



Breckland
COUNCIL

2021 Air Quality Annual Status Report (ASR)

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

Date: July 2021

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Executive Summary: Air Quality in Our Area

Air Quality in Breckland District 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. The main source of air pollution within the District 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>.

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

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 2020

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

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 2020, 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. Across the entire diffusion tube network, over the last five years, NO₂ concentrations have decreased at almost all locations since 2015 and no exceedances were reported in 2020. NO₂ concentrations increased at one of the 26 diffusion tube sites, W2 increased from 12.3 µg/m³ in 2019 to 15.9 µg/m³ in 2020, which is still below the Air Quality objective of 40 µg/m³ for NO₂. Site W2 is located outside the boundary of the declared AQMA.

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 even more ambitious than EU requirements 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 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](#)

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

(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 Market Place and Rapid chargers installed in Pedlar car park.

Increase in electric vehicle charging points have encouraged the introduction of the first two private vehicle [electric licence taxis](#) in Breckland District Council, which became operational in 2021.



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 <https://www.breckland.gov.uk/article/16966/23-03-21-New-household-waste-contract-to-start-in-Breckland-and-West-Norfolk>. Pictured below are the leaders of the three councils in front of some of the new refuse vehicles.



- Breckland District Council is launching a new initiative, the Sustainable Swaffham programme which will make Swaffham one of Norfolk's most environmentally friendly towns. The Sustainable Swaffham programme will see the rollout of several ['green' schemes](#) throughout 2021; with an initial focus on installing four electric vehicle chargers (EVC) in council-owned car parks.
- The council has just commissioned a piece of work to identify the best locations across the district for more EVC points to be delivered hopefully encouraging further take up of Electric Vehicles. Pictured below is Cllr Sam Chapman-Allen, Leader of Breckland Council endorsing the scheme.



- Breckland District Council's first [Sustainability and Climate Change Strategy](#) expected to be adopted during 2021. It 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. For more information, please visit <https://www.breckland.gov.uk/article/15017/15-07-20-Green-light-for-council-s-green-energy-switch>
- 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.

Conclusions and Priorities

Breckland District Council 2021 ASR is an update of the monitoring carried out last year and illustrates that there is a general improvement in air quality across the district. This includes an improvement to NO₂ concentrations measured within Swaffham AQMA.

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 and all NO₂ monitoring sites dropped in annual mean since 2019, with exception of diffusion tube W2, where an increase of 3.6 µg/m³, from 12.3 µg/m³ to 15.9 µg/m³ was recorded. The annual mean NO₂ concentration measured at this location remains well below the relevant air quality objective level. The diffusion tube W2 is located outside the boundary of the declared AQMA.

Breckland District Council is not considering revoking the AQMA this year due to the increase at monitoring site S12 (located within current AQMA) during 2019. Site S12 had

increased to 38.0 $\mu\text{g}/\text{m}^3$ in 2019, a 6.5 $\mu\text{g}/\text{m}^3$ increase since 2018. In 2020, site S12 dropped 56.1% to 16.3 $\mu\text{g}/\text{m}^3$ (compared to 2019 concentration), this difference in concentration may be associated with the downturn in vehicles brought about by the COVID-19 pandemic. As such, Breckland District Council will continue with the declared AQMA until there are at least five consecutive years dropping concentrations below 10% of the relevant objective.

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.

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1 Local Air Quality Management

This report provides an overview of air quality in Breckland District Council during 2020. 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

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMA) 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 the AQMA 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 a map of the AQMA boundary and 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 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). However, although no exceedances were reported within the AQMA in 2019, the maximum concentration reported in the AQMA had increased to 38.0 µg/m³ at monitoring site S12 in 2019, which is within 10% of the objective. 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. As such, Breckland District Council will continue with the declared AQMA until there are at least five consecutive years dropping concentrations below 10% of the relevant objective.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	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	24.6 µg/m ³ (2020)	AP01/18 - Breckland Council Air Quality Action Plan - 2018 09/10/2018	https://www.breckland.gov.uk/media/13048/Breckland-AQAP-2018/pdf/Breckland_AQAP_2018.pdf?m=636958655840170000

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

Breckland District Council confirm that all current AQAPs have been submitted to Defra (confirm by selecting in box).

2.2 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 report which contains the required content.*
- 2. The Swaffham AQMA has seen no recorded exceedances of the annual mean objective for NO₂ since its declaration in 2017, however the maximum concentration reported in the AQMA had increased to 38.0 µg/m³ at monitoring site S12 during 2019, which is within 10% of the objective. This location has increased from last year by 6.5 µg/m³ and therefore the Council do not wish to consider revocation at this time. This position is supported.*
- 3. QA/QC is considered to be through, and the Council are commended on the extensive detail provided when discussing procedures applied. This is encouraged in all future reports.*
- 4. Whilst no exceedances of any AQO were recorded during 2019, increases in annual mean NO₂ concentrations were noted at 21 of the Council's 26 passive monitoring sites, therefore suggesting a district-wide worsening in air quality compared to 2018. The Council are encouraged to investigate the reasons for these increases where practicable, and report on this in next year's ASR. An extension of the monitoring network in areas where the greatest increases have been identified is also encouraged if possible.*
- 5. Trends in monitoring data are presented, however further discussion of these trends is welcomed for each pollutant.*
- 6. Mapping clearly demonstrates the extent of the monitoring network, and site locations with respect to the AQMA. This is encouraged in all future reports.*

Due to the COVID-19 pandemic, the council were very restricted in their work throughout 2020, with most of the air quality activities limited to management of the NO₂ diffusion tubes and continuous monitoring stations monitoring network. Therefore, no specific investigation into the 2019 NO₂ annual mean concentrations were practicable (as per point 4 of Defra's 2020 ASR appraisal above).

Breckland District Council has taken forward and continued with a number of direct measures during the current reporting year of 2020 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 2020 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 the respective [Air Quality Action Plan](#).

Breckland District Council's priority measures for the coming year are measures 1 and 7, as detailed in Table 2.2, though equal priority will be given to all other measures.

The principal challenges and barriers to implementation that Breckland District Council anticipates are increased workload and delays due to the ongoing COVID-19 pandemic.

Progress on most of the measures detailed in Table 2.2 has been slower than expected due to the constraints by the COVID-19 pandemic. Over the course of the next reporting year, Breckland District Council will be reviewing all of these measures, particularly the measures that are being worked upon with the council's partners.

Breckland District Council anticipates that the measures in Table 2.2 will 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
- have committed £60K of additional funding to increase 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
- have committed £100k to creating tree planting scheme and other environmental schemes
- will be running a £100K green grants scheme over the summer to enable the community to act for itself on environmental issues
- will also be looking at how to reduce staff/member travel and promote active travel when employees do have to do business miles.

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)					1µg/m ³	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							This matter crosses a number of different organisational controls so a review of this will need to include officers / councils responsible for car parking at County/ District and town levels. Initial meetings to be set up in Autumn 2019. Time limits on some car parks in the centre of Swaffham are set to be introduced by Breckland as part of a trial which aims to boost the town's economy. Drivers will be limited to parking for a maximum of two hours in Market Place, Pedlars and Pit Lane car parks	Review of possible actions at county/ district (facilities team) level. Ongoing due to Covid-19 pandemic impact.
Transport Measures															
7	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.	Transport Planning and Infrastructure	Strategic highway improvements, Reprioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2018	2020	County Council District Council Town Council	County Council District Council Town Council							Norfolk County Council (NCC) has undertaken an investigation and report to examine changes to the junction and incorporate considerations around pedestrian safety and pollution modelling. The final conclusions of the report are still being produced to identify potential improvement options with a cost / benefit analysis in terms of likely pollution reductions. Initial conclusions suggest however that costly changes to the road junction would not produce significant / measurable reductions in pollution levels. Changes to the market place, roads and pathways might be possible in terms of other projects aimed at improving the attractiveness of the town centre	Review of final report and actions Norfolk County Council to work with partners at district and town council level if pollution levels increase. The draft NCC Swaffham Network Improvement Strategy February 2020 recommend that no further work is carried out on this measure whilst measured NO ₂ levels are beneath the threshold

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	2020	County Council District Council Town Council	County Council District Council Town Council						NCC Highways are in the process of producing a report considering traffic flows and the options for the one way system. The initial considerations are that this would have a limited level of improvement on air quality but could allow easier movement of traffic towards the Theatre Road car park	Review of final report and actions to be carried out in conjunction with Breckland Councils market town initiative work especially bus routes, car parks and options to reduce the amount of traffic flows north to south and south to north. The NCC Swaffham Network Improvement Strategy (published February 2020) concludes that a scheme to provide a southern access to the Theatre Street car park with associated signing is progressed. Funding will need to be identified for both detailed design and implementation
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	Ongoing	County Council District Council Town Council	County Council District Council Town Council					1µg/m ³	NCC Highways have produced a draft report to review the theatre street carpark access arrangements which are current only one way in and one way out – NCC to produce possible options on this issue within their report as per action points 7 & 8	Review of final report and actions Review of car parks to be made at district and town council levels especially the HGV lorry park. The NCC Swaffham Network Improvement Strategy February 2020 recommends that car parking signage within the town could be revisited with the removal of lorry parking pictograms and replacement with named car parks a measure to improve the visibility of the current car parking signage
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	2019	County Council District Council Town Council	County Council District Council Town Council					1µg/m ³	NCC Highways draft report produced considering traffic and signage improvements this should be read in context with the review in action point 9.	Review of final report and actions. See recommendation from the draft NCC Swaffham Network Improvement Strategy February 2020 in item 9 above.

