West Suffolk administrative area.

Bury St Edmunds

Bury St Edmunds is the largest town in West Suffolk and has several large ongoing developments currently progressing that will increase the town's size and population.

Despite this ongoing growth, recorded levels of pollution were lower in 2021 than in 2019 at all but one of the 18 locations measured during both of those years. The one location that was higher in 2021 than in 2019 recorded just 0.1µg/m^3 increase.

Pollution levels within the AQMA on Sicklesmere Road were well below (that is compliant with) the objective levels and have been for four years. Consideration could be given to the removal of the AQMA, however, it is considered appropriate to assess the impact of Bury St Edmunds southeast development prior to removing this designation. It is also noted that the last two years of data have been impacted by COVID-19 restrictions and there is the possibility of an increase in levels of nitrogen dioxide in 2022. Figure 3.2 shows the levels of pollution at the monitoring points within and close to the Sicklesmere Road AQMA.

Figure 3.2: Five-year trend data for nitrogen dioxide in, and close to, the Sicklesmere Road AQMA

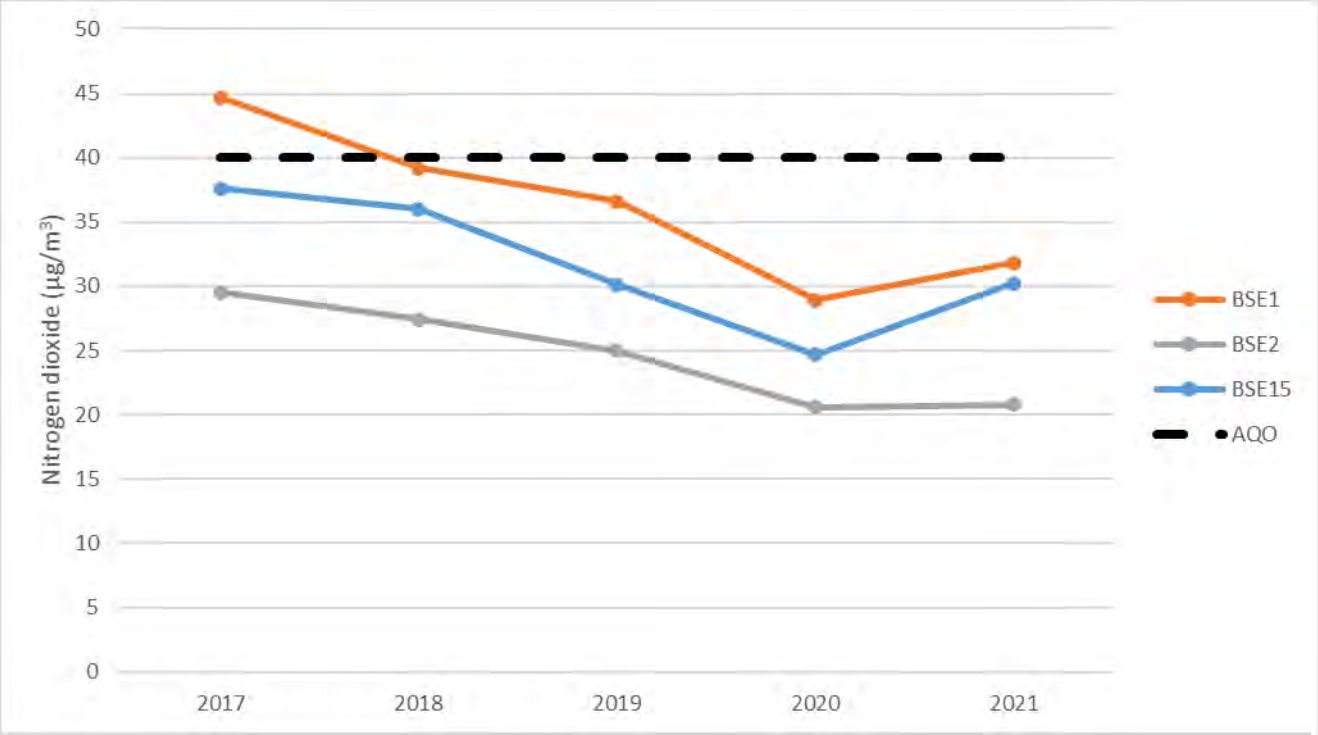
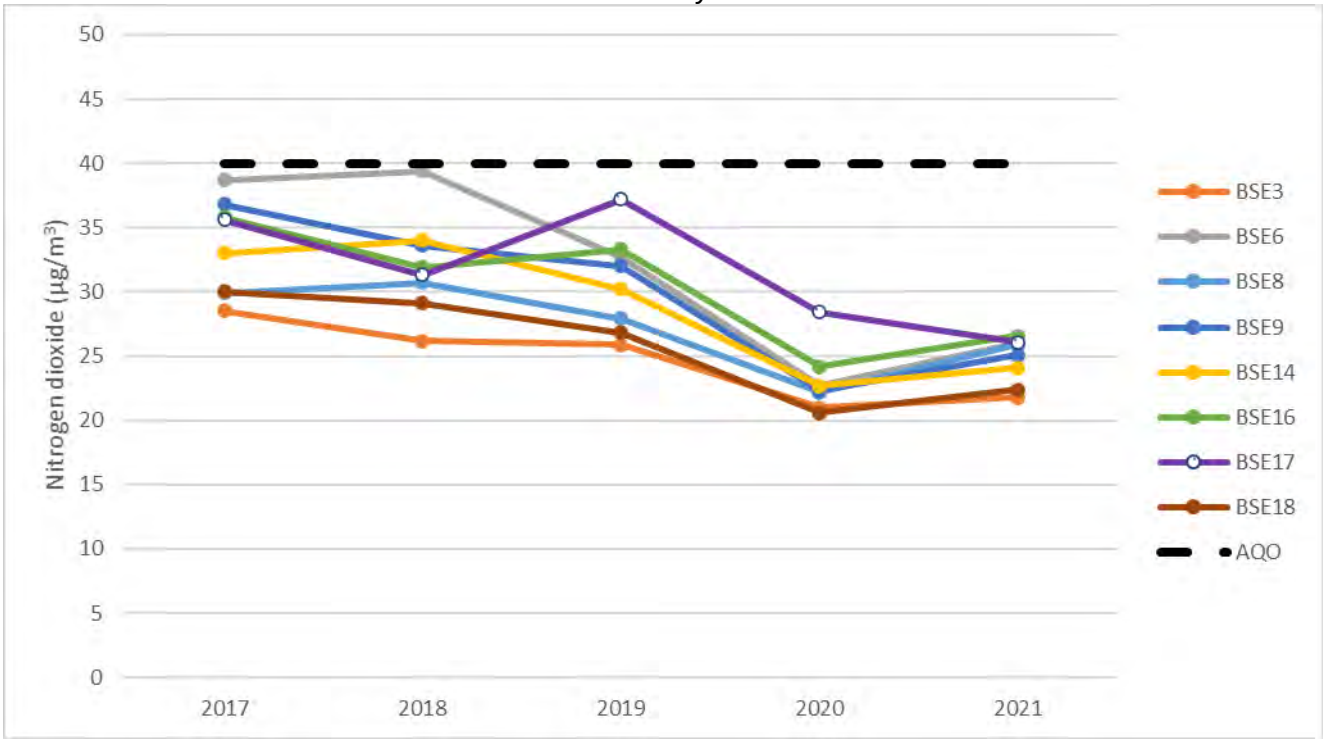


Figure 3.3 shows the level of recorded nitrogen dioxide at all other locations in Bury St Edmunds that have been measured consistently for the past five years. Of these eight sites, the lowest level of pollution in 2017 was at BSE3 (Cullum Road), being 28.5µg/m^3 while in 2021 the highest recorded concentration was 26.6µg/m^3 at BSE16 (Northgate Lodge Roundabout). This demonstrates the extent to which levels have decreased over this five-year period.

Figure 3.3: Five-year trend data for nitrogen dioxide for sites in Bury St Edmunds measured for all of the last five years

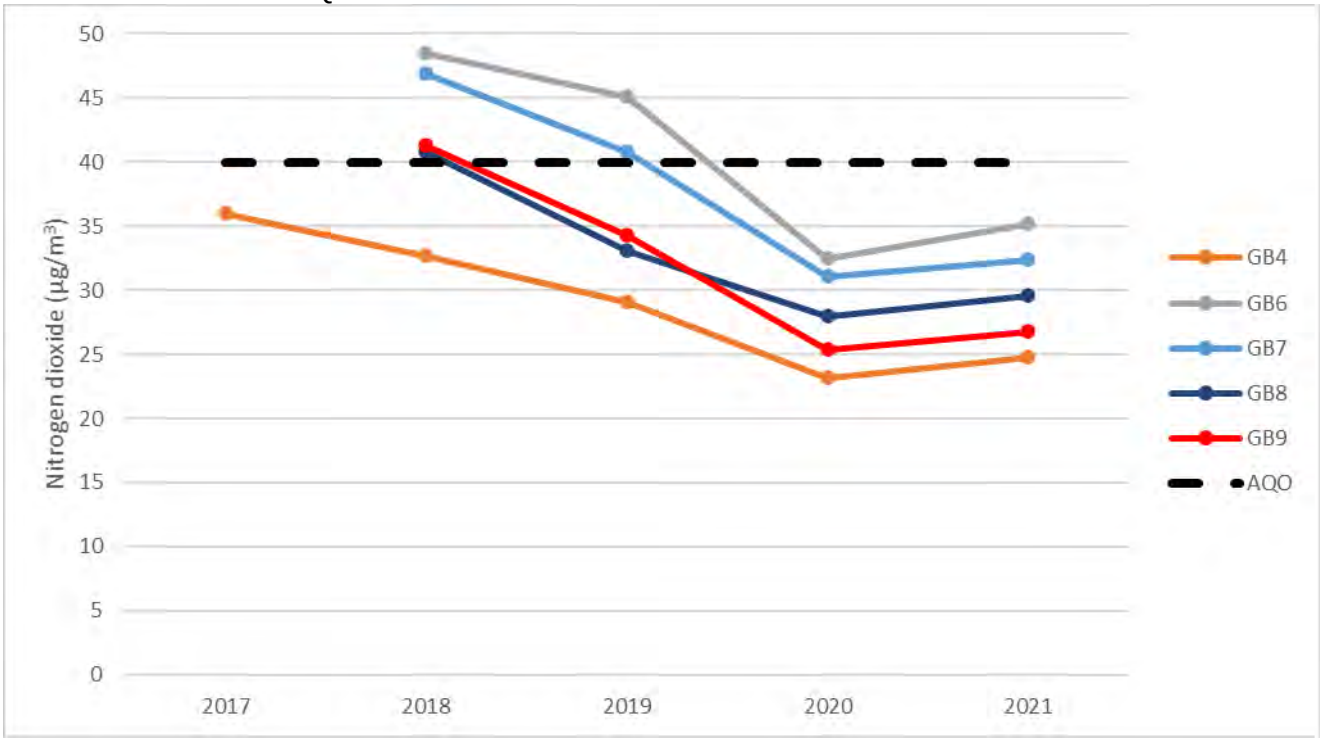


Great Barton

This village to the northeast of Bury St Edmunds, interested by the A143, which is a designated HGV route has an AQMA which comprises a row of cottages either side of, and including, the Post Office. Pollution levels within the AQMA have been below the AQO over the last two years, falling sharply from a high of 48.5µg/m^3 at GB6 in 2018 to 35.2µg/m^3 in 2021. This reduction is a combination of moving the pedestrian crossing in the village away from the AQMA and the COVID-19 pandemic. Defra recommend at least three years of data is collected prior to an AQMA being revoked and have also confirmed that data from 2020 should not be included within these three years. Figure 3.4 shows the recorded levels of nitrogen dioxide within the AQMA (GB6 and GB7), opposite the AQMA (GB8 and GB9) and immediately adjacent to the AQMA (GB4).

