



Breckland
COUNCIL

2022 Air Quality Annual Status Report (ASR)

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

Date: November, 2022

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Executive Summary: Air Quality in Our Area

Air Quality in Breckland Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas^{1,2}.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

The District of Breckland is approximately 500 square miles of mostly rural areas and comprises the principal market towns of Attleborough, Dereham, Swaffham, Thetford and Watton. The district has a fairly low population density with 130,000 residents recorded in the 2011 census⁴, but current population is 140,500 with further rapid growth predicted to rise to 159,400 by 2041. One of the main sources of air pollution within the Breckland District Council is found in Swaffham, where the A1065 runs through the centre of the town and is the main route for both local traffic and for traffic travelling to North Norfolk. The layout of the town leads to frequent traffic congestion, and this leads to elevated concentrations of Nitrogen Dioxide (NO₂). Over the past few years these concentrations have generally monitored below NO₂ annual mean Air Quality objective of 40µg/m³. Previous Air Quality (AQ) reports with full details of all monitoring and results can be found on the Council website with this link <https://www.breckland.gov.uk/article/3244/Air-Pollution>.

¹ Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

³ Defra. Air quality appraisal: damage cost guidance, July 2021

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

There is currently one Air Quality Management Area (AQMA) designated within Breckland District Council (BDC); AQMA No.2 within Swaffham spans the main vehicular route in the town centre, around the A1065. The current AQMA was declared in May 2017 due to exceedances of the NO₂ annual mean. The boundaries of Breckland's AQMA can be seen in Appendix D and online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=32.

During 2021, Breckland District Council monitored NO₂ using 26 passive NO₂ diffusion tubes and two automatic monitoring stations. There were two co-located triplicate tubes at each of the automatic sites (diffusion tube sites S3 and 20).

The NO₂ diffusion tube network is in place to monitor NO₂ concentrations across Breckland District Council, monitoring at known hotspot areas and also being used to identify any new sensitive areas. No exceedances of the NO₂ Air Quality objective of 40µg/m³ have been measured in the last five years. In 2021, NO₂ concentrations increased slightly from 2020 concentrations, with the highest increase seen at diffusion tube D2, increasing from 13.6 µg/m³ in 2020 to 21.8 µg/m³ in 2021. This is still well below the national objectives, however. Site D2 is located outside the boundary of the declared AQMA. This increase in concentrations is to be expected as traffic flow patterns are beginning to return to 'normal' flow following the Covid-19 pandemic in 2020. Two diffusion tubes (D3 and W1) remained the same as 2020 concentrations and two diffusion tubes (D1 and S14) decreased in 2021.

Automatic PM₁₀ monitoring is carried out at Breckland East Wretham (BRE01) air quality monitoring site. In 2021, data capture was high (99.1%) at the monitoring site BRE01 and the measured annual mean PM₁₀ concentration at this location was 13 µg/m³, which is significantly below PM₁₀ objectives for annual mean and the lowest recorded annual mean over the last five years.

Table A.7 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past five years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year. There were no daily mean exceedances of 50µg/m³ in 2021.

Currently, there is no monitoring of PM_{2.5} carried out within Breckland District Council. However, in accordance with LAQM. TG(16), the PM_{2.5} concentrations can be estimated from PM₁₀ monitoring using either a local PM₁₀ and PM_{2.5} monitoring ratio, or a nationally derived correction ratio of 0.7. As there is no local monitoring for PM_{2.5}, the nationally derived correction ratio of 0.7 was applied to the 2021 PM₁₀ concentration (13 µg/m³) at the automatic monitoring site East Wretham (BRE01). Therefore, the estimated PM_{2.5}

concentration in 2021 at the automatic monitoring site is 9.1 $\mu\text{g}/\text{m}^3$, which is below the $\text{PM}_{2.5}$ obligatory air quality objective of 25 $\mu\text{g}/\text{m}^3$.

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 Strategy⁵ sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero⁶ 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.

With regard to the [National Planning Policy Framework](#), air quality considerations have been adopted across the district when dealing with planning applications and the provision of pre-application advice. In 2017, an Air Quality Development Management Policy was implemented as part of the Air Quality Planning and Policy Guidance classification.

Following the declaration of the AQMA in 2017 in Swaffham, an [Air Quality Action Plan](#) (AQAP) was produced and was published in 2018. Improvements in traffic queueing and delays are a strong focus in the AQAP, with proposed removal of the traffic lights on the Station Street/Mangate Street junction, encouragement of public transport use and review of car parking enforcement and the town centre one-way system.

Progress is ongoing on the actions outlined in the 2018 AQAP including installation of infrastructure to encourage use of electric vehicles within the town centre such as fast chargers that have been installed in Swaffham, Attleborough, Thetford and Dereham.

Increase in electric vehicle charging points have encouraged the introduction of the first four private vehicle electric licence taxis in Breckland District Council, which became operational in 2021.

⁵ Defra. Clean Air Strategy, 2019

⁶ DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018



Breckland District Council have also completed the following quantitative improvements in a bid to target sources of pollution:

- Breckland has joined with two neighbouring councils (Borough of King's Lynn and West Norfolk and North Norfolk Council) in a new household waste contract with Serco. This ensures that investments can be made in a brand-new fleet of refuse collection vehicles, including reduced emissions and hybrid vehicles. For more information, please visit [New household waste contract to start in Breckland and west Norfolk \(serco.com\)](http://serco.com). Pictured below are the leaders of the three councils in front of some of the new refuse vehicles.



- Breckland District Council is working in association with Highways England, Babergh and Mid Suffolk District Councils, and six local authorities in Suffolk,

Norfolk and Essex on an initiative to install new charging points along key roads in East Anglia. This will support Government initiatives to increase the number of electric vehicles (EV) and reduce the sale and use of conventional petrol and diesel cars in the UK. Breckland District Council currently have four rapid charging points in the following Breckland car parks:

- Swaffham - Pedlars Car Park Market Place, PE37 7AB
- Attleborough - Queens Square Car Park, Queens Square, NR17 2AE
- Thetford - Pike Lane Car Park, Pike Lane, IP24 2DR
- Dereham - Cowper Road Car Park, Cowper Road, NR19 2DA

You are able to view all car electric charging points in the UK on the [Zap-Maps website](#).

- Since January 2021 Breckland Council has committed further to climate emergency by appointing a full-time Climate change and Environment officer to help with the delivery of the sustainability strategy.
- Breckland District Council's first [Sustainability and Climate Change Strategy](#) comes after Breckland Council members voted to declare a climate emergency in September 2019. Since then, the council has made tackling climate change a top priority and been developing its inaugural strategy.
- During October 2020, Breckland Council switched to a green energy tariff in all its buildings, reducing the council's fossil fuel impact and working towards making the council more environmentally-sustainable.
- The council has also introduced an agile working policy and work smart scheme. This will enable our workforce to work in a flexible and agile way which embraces current technology and reduce the need to commute and reduce work related travel. All officers are provided with laptops with email, calendar, and collaboration software from the Microsoft Office 365 solution (including Teams) also providing video and audio conferencing, chat, and document sharing. Employees will be contactable in the same way as if they were in the office.
- The Green Community Grants fund was set up to support communities in Breckland to take action for themselves. Its aim is to promote environmental sustainability and create positive behavioural change in response to climate change. The fund can also support school projects which encourage pupils to take action for the environment. The fund was open to applications from Monday 13 July to Sunday 12 September 2021. Breckland District Council considered all the applications carefully

and contacted the projects at the start of October, to let them know whether they'd been successful. The Green Community Grants fund has awarded £98,226 worth of grants, shared between 30 projects. Please visit [Green Community Grants - Breckland Council](#) for more information and to explore the map to find out more about each of the selected projects.

- Exciting new plans for the future of Watton and Swaffham have been drawn up as part of the Future Breckland project. Future Breckland: Thriving People and Places is a project to revitalise Breckland's five market towns and equip them for the future. The project has already seen a plan drawn up for Dereham: plans for Attleborough and Thetford will follow. Now, the newly revealed plans for Watton and Swaffham are setting out proposals that are individually-tailored for each town. The proposals include long-term goals for the next decade and shorter-term goals for the next one to three years. Some of the short-term suggestions put forward in the plan for Swaffham include trialling partial pedestrianisation schemes and car-free days, increasing tree planting and creating parklets and a green gateway and installing electric vehicle charging points. For more information, please visit [28/03/22: Future plans drafted for Watton and Swaffham - Breckland Council](#).
- Within the masterplan for Swaffham there are ideas proposed that include increased planting of seasonal pollinating flowers, herb gardens, colourful rain gardens and greenery throughout the town centre and areas heavily used by pedestrians, as well as planting of trees around the marketplace, which will improve the air quality. The plans also include temporary parking suspension trials to ease some of the traffic and encourage visitors to park in the car parks on Station Street and Theatre Street which will be signposted with improved wayfinding. These are items which the council believe can be delivered in 2022, but there are more details within the masterplan which include larger and heavy-duty interventions in the long run. Please visit [The Swaffham Enhancement Masterplan - The Spaces Handbook \(breckland.gov.uk\)](#) for more information.

Conclusions and Priorities

Breckland District Council 2022 ASR is an update of the monitoring carried out last year and illustrates that there has been a general improvement in air quality across the district over several years. This includes an improvement to NO₂ concentrations measured within Swaffham AQMA where there has been no exceedance since 2017.

There were no exceedances of the NO₂ annual mean air quality objective identified across the 26 passive monitoring sites and two automatic monitoring sites. There have been no exceedances within the AQMA since its declaration in 2017. In 2021, NO₂ concentrations out with the declared AQMA increased slightly from 2020 concentrations, with the highest increase seen at diffusion tube D2, increasing from 13.6 µg/m³ in 2020 to 21.8 µg/m³ in 2021, which is still below the NO₂ annual mean objective of 40 µg/m³. The 2021 NO₂ concentration measured at D2 is more in line with pre-Covid-19 concentrations, this increase in concentrations is to be expected as traffic flow patterns are beginning to return to 'normal' flow following the Covid-19 pandemic in 2020. Two diffusion tubes (D3 and W1) remained the same as 2020 concentrations and two diffusion tubes (D1 and S14) decreased in 2021.

The annual mean NO₂ concentration did not exceed 60 µg/m³ at any monitoring locations, which indicates that an exceedance of the 1-hour mean objective (200 µg/m³) is unlikely at these sites.

Having regard to all of the data, the Council may consider whether a detailed assessment is to take place with regard to any future exceedances. The findings of this assessment will inform, whether or not to revoke the AQMA. Additionally, there have been no exceedances of the PM₁₀ annual mean air quality objective within the past five years.

Local Engagement and How to get Involved

As part of the ongoing AQMA process, and since publication of the AQAP and from the 2017 public forums discussing the improvements of the district's air quality, we welcome continuous suggestions from residents, local business and interest groups in order to improve air quality in the area. We have further met with local and regional organisations and Councils to ensure that we are in touch with local concerns and are better placed to explore potential solutions.

Find out more about your local air quality by: -

- Contacting the Air Quality officer at Breckland (details at the beginning of this report) or email envprotect@breckland.gov.uk
- Contact your local councillor with any concerns
<http://democracy.breckland.gov.uk/mgMemberIndex.aspx?FN=ALPHA&VW=L&IST&PIC=0>

- Consider how and when you use your car, especially at peak times. Consider using public transport where possible for trips into towns and walking or cycling for a non-polluting and healthy alternative.

Local Responsibilities and Commitment

This ASR was prepared by Ricardo Energy and Environment on behalf of Breckland District Council with the support and agreement of the following officers and departments:

- Varuna Addy – Environmental Protection and Enforcement
- Jayne Tawana – Environmental Protection and Enforcement

This ASR has been approved by:

- Craig Fowler – Environmental Health and Licensing Manager

This ASR has not been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Varuna Addy at:

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1 Local Air Quality Management

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

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

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

2 Actions to Improve Air Quality

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 Breckland District Council can be found in Table 2.1. The table presents a description of the AQMA that is currently designated within Breckland District Council. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=32 (see full list at <https://uk-air.defra.gov.uk/aqma/list>).

Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designation is NO₂ annual mean.