15	Improve walking and cycling facilities in and around the town	Promoting Travel Alternatives	Bus route improvements Cycle network Public cycle hire scheme	2018	Ongoing	Count Council District Council Town Council	Count Council District Council Town Council					1µg/m ³	This matter crosses a number of different organisational controls so a review of this will need to include officers / councils responsible for walking and cycling at County/ District and town levels. Initial meetings were set up in Autumn 2019. This could also include the Communities team as part of the Market towns Initiative – which perhaps could include provision of cycle stands in the town and setting up of safe cycle routes. NNC advise that developers need to provide evidence within their transport assessments linking developments to the community and in this case the town centre.	Consideration of additional facilities as part of town centre improvements Issue to be raised with Breckland Business Improvement team.
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	2019	Count Council District Council Town Council	Count Council District Council Town Council						This matter crosses a number of different organisational controls so a review of this will need to include officers / councils responsible for school travel at County/ District and town levels. Initial meetings to be set up in Autumn 2019. This could also include the Communities team as part of the Market towns Initiative. All schools have travel plans. However, Norfolk County Council have no officers or resources in place to proactively promote this. Possibly a targeted programme could be made to encourage schools to maintain their travel plans and encourage implementation of identified actions. Transport is provided if school more than 3miles away. The NCC schools transport team advise that they do not specify any particular emissions standards for the vehicles used for school transport contracts. The only requirement is for the vehicles to be road legal. NCC would like to ask for lower polluting or electric vehicles but this would have a likely effect of increasing costs which would not be covered by the existing funding resources.	Swaffham Town council to make contact with local schools to maintain their travel plans and encourage implementation of identified actions
17	Taxi Licensing conditions	Promoting Low Emission Transport / Alternative to Private Vehicle Use	Taxi Licensing conditions		2021	District Council, taxi drivers		No					Encourage/make it easier for other local businesses and householders to switch to electric	Breckland Council has licensed the first fully electric private hire vehicle in the district in 2021, paving the way for greener transport options in the region.
18	Cross council collaboration and investment	Vehicle Fleet Efficiency	Other - Fleet efficiency		2021	Breckland Council and the Borough Council of King's Lynn and West Norfolk. Serco.		No		£230m		Reduce carbon footprint.	Due to start April 2021	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.

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	No							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 over the coming months in 2021	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.
Public Health Measures																
22	Investigate Green Space Initiatives	Other	Other	Ongoing	2019	District Council Town Council	District Council Town Council							1µg/m ³	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. Initial meetings were set up in Autumn 2019. This could also include the Communities team as part of the Market towns Initiative. Measure to be considered as part of development plans for Swaffham market place and possibly improvements to traffic flow stemming from transport plan in item 7	Consideration of additional facilities as part of town centre improvements. Review by Swaffham Town Council over next 6 months.

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.

Breckland District Council is addressing PM_{2.5} concentrations by targeting road traffic emissions, that are a main source of PM_{2.5}, through:

- increasing electric vehicle chargers in council owned public car parks, funded by [Breckland Council's Market Towns Initiative](#);
- continuing to encourage the [anti-idling](#) messages on their webpage;
- adopting their new [Sustainability 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 PM₁₀ concentration (16 µg/m³) at the automatic monitoring site East Wretham (BRE01). The estimated PM_{2.5} concentration in 2020 at the automatic monitoring site was 11.2 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 5.2% during 2019 (latest available data), which is below the regional average of 5.5% and 0.1% above the national average of 5.1% for 2019.

Furthermore, the current Defra 2020 background maps⁸ for Breckland District Council (2018 based) show that all 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 10.3µg/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 2020 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 2016 and 2020 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Breckland District Council undertook automatic (continuous) monitoring at two sites during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites. 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.

Please note that 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. Breckland District Council confirm that no emission sources have been identified that indicate a requirement for any monitoring of these pollutants at this time.

3.1.2 Non-Automatic Monitoring Sites

Breckland District Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 26 sites during 2020. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (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 2020 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 2020.

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 and 24.1µg/m³ in 2020. The highest NO₂ concentration reported across the diffusion tube network in 2020 was at this diffusion tube site (S8), however this is below the air quality objective.

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.

3.2.2 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 (98.2%) at the monitoring site in East Wretham (BRE01) and the measured annual mean PM₁₀ concentration at this location was 16 µg/m³, which is significantly below PM₁₀ objectives for annual mean.

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. The daily mean concentration exceeded 50µg/m³ three times throughout 2020, which is within the air quality objective and has been as such for the last five years.

3.2.3 Particulate Matter (PM_{2.5})

Currently there is not any monitoring of PM_{2.5} completed within Breckland District. 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 PM₁₀ concentration (16 µg/m³) measured at the automatic monitoring site East Wretham (BRE01). The estimated PM_{2.5} concentration in 2020 at the automatic monitoring site was 11.2 µg/m³, which is below the PM_{2.5} obligatory standard of 25 µg/m³.

3.2.4 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 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.7 in Appendix A summarises the number of exceedances over the last 5 years in line with the AQS 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	Y	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 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
BRE01	591315	288704	Rural	93.6	93.6	25	12	10	10	7
BRE02	582093	308469	Roadside	72.5	72.5	28.5	25.9	25.6	26.2	19.1*

*Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16 (confirm by selecting in box).

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

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 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
A1	604550	295125	Urban Centre	83.3%	83.3%	28.6	23.6	23.8	24.6	16.4
A2	603843	294085	Urban Background	83.3%	83.3%	11.5	10.2	9.7	10.4	7.2
D1	598920	313267	Urban Centre	83.3%	83.3%	34.3	30.9	27.3	29.3	18.4
D2	599283	313599	Urban Background	83.3%	83.3%	28.6	25	22.5	22.6	13.6
D3	599319	313197	Urban Centre	66.7%	66.7%	11.2	13.7	20	22.4	18.7
S1	581986	309031	Urban Centre	83.3%	83.3%	24.2	20.2	20	20	13.3
S2	582008	308764	Urban Centre	75.0%	75.0%	38.4	33.5	28.6	28.7	19.5
S3 - Triplicate Site	582182	308434	Roadside	83.3%	83.3%	30.5	25.8	25.7	26.2	17.3
S4	582058	308625	Roadside	83.3%	83.3%	26.9	20.9	21.4	22.4	14.6
S5	582075	308496	Roadside	83.3%	83.3%	25.7	22.7	21.8	24.1	17.1
S6	582048	308609	Roadside	75.0%	75.0%	33.2	29.1	26.9	29.6	21.0
S7	581999	309099	Roadside	83.3%	83.3%	38.4	29.7	30.2	30.2	19.1
S8	581979	309162	Roadside	66.7%	66.7%	41	34.3	30.5	31.6	24.1
S9	581959	309057	Roadside	83.3%	83.3%	26.7	21.9	21.8	23	14.2
S10	582670	309058	Roadside	83.3%	83.3%	24.9	22.7	20.3	21.6	14.5
S11	581990	309145	Roadside	66.7%	66.7%	37	30.6	30.9	26.6	12.3
S12	581986	309213	Roadside	58.3%	58.3%	32	29.2	31.5	38	16.3
S13	581978	309312	Roadside	58.3%	58.3%	26.4	21.7	14.9	25.2	20.1
S14	582082	309856	Roadside	66.7%	66.7%	24.2	21.2	17.2	21.3	19.2
T1	587126	283336	Roadside	83.3%	83.3%	27.2	25.8	24.8	25.1	18.0
T2	586846	282721	Roadside	83.3%	83.3%	25.7	22	21.9	21.2	14.4
T3	587036	284579	Suburban	83.3%	83.3%	14.9	14.1	12	14.1	9.9
W1	591747	300796	Urban Centre	75.0%	75.0%	26.7	24.1	24	24.2	8.9
W2	591885	300622	Urban Background	75.0%	75.0%	13.1	12.4	11.8	12.3	15.9
20 - Triplicate Site	591315	288704	Rural	83.3%	83.3%	11.1	10.8	10.8	10.1	6.7
30	599403	286353	Rural	83.3%	83.3%	15.8	13.7	10.2	11.5	7.1

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16 (confirm by selecting in box).

Diffusion tube data has been bias adjusted (**confirm by selecting in box**).

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 (**confirm by selecting in box**).