Away from the AQMA, other locations in Great Barton are well below the AQO. For the sites not in the immediate vicinity of the AQMA, the highest recorded concentration of nitrogen dioxide recorded in 2021 was 22.2µg/m^3 at GB3 (Forge Bungalows on the A143). A new monitoring location was installed in 2020 to ensure levels of pollution close to the new pedestrian crossing location were not high. This location, GB10, recorded 22.0µg/m^3 in 2021, which is significantly lower than the AQO and the levels recorded in the AQMA.

Figure 3.4: Five-year trend data for nitrogen dioxide sites in, and close to, the Great Barton AQMA



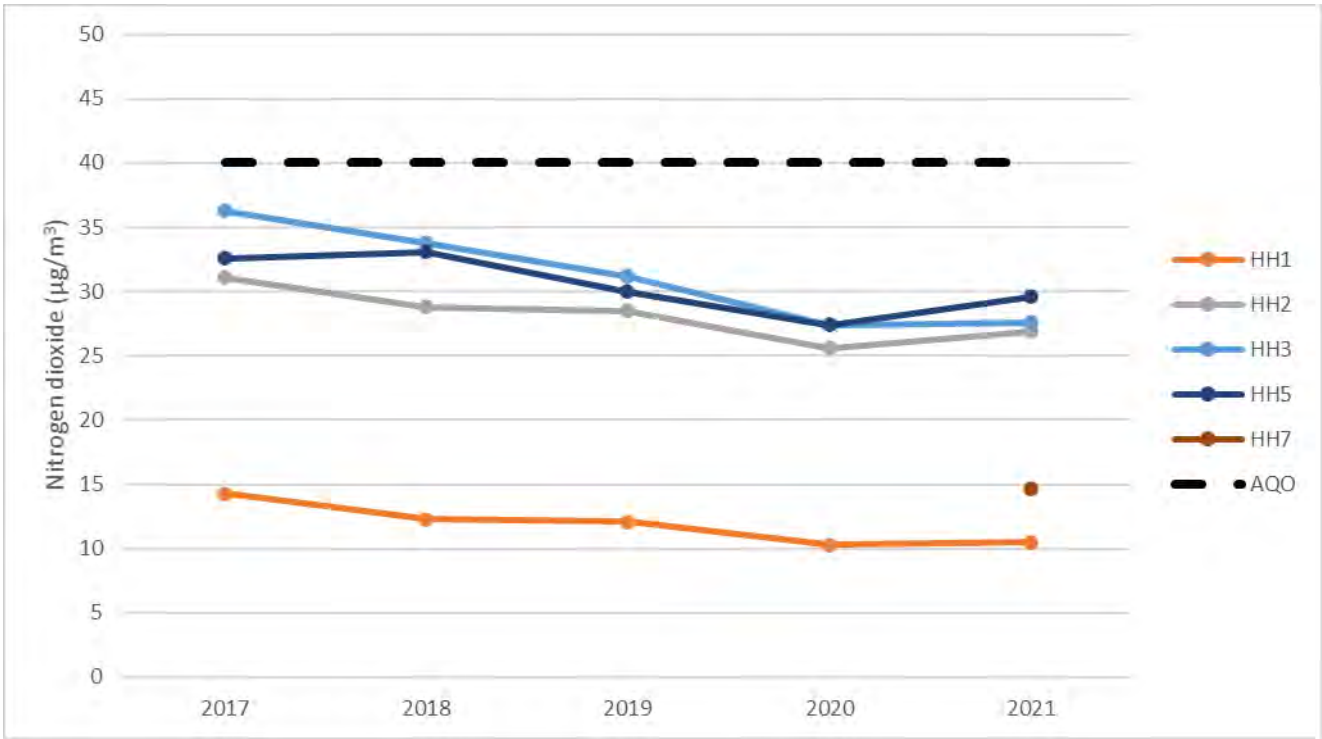
Haverhill

Monitoring in Haverhill continues to show compliance with the annual air quality objectives in all locations. The main area of concern is Withersfield Road (A1307) where historically levels were close to the objectives. However, steady decreases in pollution over the past decade have resulted in pollution levels being well below the objective (40µg/m^3), with the highest recorded level of pollution in 2021 being just 29.6µg/m^3.

A new monitoring point was introduced on Mount Road following requests from councillors, with recorded levels being significantly below the objective at 14.7µg/m^3.

Figure 3.5 shows the downward trend of pollution over the last five years, including the control site (HH1) which is situated on a quiet road on the outskirts of Haverhill.

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



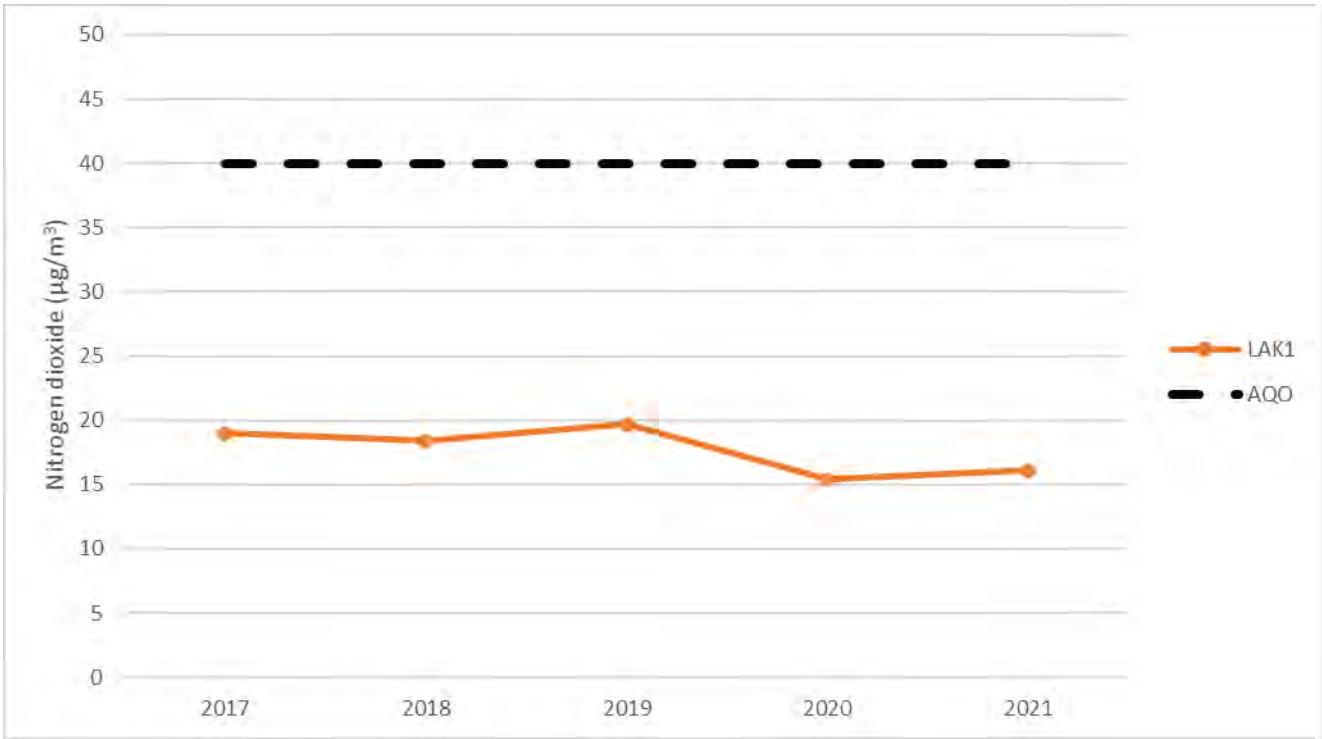
Ixworth

Two monitoring locations were installed in the village of Ixworth at the request of the parish council who were concerned by the potential for pollution from the A143. The A143 bypasses the village, but some dwellings are close to this bypass. Two monitoring locations, one close to the A143 (IXW1) and one on the High Street (IXW2) were introduced in 2021. Both locations were well below the objectives, with the IXW2 recording 18.3µg/m^3 and IXW1 recording 16.3µg/m^3. Pollution levels on the High Street were slightly higher due to the 'canyon' effective of the High Street, despite the lower number of passing vehicles.

Lakenheath

Lakenheath has a single monitoring point on the High Street in the centre of the village. Recorded levels of nitrogen dioxide pollution had remained fairly consistent prior to 2020, but has seen a reduction during 2020. Although levels increased again slightly in 2021, the recorded value of 16.1µg/m^3 is still less than half of the AQO. Figure 3.6 shows the recorded levels of nitrogen dioxide in Lakenheath.

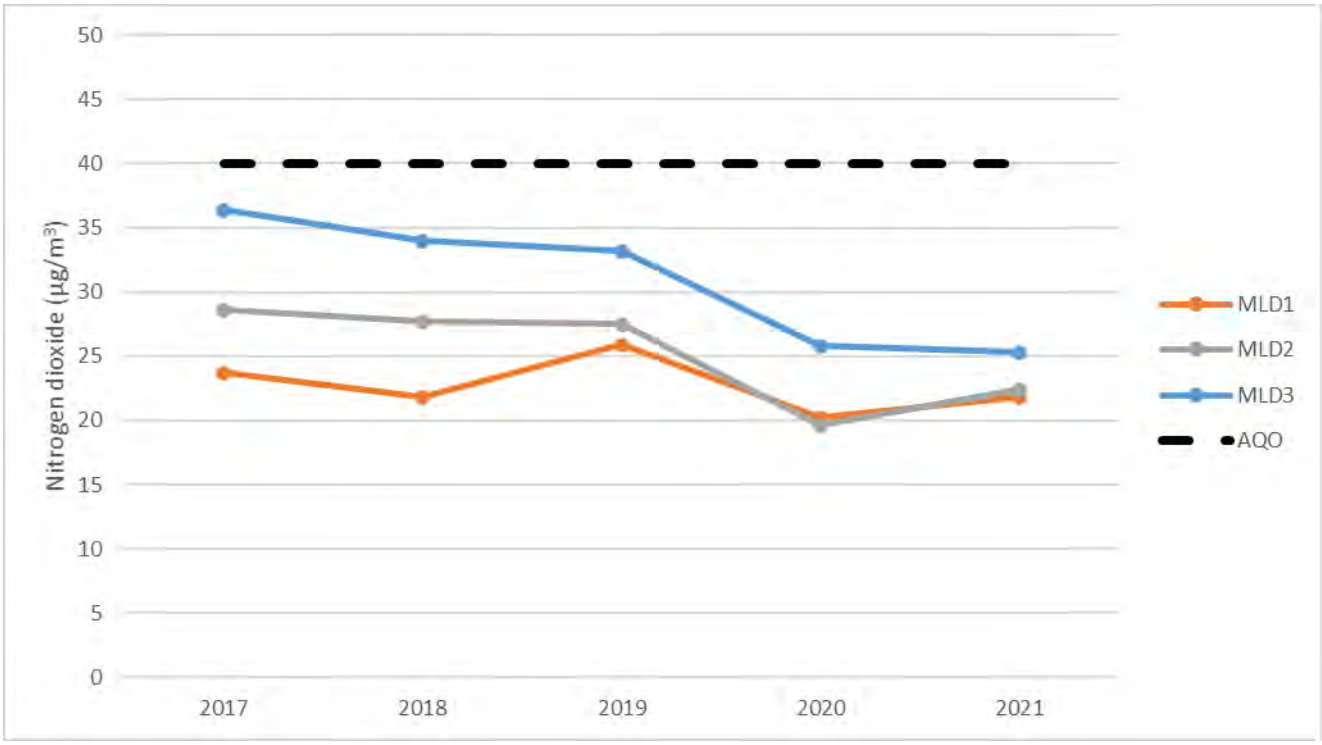
Figure 3.6: Five-year trend data for nitrogen dioxide monitoring site in Lakenheath



Mildenhall

The three monitoring locations in Mildenhall remain well below the AQO of 40µg/m^3 with the highest value being 25.3µg/m^3 at MLD3 on Kingsway. Prior to 2020, monitoring sites in Mildenhall had not shown the same long term downward trend in pollution levels as other areas of West Suffolk. However, these sites did record a significant drop in pollution levels in 2020 in line with the rest of West Suffolk and the pollution levels in 2021 remain lower than pre-pandemic levels. Figure 3.7 shows the levels of air pollution at the three monitoring locations in Mildenhall, showing a marked decrease in pollution in 2020 and 2021.