The councils 2019 ASR mentioned consideration to revoke the declared AQMA if the downward trend in concentrations continued and all monitoring was below 10% of the annual mean Air Quality Objective for NO₂ (40 µg/m³). There have been no exceedances reported within the AQMA since 2017. A maximum concentration of 38.0 µg/m³ was reported at monitoring site S12 in 2019, which is within 10% of the objective. This diffusion tube is located outside the AQMA boundary. This location had increased from 2018 concentration by 6.5 µg/m³. In 2020, site S12 dropped 56.1% to 16.3 µg/m³ (compared to 2019 concentration), this difference in concentration may be associated with the downturn in vehicles brought about by the COVID-19 pandemic. In 2021, diffusion tube monitoring site S12 increased slightly to 19.2 µg/m³ which is still well below the national objective. Having taken advice from the DEFRA helpdesk on this matter, the Council has been advised that it would be useful to have an additional year of data for S12 to determine whether the 2019 result was truly representative of concentrations. The larger data picture, over a prolonged period, assures us that this is not erroneous data, or data that does not reflect longer term trends.

Next year, the Council will consider whether a detailed assessment is necessary to evidence the likelihood of future exceedances. The findings of this assessment will inform whether or not to revoke the AQMA.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
Breckland District Council Air Quality Management Area Number 2 Order 2017	1 st May 2017	NO ₂ Annual Mean	An area encompassing a number of residential properties in Station Street and London Road Swaffham	No	41 µg/m ³	25.7 µg/m ³	AP01/18 - Breckland Council Air Quality Action Plan - 2018 09/10/2018	Breckland Council Air Quality Action Plan*

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

Breckland District Council confirm that all current AQAPs have been submitted to Defra.

*The latest Air Quality Action Plan will be uploaded to the Breckland Council website in due course

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

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

1. The Council have provided a thorough and concise report which contains the required content.
2. The AQMA has not seen an exceedance of the annual mean objective for NO₂ since its declaration in 2017, with all monitoring locations below the objective in 2020. However, concentrations increased, although remained within 10% of the objective in 2019. The Council have stated they do not intend to consider revocation until five consecutive years of concentrations below 10% of the objective have been observed. This is supported, and the Council is encouraged to continue implementing AQAP measures and close monitoring of their AQMA.
3. The report includes some good measures to tackle PM_{2.5} emissions and concentrations within the District, as well as providing a link to the Public Health Outcomes Framework. A reference to indicator D.01 has been made with a comparison to regional and national values. This is welcomed.
4. The Council have provided an update on the progress made in 2020 against measures in their Air Quality Action Plan within Table 2.2. However, the Council have not completed columns on funding, measure status and key performance indicators for most measures. The Council is encouraged to complete these fields in the future.
5. There is a minor inconsistency between tables. In Table 2.1 under column "Reported Level of Exceedance: Current Year" does not correspond to reported results in other sections of the report (24.6 µg/m³ vs 24.1 µg/m³). Whilst the difference is slight, the Council should ensure accurate and consistent reporting of data in future ASRs.
6. Trends are presented, with a robust comparison to air quality objectives. However, discussion of patterns in Section 3 is limited and brief. There have been fluctuations in annual mean NO₂ concentrations in recent years (notable increase at S8 in 2019, and at W2 in 2020), and the Council could provide some local insight into these trends.

Breckland District Council has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Details of all

measures completed, in progress or planned are set out in Table 2.2. 12 measures are included within Table 2.2, with the type of measure and the progress Breckland District Council have made during the reporting year of 2021 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective [Air Quality Action Plan](#), the latest will be uploaded to the Breckland Council website in due course.

As mentioned in the council's 2021 ASR on the 2020 Defra appraisal, there was no specific investigation into the general increasing trend exhibited in 2019 NO₂ annual mean concentrations due to the ongoing Covid-19 pandemic the council continued to be restricted in their work throughout 2021.

Breckland District Council will continue to review all of the measures, as detailed in Table 2.2, with our partners to ensure they remain relevant and will ensure that all actions deemed necessary will be prioritised. However, it should be noted that these actions were instigated to bring the levels below the air quality exceedance levels. As there have been no exceedances of the NO₂ annual mean air quality objective identified across the 26 passive monitoring sites and two automatic monitoring sites throughout 2021, then this may negate the need for the measures to be implemented/fully implemented. This will be kept under review.

Breckland District Council worked to implement these measures in partnership with the following stakeholders during 2021:

- Breckland has joined with two neighbouring councils (Borough of King's Lynn and West Norfolk and North Norfolk Council) in a new household waste contract with Serco. This ensures that investments can be made in a brand-new fleet of refuse collection vehicles, including reduced emissions and hybrid vehicles.
- Breckland District Council is working in association with Highways England, Babergh and Mid Suffolk District Councils, and six local authorities in Suffolk, Norfolk and Essex on an initiative to install new charging points along key roads in East Anglia.

The principal challenges and barriers to implementation that Breckland District Council anticipates facing are detailed in the final column of Table 2.2.

Progress on the measures mentioned in Table 2.2 have been slower than expected due to the ongoing delayed impacts of Covid-19. Breckland District Council's Environmental

Health department has been at the forefront of Covid-19 support for the last two years and only a small amount of progress has been made due to wider public health priorities and resources, but this has included a review of the AQAP and engagement with all relevant partners. As all air quality work involves partnership working, Breckland District Council are very dependent on work which others can realistically achieve too.

Breckland District Council anticipates that the measures stated above and in Table 2.2 will help achieve compliance in Air Quality Management Area Number 2 Order 2017.

Action on air pollution is also being tackled through Breckland District Council's climate change actions. In terms of climate change actions and air quality, Breckland District Council:

- adopted its first sustainability strategy in 2021, including a target of being NetZero by 2035, for more information please visit [What does climate change mean for the District? - Breckland Council](#).
- have increased the number of Electric Vehicle (EV) charging points across the district, Breckland District Council are currently commissioning a piece of work to identify likely demand and potential locations.
- ran a £100K green grants scheme over the summer 2021 to enable the community to act for itself on environmental issues, please visit [Green Community Grants - Breckland Council](#) for more information and to explore the map to find out more about each of the selected projects.
- will also be looking at how to reduce staff/member travel and promote active travel when employees do have to do business miles.
- have provision of green wall/ planters in Swaffham.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Policy Actions															
1	Consideration of Air Quality Impacts when providing comments on planning applications within an AQMA or where an AQMA could be impacted or created	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ongoing	Ongoing	District Council (LPA & Env Protection Team)	District Council (LPA & Env Protection Team)	None	None	None	None	1µg/m³	Number of pre application discussions and planning applications	Ongoing consultations - requiring review of AQ impacts of proposals and recommending mitigation including active travel and measure to encourage forms of low or non-polluting travel	Ongoing action – AQ as part of planning development to link in action around the local plan
6	Review car parking policy arrangements and consider the implementation of control measures, enforcement and the likely benefits. This will need to be compatible with the proposed countywide review of Civil Parking Enforcement (CPE)	Traffic Management	Other	2018	Ongoing	County Council and District Council Town Council	County Council District Council Town Council	None	None	Not yet determined	Not yet determined	1µg/m³	Emissions within national objectives	The provision of car parking is part of an ongoing review process however short stay parking has now been made permanent on the town center BDC owned car parks, with a 2 hr. wait time limit. Breckland has been working with its partners at Norfolk County Council on its Swaffham Network Improvement Strategy April 2020 Survey work was carried out to examine the situation. It was concluded that the stop/start behaviour and queuing to negotiate a parked vehicle partially obstructing the road was not a particularly long-lived phenomenon and as such could not really be making a significant contribution to the annual mean figure of observed NO2. In addition to	The Breckland Council Regeneration team are undertaking consultation, including Swaffham Town Council, on two large projects for Swaffham; Future Breckland and Heritage Action Zone (HAZ) Town Centre Masterplan both these plans are likely to include proposals for enhancement of the Swaffham Market area and parking / accessibility / street access which will address items identified in the AQAP, so it is not considered to duplicate this action in this plan. The public consultations for both these documents are to be undertaken in late 2021 and should be completed by end March 2022, at which point the consultations will be reviewed and an action plan developed, and funding applied for.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation	
Policy Actions																
														<p>this, any changes made to the current restrictions and yellow lines would have a detrimental impact on residents parking. It is recommended that no changes are made to the current parking restrictions and that this measure not considered any further.</p>		
7	<p>Further investigate an improvement at the Station Street/ Mangate Street junction to reduce queuing and delays particularly on Station Street and, if appropriate, devise a scheme for implementation. This may result in removing the traffic lights.</p>	<p>Transport Planning and Infrastructure</p>	<p>Strategic highway improvements, Reprioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane</p>	2018	2021	<p>County Council District Council Town Council</p>		<p>County Council District Council Town Council</p>	None	None	Not yet determined	Not yet determined	1µg/m ³	<p>Emissions within national objectives</p>	<p>Breckland has been working with its partners at Norfolk County Council on its Swaffham Network Improvement Strategy April 2020 Survey work was carried out to examine the situation. A number of proposals were considered however recent air quality measurements have shown that the NO2 levels on Station Street are now under 40µg/m³. In view of this it may be had to justify developing a scheme at this time. It is recommended that no further work is carried out on this measure whilst measured NO2 levels are beneath the threshold.</p>	<p>See comments action point 6 above with plan consultation to be completed by end March 2022</p>

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Policy Actions															
8	Review town centre one-way system to create a better circulation of traffic around the town and, if appropriate, devise a revised layout	Transport Planning and Infrastructure	Other	2018	2023	County Council District Council Town Council	County Council District Council Town Council	None	None	Not yet determined	Not yet determined	1µg/m ³	Emissions within national objectives	Breckland has been working with its partners at Norfolk County Council on its Swaffham Network Improvement Strategy April 2020 Survey work was carried out to examine the situation. Feasibility work concluded that an option to provide a two-way access from the south to the car park appeared possible. It is recommended that a scheme to provide a southern access to the Theatre Street carpark could be considered as part of the town center improvement plans as detailed in point 6. Funding would need to be identified for both detailed design and implementation.	See comments action point 6 above with plan consultation to be completed by end March 2022
9	Review town centre car parking arrangements to minimise vehicular traffic in sensitive areas and, if appropriate, devise a revised strategy	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2018	2023	County Council District Council Town Council	County Council District Council Town Council	None	None	Not yet determined	Not yet determined	1µg/m ³	Emissions within national objectives	Breckland has been working with its partners at Norfolk County Council see work carried out in item 8 above. Breckland Council have discussed the Station rd. HGV parking with the town council, and they are now in the process of updating the car parking orders to remove the HGV parking on that car park. This will	See comments action point 6 above with plan consultation to be completed by end March 2022

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Policy Actions															
														require consultation and a formal order which will also allow for further EV charging locations.	
10	Consider options for new car parks on the edge of the town to keep vehicles from entering the town centre	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2019	2021	Count Council District Council Town Council	County Council District Council Town Council	N/A	N/A	N/A	N/A	N/A	N/A	Breckland has been working with its partners at Norfolk County Council on its Swaffham Network Improvement Strategy April 2020 and as part of this work it was not considered that placing new car parks on the edge of town would be beneficial so will not be considered further.	
15	Improve walking and cycling facilities in and around the town	Promoting Travel Alternatives	Bus route improvements Cycle network Public cycle hire scheme	2018	2023	Count Council District Council Town Council	Count Council District Council Town Council	None	None	Not yet determined	Not yet determined	1µg/m³	Emissions within national objectives	This matter is being considered as part of the Future Breckland and Heritage Action Zone (HAZ) Town Centre Masterplan plans consultation process potentially including provision of cycle stands in the town and setting up of safe cycle routes. Item 1 above requires developers to provide evidence within their transport assessments	Town Plan is now final and available at https://www.breckland.gov.uk/media/19645/Swaffham-Town-Delivery-Plan-2022/pdf/Draft-for-Publishing-Swaffham-Town-Delivery-Plan-final.pdf?m=637819928064470000