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

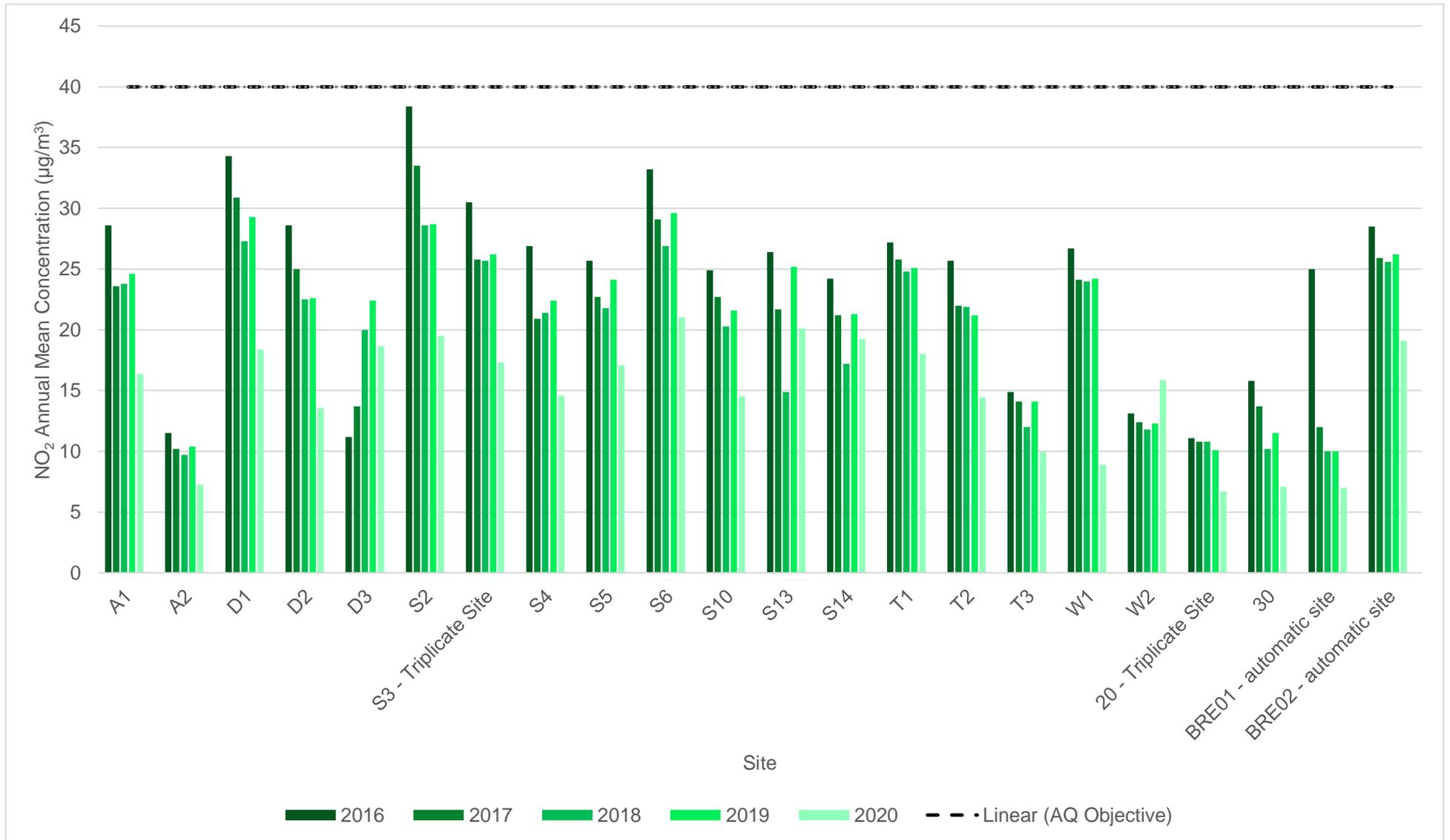


Figure A. 2 - Trends in Annual Mean NO₂ Concentrations – Within Declared AQMA

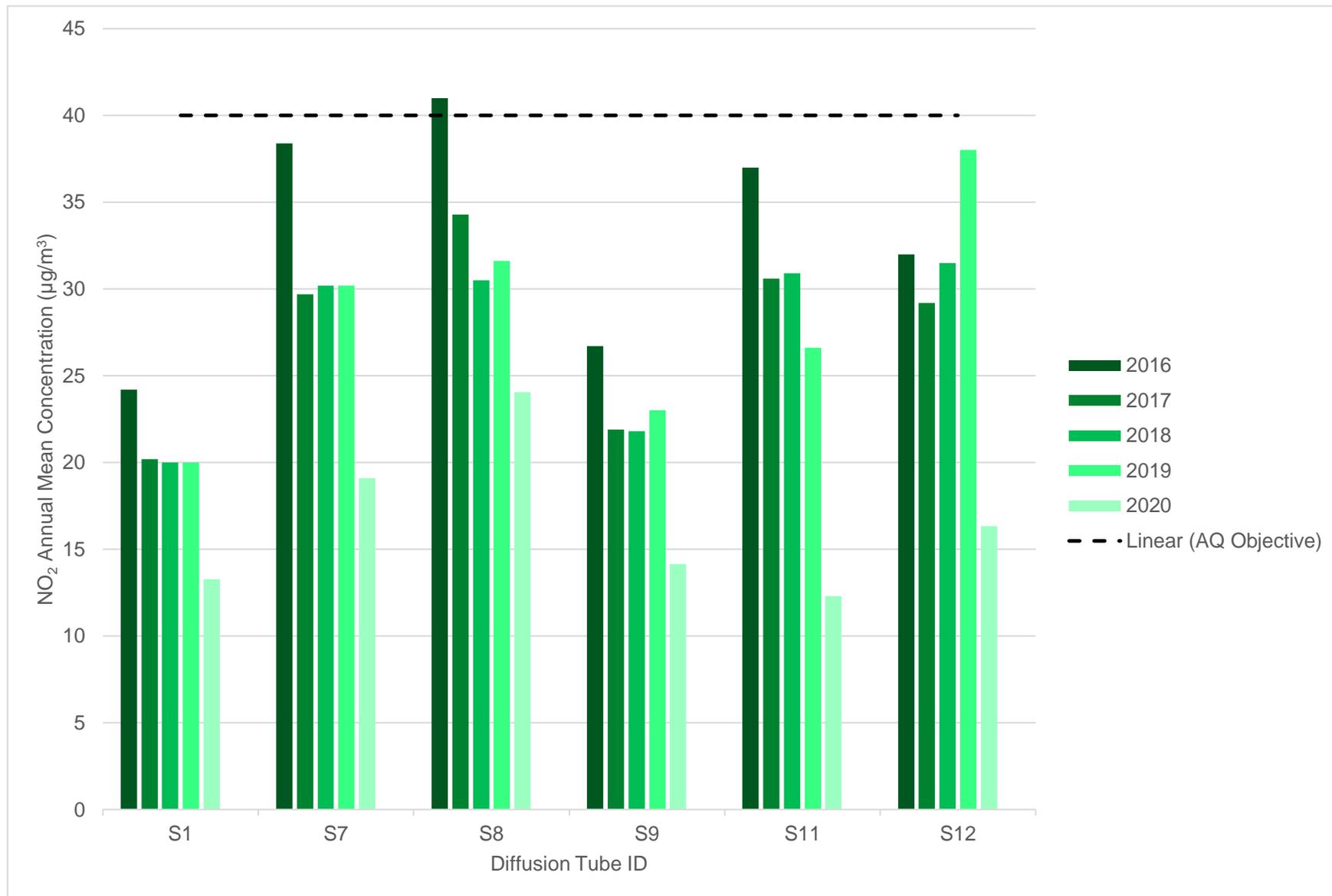


Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
BRE01	591315	288704	Rural	93.6	93.6	0	0	0	0	0
BRE02	582093	308469	Roadside	72.5	72.5	0	0	0	0	0 (97)

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 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
S20	591315	288704	Rural	98.2	98.2	15	16	17	15	16

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16 (confirm by selecting in box).

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.1 – Trends in Annual Mean PM₁₀ Concentrations

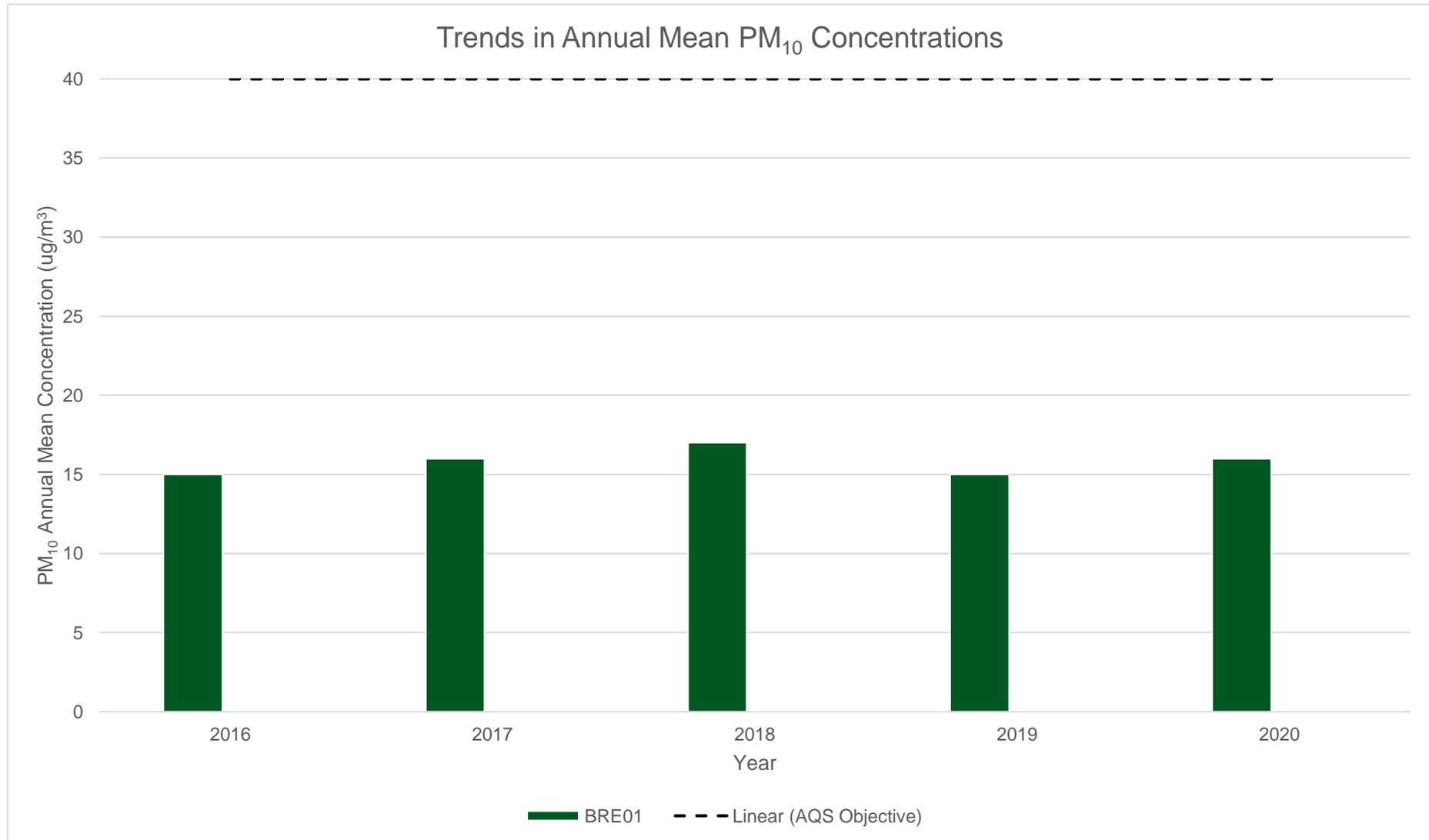


Table A.7 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
BRE01	591315	288704	Rural	98.2	98.2	1	4	4	3	3

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%).