Figure 3.7: Five-year trend data for nitrogen dioxide monitoring sites in Mildenhall



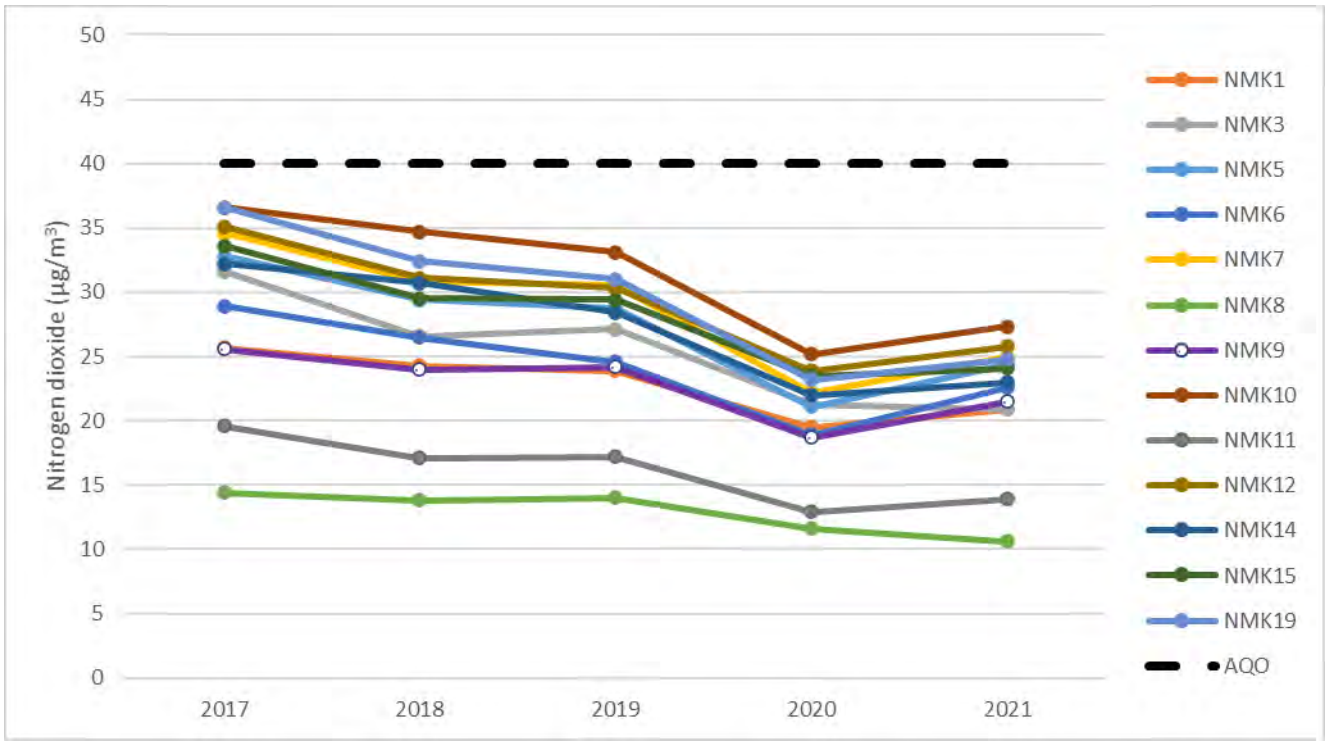
Newmarket

Extensive monitoring has occurred along Newmarket High Street and Old Station Road, which were formally an AQMA. There has been a steady decrease in air pollution over the last five years. For example, the monitoring points at the taxi rank on the High Street (NMK10) and outside 18 Old Station Road (NMK19) both recorded 36.6µg/m^3 in 2017, but only 27.3µg/m^3 and 24.8µg/m^3 respectively in 2021.

A single monitoring point away from the town centre, on Exning Road, also shows nitrogen dioxide levels are well below the AQO and reducing over the long term.

Figure 3.8 shows the records for the last five years from monitoring points along the High Street and Old Station Road, as well as a control point within the Memorial Gardens (NMK8).

Figure 3.8: Five-year trend data for nitrogen dioxide monitoring sites in Newmarket town centre



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	Hourly – 0. Annual - not applicable	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 Rd/Church Road	Kerbside	578073	286254	NO_2	Not in AQMA	8.0	1.0	2.1
BRN8	Brandon - Hellesdon House, High Street	Roadside	578372	286774	NO_2	Not in AQMA	0.0	1.5	2.2
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	Hourly – 0. Annual – 0.5	2.5	2.4
BRN12	Brandon - 1 Thetford Road	Roadside	578486	286558	NO_2	Not in AQMA	0.0	1.7	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)
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
NMK3	Newmarket - Old Station Rd / 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	Hourly – 0. Annual - not applicable	<1.0	2.2
NMK6	Newmarket - 'KFC' downpipe	Roadside	564307	263338	NO_2	Not in AQMA	Hourly – 0. Annual – 0.	6.5	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)
NMK7	Newmarket - 'White Hart' crossing	Kerbside	564233	263274	NO_2	Not in AQMA	Hourly – 0. Annual – 5.9	1.0	2.4
NMK8	Newmarket - Park area	Urban background	564138	263301	NO_2	Not in AQMA	Hourly – 0. Annual - not applicable	Not applicable	2.2
NMK9	Newmarket - Blackbear lane/High Street	Kerbside	564043	263159	NO_2	Not in AQMA	3.0	0.6	2.4
NMK10	Newmarket - Taxi rank	Roadside	564362	263381	NO_2	Not in AQMA	Hourly – 0. Annual - not applicable	<1.0	2.5
NMK11	Newmarket - Market Street 'EE'	Urban centre	564380	263407	NO_2	Not in AQMA	Hourly – 0. Annual - not applicable	11.0	2.0
NMK12	Newmarket - Clock tower crossing	Roadside	564550	263544	NO_2	Not in AQMA	Hourly – 0. Annual – 0.3	2.5	2.1
NMK14	Newmarket - 'Rutland Arms' crossing	Kerbside	564480	263464	NO_2	Not in AQMA	Hourly – 0. Annual - not applicable	<1.0	2.4
NMK15	Newmarket - 'Savers' lamppost	Roadside	564383	263381	NO_2	Not in AQMA	Hourly – 0. Annual – 5.5	2.5	2.3
NMK17	Newmarket – Exning Road/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
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	Within Sicklesmere Road 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
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

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)
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	Within Sicklesmere Road 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
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

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)
BSE24	BSE - Hollow Road Bridge	Roadside	586418	265179	NO_2	Not in AQMA	9.2	1.7	2.0
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	Hourly – 0. Annual - not applicable	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	N/A	1.5	1.9
GB3	The Forge Bungalows	Roadside	589163	267013	NO_2	Not in AQMA	4.0	1.4	2.3
GB4a, GB4b, GB4c	Post Office (lamppost)	Roadside	589130	266969	NO_2	Not in AQMA	0.0	1.4	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)
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	Within Great Barton AQMA	0.3	1.0	2.4
GB7a, GB7b, GB7c	The Drift, 8 The Street	Roadside	589100	266941	NO_2	Within 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
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.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details. Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment. Exceedances of the NO2 annual mean objective of 40µg/m3 are shown in bold. All diffusion tube locations were monitor for the full calendar year.

Diffusion tube ID	X OS Grid ref (easting)	Y OS Grid ref (northing)	Site type	Valid data capture for the full calendar year of 2021 (%)	2017	2018	2019	2020	2021
BRN2	577993	286163	Roadside	100.0%	31.5	28.6	26.4	22.2	24.6
BRN3	578406	286460	Urban centre	100.0%	13.6	12.6	13.5	10.4	10.9
BRN5	578206	286407	Roadside	76.9%	37.4	31.1	27.4	21.0	23.4
BRN7	578073	286254	Kerbside	92.3%	32.0	31.5	29.5	25.9	26.3
BRN8	578372	286774	Roadside	40.4%	24.0	22.6	23.0	20.2	21.1
BRN9	578372	286867	Kerbside	75.0%	31.0	28.2	22.5	17.4	21.1
BRN10	578395	286633	Roadside	100.0%	30.5	30.4	36.1	23.8	26.3
BRN12	578486	286558	Roadside	75.0%		23.1	23.1	18.1	18.3
BRN15	578317	287103	Roadside	75.0%		28.1	27.9	20.0	24.2
BRN17	578297	286469	Roadside	76.9%					19.3

Diffusion tube ID	X OS Grid ref (easting)	Y OS Grid ref (northing)	Site type	Valid data capture for the full calendar year of 2021 (%)	2017	2018	2019	2020	2021
LAK1	571378	282855	Kerbside	100.0%	19.0	18.4	19.7	15.4	16.1
MLD1	571136	274878	Roadside	100.0%	23.7	21.8	25.9	20.2	21.8
MLD2	571092	274785	Roadside	100.0%	28.6	27.7	27.5	19.6	22.4
MLD3	571326	274780	Roadside	90.4%	36.4	34.0	33.2	25.8	25.3
NMK1	564716	263502	Roadside	100.0%	25.7	24.3	23.9	19.5	20.9
NMK3	564707	263493	Roadside	100.0%	31.6	26.6	27.1	21.3	20.9
NMK5	564337	263343	Kerbside	92.3%	32.8	29.4	28.7	21.1	24.4
NMK6	564307	263338	Roadside	80.8%	28.9	26.5	24.6	18.9	22.6
NMK7	564233	263274	Kerbside	100.0%	34.6	30.8	30.5	22.2	25.0
NMK8	564138	263301	Urban background	90.4%	14.4	13.8	14.0	11.6	10.6
NMK9	564043	263159	Kerbside	100.0%	25.6	24.0	24.2	18.7	21.5
NMK10	564362	263381	Roadside	100.0%	36.6	34.7	33.1	25.2	27.3
NMK11	564380	263407	Urban centre	100.0%	19.6	17.1	17.2	12.9	13.9