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Policy Actions															
														linking developments to the community and in this case the town center.	
16	Review existing travel arrangements to schools and any existing Travel Plans Including the role of car sharing	Promoting Travel Alternatives	Bus route improvements Cycle network Public cycle hire scheme	2018	2022	Count Council District Council Town Council	Count Council District Council Town Council	None	None	Not yet determined	Not yet determined	1µg/m ³	Emissions within national objectives	Swaffham Town council to contact local schools to maintain their travel plans and encourage implementation of identified actions A fuller update is in hand, but the advice is that transport to the secondary academy is predominantly buses and walking, there aren't many parents who drop off students there. 1. The school does encourage car sharing to the extent it can but doesn't have a policy directed specifically to this. The school's main concern where cars are concerned is to control the bunching of cars at arrival and departure times on the relatively narrow access roads and reducing the number of car	Town Plan is now final and available at https://www.breckland.gov.uk/media/19645/Swaffham-Town-Delivery-Plan-2022/pdf/Draft-for-Publishing-Swaffham-Town-Delivery-Plan-final.pdf?m=637819928064470000

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Policy Actions															
														<p>journeys is part of this.</p> <p>2. Given the young age of the children, there is no policy to encourage cycling to school. Walking with parents/carers is of course encouraged, but some parents find the pathways narrow, often with overhanging bushes, and the proximity of fast and heavy traffic intimidating.</p> <p>3. There is however a clear focus on the air pollution issue as the school is very close to the A1065. A video made by all classes in the school at the time of the COP environmental summit in November included a very telling item with children standing in the school grounds demonstrating the noise and pollution effect of the heavy traffic passing along the A1065 just behind the hedge.</p>	
17	Taxi Licensing conditions	Promoting Low Emission Transport / Alternative to Private Vehicle Use	Taxi Licensing conditions	2021	2021	District Council, taxi drivers		None	None	Not yet determined	Not yet determined	1µg/m ³	Emissions within national objectives	Encourage/make it easier for other local businesses and householders to switch to electric. Within the next 12 months Breckland Council will be reviewing our Hackney Carriage and	As of 2022, Breckland Council have licensed 4 electric vehicles in district, paving the way for greener transport options in the region.

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Policy Actions															
														Private Hire Vehicle Licensing Specifications to encourage lower emissions and more environmentally friendly vehicles.	
18	Cross council collaboration and investment	Vehicle Fleet Efficiency	Other - Fleet efficiency	2021	2021	Breckland Council and the Borough Council of King's Lynn and West Norfolk. Serco.		No		£230m			Reduce carbon footprint.	Reduce carbon footprint. The contract largely uses a new fleet of vehicles with some electric vehicles. The new fuel-efficient trucks are quieter, produce less CO2 per mile and use 18% less fuel	The contract will also see a brand-new fleet of bin collection trucks and other vehicles rolled out, which will operate across all three council areas. These will include reduced emissions and hybrid vehicles. Also the introduction of route optimisation, which came into effect in March 2022
19	Sustainable Swaffham programme / EV Charging Installation	Promoting Low Emission Plant	Emission control equipment for small and medium sized stationary combustion sources / replacement of combustion sources / Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2021	2021/2022	Breckland Council and Breckland Council's Market Towns Initiative	Breckland Council's Market Towns Initiative	None	None	Not yet determined	Not yet determined	1µg/m ³	Emissions within national objectives	Ongoing Breckland Council is launching a new initiative which will make Swaffham one of Norfolk's most environmentally friendly towns. The Sustainable Swaffham programme will see the rollout of a number of 'green' schemes being consulted in late 2021 / early 2022 Breckland will be installing four additional charging points in the Theatre St car park in Swaffham which are being funded by the Market Town Initiative. There are no plans for Future Breckland work to put any more in Swaffham.	These initial green schemes will be followed up with further activity in the future, with the next focus expected to be on sustainable transport and green connectivity. However, the Swaffham district councillors are inviting all residents and businesses to help shape the future programmes and approaches by getting in touch directly. Please also see Breckland 2035 Sustainability Strategy, https://www.breckland.gov.uk/environment/climate-change

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Policy Actions															
22	Investigate Green Space Initiatives	Other	Other	2018/19	2022/23	District Council Town Council	District Council Town Council	None	None	Not yet determined	Not yet determined	1µg/m ³	Emissions within national objectives	This matter crosses a number of different organisational controls so a review of this will need to include officers / councils responsible for green spaces at County/ District and town levels.	see Breckland 2035 Sustainability Strategy, https://www.breckland.gov.uk/environment/climate-change

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.

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

- increasing electric vehicle chargers in council owned public car parks, Breckland District Council is working in association with Highways England, Babergh and Mid Suffolk District Councils, and six local authorities in Suffolk, Norfolk and Essex on an initiative to install new charging points along key roads in East Anglia. This will support Government initiatives to increase the number of Electric Vehicles (EV) and reduce the sale and use of conventional petrol and diesel cars in the UK. Breckland District Council currently have four rapid charging points in the following Breckland car parks:
 - Swaffham - Pedlars Car Park Market Place, PE37 7AB
 - Attleborough - Queens Square Car Park, Queens Square, NR17 2AE
 - Thetford - Pike Lane Car Park, Pike Lane, IP24 2DR
 - Dereham - Cowper Road Car Park, Cowper Road, NR19 2DA
- committed to delivering four additional electric vehicle charging points in the Theatre Street car park in Swaffham, expected to be completed in December 2022,
- continuing to encourage the [anti-idling](#) messages on the council's webpage,
- adopting their new [Sustainability 2035 Strategy](#) and celebrating Breckland Council's first fully electric private hire vehicle.

Additionally, Breckland District Council have switched to a green energy tariff (which uses renewable energy) for all of its buildings, as an ongoing commitment to be more environmentally friendly. Moreover, Breckland Council raise awareness of the use of wood burners and open fires via their website. Although there are no smoke control areas in Breckland District Council, the council have created an [open fires and wood burning stove](#) webpage to encourage best practice when using open fires and wood-burning appliances,

as they can be a source of air pollution. More information can be found on the [Burnright](#) website.

Currently, there is not any monitoring of PM_{2.5} carried out within Breckland District Council. However, in accordance with LAQM. TG(16), the PM_{2.5} concentrations can be estimated from PM₁₀ monitoring using either a local PM₁₀ and PM_{2.5} monitoring ratio, or a nationally derived correction ratio of 0.7. As there is no local monitoring for PM_{2.5}, the nationally derived correction ratio of 0.7 was applied to the 2021 PM₁₀ concentration (13 µg/m³) at the automatic monitoring site East Wretham (BRE01). Therefore, the estimated PM_{2.5} concentration in 2021 at the automatic monitoring site is 9.1 µg/m³, which is below the PM_{2.5} obligatory air quality objective of 25 µg/m³.

The Public Health Outcomes Framework indicator⁷ for the fraction of deaths attributable to PM_{2.5} in Breckland was 5.6% during 2020 (latest available data), which is below the regional average of 5.8% and the same as the national average for 2020.

Furthermore, the current Defra 2021 background maps⁸ for Breckland District Council (2018 based) show that all 2021 background concentrations of PM_{2.5} are below the annual mean air quality objective for PM_{2.5}. The highest concentration is predicted to be 10.3 µg/m³ within the 1 x 1km grid square with the centroid grid reference of 578500, 287500. This is an area that encompasses a stretch of the A1065 Trunk Road on the outskirts of Brandon, closely located to a several distribution hubs and light industry.

⁷ <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework>

⁸ <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

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

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

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Breckland District Council undertook automatic (continuous) monitoring at two sites during 2021. Table A.1 in Appendix A shows the details of the automatic monitoring sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. The [Air Quality in England](#) page presents automatic monitoring results for Breckland District Council, with automatic monitoring results also available through the [UK-Air website](#).

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Breckland District Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 26 sites during 2021. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

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.

3.1.3 Nitrogen Dioxide (NO₂)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

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

Table A.5 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past five years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

Following the application of bias adjustment and annualisation to the raw data, no sites were reported to exceed the NO₂ annual mean objective in 2021.

Monitoring within AQMA Number 2 Order 2017

Currently, there are five diffusion tubes located within the boundary of AQMA Number 2 (see Figure A.2). These are diffusion tube S1, S7, S8, S9 and S11.

In 2016 the non-automatic monitoring location S8 was reported at 41 µg/m³, prompting the declaration of the 2017 AQMA. By subsequent comparison, S8 has reported significantly lower annual means in the following years of 34.3µg/m³ in 2017, 30.5µg/m³ in 2018, 31.6µg/m³ in 2019, 24.1µg/m³ in 2020 and 25.7 µg/m³ in 2021. The NO₂ concentrations demonstrated a decreasing trend since the AQMA declaration, until 2019, when there was a 1.1 µg/m³ increase in concentrations. Due to the Covid-19 pandemic and associated downturn in vehicles, it was not possible to determine if this slight increase in trend would have continued into 2020. Though the 2021 concentrations have increased by 1.6 µg/m³ since the 2020 concentrations, this is still 5.9 µg/m³ lower than the 2019 concentration.

Breckland District Council will continue to monitor at this location to determine future trends. The Council has been advised to carry out a detailed assessment next year to determine if the AQMA can be revoked.

NO₂ monitoring is also carried out at 20 other non-automatic monitoring locations and two automatic monitoring locations (Figure A.1).

Monitoring outside of the AQMA

Out with the declared AQMA, Breckland District Council have seen an increase in diffusion tube W2 since 2020, increasing from 12.3 µg/m³ in 2019 to 15.9 µg/m³ in 2020 and 19 µg/m³ in 2021. This diffusion tube is located in a residential area in Watton. This increasing trend will be investigated further throughout 2022 and findings will be reported in next year's ASR.

In 2021, NO₂ concentrations increased slightly from 2020 concentrations, with the highest increase seen at diffusion tube D2, increasing from 13.6 µg/m³ in 2020 to 21.8 µg/m³ in 2021. The 2021 NO₂ concentration measured at D2 is more in line with pre-Covid-19 concentrations, this increase in concentrations is to be expected as traffic flow patterns are beginning to return to 'normal' flow following the Covid-19 pandemic in 2020. Two diffusion tubes (D3 and W1) remained the same as 2020 concentrations and two diffusion tubes (D1 and S14) decreased in 2021.

The annual mean NO₂ concentration did not exceed 60 µg/m³ at any monitoring locations, which indicates that an exceedance of the 1-hour mean objective (200 µg/m³) is unlikely at these sites.

3.1.4 Particulate Matter (PM₁₀)

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Data capture was high (99.1%) at the monitoring site in East Wretham (BRE01) and the measured annual mean PM₁₀ concentration at this location in 2021 was 13 µg/m³, which is significantly below PM₁₀ objectives for annual mean and the lowest recorded annual mean over the last five years.

Table A.7 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past five years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year. There were no daily mean exceedances of 50µg/m³ in 2021.

3.1.5 Particulate Matter (PM_{2.5})

Currently, there is not any monitoring of PM_{2.5} carried out within Breckland District Council. However, in accordance with LAQM. TG(16), the PM_{2.5} concentrations can be estimated from PM₁₀ monitoring using either a local PM₁₀ and PM_{2.5} monitoring ratio, or a nationally derived correction ratio of 0.7. As there is no local monitoring for PM_{2.5}, the nationally derived correction ratio of 0.7 was applied to the 2021 PM₁₀ concentration (13 µg/m³) at the automatic monitoring site East Wretham (BRE01). Therefore, the estimated PM_{2.5} concentration in 2021 at the automatic monitoring site is 9.1 µg/m³, which is below the PM_{2.5} obligatory air quality objective of 25 µg/m³.

As part of the Council's commitment to provide a clean and safe environment in relation to air quality, a dual PM_{2.5}/PM₁₀ will be used at Wretham in 2023.

3.1.6 Other Pollutants

In addition to monitoring NO₂ and PM₁₀, the automatic analyser located at East Wretham (BRE01) also monitors Ozone (O₃) concentrations. There is no requirement to report this data for LAQM purposes; however, the results are discussed herein for completeness.

The air quality (AQ) objective for ground level O₃ (to be met by 2005) states that the maximum daily concentration (measured as an 8-hour mean) of 100 µg/m³ should not be exceeded more than 10 times per year.