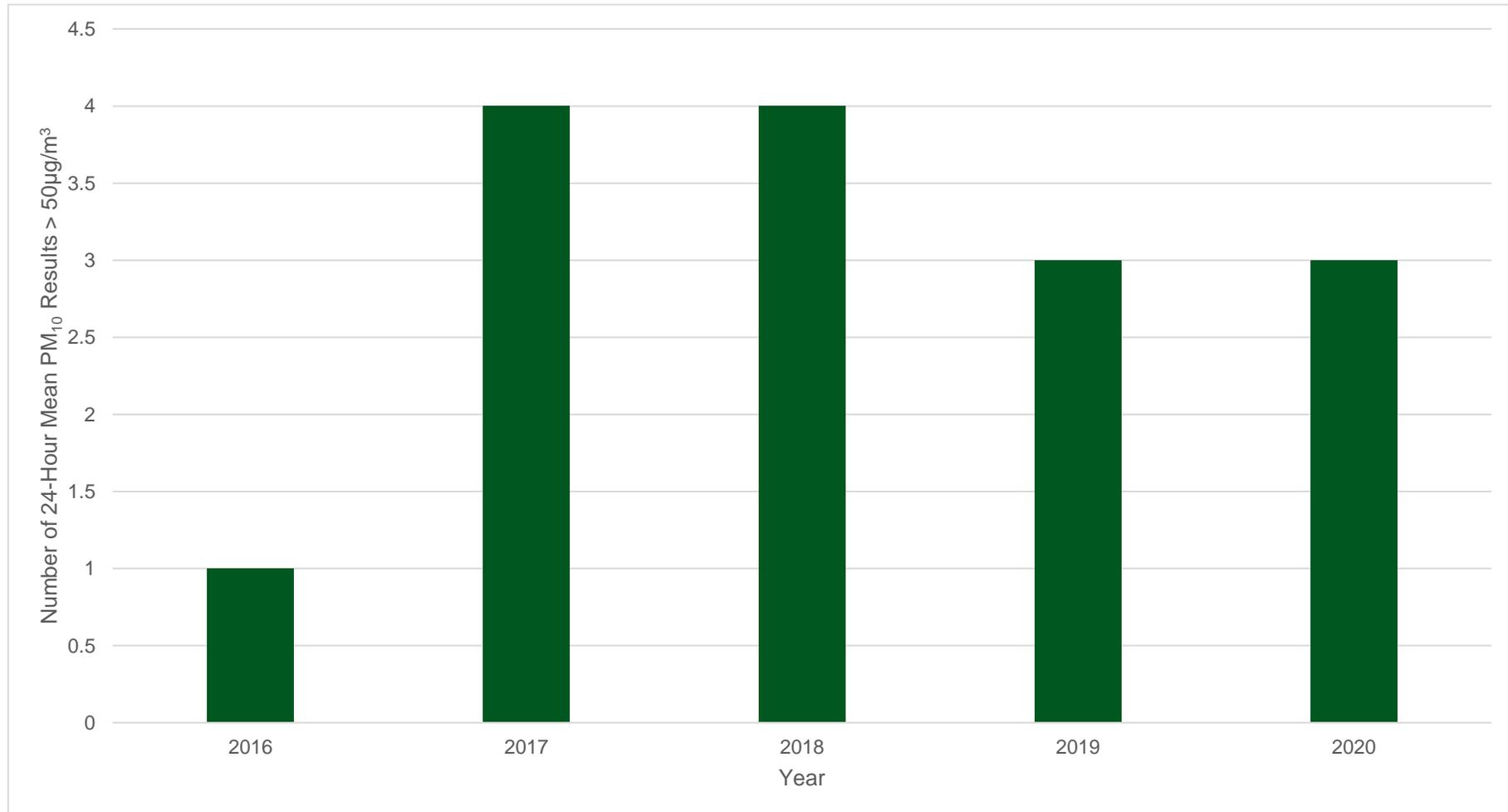
Figure A.2 – Trends in Number of 24-Hour Mean PM₁₀ Results > 50µg/m³ at automatic site BRE01 (Wretham)

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⁾	O ₃ Number of Exceedances of Maximum Daily Concentration (8 hours rolling mean)				
						2016	2017	2018	2019	2020
BRE01	591315	288704	Rural	99	99	12	6	29	18	25

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16 (confirm by selecting in box).

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 2020

Table B.1 – NO₂ 2020 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 (0.81) and Annualised	Distance Corrected to Nearest Exposure	
A1	604550	295125	28.1	23.8	13.8			18.6	17.8	19.0	21.3	21.2	30.1	22.3	20.1	16.4	-	
A2	603843	294085	12.8	10.3	6.5			7.3	5.9	6.9	8.3	8.6	15.4	12.4	8.9	7.2	-	
D1	598920	313267	36.7	33.8	14.9			19.7	23.1	16.2	16.7	23.2	29.2	29.7	22.6	18.4	-	
D2	599283	313599	23.2	17.6	10.4			12.2	14.1	16.9	19.5	20.8	24.4	21.8	16.7	13.6	-	
D3	599319	313197		30.1	12.1			18.1	20.9	22.6	25.8	27.5	29.2		20.6	18.7	-	
S1	581986	309031	19.3	16.4	11.0			15.2	14.9	17.6	19.5	18.9	21.5	20.5	16.3	13.3	-	
S2	582008	308764	33.1	28.4	14.4				29.7	26.0	29.9	8.8	35.1	29.8	24.0	19.5	-	
S3(3)	582182	308434	26.2	20.8	13.3			21.2	21.2	24.1	25.4	23.0	30.9	24.9	-	-	-	Triplicate Site with S3(3), S3A(3) and S3B(3) - Annual data provided for S3B(3) only
S3A(3)	582182	308434	25.9	21.8	13.2			21.3	22.2	24.0	24.8	23.0	31.9	26.0	-	-	-	Triplicate Site with S3(3), S3A(3) and S3B(3) - Annual data provided for S3B(3) only
S3B(3)	582182	308434	25.1	21.2	13.1			20.9	20.9	24.1	24.4	23.4	31.5	23.9	21.3	17.3	-	Triplicate Site with S3(3), S3A(3) and S3B(3) - Annual data provided for S3B(3) only
S4	582058	308625	22.1	17.1	12.3			16.4	15.8	19.4	21.4	20.8	24.3	22.0	17.9	14.6	-	
S5	582075	308496	28.1	29.1	13.5			15.7	19.8	20.7	20.5	22.8	29.7	26.7	21.0	17.1	-	
S6	582048	308609	30.4	27.6	14.0			21.9	25.2	29.0		56.1	29.0	28.5	25.9	21.0	-	
S7	581999	309099	26.7	20.4	16.1			22.3	22.0	28.5	32.0	24.7	31.3	26.9	23.5	19.1	-	
S8	581979	309162		27.8				21.1	26.9	26.7	30.4	29.9	34.1	31.3	28.6	24.1	-	
S9	581959	309057	18.1	18.8	10.6			14.9	17.6	18.2	20.5	23.0	25.2	22.8	17.4	14.2	-	
S10	582670	309058	26.1	24.2	10.6			14.0	18.0	16.0	17.9	22.6	23.7	22.1	17.9	14.5	-	

S11	581990	309145	20.9	16.9	9.6			13.7	16.2	15.5			24.8	20.7	15.7	12.3	-	
S12	581986	309213	24.2	20.4					15.0		20.5	22.6	29.0	25.8	22.5	16.3	-	
S13	581978	309312			17.1			22.5	21.2	28.7		27.3	32.7	30.4	23.7	20.1	-	
S14	582082	309856	29.1	23.7	15.0			22.7	23.1		25.4	31.5	37.2		23.4	19.2	-	
T1	587126	283336	28.3	23.8	15.0			20.3	19.9	23.0	25.6	25.4	27.8	28.2	22.2	18.0	-	
T2	586846	282721	24.0	18.8	11.8			14.8	13.9	18.5	19.8	20.4	23.5	24.1	17.7	14.4	-	
T3	587036	284579	19.5	16.3	7.6			9.4	9.1	9.1	11.5	13.1	20.8	16.5	12.2	9.9	-	
W1	591747	300796		22.1	7.1			7.8	7.7	8.1	9.1	10.2	19.5	16.3	10.9	8.9	-	
W2	591885	300622	16.0		13.9			16.7	19.8	20.7	22.9	23.5	24.9	28.6	19.5	15.9	-	
20(3)	591315	288704	13.3	8.6	6.6			7.1	6.4	7.4	7.8	8.2	12.1	10.3	-	-	-	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	13.1	9.1	6.0			7.0	6.3	7.5	7.7	7.1	12.8	10.6	-	-	-	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	12.6	9.3	5.9			6.9	6.3	7.3	7.4	8.1	11.8	11.3	8.3	6.7	-	Triplicate Site with 20(3), 20(3)A and 20(3)B - Annual data provided for 20(3)B only
30	599403	286353	12.0	8.5	6.0			7.2	6.1	7.1	9.4	8.7	15.3	12.5	8.7	7.1	-	

- All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1 (confirm by selecting in box).
- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16 (confirm by selecting in box).
- Local bias adjustment factor used (confirm by selecting in box).
- National bias adjustment factor used (confirm by selecting in box).
- Where applicable, data has been distance corrected for relevant exposure in the final column (confirm by selecting in box).
- Breckland District Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System (confirm by selecting in box).

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 2020

Breckland District Council has not identified any new sources relating to air quality within the reporting year of 2020.

Additional Air Quality Works Undertaken Breckland District Council During 2020

Breckland District Council commissioned WYG to complete a Dust, Air Quality and Odour Assessment in July 2020 for the proposed agricultural feed mill at Chalk Lane, Snetterton. This report completed a traffic air quality assessment and an industrial emission air quality assessment.

The air quality background concentrations in the vicinity of the proposed development site are below the Air Quality Objective (AQO) of 40 $\mu\text{g}/\text{m}^3$ for NO_2 and PM_{10} .

The Design Manual for Roads and Bridges (DMRB) screening assessment concluded that during the operational phase, there will be no significant effects on local air quality from the additional development traffic on the local road network. Therefore, further detailed operational air quality assessment is not required.

The industrial emission air quality assessment concluded that there will be no significant long-term or short-term effects on local air quality both for the protection of human health and for the protection of vegetation and ecosystems from the operation of steam boilers and dust scrubbers. The significance of the NO_2 impact on the receptors is determined to be 'negligible'.

Breckland District Council has not completed any additional works within the reporting year of 2020.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2020 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 all diffusion tubes were exposed beyond the 4 to 5 week recommended exposure period from March until June (due to restriction imposed by the COVID-19 pandemic), a Time Weighted Annual Mean was used to calculate the annual mean NO₂ concentration using the [Diffusion Tube Processing Tool](#) (v1.0).