Diffusion tube ID	X OS Grid ref (easting)	Y OS Grid ref (northing)	Site type	Valid data capture for the full calendar year of 2021 (%)	2017	2018	2019	2020	2021
NMK12	564550	263544	Roadside	100.0%	35.1	31.1	30.3	23.9	25.8
NMK14	564480	263464	Kerbside	100.0%	32.2	30.7	28.4	22.0	23.0
NMK15	564383	263381	Roadside	84.6%	33.6	29.5	29.4	23.5	24.1
NMK17	563397	264498	Roadside	100.0%	25.1	20.3	21.4	16.1	16.6
NMK19	564626	263525	Kerbside	100.0%	36.6	32.4	31.0	23.2	24.8
IXW1	593655	270127	Roadside	100.0%					16.3
IXW2	593281	270545	Roadside	90.4%					18.3
BSE1	586253	263147	Roadside	100.0%	44.7	39.2	36.6	28.9	31.8
BSE2	586320	263053	Roadside	100.0%	29.5	27.4	25.0	20.6	20.8
BSE3	585236	263746	Roadside	100.0%	28.5	26.2	25.9	21.0	21.8
BSE6	584905	264171	Roadside	100.0%	38.7	39.4	32.7	22.7	26.0
BSE8	585461	265050	Roadside	75.0%	29.9	30.7	27.9	22.2	25.9
BSE9	585085	265924	Roadside	100.0%	36.8	33.6	32.0	22.3	25.1

Diffusion tube ID	X OS Grid ref (easting)	Y OS Grid ref (northing)	Site type	Valid data capture for the full calendar year of 2021 (%)	2017	2018	2019	2020	2021
BSE14	585624	264334	Roadside	92.3%	33.0	34.0	30.2	22.7	24.1
BSE15	586273	263135	Roadside	100.0%	37.6	36.0	30.1	24.7	30.2
BSE16	585424	264977	Roadside	90.4%	35.8	31.9	33.3	24.2	26.6
BSE17	585264	264921	Roadside	75.0%	35.6	31.3	37.2	28.4	26.1
BSE18	586126	263328	Roadside	100.0%	30.0	29.1	26.8	20.6	22.4
BSE19	584618	264471	Roadside	92.3%		30.8	29.4	18.3	22.5
BSE20	585031	264466	Roadside	92.3%			18.1	13.4	16.8
BSE21	585555	264494	Roadside	100.0%			26.7	20.7	23.4
BSE23	585285	263841	Roadside	67.3%			18.4	13.8	15.1
BSE24	586418	265179	Roadside	100.0%			30.2	25.2	26.6
BSE26	584957	264164	Roadside	100.0%			26.7	18.8	21.2
BSE27	585349	263781	Roadside	90.4%			23.1	16.7	21.5
BSE28	585314	264960	Roadside	92.3%				20.6	26.3

Diffusion tube ID	X OS Grid ref (easting)	Y OS Grid ref (northing)	Site type	Valid data capture for the full calendar year of 2021 (%)	2017	2018	2019	2020	2021
BSE29	585845	263730	Roadside	100.0%				13.6	13.9
BSE30	585185	264285	Urban centre	100.0%				16.3	17.8
BSE31	583648	264767	Roadside	100.0%				22.5	24.0
GB2	588917	267370	Suburban	100.0%	11.4	10.3	10.5	8.5	7.6
GB3	589163	267013	Roadside	100.0%	31.8	26.2	27.2	22.2	22.2
GB4a, GB4b, GB4c	589130	266969	Roadside	100.0%	36.0	32.7	29.1	23.2	24.8
GB5	588993	266838	Roadside	100.0%	32.2	30.2	27.4	21.5	21.6
GB6	589120	266960	Roadside	100.0%		48.5	45.1	32.5	35.2
GB7a, GB7b, GB7c	589100	266941	Roadside	100.0%		46.9	40.8	31.1	32.4
GB8	589093	266949	Roadside	100.0%		40.8	33.1	28.0	29.6
GB9	589117	266970	Roadside	100.0%		41.3	34.3	25.4	26.8
GB10	589228	267071	Roadside	100.0%				21.2	22.0

Diffusion tube ID	X OS Grid ref (easting)	Y OS Grid ref (northing)	Site type	Valid data capture for the full calendar year of 2021 (%)	2017	2018	2019	2020	2021
HH1	568609	245575	Suburban	100.0%	14.3	12.3	12.1	10.3	10.5
HH2	567270	245981	Roadside	100.0%	31.1	28.8	28.5	25.6	26.9
HH3	566891	245892	Roadside	100.0%	36.3	33.8	31.2	27.4	27.6
HH5	566941	245850	Roadside	92.3%	32.6	33.1	30.0	27.4	29.6
HH7	567553	245289	Kerbside	100.0%					14.7

West Suffolk Council can confirm that:

- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16
- Diffusion tube data has been bias adjusted.
- Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), that is, prior to any fall-off with distance correction.

Table A.1 – Annual mean NO_2 monitoring results for historic sites: non-automatic monitoring (µg/m^3)

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%. 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	2017	2018	2019	2020	2021
BRN1	Brandon – 6 Church Road	578044	286249	Roadside	20.9	19.7	21.0	17.1	
BRN4	Brandon – London Road - Stores Street	578351	286503	Roadside	30.9	27.2			
BRN6	Brandon - London Rd - Coulson Lane	578270	286467	Roadside	25.5	22.4	22.5		
BRN11	Brandon - 175 Thetford Road	579160	286357	Roadside	18.4				
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	12.0	10.6			
ICK1	Icklingham	577266	272907	Roadside	23.2				
NMK2	Newmarket – 36 Old Station Road	564689	263500	kerbside	35.6	27.7	28.5	23.2	
NMK16	Newmarket - Station Approach	564375	262849	Kerbside	13.7				

Diffusion tube ID	Site name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site type	2017	2018	2019	2020	2021
NMK18	Newmarket - Nimbus Way	563205	265853	Other (A14 back ground)	21.0				
BSE5	Horringer Road lights	584703	263483	Roadside	26.2	21.7	20.8		
BSE7	Northgate Lodge Roundabout	585446	264956	Roadside	29.3	25.9	24.2		
BSE10	Samson Close	584498	266084	Suburban	13.5	12.6			
BSE11	Eastgate Street (Vinefields junction)	585940	264618	Roadside	21.3				
BSE12	8 Mustow Street	585728	264371	Roadside	22.4				
BSE22	Churchgate Street	585508	264072	Roadside			19.4		
BSE25	Orttewell Road	587455	264215	Roadside			16.3		

Appendix B: Full monthly diffusion tube results for 2021

Table B.1 – NO_2 2021 diffusion tube results ($\mu g/m^3$)

Notes: No sites required distance correction. See Appendix C for details on bias adjustment and annualisation.

Diffusion tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.78)	Comment
BRN2	577993	286163	33.2	31.1	32.2	30.6	30.4	28.0	28.3	27.8	34.1	29.6	38.5	34.7	31.5	24.6	
BRN3	578406	286460	23.0	15.7	14.8	12.9	10.4	8.5	9.1	9.7	13.2	14.7	19.5	16.5	14.0	10.9	
BRN5	578206	286407			30.4	28.4	26.3	19.5	27.8	27.0		32.8	43.7	33.8	30.0	23.4	
BRN7	578073	286254	38.2		32.4	31.5	35.5	26.7	34.3	24.9	39.1	35.2	37.6	35.9	33.8	26.3	
BRN8	578372	286774			31.4			25.1			31.3		34.1	32.1	30.8	21.1	
BRN9	578372	286867		31.0	24.1	26.7		22.4		22.0	31.1	24.8	32.5	29.0	27.1	21.1	
BRN10	578395	286633	37.0	38.7	31.1	33.2	35.7	27.5	34.4	26.6	41.5	33.2	33.3	32.5	33.7	26.3	
BRN12	578486	286558			18.3	21.9	21.3	20.5	20.4	22.8	27.1	24.3	34.3		23.4	18.3	
BRN15	578317	287103	35.2	34.6	30.7	31.5	28.1		29.6	27.3	33.8	28.5			31.0	24.2	
BRN17	578297	286469	33.3		25.1	24.2			18.0	17.3	26.3	25.2	27.5	26.2	24.8	19.3	
LAK1	571378	282855	27.9	24.4	19.2	17.5	19.5	12.0	17.7	14.8	24.0	21.9	23.9	24.5	20.6	16.1	
MLD1	571136	274878	36.9	30.9	29.1	27.3	25.4	21.5	26.0	12.9	32.1	30.7	32.8	30.1	28.0	21.8	
MLD2	571092	274785	28.3	29.5	30.1	27.8	25.3	21.4	23.2	21.8	35.2	33.7	35.9	32.4	28.7	22.4	
MLD3	571326	274780	39.4	36.9	32.0	26.5	27.5	22.8	27.6	23.2	38.0		42.5	39.8	32.4	25.3	
NMK1	564716	263502	35.0	26.5	26.0	28.4	25.2	18.5	24.9	20.8	28.4	25.6	33.7	28.9	26.8	20.9	
NMK3	564707	263493	30.6	27.8	31.2	25.4	24.6	19.3	16.5	20.0	30.0	28.8	38.2	29.7	26.8	20.9	
NMK5	564337	263343	35.6	31.0	27.3	27.8	27.9	26.8	24.9		34.6	32.5	40.7	35.7	31.3	24.4	
NMK6	564307	263338	34.6	22.3	29.3	29.9	23.6	24.0		25.8	30.2		39.3	30.9	29.0	22.6	
NMK7	564233	263274	41.0	29.9	33.8	23.3	29.6	27.0	27.4	22.6	34.2	33.0	48.1	34.3	32.0	25.0	
NMK8	564138	263301	21.8	16.3	13.4	12.2	10.7	7.3	9.3	8.0	14.6		18.9	17.4	13.6	10.6	
NMK9	564043	263159	30.1	25.1	25.1	29.2	25.0	25.4	22.9	22.9	32.3	30.9	34.9	26.4	27.5	21.5	
NMK10	564362	263381	45.5	27.3	34.1	34.2	30.5	29.4	30.1	32.8	30.0	34.0	50.5	42.1	35.0	27.3	
NMK11	564380	263407	25.1	19.5	17.6	17.8	14.4	12.2	12.6	8.6	18.7	20.6	23.6	23.1	17.8	13.9	
NMK12	564550	263544	38.2	31.7	34.8	31.1	29.9	30.3	23.0	28.9	33.9	33.8	45.5	36.4	33.1	25.8	
NMK14	564480	263464	36.0	27.7	26.6	26.4	25.6	20.3	18.0	27.3	34.2	35.3	39.4	36.5	29.4	23.0	
NMK15	564383	263381	34.4	31.7	26.0	27.8		14.3	26.1		32.6	36.0	37.3	42.9	30.9	24.1	
NMK17	563397	264498	28.1	24.6	20.9	19.3	19.8	16.4	13.8	14.8	20.5	23.8	28.8	24.3	21.3	16.6	
NMK19	564626	263525	41.0	33.0	29.3	29.2	31.2	24.1	23.5	21.1	36.9	35.9	41.7	35.2	31.8	24.8	
IXW1	593655	270127	23.7	26.5	21.4	19.3	21.5	18.2	16.9	9.9	26.5	20.4	21.8	24.6	20.9	16.3	
IXW2	593281	270545	32.0	24.5	27.1	19.3	19.4	16.0	16.3	18.4	25.3		32.0	27.5	23.4	18.3	
BSE1	586253	263147	47.1	34.1	44.4	34.6	41.3	38.9	36.7	37.7	38.6	42.4	52.1	40.8	40.7	31.8	
BSE2	586320	263053	33.5	27.6	30.4	20.9	24.7	22.3	14.4	24.6	28.5	26.9	37.5	28.6	26.7	20.8	
BSE3	585236	263746	32.1	26.3	31.8	26.5	25.8	18.5	22.2	26.5	27.7	31.8	40.2	25.5	27.9	21.8	
BSE6	584905	264171	37.0	26.9	31.5	33.3	32.8	33.1	28.3	28.1	37.8	35.0	36.5	39.6	33.3	26.0	
BSE8	585461	265050	39.1	37.6			29.6	27.5	24.7	25.5		33.1	42.0	39.2	33.1	25.9	
BSE9	585085	265924	35.4	32.0	30.4	29.2	37.8	30.5	24.7	24.6	38.2	32.6	35.4	35.1	32.2	25.1	
BSE14	585624	264334	37.4	30.8		27.5	31.9	27.5	31.8	26.2	33.8	35.8	40.0	17.6	30.9	24.1	
BSE15	586273	263135	53.6	41.6	32.7	26.1	35.8	26.4	31.1	25.9	41.7	47.0	45.9	56.9	38.7	30.2	
BSE16	585424	264977	36.4	33.7	34.2		38.1	27.8	22.8	24.6	37.1	36.0	42.2	42.7	34.1	26.6	
BSE17	585264	264921	43.9				28.5	25.9	26.2	24.9	35.5	39.8	39.4	37.2	33.5	26.1	
BSE18	586126	263328	38.7	32.3	28.2	29.5	24.3	23.2	24.9	23.9	33.2	23.3	34.3	28.7	28.7	22.4	
BSE19	584618	264471	35.5	31.9	31.0	25.7	29.8	18.3	19.9	21.1		29.9	39.9	34.8	28.9	22.5	