Table A.8 in Appendix A summarises the number of exceedances over the last 5 years in line with the AQ objective.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
BRE01	East Wretham	Rural	591315	288704	NO ₂ , PM ₁₀ , O ₃	N	Chemiluminescence, TEOM corrected by VCM	0	10	0
BRE02	Swaffham	Roadside	582093	308469	NO ₂	N	Chemiluminescent	0	2	0

Notes:

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

(2) N/A if not applicable

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
A1	High Street Attleborough	Urban Centre	604550	295125	NO ₂	N	0	6	NO	2
A2	Croft Green Attleborough	Urban Background	603843	294085	NO ₂	N	0	7	NO	2
D1	High Street Dereham	Urban Centre	598920	313267	NO ₂	N	0	2	NO	2
D2	Station Road Dereham	Urban Background	599283	313599	NO ₂	N	0	8	NO	2
D3	Wellington Street Dereham	Urban Centre	599319	313197	NO ₂	N	0	5	NO	2
S1	Impsons Butchers Swaffham	Urban Centre	581986	309031	NO ₂	Y	0	5	NO	2.5
S2	Ceres Books Swaffham	Urban Centre	582008	308764	NO ₂	N	0	3	NO	2
S3 (3)	London Street	Roadside	582182	308434	NO ₂	N	0	4	YES	2
S3a (3)	London Street	Roadside	582182	308434	NO ₂	N	0	4	YES	2
S3b (3)	London Street	Roadside	582182	308434	NO ₂	N	0	4	YES	2
S4	Bridewell Place Swaffham	Roadside	582058	308625	NO ₂	N	0	4	NO	2
S5	London Street Zebra Crossing	Roadside	582075	308496	NO ₂	N	0	7	NO	2
S6	London Street N Roundabout	Roadside	582048	308609	NO ₂	N	0	5	NO	2
S7	Station Road Swaffham	Roadside	581999	309099	NO ₂	Y	0	7	NO	2
S8	Station Road Swaffham	Roadside	581979	309162	NO ₂	Y	0	5	NO	2
S9	Anglia Computer Solutions Swaffham	Roadside	581959	309057	NO ₂	Y	0	4	NO	2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
S10	Kev's Tackle Swaffham	Roadside	582670	309058	NO ₂	N	0	3	NO	2
S11	13 Station Road Swaffham	Roadside	581990	309145	NO ₂	Y	0	3	NO	2
S12	Glazedale Lamp post Swaffham	Roadside	581986	309213	NO ₂	N	0	3	NO	2
S13	33 Station Road Swaffham	Roadside	581978	309312	NO ₂	N	0	3	NO	1
S14	Corner Whitecross	Roadside	582082	309856	NO ₂	N	0	3	NO	2
T1	London Street Fire Station	Roadside	587126	283336	NO ₂	N	0	3	NO	2
T2	55 Bury Road Thetford	Roadside	586846	282721	NO ₂	N	0	3	NO	2
T3	41 E. Cavell Close Thetford	Suburban	587036	284579	NO ₂	N	0	101	NO	2
W1	High Street Corals Watton	Urban Centre	591747	300796	NO ₂	N	0	2.5	NO	2
W2	Charles Avenue Watton	Urban Background	591885	300622	NO ₂	N	0	2	NO	2
20(3)	Wretham SSSI	Rural	591315	288704	NO ₂	N	0	55	YES	3
20a (3)	Wretham SSSI	Rural	591315	288704	NO ₂	N	0	55	YES	3
20b (3)	Wretham SSSI	Rural	591315	288704	NO ₂	N	0	55	YES	3
30	East Harling	Rural	599403	286353	NO ₂	N	0	2.5	NO	2

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results: Automatic Monitoring (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
BRE01	591315	288704	Rural	91.9	91.9	12	10	10	7	7
BRE02	582093	308469	Roadside	99.6	99.6	25.9	25.6	26.2	19.1*	21

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

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

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Table A.4 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
A1	604550	295125	Urban Centre	90.7	90.7	23.6	23.8	24.6	16.4	17.4
A2	603843	294085	Urban Background	98.6	98.6	10.2	9.7	10.4	7.2	7.7
D1	598920	313267	Urban Centre	91.8	91.8	30.9	27.3	29.3	18.4	17.5
D2	599283	313599	Urban Background	89.0	89.0	25.0	22.5	22.6	13.6	21.8
D3	599319	313197	Urban Centre	98.6	98.6	13.7	20.0	22.4	18.7	18.6
S1	581986	309031	Urban Centre	91.2	91.2	20.2	20.0	20.0	13.3	14.7
S2	582008	308764	Urban Centre	98.6	98.6	33.5	28.6	28.7	19.5	23.1
S3(3), S3A(3), S3B(3)	582182	308434	Roadside	98.6	98.6	25.8	25.7	26.2	17.3	20.7
S4	582058	308625	Roadside	80.5	80.5	20.9	21.4	22.4	14.6	17.7
S5	582075	308496	Roadside	74.0	74.0	22.7	21.8	24.1	17.1	19.4
S6	582048	308609	Roadside	80.0	80.0	29.1	26.9	29.6	21.0	22.6
S7	581999	309099	Roadside	90.4	90.4	29.7	30.2	30.2	19.1	22.9
S8	581979	309162	Roadside	90.7	90.7	34.3	30.5	31.6	24.1	25.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
S9	581959	309057	Roadside	57.5	57.5	21.9	21.8	23.0	14.2	20.8
S10	582670	309058	Roadside	98.6	98.6	22.7	20.3	21.6	14.5	15.2
S11	581990	309145	Roadside	98.6	98.6	30.6	30.9	26.6	12.3	14.6
S12	581986	309213	Roadside	98.6	98.6	29.2	31.5	38.0	16.3	19.2
S13	581978	309312	Roadside	90.1	90.1	21.7	14.9	25.2	20.1	23.6
S14	582082	309856	Roadside	55.9	55.9	21.2	17.2	21.3	19.2	17.9
T1	587126	283336	Roadside	98.6	98.6	25.8	24.8	25.1	18.0	20.2
T2	586846	282721	Roadside	98.6	98.6	22.0	21.9	21.2	14.4	16.5
T3	587036	284579	Suburban	89.6	89.6	14.1	12.0	14.1	9.9	10.4
W1	591747	300796	Urban Centre	98.6	98.6	24.1	24.0	24.2	8.9	8.9
W2	591885	300622	Urban Background	98.6	98.6	12.4	11.8	12.3	15.9	19.0
20(3), 20(3)A, 20(3)B	591315	288704	Rural	98.6	98.6	10.8	10.8	10.1	6.7	6.9
30	599403	286353	Rural	98.6	98.6	13.7	10.2	11.5	7.1	8.4

- ☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16
- ☒ Diffusion tube data has been bias adjusted.
- ☒ Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.
- ☒ Time Weighted Annual Mean recorded in 2021 as per Diffusion Tube Data Processing Tool and Diffusion Tube Calendar Inputs

Notes:

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

Exceedances of the NO_2 annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

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

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

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

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations – Outside Declared AQMA

