



North Devon Council
Annual Status Report 2021

Bureau Veritas

September 2021

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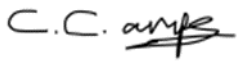



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2021 Air Quality Annual Status Report (ASR)

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

Date: August 2021

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Executive Summary: Air Quality in Our Area

Air Quality in North Devon 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 North Devon is a predominantly rural district and is fortunate in having good air quality. North Devon's primary pollutants are produced from vehicle emissions. The main pollutant of concern across the district is NO₂, with particulate matter (PM₁₀ and PM_{2.5}) also being of concern.

North Devon Council have undergone routine monitoring of NO₂ since 2000 and are currently conducting non-automatic monitoring of NO₂ at 28 sites and automatic monitoring of PM₁₀ and PM_{2.5} at 1 site.

Currently in North Devon there is one Air Quality Management Area (AQMA); North Devon AQMA No.1 (https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=172). The AQMA includes the B3231 situated in Braunton. The AQMA was declared in 2011 as a result of exceedances of the NO₂ annual mean objective of 40µg/m³. North Devon Council and relevant stakeholders have subsequently developed an Air Quality Action Plan (AQAP) 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

outline measures to be implemented with the aim to reduce NO₂ concentrations, and to achieve compliance with the annual mean objective, within the AQMA.

During 2020 there have been no exceedances of NO₂ air quality objectives at any of the 28 sites across the district. There have also been no exceedances of PM₁₀ and PM_{2.5} objectives at Barnstaple (North Devon Council's automatic monitoring site) since 2014. For five consecutive years, NO₂ annual mean concentrations at the two sites in the existing AQMA have been below the NO₂ annual mean objective. The concentrations at both sites within the AQMA have decreased during 2020 from their 2019 concentrations. These values are well below 10% of the air quality objective and although the NO₂ annual mean concentrations have remained below the annual mean objective and have consistently continued to decline, North Devon Council have decided to keep the AQMA in place due to potential unforeseen spikes in NO₂ concentrations.

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 Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Concentrations of air pollutants across the majority of North Devon continue to be below the air quality objectives. Due to increased development and vehicle numbers within the district the Council will continue to liaise with relevant stakeholders to protect and improve local conditions and the Braunton AQMA will remain in designation.

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

The 2016 AQAP remains the main document designed to improve local air quality within the Braunton AQMA and across the district. The measures that are documented within the AQAP and Table 2.2 have been designed to reduce NO₂ concentrations within the Braunton AQMA. Where possible these have been developed throughout 2020.

In February of 2020, a Technical Working Group meeting took place with representatives from North Devon Council, Devon County Council and now Braunton Parish Council in attendance. The meetings are used as both an idea platform for possible new measures, and also to inform upon developments relating to the current measures. Actions for relevant parties are assigned where appropriate to enable the development of measures, and updates are provided on each measure at the next subsequent meeting.

During the meeting, the group discussed the installation of the Zebra Crossing on Chaloners Road and confirmed that following the results of a safety assessment, upgrading the Zebra Crossing to a Signal light crossing is a priority of the County. Another topic discussed was MOVA, which was determined a medium term objective for the County, meaning it will be delivered in 4/5 years' time unless alternative funding can be obtained in the meantime. If funding becomes available for MOVA, the group suggested it would be logical for MOVA to be installed at the same time as the Zebra Crossing. It was also noted that a junction modelling assessment was needed to quantify the benefit that MOVA will have to the AQMA.

Monitoring of NO₂ is to continue within the Braunton AQMA and across the district so that concentration trends can continue to be identified and any decisions on the possible revocation of the AQMA are based upon long term trends in NO₂ concentrations. Based upon Defra recommendations, a detailed study of Braunton AQMA will be completed once 5 years of consecutive compliance has been enacted within the AQMA.

Conclusions and Priorities

Throughout 2020, there have been no exceedances in any NO₂ or particulate matter air quality objectives across North Devon district. PM₁₀ and PM_{2.5} annual mean concentrations recorded at the automatic monitoring site in Barnstaple were 14.2 µg/m³ and 8.4 µg/m³ respectively in 2020. These values are far below the annual mean objective of 40 µg/m³ and annual mean target value of 20 µg/m³ for PM₁₀ and PM_{2.5} respectively.