Diffusion tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.78)	Comment
BSE20	585031	264466	29.3	22.6	21.2	17.2	17.5	14.5	15.2		21.6	23.8	27.9	25.9	21.5	16.8	
BSE21	585555	264494	35.5	25.5	33.4	22.1	27.5	22.7	23.5	21.4	31.2	35.1	40.5	41.8	30.0	23.4	
BSE23	585285	263841		22.3	20.3	17.1	16.3		12.9	13.5		22.5	27.4		19.0	15.1	
BSE24	586418	265179	45.7	34.3	37.7	27.1	28.7	25.5	28.7	30.4	39.2	34.9	40.5	37.0	34.1	26.6	
BSE26	584957	264164	31.0	25.3	25.4	20.4	23.6	22.7	23.2	22.5	28.2	34.5	34.3	35.4	27.2	21.2	
BSE27	585349	263781	36.1	26.2	27.3	25.0	20.5	21.2		21.0	28.5	27.5	38.8	30.5	27.5	21.5	
BSE28	585314	264960	34.2	31.4	35.3	36.9	31.3		25.8	29.2	36.5	32.1	44.1	33.8	33.7	26.3	
BSE29	585845	263730	27.6	21.1	18.9	14.6	14.9	10.8	11.7	11.0	17.1	20.5	22.8	22.7	17.8	13.9	
BSE30	585185	264285	24.7	28.7	20.9	22.6	20.7	20.9	19.4	17.3	24.1	23.7	25.7	25.1	22.8	17.8	
BSE31	583648	264767	35.7	34.1	29.5	24.6	32.7	25.4	27.2	20.8	37.7	33.6	36.2	31.1	30.7	24.0	
GB2	588917	267370	17.9	9.1	9.7	7.5	7.0	5.4	5.3	5.2	9.8	12.2	15.0	13.4	9.8	7.6	
GB3	589163	267013	42.0	22.9	25.2	21.5	26.6	19.2	22.6	23.4	30.8	36.5	35.4	35.1	28.4	22.2	
GB4a	589130	266969	37.3	30.9	29.8	25.1	27.2	21.8	28.0	30.1	31.5	26.1	42.9	37.4	-	-	Triplicate site with GB4a, GB4b and GB4c - Annual data provided for GB4c only
GB4b	589130	266969	43.4	30.8	32.4	25.5	26.5	17.1	23.8	30.7	35.7	34.5	53.9	26.8	-	-	Triplicate site with GB4a, GB4b and GB4c - Annual data provided for GB4c only
GB4c	589130	266969	41.6	34.0	32.9	30.0	31.9	31.0	25.9	32.4	31.3	30.5	43.1	33.1	31.9	24.8	Triplicate site with GB4a, GB4b and GB4c - Annual data provided for GB4c only
GB5	588993	266838	35.8	25.5	27.3	22.8	27.5	19.9	24.4	21.7	32.1	30.3	32.1	33.1	27.7	21.6	
GB6	589120	266960	59.2	33.8	43.5	41.8	45.9	39.5	38.9	45.5	53.0	50.8	56.8	32.1	45.1	35.2	
GB7a	589100	266941	44.9	43.7	38.1	38.9	43.2	28.5	36.7	38.7	43.3	45.4	48.0	37.8	-	-	Triplicate site with GB7a, GB7b and GB7c - Annual data provided for GB7c only
GB7b	589100	266941	53.3	43.7	38.6	37.8	48.2	36.5	37.7	34.1	49.8	44.3	49.1	47.0	-	-	Triplicate site with GB7a, GB7b and GB7c - Annual data provided for GB7c only
GB7c	589100	266941	51.6	45.3	38.4	36.8	39.2	28.5	27.9	36.8	48.7	41.7	48.3	43.7	41.5	32.4	Triplicate site with GB7a, GB7b and GB7c - Annual data provided for GB7c only
GB8	589093	266949	47.2	36.5	39.2	35.4	30.5	32.4	32.5	33.6	37.5	36.4	48.4	45.3	37.9	29.6	
GB9	589117	266970	44.3	32.5	33.1	31.4	32.3	28.4	25.8	28.7	42.4	36.2	41.3	36.4	34.4	26.8	
GB10	589228	267071	32.6	27.6	23.6	22.7	24.7	22.3	20.5	24.1	36.2	34.0	37.2	33.2	28.2	22.0	
HH1	568609	245575	22.7	14.3	13.6	8.7	9.1	7.6	8.3	11.8	13.5	16.8	19.6	16.1	13.5	10.5	
HH2	567270	245981	45.3	38.1	35.9	29.1	26.3	25.4	25.3	25.2	43.2	40.8	39.3	39.5	34.5	26.9	
HH3	566891	245892	48.0	37.7	40.8	26.7	34.3	17.6	29.1	24.7	37.3	43.7	47.1	38.2	35.4	27.6	
HH5	566941	245850	46.3	43.7	28.5	41.6		32.0	31.9	29.5	43.3	38.9	44.4	37.5	38.0	29.6	
HH7	567553	245289	27.3	15.8	21.5	17.0	14.4	12.9	11.3	12.1	20.6	23.2	24.9	25.1	18.8	14.7	

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% and >25% in line with LAQM.TG16
- 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 / air quality monitoring data quality assurance and quality control

New or changed sources identified within West Suffolk Council during 2021

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 2021

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 2021, 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 2021 diffusion tube monitoring calendar as published by Defra.

Diffusion tube annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25% where results may not be reflective of the yearly average. Annualization 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, BRN8 and BSE23, where data collection was 40.4% and 67.3% 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.2

Diffusion tube bias adjustment factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes

to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

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

The bias adjustment is based on 23 studies on spreadsheet version 03/22. As evident from the data presented in Table C.1, the bias adjustment factor has remained relatively consistent over the past 5 years.

Table C.1 – Bias adjustment factors

Monitoring year	Local or national	If national, version of national spreadsheet	Adjustment factor
2021	National	03/22	0.78
2020	National	03/21	0.77
2019	National	03/20	0.75
2018	National	03/19	0.76
2017	National	03/18	0.77

NO_2 fall-off with distance from the road

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

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 2021.

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

Diffusion tube ID	Annualisation factor Wicken Fen	Annualisation factor St Osyth	Average annualisation factor	Raw data annual mean	Annualised annual mean	Comments
BRN8	0.8982	0.8601	0.8791	30.8	27.1	
BSE23	1.0399	0.9947	1.0173	19.0	19.4	

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)

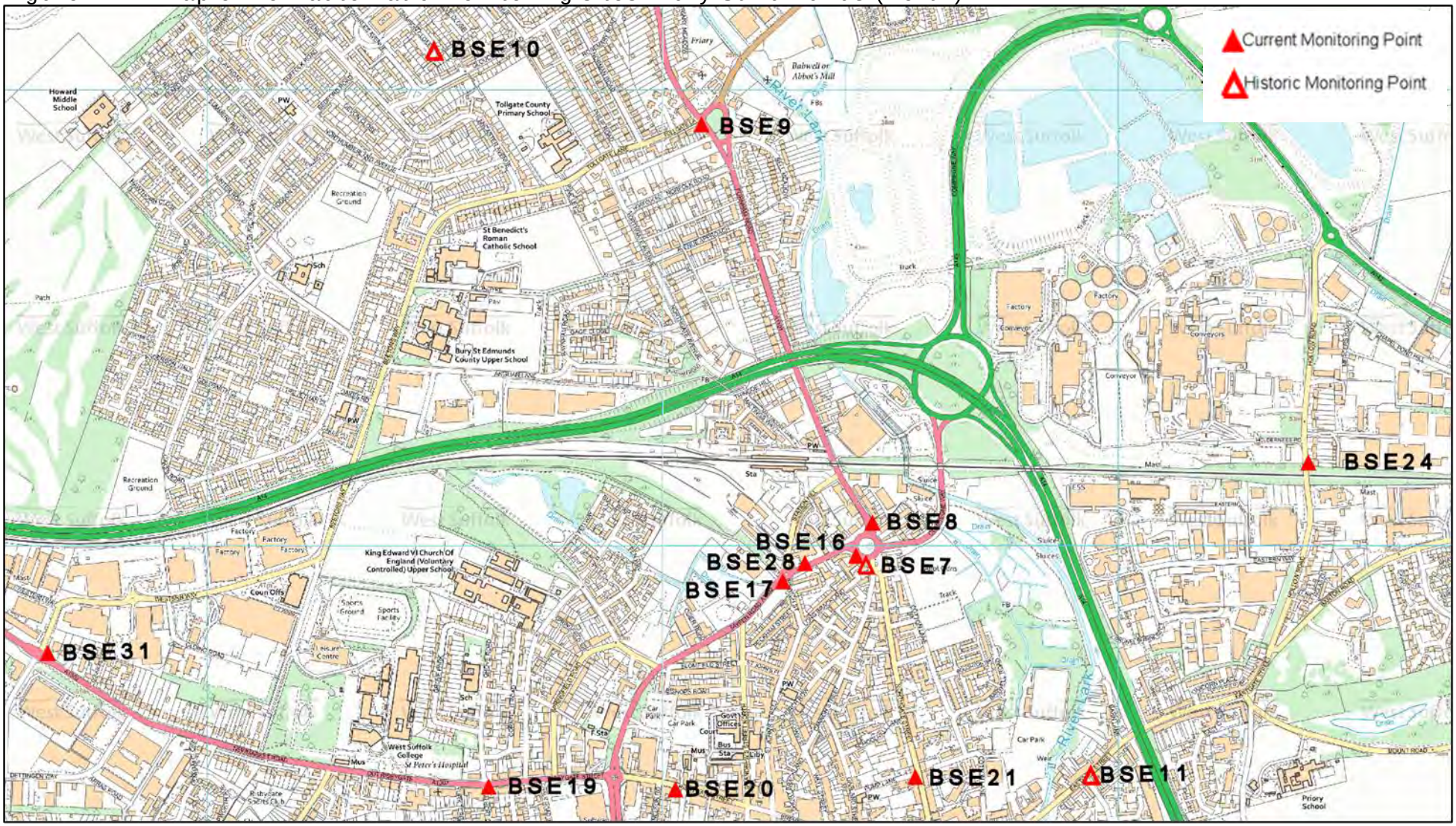
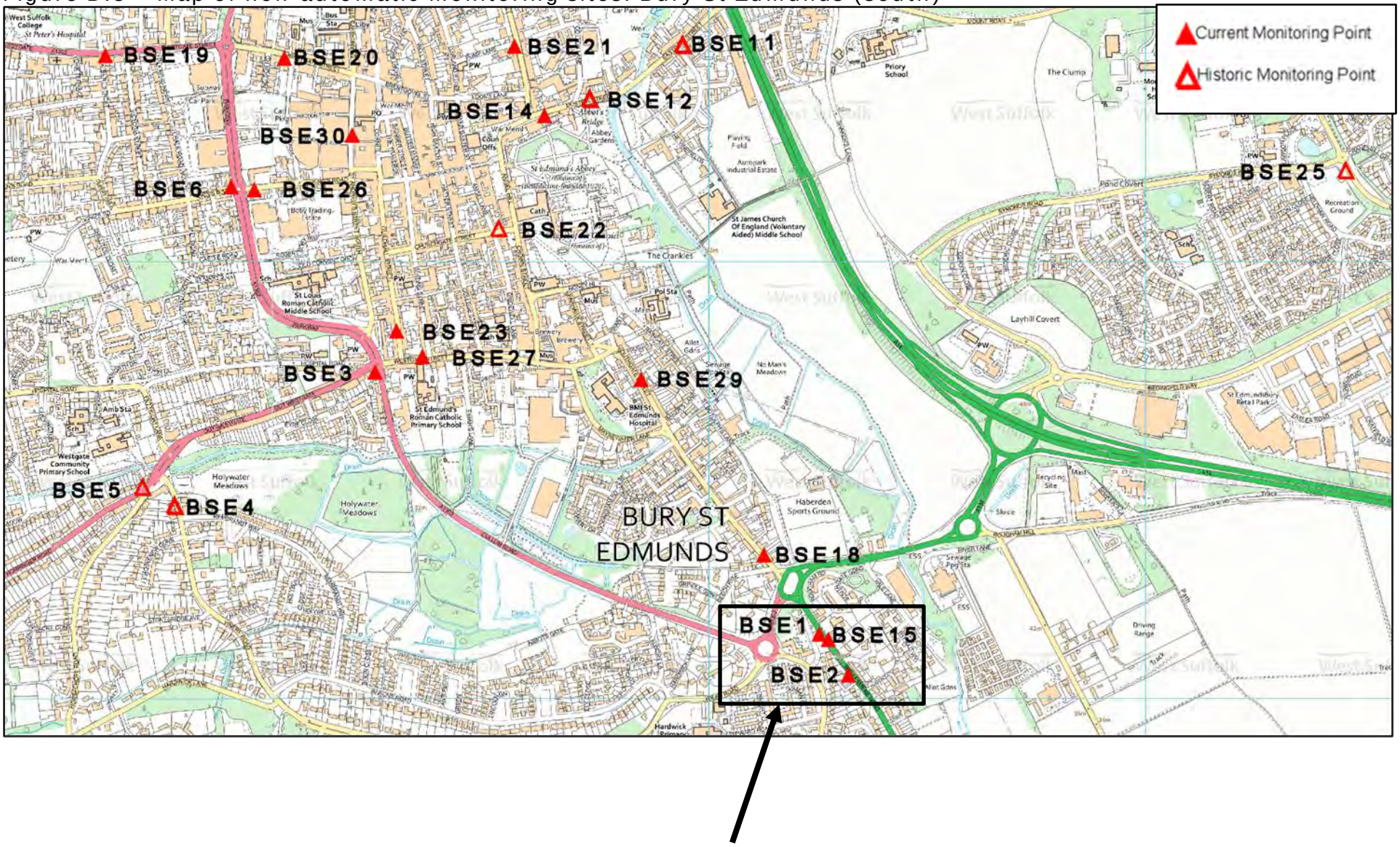