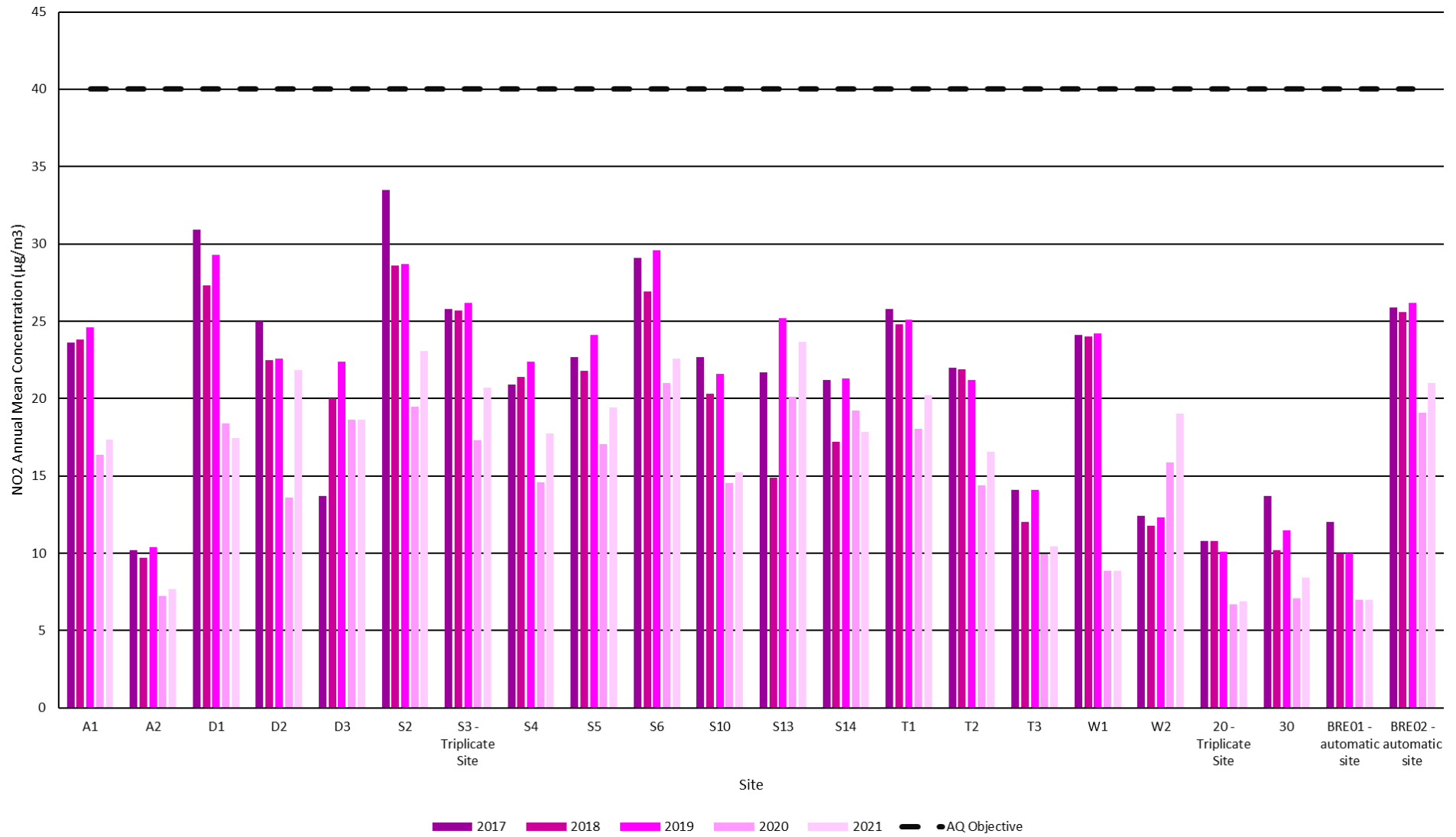


Figure A.2 – Trends in Annual Mean NO2 Concentrations – Within Declared AQMA

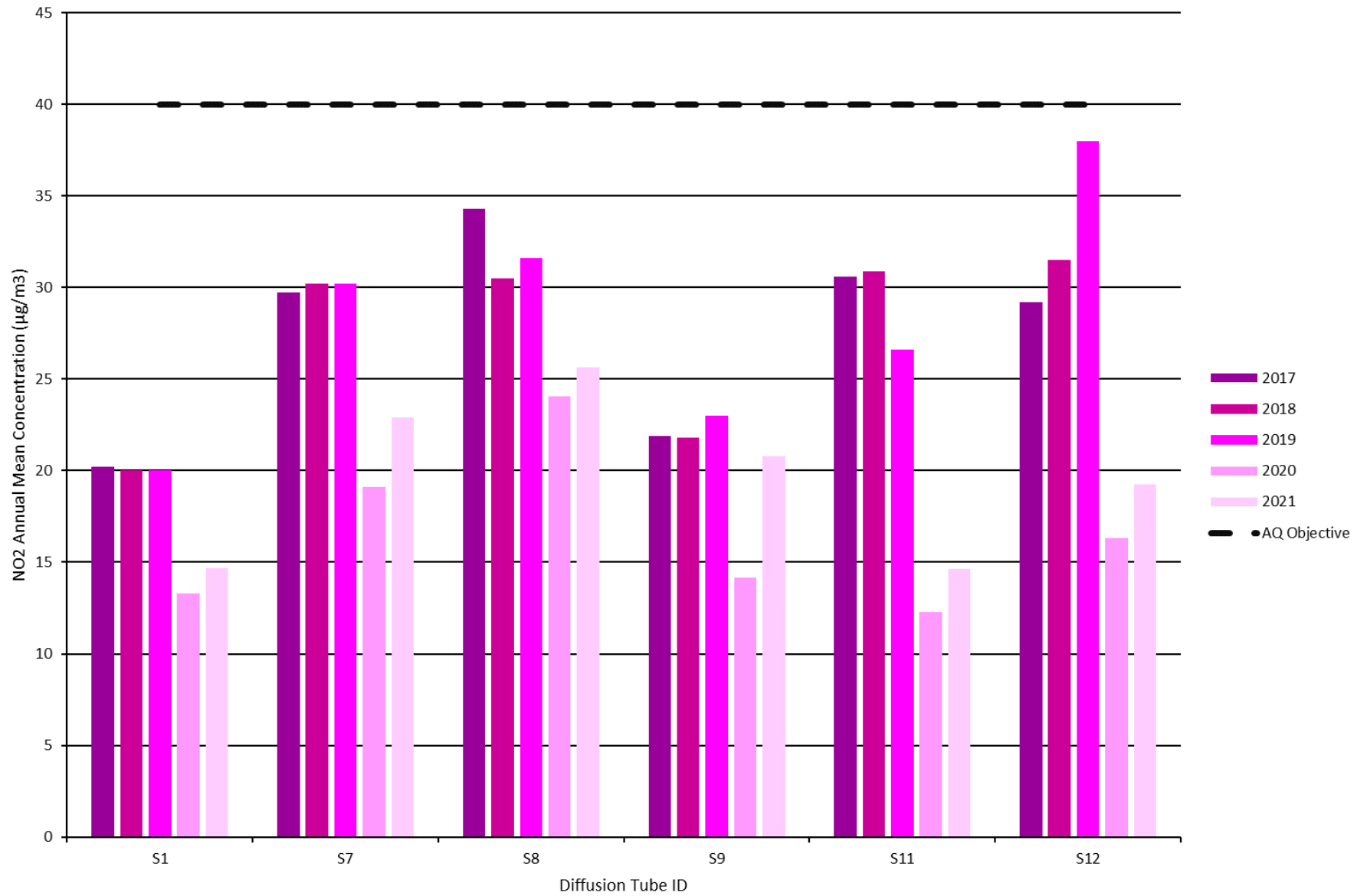


Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
BRE01	591315	288704	Rural	91.9	91.9	0	0	0	0	0
BRE02	582093	308469	Roadside	99.6	99.6	0	0	0	0 (97)	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m³ have been recorded.

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

Table A.6 – Annual Mean PM₁₀ Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
BRE01	591315	288704	Rural	99.1	99.1	16	17	15	16	13

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

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

Figure A.3 – Trends in Annual Mean PM₁₀ Concentrations

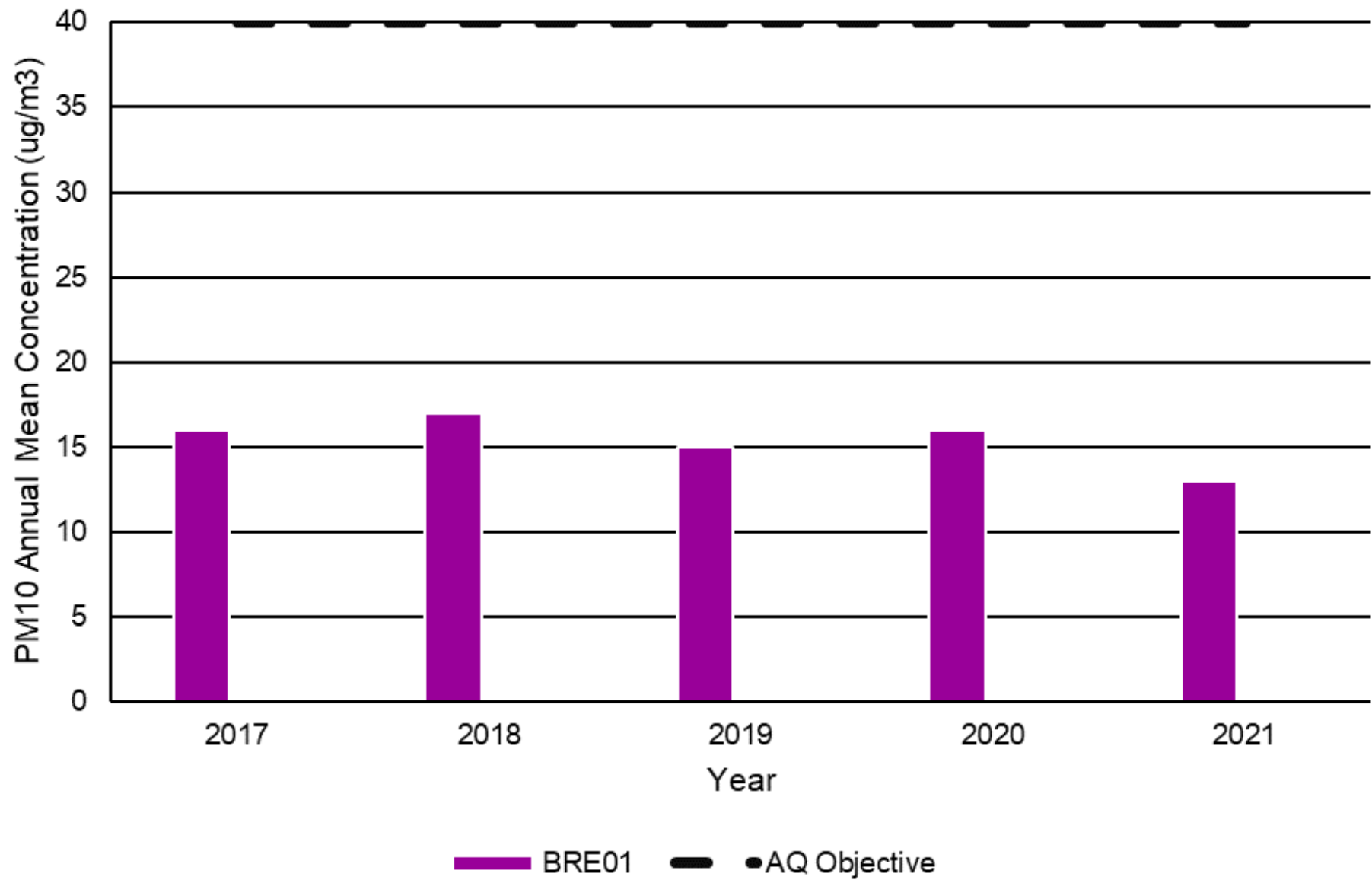


Table A.7 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
BRE01	591315	288704	Rural	99.1	99.1	4	4	3	3	0

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m³ have been recorded.

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

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

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

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

Figure A.4 – Trends in Number of 24-Hour Mean PM₁₀ Results > 50µg/m³

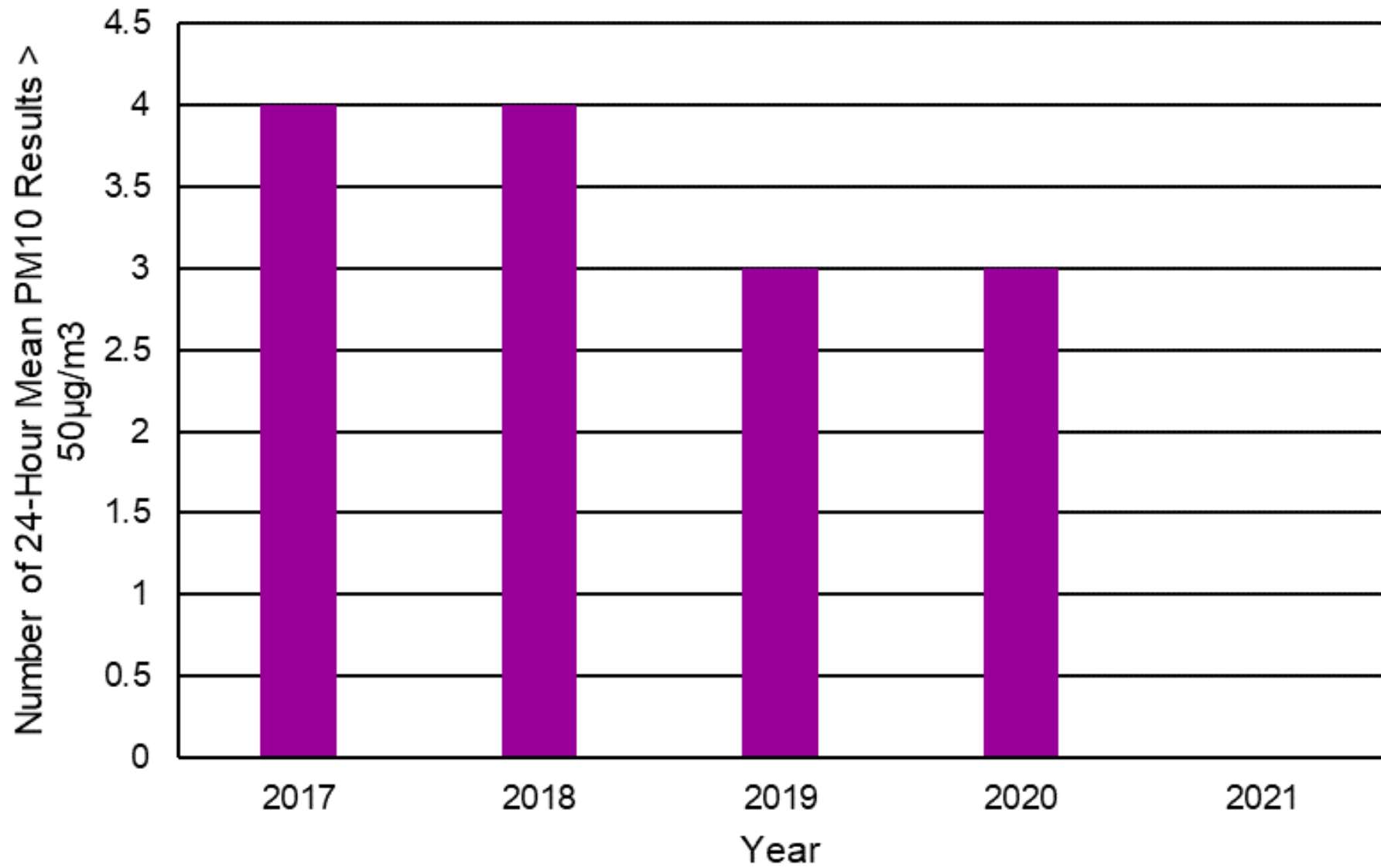


Table A.8 – Annual Mean O₃ Monitoring Results (µg/m³) – 100 µg m⁻³ not to be exceeded more than 10 times a year

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	O3 Number of Exceedances of Maximum Daily Concentration (8 hour rolling mean)				
						2017	2018	2019	2020	2021
BRE01	591315	288704	Rural	99	99	6	29	18	25	12

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

Notes:

The annual mean concentrations are presented as µg/m³.