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 2020 AIR-PT results, Gradko scored 75% in AIR-PT AR036 (January to February 2020)⁹. No results were reported for AIR-PT AR037 (May – June 2020) and AIR-PT AR039 (July – August 2020), however AIR-PT AR040 (September – October 2020) scored 75%. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

Diffusion Tube Annualisation

For the 2020 diffusion tubes, annualisation was required at six of the monitoring sites as data capture was below 75%. Annualisation is required for any site with data capture less than 75% but greater than 25%. Sites D3, S8, S11 and S14 were active for only eight months (66.7%) in 2020 which is considered an invalid data capture. Sites S12 and S13

⁹ Available at <https://laqm.defra.gov.uk/assets/laqmno2performancedatauptoOctober2020v1.pdf>

were active for only seven months (58.3%) in 2020 which is considered an invalid data capture.

Table C. 3 illustrates the monitoring stations and associated ratios used for the annualisation of diffusion tubes D3, S8, S11, S12, S13 and S14. The annualisation factors were processed using LAQM's Diffusion Tube Data Processing Tool (v.1.0)¹⁰.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 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.TG(16) 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 0.81 to the 2020 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 2020 local and national¹¹ BIAS adjustment calculations for Breckland District Council.

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

¹¹ National Bias Adjustment spreadsheet (v 03/21) Available at <https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

National Diffusion Tube Bias Adjustment

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/21				
<p>Follow the steps below in the correct order to show the results of relevant co-location studies</p> <p>Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods</p> <p>Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet</p> <p>This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.</p>							<p>This spreadsheet will be updated at the end of June 2021</p> <p>LAQM Helpdesk Website</p>				
<p>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.</p>							<p>Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.</p>				
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	<p>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 factor¹ shown in blue at the foot of the final column.</p> <p>If you have your own co-location study then see footnote¹. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953</p>								
If a laboratory is not chosen, we have no data for this laboratory.	If a preparation method is not chosen, we have no data for this method at this laboratory.	If a year is not chosen, we have no data									
Analysed By	Method	Year	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 ¹	Bias Adjustment Factor (A) (Cm/Dm)	
Gradko	20% TEA in water	2020	R	Gedling Borough Council	10	31	25	24.1%	G	0.81	
Gradko	20% TEA in water	2020	R	SOUTHAMPTON CITY COUNCIL	12	37	27	37.1%	G	0.73	
Gradko	20% TEA in water	2020	R	Fareham Borough Council	10	25	14	77.4%	G	0.56	
Gradko	20% TEA in water	2020	R	Fareham Borough Council	12	30	22	35.1%	G	0.74	
Gradko	20% TEA in water	2020	R	Fareham Borough Council	10	22	17	26.5%	G	0.79	
Gradko	20% TEA in water	2020	R	SOUTHAMPTON CITY COUNCIL	11	32	31	4.9%	G	0.95	
Gradko	20% TEA in water	2020	KS	Marjlebone Road Intercomparison	12	57	43	33.3%	G	0.75	
Gradko	20% TEA in water	2020	R	Bath & North East Somerset	11	32	29	13.0%	G	0.89	
Gradko	20% TEA in water	2020	R	Gateshead Council	12	22	17	28.1%	G	0.78	
Gradko	20% TEA in water	2020	R	Gateshead Council	12	23	21	11.8%	G	0.90	
Gradko	20% TEA in water	2020	R	Gateshead Council	10	26	25	6.5%	G	0.94	
Gradko	20% TEA in water	2020	R	Gateshead Council	12	28	21	30.5%	G	0.77	
Gradko	20% TEA in water	2020	R	Gateshead Council	12	31	32	-3.4%	G	1.03	
Gradko	20% TEA in water	2020	R	Luton Borough Council	9	38	28	33.8%	G	0.75	
Gradko	20% TEA in water	2020	R	Nottingham City Council	12	31	34	-8.5%	G	1.09	
Gradko	20% TEA in water	2020	R	Dudley MBC	13	33	28	19.9%	G	0.83	
Gradko	20% TEA in water	2020	UB	Dudley MBC	13	23	14	61.2%	G	0.62	
Gradko	20% TEA in water	2020	R	Dudley MBC	13	44	34	30.6%	G	0.77	
Gradko	20% TEA in water	2020		Overall Factor¹ (18 studies)					Use	0.81	

Local Diffusion Tube Bias Adjustment – Swaffham Triplicate Site (S3) and Automatic Site (BRE02) and Wretham Triplicate Site (S20) and Automatic Site (BRE01)

Local Bias Adjustment Outputs - Information Only					
Go back to STEP 3 - Bias Adjustment to define factor					
	STEP 3a Local Bias Adjustment Input 1	STEP 3b Local Bias Adjustment Input 2	STEP 3c Local Bias Adjustment Input 3	STEP 3d Local Bias Adjustment Input 4	STEP 3e Local Bias Adjustment Input 5
Periods used to calculate bias	5	10			
Bias Adjustment Factor A	0.79 (0.69 - 0.93)	0.83 (0.74 - 0.95)			
Diffusion Tube Bias B	26% (8% - 44%)	20% (5% - 36%)			
Diffusion Tube Mean ($\mu\text{g}/\text{m}^3$)	23.6	8.7			
Mean CV (Precision)	2.7%	3.6%			
Automatic Mean ($\mu\text{g}/\text{m}^3$)	18.8	7.2			
Data Capture	94%	96%			
Adjusted Tube Mean ($\mu\text{g}/\text{m}^3$)	19 (16 - 22)	7 (6 - 8)			
Overall Diffusion Tube Precision	Good Overall Precision	Good Overall Precision			
Overall Continuous Monitor Data Capture	Poor Overall Data Capture	Good Overall Data Capture			
Combined Local Bias Adjustment Factor	0.81		Warning - One or more Co-location studies has Poor Overall Continuous Monitor Data Capture (i.e. <90%). Local Bias Adjustment Factor should be treated with caution.		

Table C. 1 Bias Adjustment Factor

Data Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	Local	-	0.81
2019	Local	-	0.95
2018	Local	-	0.89

2017	Local	-	0.86
2016	National	Not specified	0.92

NO₂ Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure should be 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 2020 as there were no monitoring site where the annual mean concentration is greater than 36µg/m³ 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. The sites are Quality Assurance/Quality Control (QA/QC) and audited by Ricardo Energy and Environment. The Engineer Support Unit (ESU) for these sites is Matts Monitors Air Monitoring Systems.

The 2020 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

<https://www.airqualityengland.co.uk/assets/downloads/airqualityengland-statistics-report-BRE01-2020link.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 PM₁₀ concentration (16 µg/m³) at the automatic monitoring site East Wretham (BRE01). The estimated PM_{2.5} concentration in 2020 at the automatic monitoring site was 11.2µg/m³, which is below the PM obligatory standard of 25µg/m³.

Automatic Monitoring Annualisation

Annualisation was required for one automatic monitoring site in Breckland District Council (Swaffham BRE02) as data capture was below 75%. A summary of the annualisation factors is presented in Table C. 2.

Wretham (BRE01) automatic monitoring site within Breckland District Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data at this site.

NO₂ Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure should be 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 2020.

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

Site ID	Annualisation Factor Norwich Lakenfields	Annualisation Factor Wicken Fen	Annualisation Factor Wretham	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
BRE02	1.1974	0.8076	1.1854	1.0635	18	19.1	

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

Diffusion Tube ID	Annualisation Factor Wretham	Annualisation Factor Wicken Fen	Annualisation Factor Norwich Lakenfields	Average Annualisation Factor	Raw Data Time Weighted Annual Mean ($\mu\text{g}/\text{m}^3$)	Annualised Data Time Weighted Annual Mean ($\mu\text{g}/\text{m}^3$)	Comments
D3	1.0969	1.1226	1.1208	1.1134	20.6	22.9	
S8	1.0427	1.0315	1.0333	1.0358	28.6	29.6	
S11	0.9634	0.9622	0.9740	0.9665	15.7	15.1	
S12	0.8963	0.8869	0.8913	0.8915	22.5	20.1	
S13	1.0627	1.0272	1.0467	1.0455	23.7	24.8	
S14	0.9913	1.0243	1.0223	1.0126	23.4	23.7	

Table C. 4 Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1 - Swaffham	Local Bias Adjustment Input 2 - Wretham	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	5	10	-	-	-
Bias Adjustment Factor A	0.79 (0.69 - 0.93)	0.83 (0.74 - 0.95)	-	-	-
Diffusion Tube Bias B	26% (8% - 44%)	20% (5% - 36%)	-	-	-
			-	-	-
Diffusion Tube Mean ($\mu\text{g}/\text{m}^3$)	23.6	8.7	-	-	-
Mean CV (Precision)	2.7%	3.6%	-	-	-
			-	-	-
Automatic Mean ($\mu\text{g}/\text{m}^3$)	18.8	7.2	-	-	-
Data Capture	94%	96%	-	-	-
			-	-	-
Adjusted Tube Mean ($\mu\text{g}/\text{m}^3$)	19 (16 - 22)	7 (6 - 8)	-	-	-
Combined Local Bias Adjustment Factor	0.81	<i>Warning - One or more Co-location studies has Poor Overall Continuous Monitor Data Capture (i.e. <90%). Local Bias Adjustment Factor should be treated with caution.</i>			

Notes:

A duplicate local bias adjustment factor has been used to bias adjust the 2020 diffusion tube results.