Figure D.3 – Map of non-automatic monitoring sites: Bury St Edmunds (south)



See Figure D.4: Sicklesmere Road AQMA

Figure D.3 – Map of Sicklesmere Road AQMA

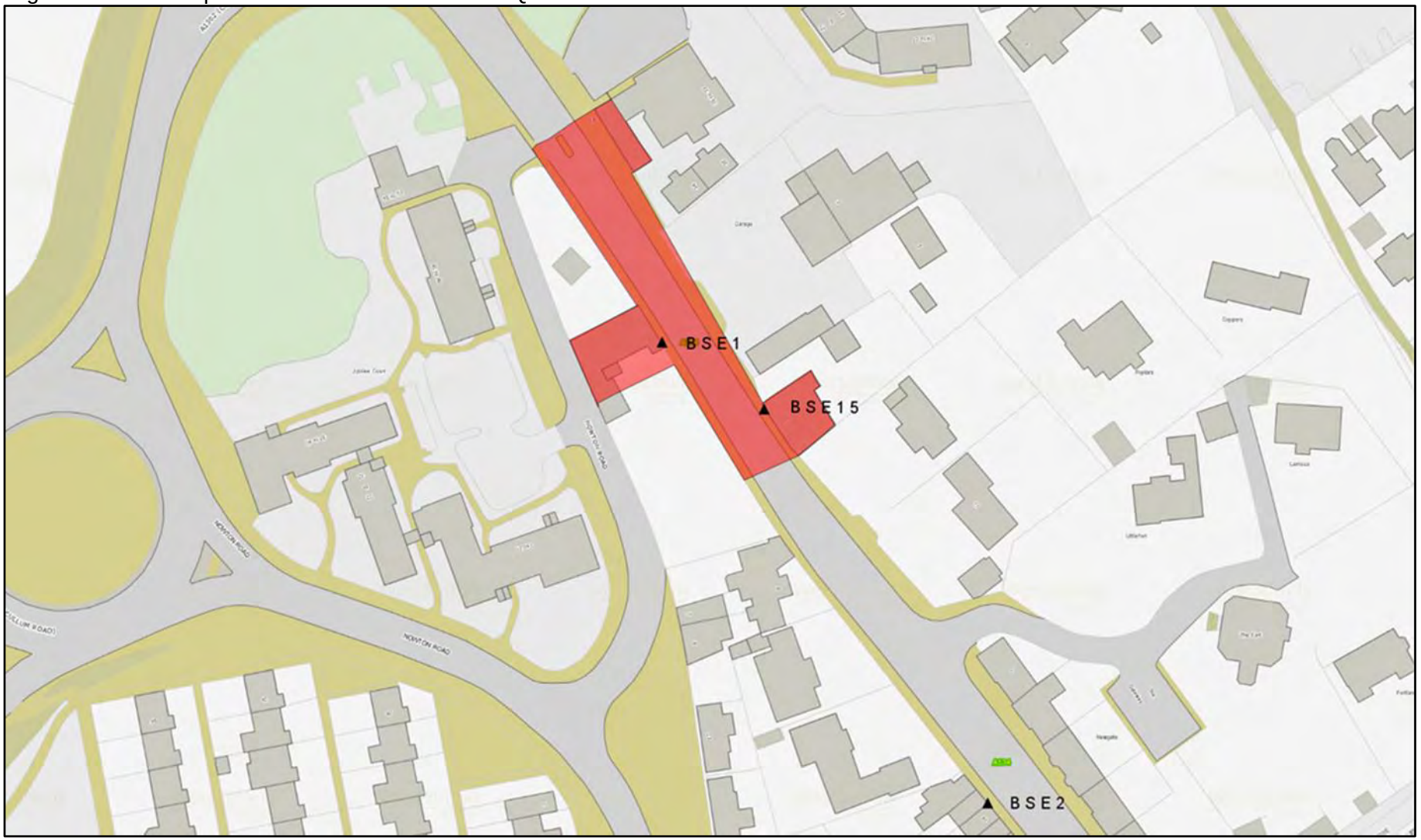
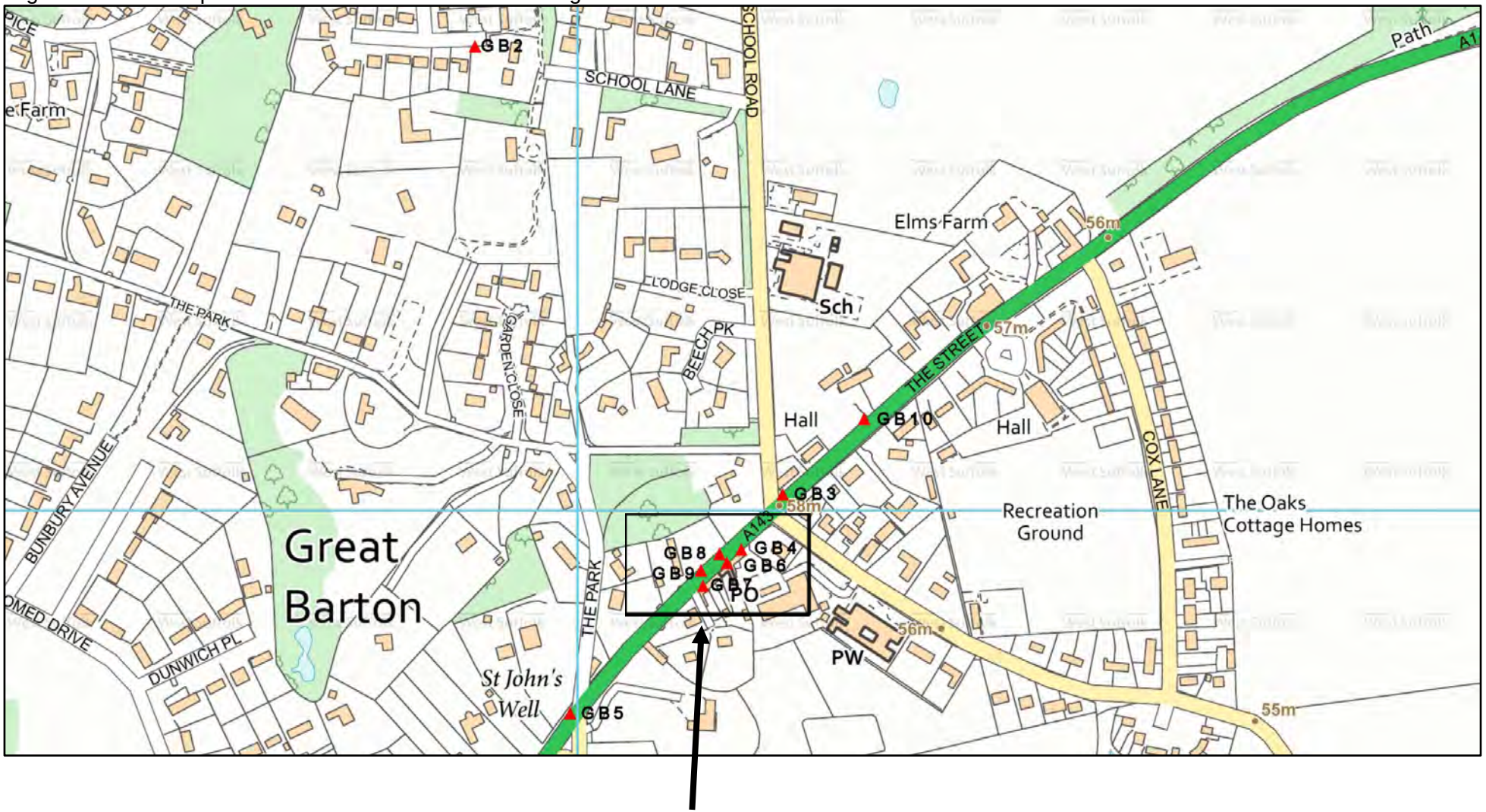