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO₂ 2021 Diffusion Tube Results (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO ₂ Mean Concentrations (µg/m ³)												Time Weighted Annual Mean (µg/m ³)			Comment
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.84) and Annualised	Distance Corrected to Nearest Exposure	
A1	604550	295125	24.6	23.7	21.6	19.2	20.9	18.9	17.3	15.6	22.0	21.2		22.7	20.7	17.4	-	
A2	603843	294085	12.7	11.9	9.7	7.8	7.6	6.7	5.7	5.9	8.3	9.1	14.2	11.1	9.1	7.7	-	
D1	598920	313267		27.8	29.4	27.0	17.9	16.8	14.8	15.3	18.3	18.6	23.9	19.2	20.8	17.5	-	
D2	599283	313599	24.5	23.6	18.4	19.7	27.1	25.8	23.8	28.5		30.7	38.8	27.1	26.0	21.8	-	
D3	599319	313197	27.4	21.6	22.8	16.7	19.9	19.0	17.7	19.2	24.0	24.7	32.1	23.3	22.2	18.6	-	
S1	581986	309031	18.2	22.3	16.3	18.7	17.7	15.5	14.7	13.9	18.3		18.7	17.7	17.5	14.7	-	
S2	582008	308764	29.4	29.0	27.6	24.0	26.2	24.5	23.0	24.0	29.1	28.7	38.3	27.3	27.5	23.1	-	
S3(3)	582182	308434	23.0	28.1	20.2	25.5	25.6	22.7	23.5	19.8	26.9	23.8	30.5	20.9	-	-	-	Triplicate Site with S3(3), S3A(3) and S3B(3) - Annual data provided for S3B(3) only
S3A(3)	582182	308434	25.2	29.0	22.0	25.3	25.7	22.1	23.0	20.1	25.6	23.5	29.1	24.1	-	-	-	Triplicate Site with S3(3), S3A(3) and S3B(3) - Annual data provided for S3B(3) only
S3B(3)	582182	308434	25.0	29.2	21.0	24.3	26.5	22.9	23.3	19.5	26.2	24.4	30.4	24.1	24.6	20.7	-	Triplicate Site with S3(3), S3A(3) and S3B(3) - Annual data provided for S3B(3) only
S4	582058	308625	21.4	23.6	20.3	23.4	20.3	19.8	18.4	20.1		19.5	24.7		21.1	17.7	-	
S5	582075	308496	29.2		25.3	25.9	22.9	21.1	18.7	21.2	23.2	21.9			23.1	19.4	-	
S6	582048	308609	26.8	29.7	26.1	24.3	27.1	24.6		25.0	28.7	29.6		26.9	26.9	22.6	-	
S7	581999	309099	24.5		23.3	31.1	27.0	27.1	27.3	25.7	27.5	25.3	32.7	27.1	27.3	22.9	-	
S8	581979	309162	31.5	31.4	29.9	26.8		28.6	25.0	30.8	31.2	34.0	40.7	28.6	30.5	25.7	-	
S9	581959	309057			19.6	22.5	20.0	21.0	17.6	22.0		23.5			20.7	20.8	-	
S10	582670	309058	22.4	19.8	17.9	15.1	17.6	15.8	15.0	16.9	18.7	21.1	18.7	20.4	18.1	15.2	-	

S11	581990	309145	20.7	21.2	15.8	14.9	16.4	15.6	15.0	14.3	18.3	18.8	21.5	17.3	17.4	14.6	-	
S12	581986	309213	24.8	28.2	20.2	23.9	21.1	18.4	20.0	19.1	23.8	22.4	29.4	23.6	22.9	19.2	-	
S13	581978	309312	26.4	32.1	25.4	29.7	28.2	27.8	26.7	28.2	29.1	27.7	28.0		28.1	23.6	-	
S14	582082	309856	30.7	35.4	24.1	27.4						14.1	25.6	15.7	24.7	17.9	-	
T1	587126	283336	28.4	28.6	25.4	23.0	22.9	19.9	16.3	19.9	24.5	25.2	32.7	24.2	24.0	20.2	-	
T2	586846	282721	23.3	23.4	20.6	20.8	18.1	19.0	15.6	16.1	19.6	19.9	21.8	19.2	19.7	16.5	-	
T3	587036	284579	18.7	16.5	13.6		10.4	7.8	7.6	8.1	9.9	14.0	18.1	14.0	12.4	10.4	-	
W1	591747	300796	16.3	13.8	12.0	8.7	8.5	6.9	6.7	6.9	10.6	10.0	15.9	12.1	10.6	8.9	-	
W2	591885	300622	28.8	1.9	26.1	26.5	22.8	23.2	18.3	21.7	24.6	21.6	34.3	23.5	22.6	19.0	-	
20(3)	591315	288704	11.4	10.9	9.8	5.9	6.2	6.0	6.2	6.0	9.2	8.2	12.0	9.0	-	-	-	Triplicate Site with 20(3), 20(3)A and 20(3)B - Annual data provided for 20(3)B only
20(3)A	591315	288704	11.7	10.6	9.5	6.1	6.9	5.8	6.0	5.9	8.6	7.9	12.1	9.1	-	-	-	Triplicate Site with 20(3), 20(3)A and 20(3)B - Annual data provided for 20(3)B only
20(3)B	591315	288704	11.4	10.5	8.6	6.1	6.6	6.0	6.2	5.5	9.3	8.2	11.4	8.1	8.2	6.9	-	Triplicate Site with 20(3), 20(3)A and 20(3)B - Annual data provided for 20(3)B only
30	599403	286353	13.4	12.6	10.5	9.0	8.1	7.8	7.6	8.3	8.6	9.6	12.7	12.7	10.0	8.4	-	

All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.

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

Local bias adjustment factor used.

National bias adjustment factor used.

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

Breckland District Council confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Breckland District Council During 2021

Breckland District Council has identified two potential new sources relating to air quality within the reporting year of 2021, these are as follows:

- A planning application regarding a biogas service station with anaerobic digesters for HGVs in Snetterton. As there are two residential houses nearby this proposed development, an AQ assessment/screening has been requested.
- Planning application at Cherry Tree Farm (planning reference 3PL/2021/0931/F) – Erection of agricultural buildings and facilities to include feed mill, electrical substation, weighing platform cover, welfare unit, plant room and water tank, turning area, clean water soakage lagoon and new hedgerow (retrospective). This development is 19 miles southeast of Watton.

Please note that both planning applications are currently 'Undecided', an update will be included in next year's ASR.

Additional Air Quality Works Undertaken Breckland District Council During 2021

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

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2021 were supplied and analysed by Gradko International Ltd, the tubes were prepared using the 20% TEA in water method. All results have been bias adjusted, annualised (where required) and expressed as a Time Weighted Annual Mean NO₂ concentration before being presented in Table B.1. As detailed within LAQM.TG(16) as some diffusion tubes were exposed out with the 4 to 5 week

recommended exposure, specifically in August 2021 when the diffusion tube exposure period was shorter than the recommended 4 weeks (- 4 days), a Time Weighted Annual Mean was used to calculate the annual mean NO₂ concentration using the [Diffusion Tube Processing Tool](#) (v2.0).

Gradko International Ltd is a UKAS accredited laboratory and participates in laboratory performance and proficiency testing schemes. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. The laboratory follows the procedures set out in the Harmonisation Practical Guidance and participates in the AIR proficiency-testing (AIR-PT) scheme. Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the AIR-PT scheme. Laboratory performance in the AIR-PT is also assessed by the National Physical Laboratory (NPL), alongside laboratory data from the monthly NPL Field Inter-Comparison Exercise.

In the 2021 AIR-PT results, Gradko scored 25% in AIR-PT AR042 (January to March 2021)⁹. At the time of writing this ASR, there were no results available for April 2021 onwards. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

Diffusion Tube Annualisation

For the 2021 diffusion tubes, annualisation was required at two of the monitoring sites (S9 and S14) as data capture was below 75%. Annualisation is required for any site with data capture less than 75% but greater than 25%.

Table C.2 illustrates the monitoring stations (Breckland East Wretham, Wicken Fen and Norwich Lakeneside) and associated ratios used for the annualisation of diffusion tubes S9 and S14. The annualisation factors were processed using LAQM's Diffusion Tube Data Processing Tool (v.2.0)¹⁰.

⁹ Available at [WASP – Annual Performance Criteria for NO₂ Diffusion Tubes \(defra.gov.uk\)](https://www.defra.gov.uk/wasp/)

¹⁰ Available at: <https://laqm.defra.gov.uk/>

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Breckland District Council have applied a local bias adjustment factor of 0.84 to the 2021 monitoring data. A summary of bias adjustment factors used by Breckland District Council over the past five years is presented in Table C.1.

With regard to the application of a bias adjustment factor for diffusion tubes, Defra LAQM.TG(16) and the LAQM Helpdesk recommend the use of a local bias adjustment factor where available and relevant to diffusion tube sites. The local bias adjustment factor has been used in this year's ASR to ensure best practice in line with LAQM.TG(16) whilst maintaining consistency with previous years' results.

There is no difference between the 2021 local and national¹¹ BIAS adjustment calculations for Breckland District Council as the national bias adjustment factor was also 0.84 (Figure C. 1).

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	Local	-	0.84
2020	Local	-	0.81
2019	Local	-	0.95
2018	Local	-	0.89
2017	Local	-	0.86

¹¹ National Bias Adjustment spreadsheet (v 03/22) Available at [National Bias Adjustment Factors | LAQM \(defra.gov.uk\)](https://www.defra.gov.uk/laqm-tg16/national-bias-adjustment-factors/)

Figure C. 1 – National Diffusion Tube Bias Adjustment

National Diffusion Tube Bias Adjustment Factor Spreadsheet						Spreadsheet Version Number: 03/22				
Follow the steps below in the correct order to show the results of relevant co-location studies Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.						This spreadsheet will be updated at the end of June 2022 LAQM Helpdesk Website				
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.						Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.				
Step 1:		Step 2:		Step 3:		Step 4:				
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List		Select a Year from the Drop-Down List		Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor shown in blue at the foot of the final column.				
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.		If a year is not shown, we have no data.		If you have your own co-location study then see footnote 6. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQM-Helpdesk@bureauveritas.com or 0800 0327953				
Analysed By ¹	Method ²	Year ³	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) ($\mu\text{g}/\text{m}^3$)	Automatic Monitor Mean Conc. (Cm) ($\mu\text{g}/\text{m}^3$)	Bias (B)	Tube Precision ⁴	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2021	R	Brent Council	12	51	46	9.8%	G	0.91
Gradko	20% TEA in water	2021	R	Gateshead Council	10	23	19	23.8%	G	0.81
Gradko	20% TEA in water	2021	R	Gateshead Council	12	25	22	13.7%	G	0.88
Gradko	20% TEA in water	2021	R	Gateshead Council	11	27	25	9.8%	G	0.91
Gradko	20% TEA in water	2021	R	Gateshead Council	12	31	25	26.8%	G	0.79
Gradko	20% TEA in water	2021	R	Gateshead Council	12	32	34	-4.1%	G	1.04
Gradko	20% TEA in water	2021	KS	Marglebone Road Intercomparison	11	53	42	25.0%	G	0.80
Gradko	20% TEA in water	2021	R	Monmouthshire County Council	11	35	29	21.8%	G	0.82
Gradko	20% TEA in water	2021	R	Belfast City Council	12	25	20	24.3%	G	0.80
Gradko	20% TEA in water	2021	UC	Belfast City Council	12	25	20	28.5%	G	0.78
Gradko	20% TEA in water	2021	R	Belfast City Council	12	42	35	19.8%	G	0.84
Gradko	20% TEA in water	2021	R	Belfast City Council	12	38	27	39.4%	G	0.72
Gradko	20% TEA in water	2021	UB	Dudley MBC	12	20	15	36.0%	G	0.74
Gradko	20% TEA in water	2021	R	Dudley MBC	12	30	29	4.2%	G	0.96
Gradko	20% TEA in water	2021	R	Dudley MBC	12	42	40	5.5%	G	0.95
Gradko	20% TEA in water	2021	R	Lambeth	10	91	62	46.6%	G	0.68
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	38	32	18.4%	G	0.84
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	28	27	4.9%	G	0.95
Gradko	20% TEA in water	2021		Overall Factor⁵ (32 studies)					Use	0.84

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO₂ monitoring locations within Breckland District Council required distance correction during 2021 as there were no monitoring site where the annual mean concentration is greater than 36 $\mu\text{g}/\text{m}^3$ and the monitoring sites are located at a point of relevant exposure.

QA/QC of Automatic Monitoring

Within Breckland District Council, there are two automatic monitoring sites (BRE01 and BRE02). Breckland District Council members are the Local Site Operator (LSO) for these two sites and carry out calibrations routinely. BRE02 is audited by Ricardo Energy and Environment (Ricardo) and both sites are Quality Assurance/Quality Control (QA/QC) by

Ricardo. The Engineer Support Unit (ESU) for both of these sites is Matts Monitors Air Monitoring Systems.