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

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

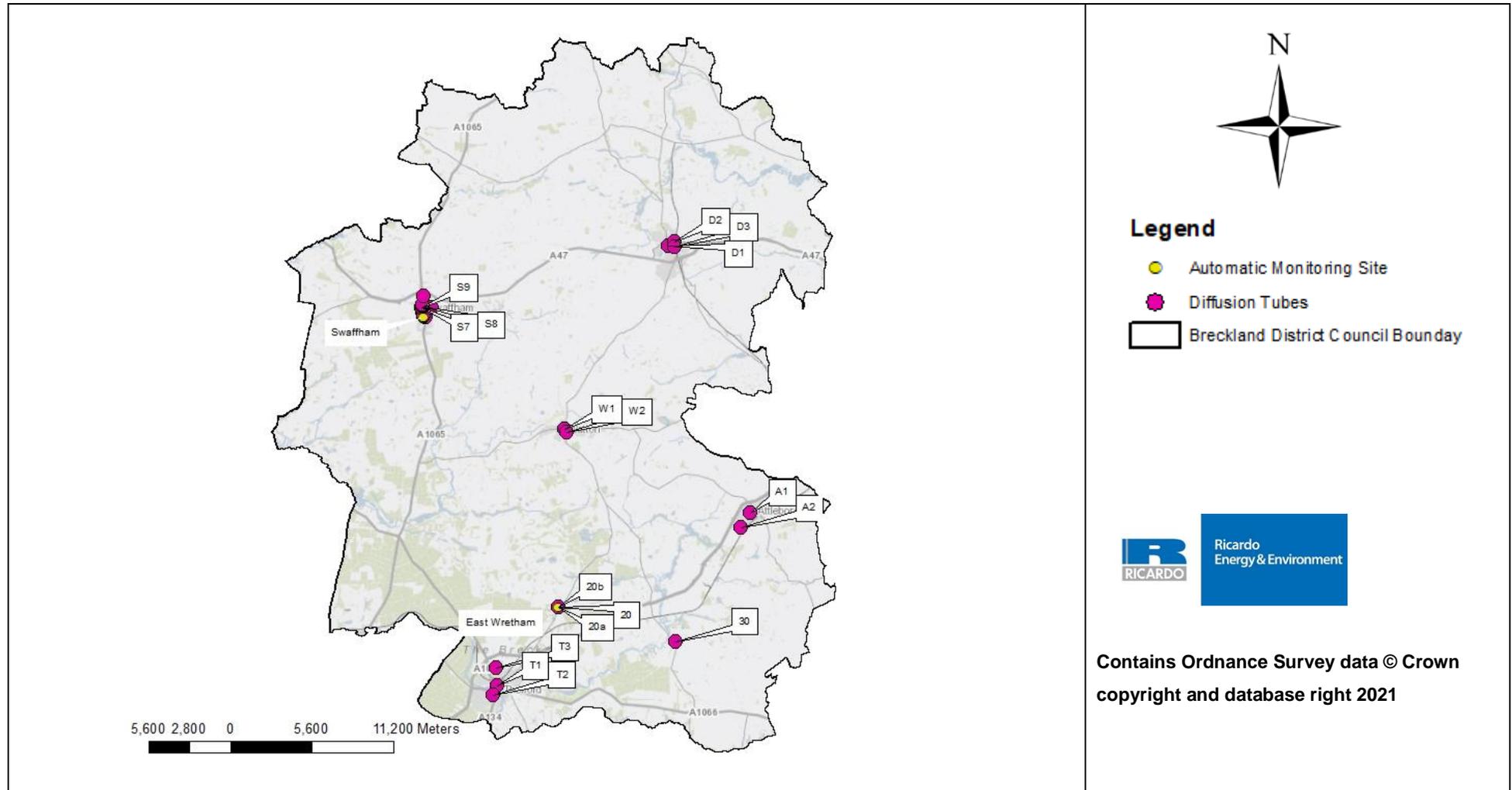


Figure D. 2 – AQMA and diffusion tubes

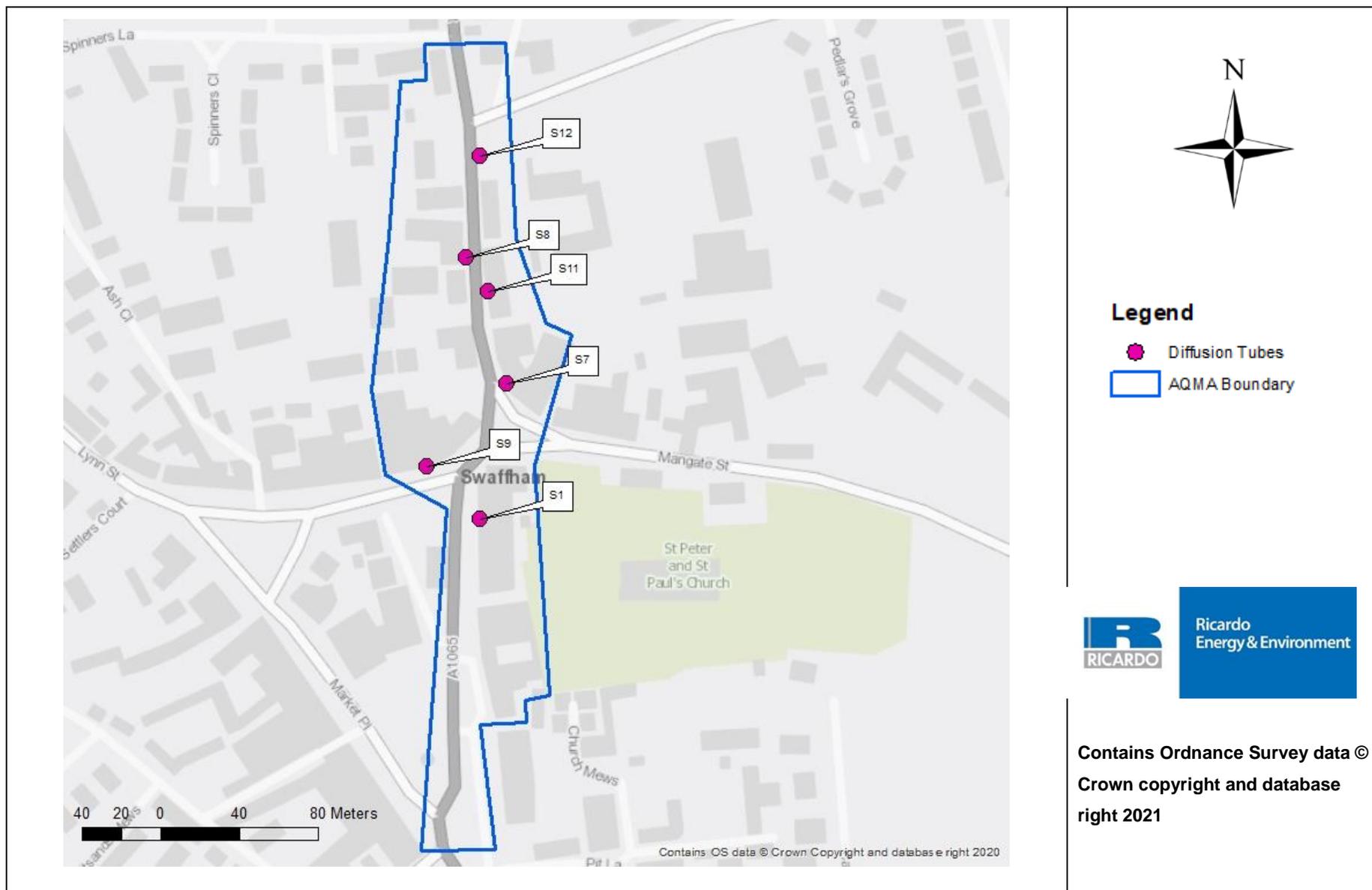


Figure D. 3 – Swaffham monitoring sites

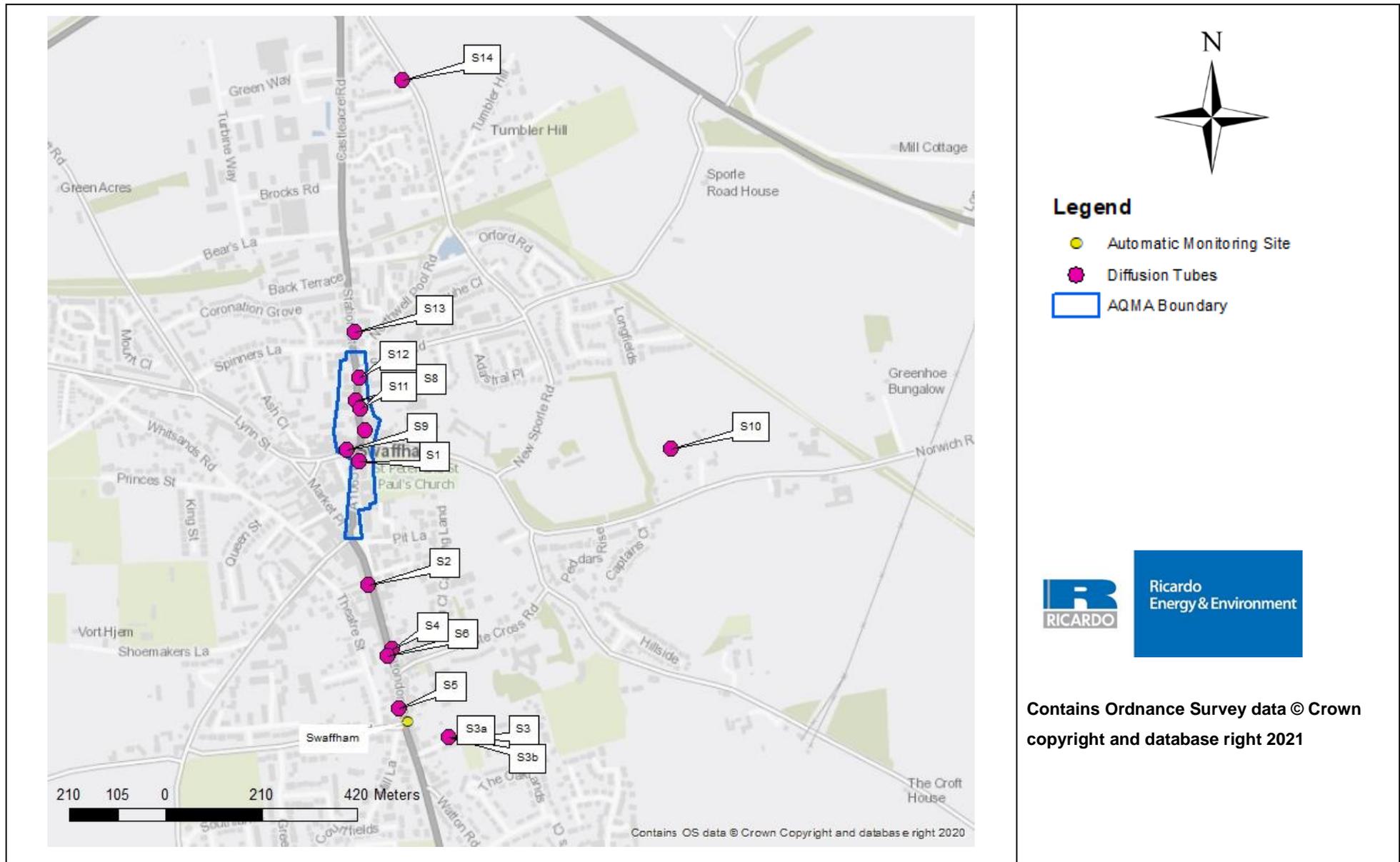


Figure D. 4 – Dereham Diffusion Tubes



Figure D. 5 – Watton Diffusion Tubes



Figure D. 6 – Attenborough Diffusion Tubes

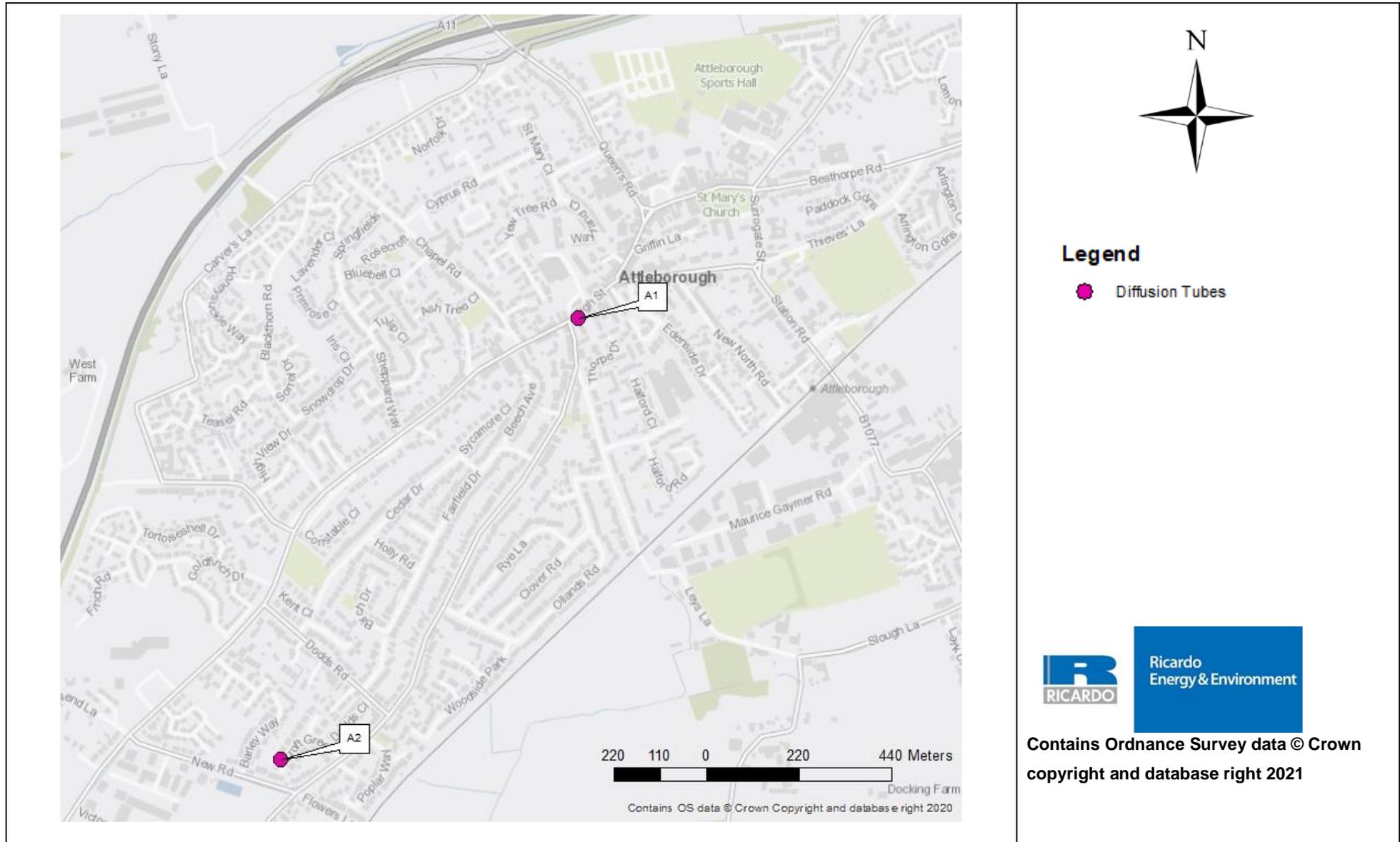


Figure D.7 – East Harling Diffusion Tube



Figure D. 8 – Wretham Monitoring Sites

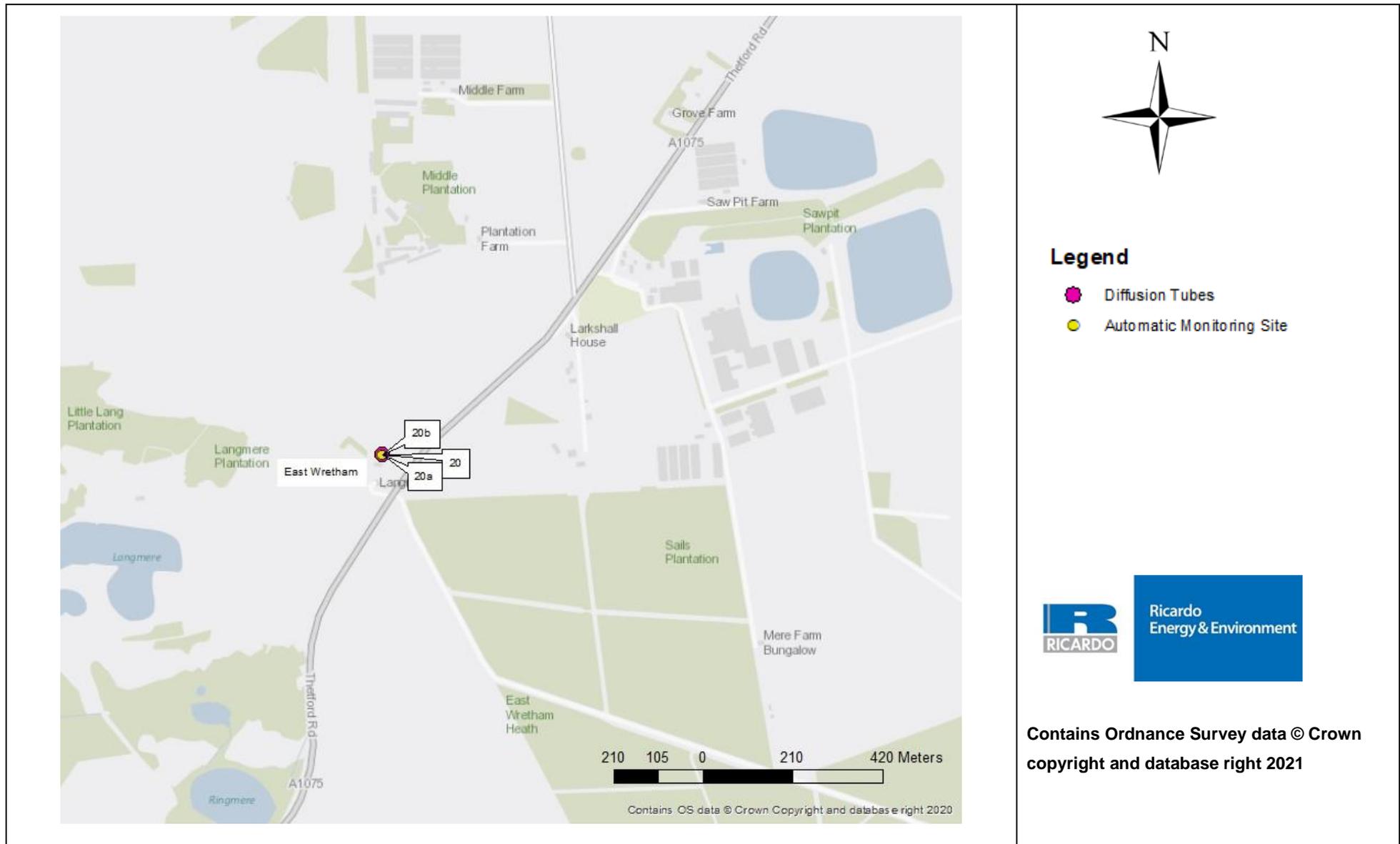


Figure D. 9 – Thetford Diffusion Tubes



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).

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO₂) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data¹³ suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)¹⁴ has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO₂ annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

¹³ Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

¹⁴ Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

represents an absolute reduction of between 10 to 20µg/m³ if expressed relative to annual mean averages. During this period, changes in PM_{2.5} concentrations were less marked than those of NO₂. PM_{2.5} concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that PM_{2.5} concentrations during the initial lockdown period are of the order 2 to 5µg/m³ lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within Breckland District Council