Figure D.5 – Map of non-automatic monitoring sites: Great Barton



See Figure D.6: Great Barton AQMA

Figure D.6 – Map of Great Barton AQMA

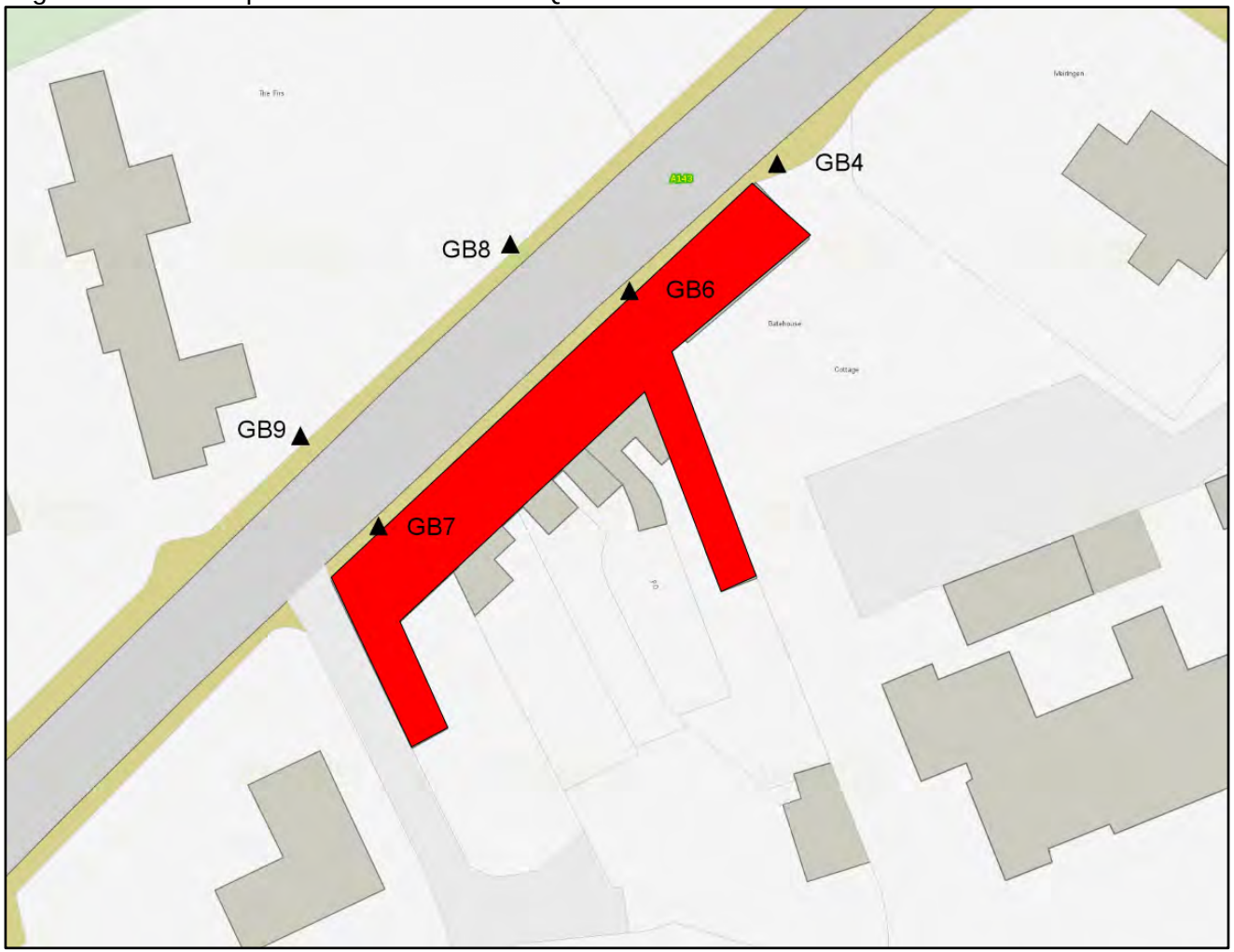


Figure D.4 – Map of non-automatic monitoring sites: Haverhill

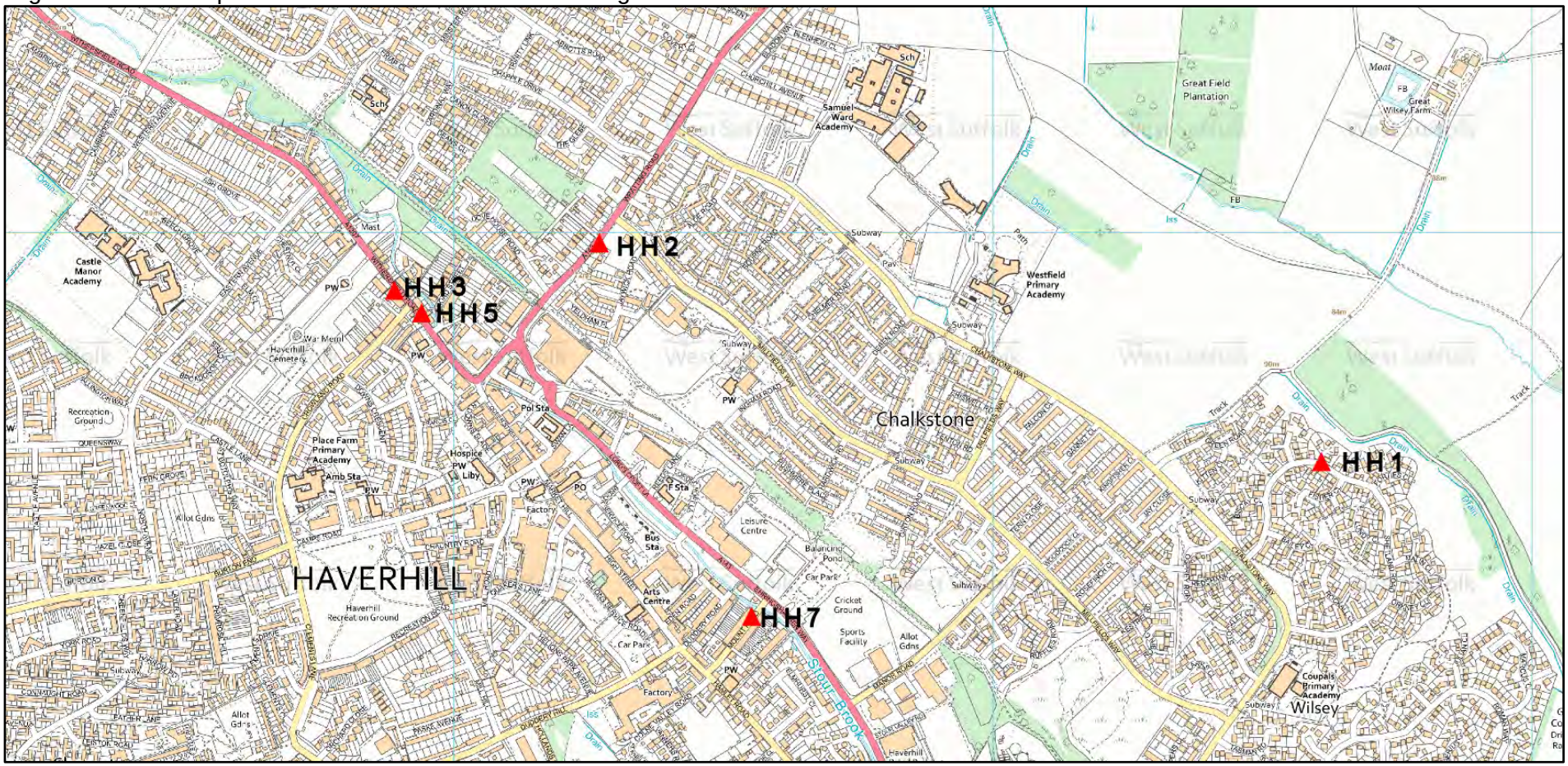


Figure D.8 – Map of non-automatic monitoring sites: Ixworth

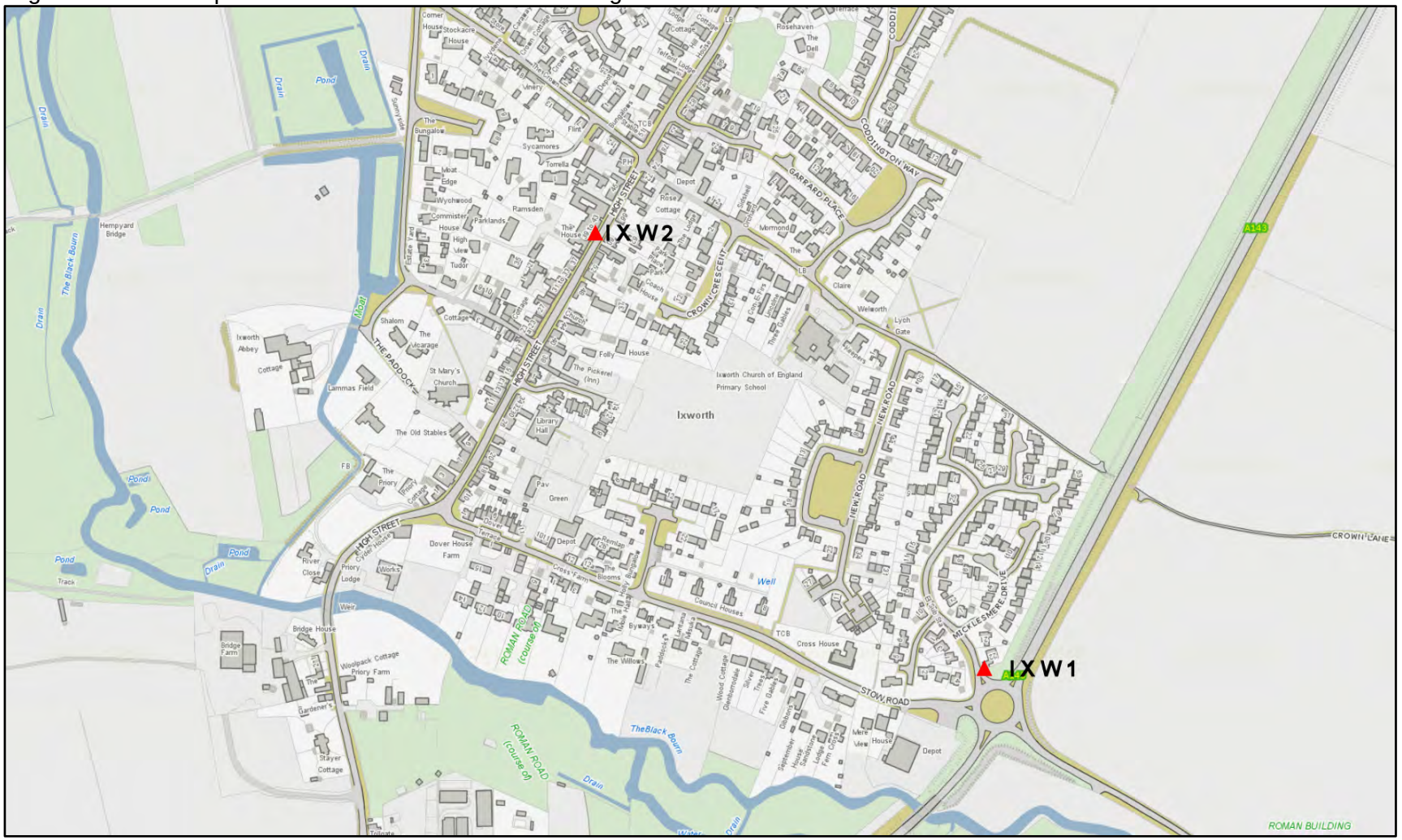


Figure D.9 – Map of non-automatic monitoring sites: Lakenheath

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

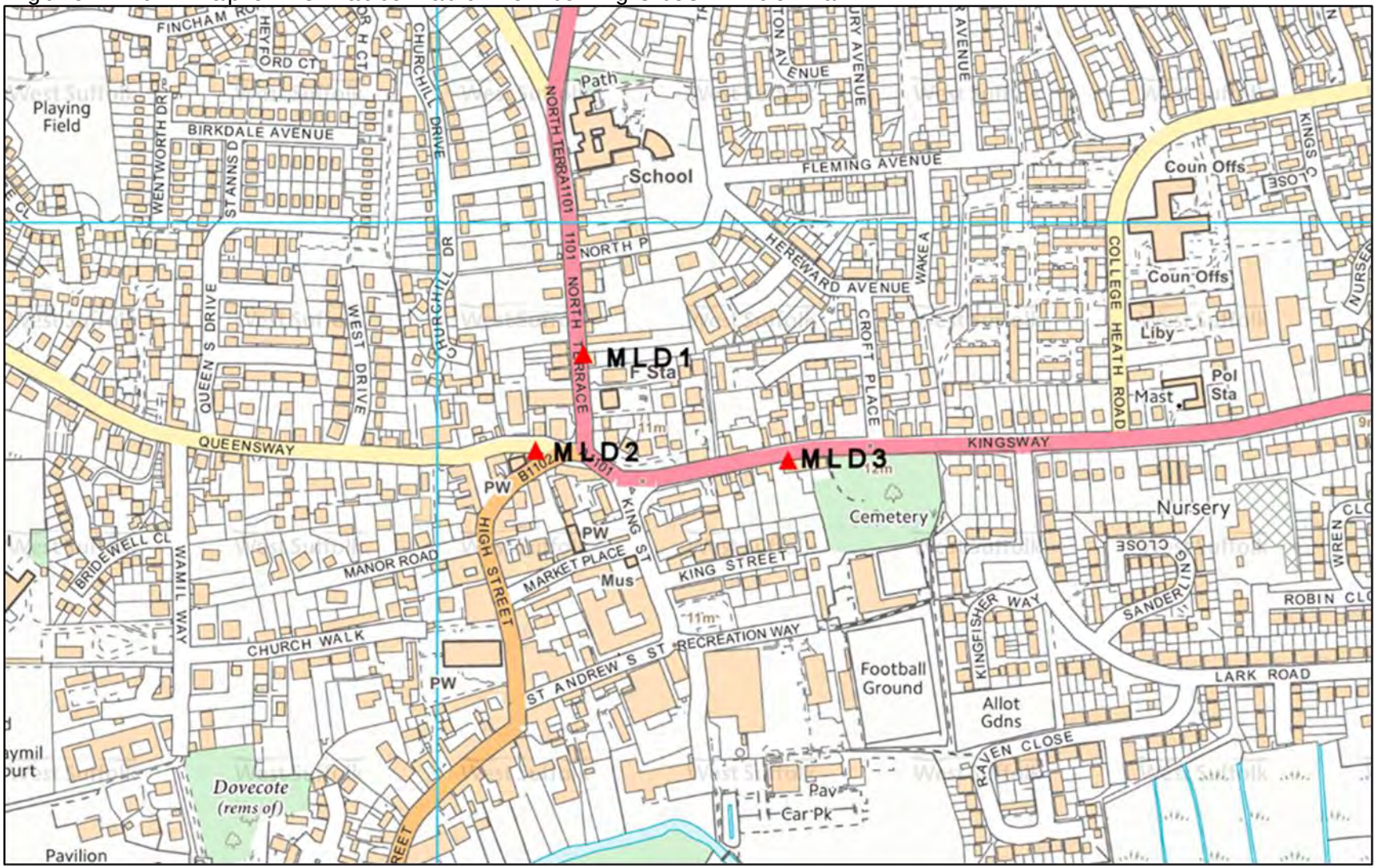