The 2021 data was marked as 'ratified' at the time of writing this report. All live and historic data is available through the Air Quality in England website, available at

<https://www.airqualityengland.co.uk/>.

PM₁₀ and PM_{2.5} Monitoring Adjustment

PM₁₀ monitoring is carried out by a TEOM1400AB analyser. As stated in LAQM. TG(16) Chapter 7, the PM₁₀ TEOM1400AB can be used by local authorities after correction by the Volatile Correction Model (VCM). This method adds the 1.87 times the volatile fraction as measured by remote FDMSs to the TEOM data in order to correct for the underestimation of PM concentrations by the TEOM. This process is carried out by QA/QC processes, not by Breckland District Council. VCM PM₁₀ data is available at [airqualityengland-statistics-report-BRE01-2021link.pdf](#).

Currently there is not any monitoring of PM_{2.5} completed within Breckland District. However, in accordance with LAQM. TG(16) Annex B: Derivation of PM_{2.5} to PM₁₀ Ratio, the PM_{2.5} concentrations can be estimated from PM₁₀ monitoring using either a local PM₁₀ and PM_{2.5} monitoring ratio, or a nationally derived correction ratio of 0.7. As there is no local monitoring for PM_{2.5}, the nationally derived correction ratio of 0.7 was applied to the 2021 PM₁₀ concentration (13 µg/m³) at the automatic monitoring site East Wretham (BRE01). Therefore, the estimated PM_{2.5} concentration in 2021 at the automatic monitoring site is 9.1 µg/m³, which is below the PM_{2.5} obligatory air quality objective of 25 µg/m³.

Automatic Monitoring Annualisation

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

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

No automatic NO₂ monitoring locations within Breckland District Council required distance correction during 2021.

Table C.2 – Annualisation Summary (concentrations presented in $\mu\text{g}/\text{m}^3$)

Site ID	Annualisation Factor Breckland East Wretham	Annualisation Factor Wicken Fen	Annualisation Factor Norwich Lakeside	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
S9	1.0988	1.2715	1.2131	1.1944	20.7	24.7	
S14	0.9189	0.8020	0.8600	0.8603	24.7	21.2	

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2
Periods used to calculate bias	12	10
Bias Factor A	0.84 (0.79 - 0.88)	0.85 (0.76 - 0.96)
Bias Factor B	20% (13% - 26%)	18% (4% - 32%)
	20	18
Diffusion Tube Mean ($\mu\text{g}/\text{m}^3$)	24.5	8.5
Mean CV (Precision)	2.9%	3.3%
Automatic Mean ($\mu\text{g}/\text{m}^3$)	20.5	7.2
Data Capture	100%	98%
Adjusted Tube Mean ($\mu\text{g}/\text{m}^3$)	21 (19 - 22)	7 (6 - 8)

Overall Diffusion Tube Precision	Good Overall Precision	Good Overall Precision
Overall Continuous Monitor Data Capture	Good Overall Data Capture	Good Overall Data Capture

Notes:

A combined local bias adjustment factor of 0.84 has been used to bias adjust the 2021 diffusion tube results.