- Reductions of NO₂ concentrations of between 23.9% and 57% were experienced at roadside diffusion tube monitoring sites within Breckland District Council's AQMA in 2020 compared to 2019. This equated to an overall 39.5% reduction in annual mean concentration relative to 2019.
- The pollution levels within the Town of Swaffham were examined during the restriction imposed as part of the first lockdown in early 2020 and it was noted that due to reduced traffic flow pollution levels dropped significantly. Overall, reductions of NO₂ concentrations of between 9.7% and 57% were experienced throughout Swaffham in 2020 compared to 2019.
- Reductions of NO₂ concentrations of between 9.7% and 34.9% were experienced at all other roadside diffusion tube monitoring sites (out with the AQMA) within Breckland District Council in 2020 compared to 2019. This equated to an overall 29% reduction in annual mean concentration relative to 2019.
- Reductions of NO₂ concentrations of between 33.7 % and 38.3 % were experienced at rural diffusion tube monitoring sites within Breckland District Council in 2020 compared to 2019. This equated to an overall 36 % reduction in annual mean concentration relative to 2019.
- Reductions of NO₂ concentrations of between 30.3% and 39.9% were experienced at urban background diffusion tube monitoring sites within Breckland District Council in 2020 compared to 2019. Though one urban background site (W2) increased 29% in 2020 compared to 2019.