Figure D.11 – Map of non-automatic monitoring sites: Newmarket town centre

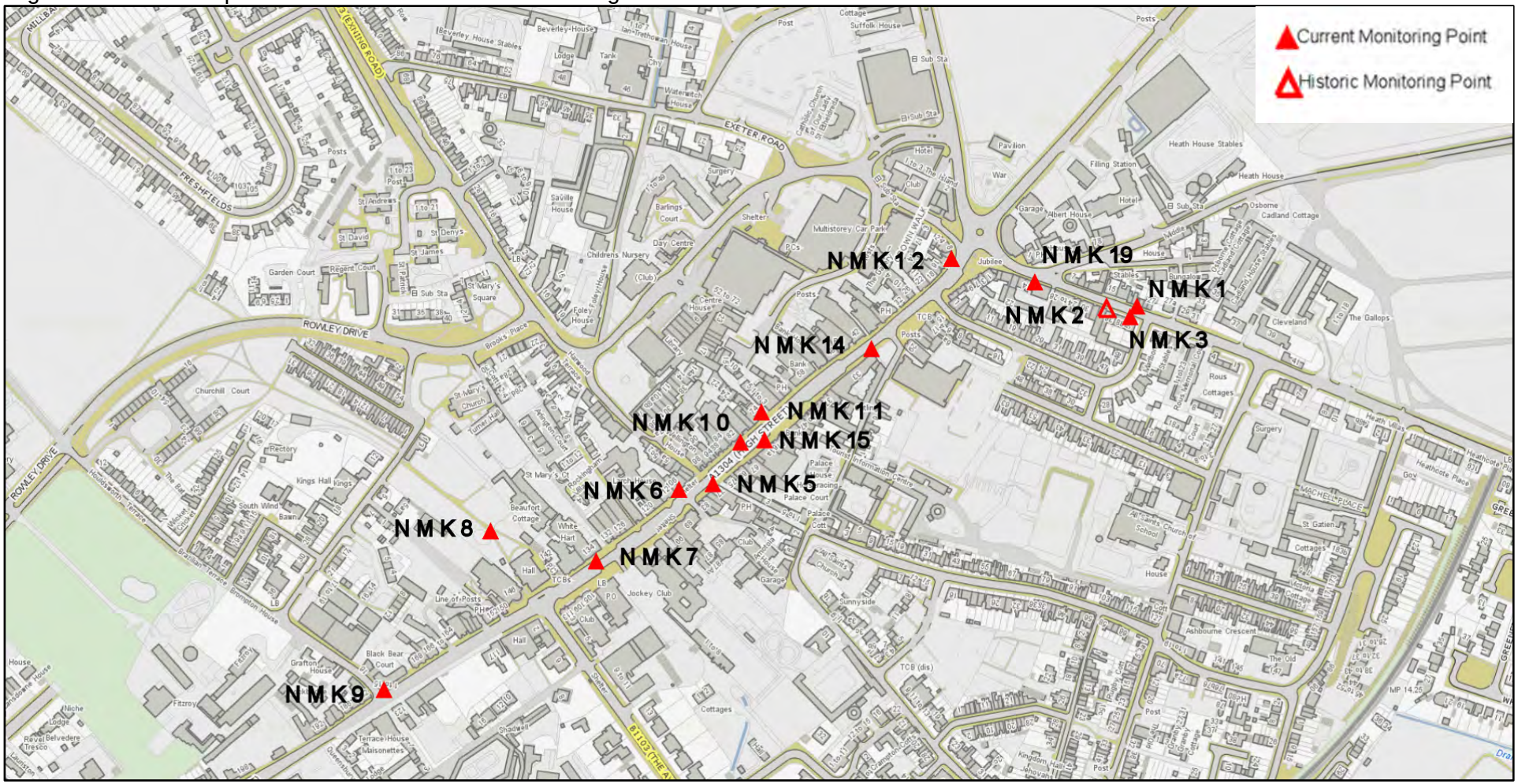
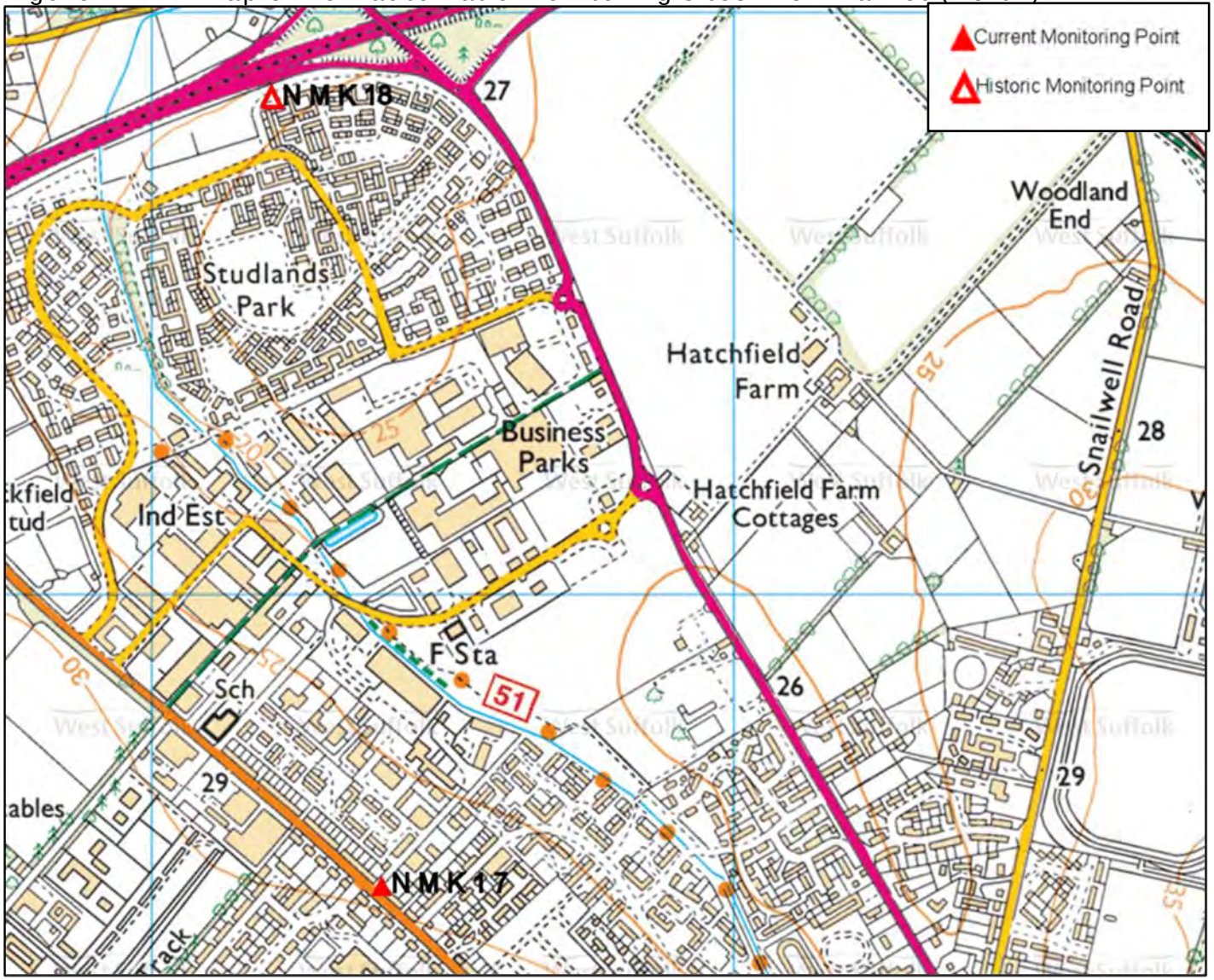


Figure D.12 – Map of non-automatic monitoring sites: Newmarket (north)



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 / 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
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 2.5 micrometres or less
QA/QC	Quality assurance and quality control
SO_2	Sulphur dioxide

References

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