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

Figure D.1 – Map of All Monitoring Site in Breckland District Council

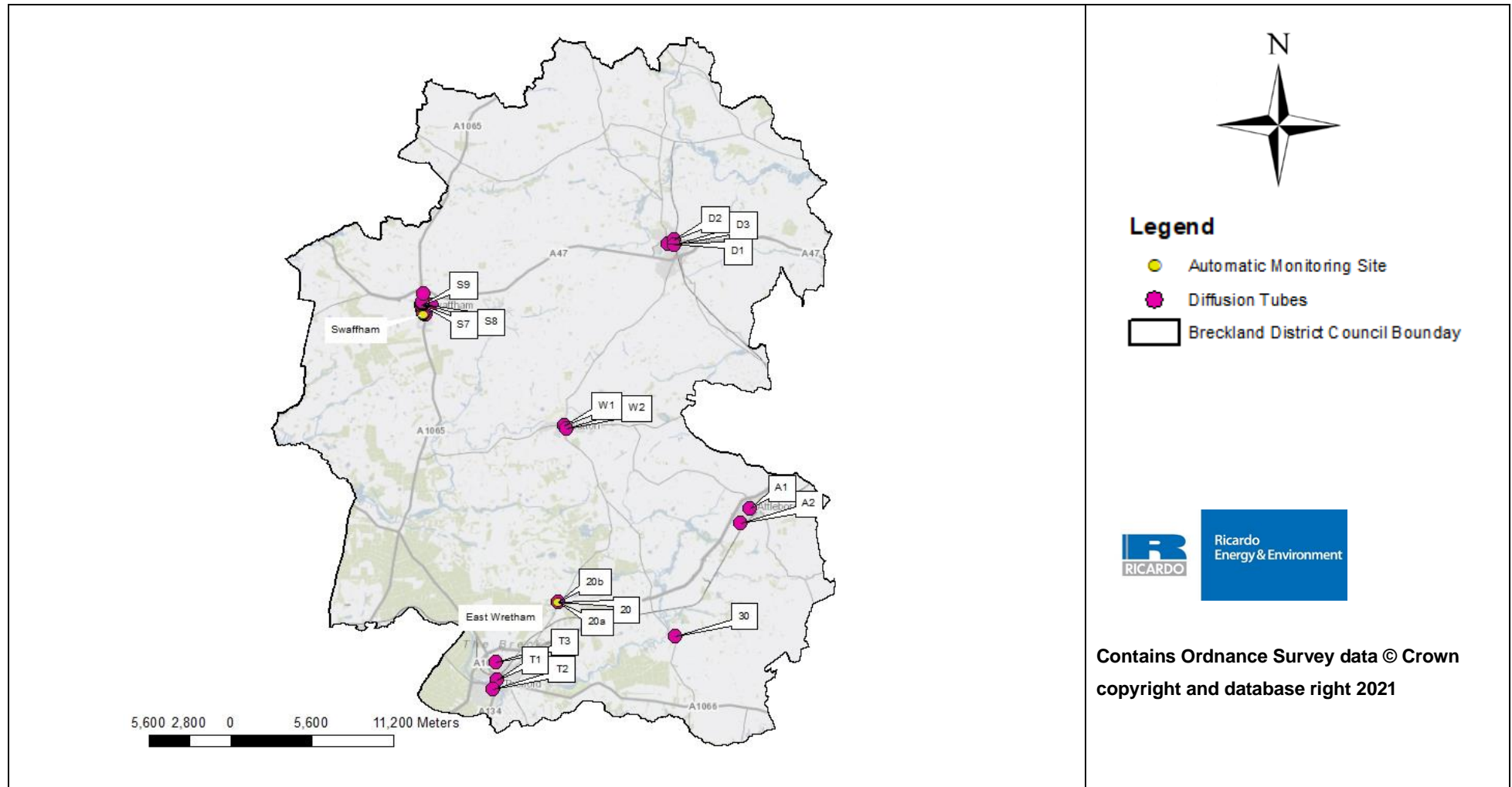


Figure D.2 – AQMA and diffusion tubes

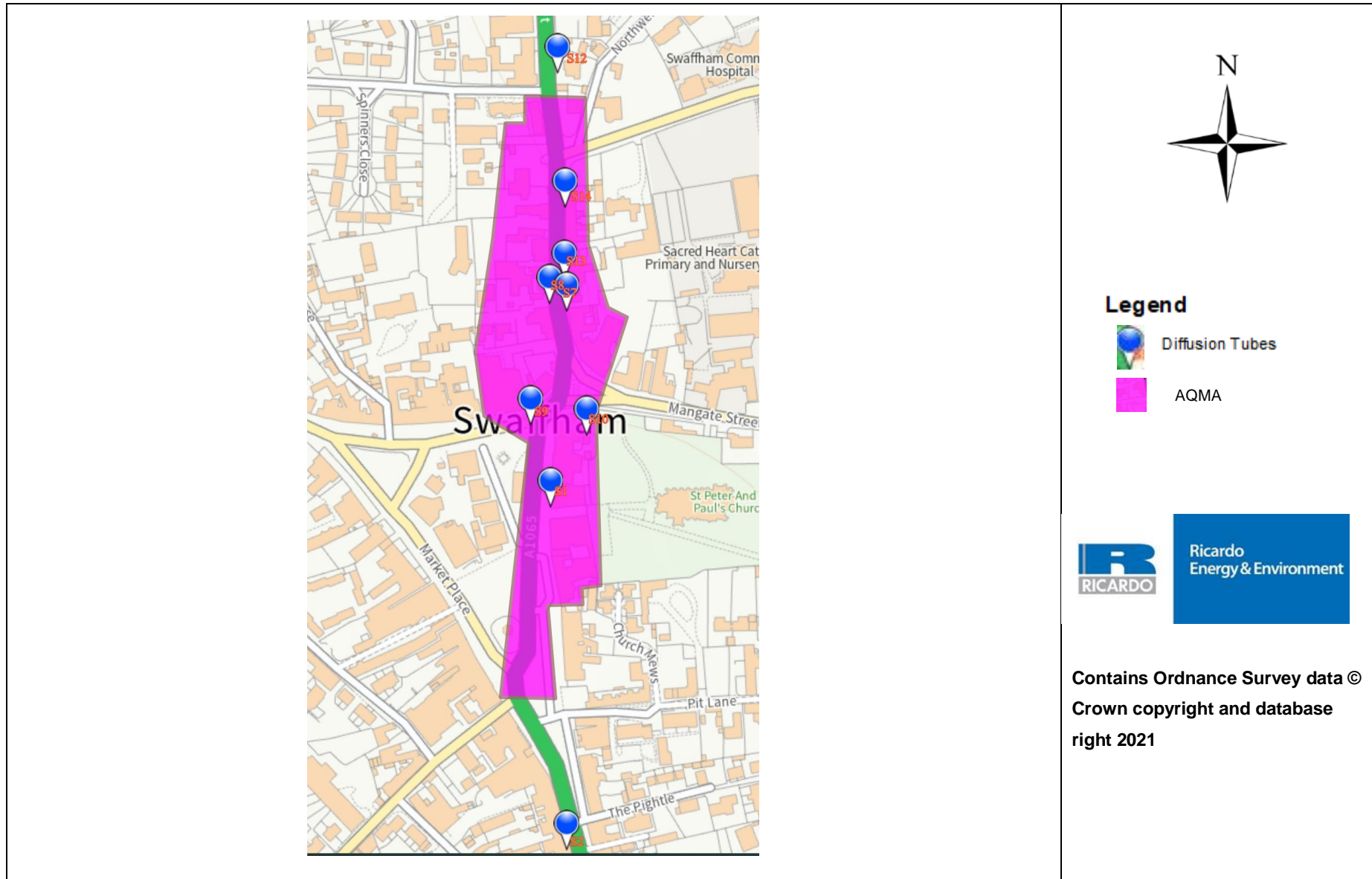


Figure D.3 – Swaffham monitoring sites

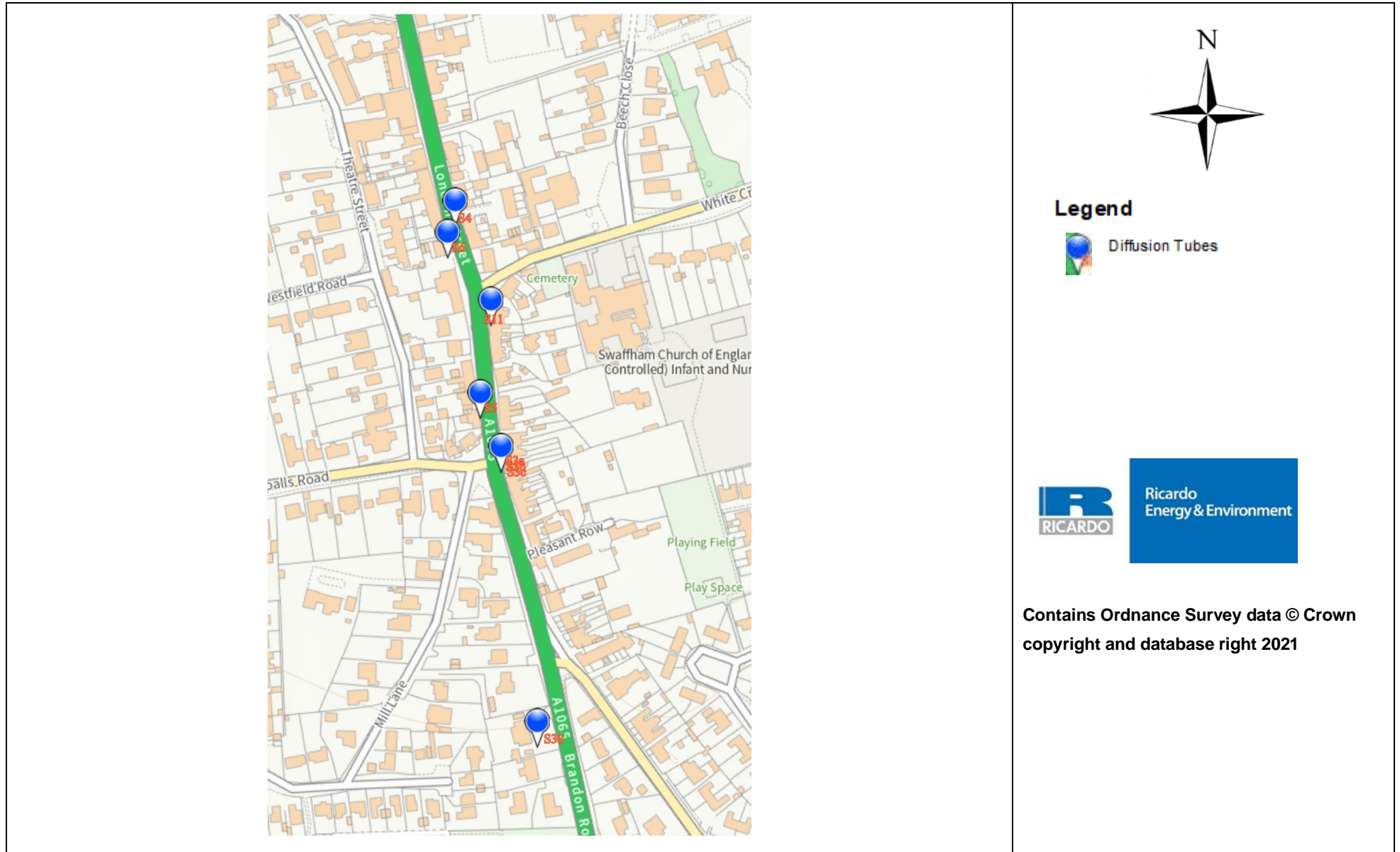


Figure D.4 – Dereham Diffusion Tubes



Figure D.5 – Watton Diffusion Tubes



Figure D.6 – Attenborough Diffusion Tubes

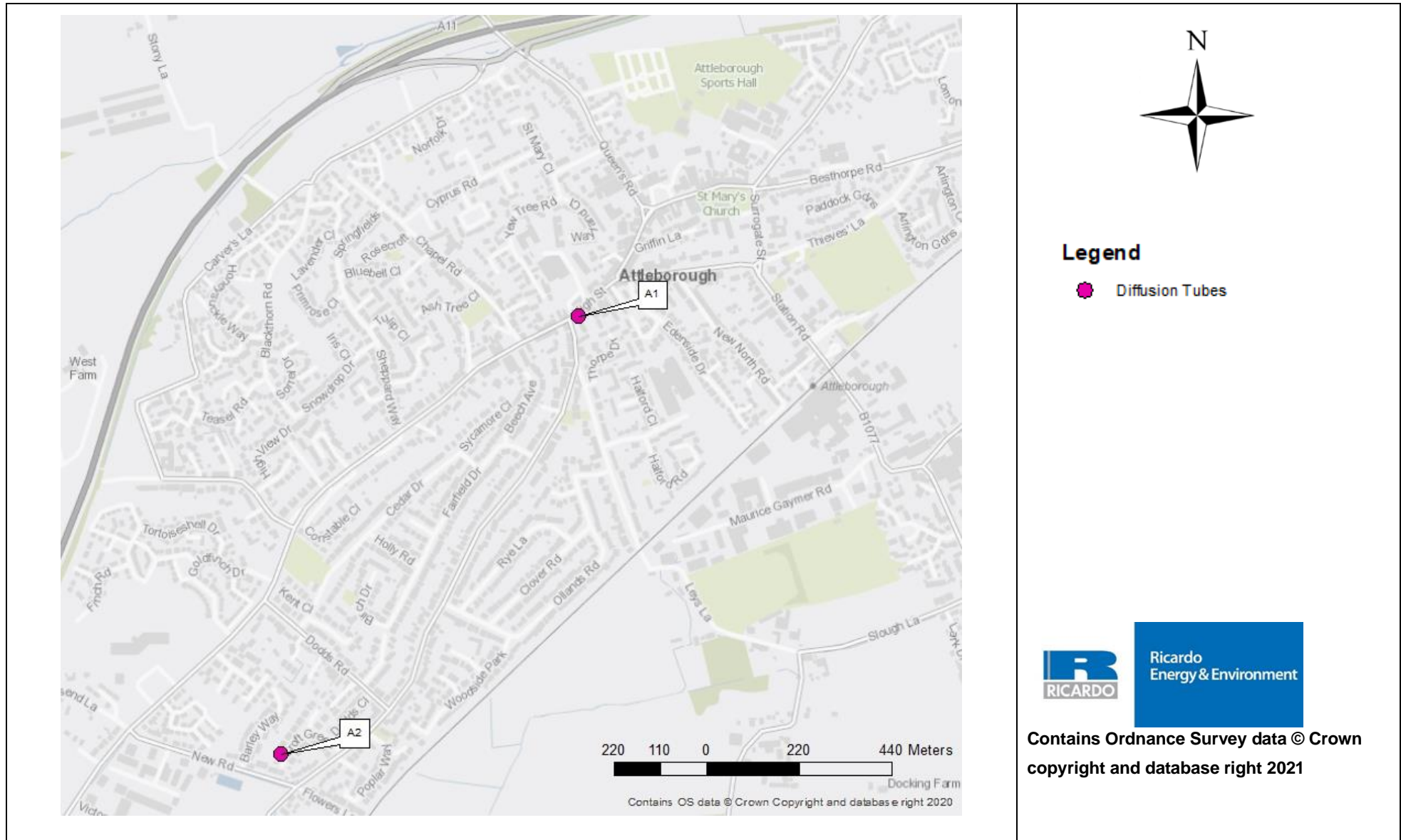


Figure D.7 – East Harling Diffusion Tube



Figure D.8 – Wretham Monitoring Sites

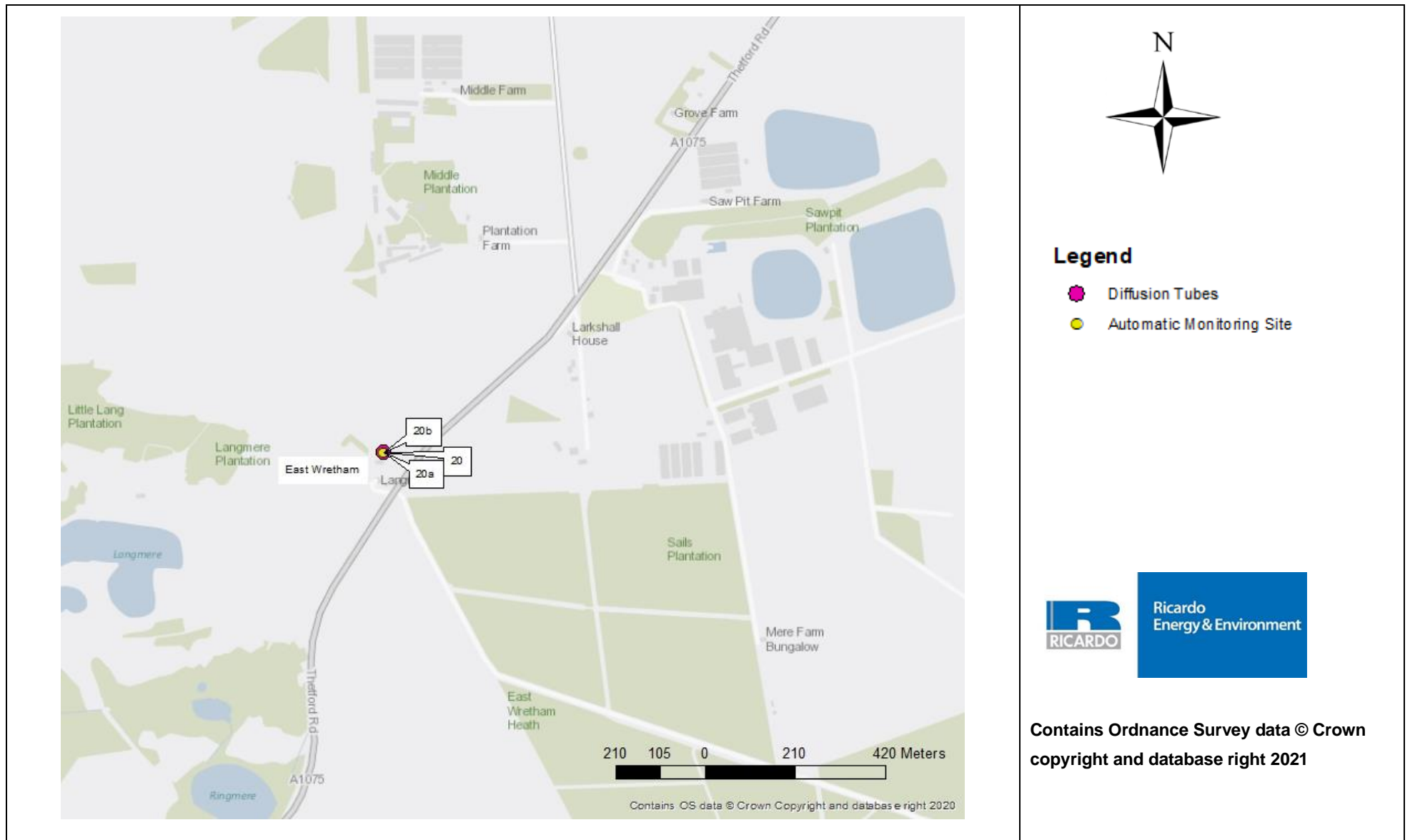


Figure D.9 – Thetford Diffusion Tubes



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England¹²

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

¹² The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly.
- Breckland District Council Air Quality Reports, available at: <https://www.breckland.gov.uk/article/3244/Air-Pollution>
- National Planning Policy Framework, available at [National Planning Policy Framework - Guidance - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/policies/national-planning-policy-framework)
- Breckland Council Air Quality Action Plan, available at [Breckland Council Air Quality Action Plan](#)
- New household waste contract to start in Breckland and west Norfolk, article available at [New household waste contract to start in Breckland and west Norfolk \(serco.com\)](#)
- Breckland Council Green Community Grants, available at [Green Community Grants - Breckland Council](#)
- Breckland Council Future plans drafted for Watton and Swaffham, available at [28/03/22: Future plans drafted for Watton and Swaffham - Breckland Council](#)
- UK AIR, List of Local Authorities with AQMAs , [List of Local Authorities with AQMAs - Defra, UK](#)
- Breckland 2035 Sustainability Strategy, available at [What does climate change mean for the District? - Breckland Council](#)
- Public Health Outcomes Framework indicator, available at: <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework>
- Defra 2021 background maps, available at: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>
- Air Quality in England, available at: https://www.airqualityengland.co.uk/local-authority/?la_id=38
- LAQM Diffusion Tube Data Processing Tool, available at [Air Quality Assessment | LAQM \(defra.gov.uk\)](#)
- LAQM National Diffusion Tube Bias Adjustment (03/22), available at [National Bias Adjustment Factors | LAQM \(defra.gov.uk\)](#)

- LAQM NO₂ Performance Data, available at [WASP – Annual Performance Criteria for NO₂ Diffusion Tubes \(defra.gov.uk\)](#)