- A reduction of 29.5% in NO₂ concentration was experienced at Breckland District Council's suburban diffusion tube monitoring site in 2020 compared to 2019.
- Reductions of NO₂ concentrations of between 16.7% and 63.3% were experienced at urban centre diffusion tube monitoring sites within Breckland District Council in 2020 compared to 2019. This equated to an overall 36.1% reduction in annual mean concentration relative to 2019.

See Figure F. 1 and Figure F. 2 for passive and automatic monitoring site NO₂ annual mean difference comparison plots between 2019 and 2020.

Opportunities Presented by COVID-19 upon LAQM within Breckland District Council

- Walking and cycling were promoted as sustainable methods of transport during the COVID-19 lockdowns as a way of maintaining mental health well-being and Breckland District Council will continue this measure going forward.
- Breckland District Council will begin looking at how to reduce staff/member travel and promote active travel when employees do have to do business miles.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Breckland District Council

See below for details on the challenges and constraints that have been experienced in Breckland District Council in relation to LAQM within 2020 that can be attributed to the pandemic. Where relevant, for each challenge an impact rating has been stated in line with guidance presented within the LAQM Impact Matrix provided within Table F 1.

- Breckland District Council's 2020 ASR Defra Appraisal states "*Whilst no exceedances of any AQO were recorded during 2019, increases in annual mean NO₂ concentrations were noted at 21 of the Council's 26 passive monitoring sites, therefore suggesting a district-wide worsening in air quality compared to 2018. The Council are encouraged to investigate the reasons for these increases where practicable, and report on this in next year's ASR*". Due to the COVID-19 pandemic the council were very restricted in their work throughout 2020, with most of the activities limited to continuing with the nitrogen dioxide diffusion tubes and

continuous monitoring stations monitoring. Therefore, no specific investigation into the 2019 NO₂ annual mean concentrations were practicable. **Small**

- During 2020, access to all of the diffusion tube monitoring sites was restricted due to their locations on residential buildings. Therefore, it was not possible to maintain diffusion tube exposure periods in line with the national monitoring calendar for all sites. As a result, all diffusion tubes were exposed from March until June, this has affected data capture within 2020, resulting in passive monitoring sites having to undergo time weighted annual mean. **Medium Impact**

Figure F. 1 – Comparison of 2019 and 2020 diffusion tube data

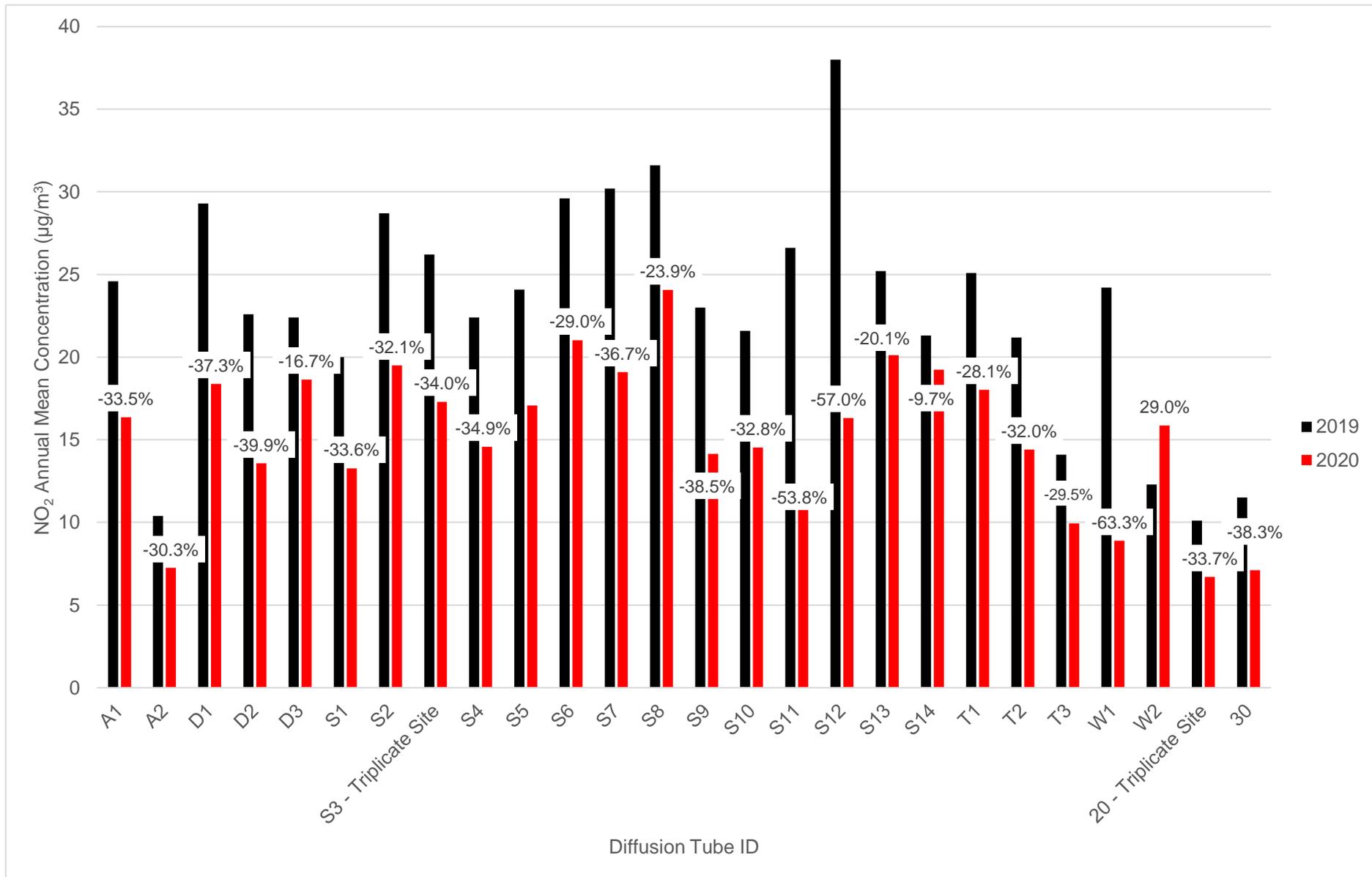


Figure F. 2 – Comparison of automatic data from 2019 to 2020

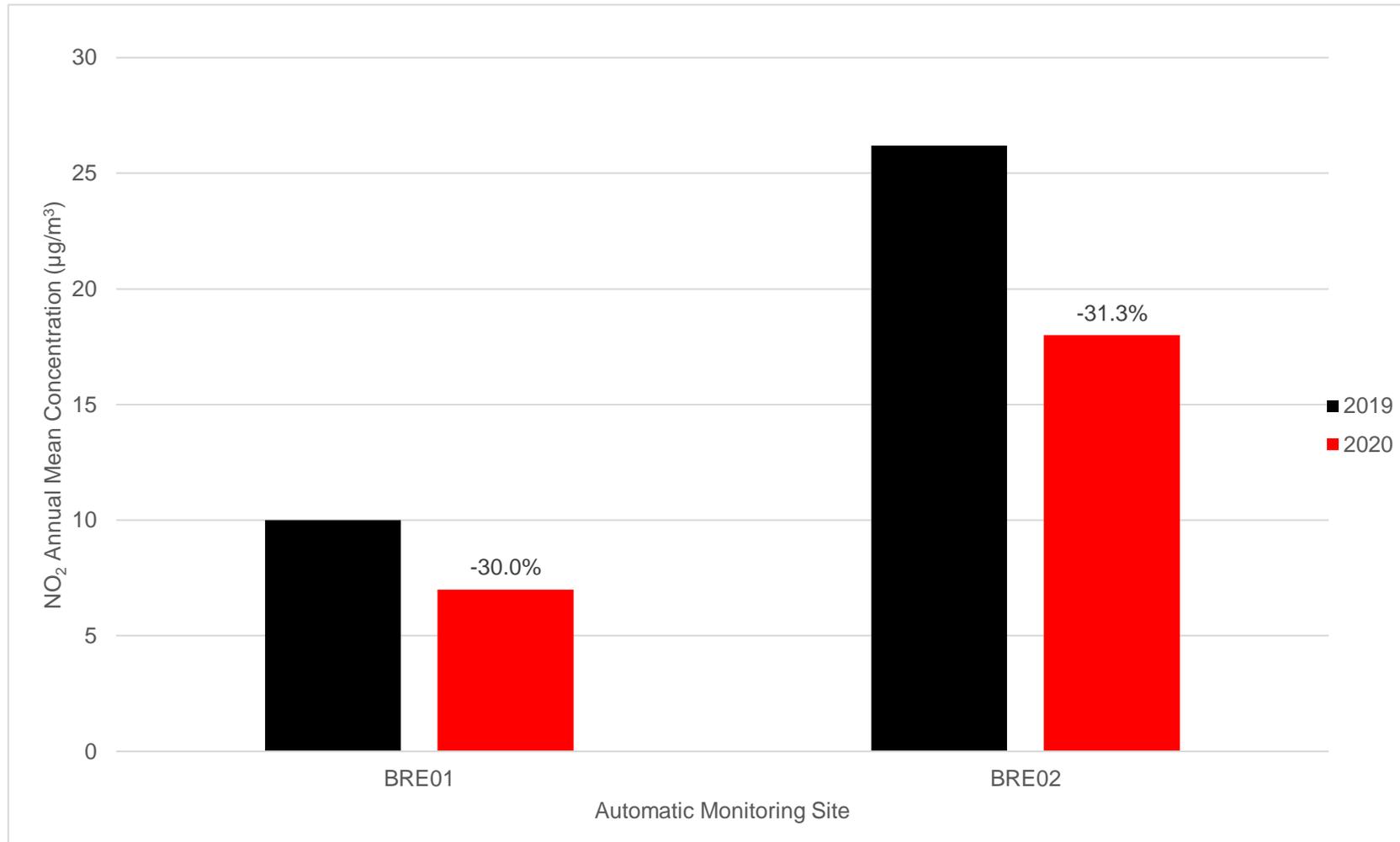


Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: Large
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

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 Highways England
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 Government and Department of the Environment Northern Ireland.
- Public Health England, Health Matters: air pollution Guidance, June 2021
- <https://www.breckland.gov.uk/article1730126-05-21-First-fully-electric-private-hire-vehicle-now>
- Burnright, available at <https://www.burnright.co.uk/>