Following completion of North Devon Council's 2021 ASR and based on Defra's appraisal, it has been concluded that the existing Braunton AQMA should remain. NO₂ monitoring data within the AQMA continues to be below the annual mean objective and concentrations at

the monitoring sites within the AQMA were below 10% of the annual mean objective. It is because of this and potential unpredicted uncertainties in the future NO₂ concentrations within the AQMA that the Braunton AQMA should remain.

Local Engagement and How to get Involved

Air quality continues to move up the political agenda and public concern to grow as there is a greater understanding of the issues and complexities around the quality of the air we all breathe. Industry, agriculture, transport, planning and individuals are being encouraged to look at interventions, behavioural changes and practical actions to improve air quality. These issues need to be addressed at all levels, internationally to individually. In terms of air quality everyone can make a difference.

Due to the main source of air pollution in North Devon originating from transport sources, the simplest way for the public to get involved with helping improving air quality within the area would be to look at alternatives to the way they usually travel.

The following are suggested alternatives to private travel that would contribute to improving the air quality within the district:

- Use public transport where available – This reduces the number of private vehicles in operation reducing pollutant concentration through the number of vehicles and reducing congestion;
- Walk or cycle if your journey allows – From choosing to walk or cycle for your journey the number of vehicles is reduced and also there is the added benefit of keeping fit and healthy.
- Car/lift sharing – Where a number of individuals are making similar journeys, such as travelling to work or to school car sharing reduces the number of vehicles on the road and therefore the amount of emissions being released. This can be promoted via travel plans through the workplace and within schools; and
- Alternative fuel / more efficient vehicles – Choosing a vehicle that meets the specific needs of the owner, fully electric, hybrid fuel and more fuel-efficient cars are available and all have different benefits by reducing the amount of emissions being released.

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1 Local Air Quality Management

This report provides an overview of air quality in North Devon 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 North Devon Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by North Devon Council can be found in Table 2.1. The table presents a description of the one AQMA that is currently designated within North Devon Council. Appendix D: Map(s) of Monitoring Locations and AQMAs provides a map of the AQMA and the air quality monitoring locations in relation to the AQMA. The air quality objective pertinent to the current AQMA designation is for NO₂ annual mean

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
North Devon AQMA No.1	11/07/2011	NO ₂ Annual Mean	Area encompassing the B3231 in Braunton between the junction of the square in the middle of the village and the village green.	NO	44.4	26.4	North Devon Council – Air Quality Action Plan May 2016	https://www.northdevon.gov.uk/media/377432/final-air-quality-action-plan-2016-published-on-website-august-2016.pdf

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

North Devon Council confirm that all current AQAPs have been submitted to Defra.

2.2 Progress and Impact of Measures to address Air Quality in North Devon Council

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

1. *"Non-automatic monitoring of NO₂ was conducted at 28 sites during 2019."* During 2020, non-automatic monitoring continued at 28 sites across the district.
2. *"Though no exceedances of the NO₂ annual mean objective have been reported in 2019, NO₂ concentrations have fluctuated and it appears as though a potential upward trend is emerging. Further measures are advised as a priority in order to mitigate further increases in concentrations, subsequently preventing the requirement for reactionary measures in the future."* There have been no exceedances of the NO₂ annual mean objective during 2020 and concentrations at all sites have reduced. This is consistent with the reduction in road traffic throughout the UK causing a decrease in NO₂ concentrations.

More detail on these measures can be found in their respective Action Plan: 2016 North Devon Air Quality Action Plan.

Key completed measures are:

- M7: Redirecting traffic along A399
- M11: Implementing school / work travel plans
- M12: Developing a supplementary planning document for air quality
- M14: Installation of a "Park + Change" facility at Chivenor

It is noted that the proposed change of the zebra crossing on Chaloners Road to a signal controlled crossing has been identified as a safety priority as agreed by Braunton Parish Council and Devon County Council - in the context of measure M4.

The principal challenge / barrier to implementation that North Devon Council anticipates facing is the availability and associated prioritisation of funding. This has caused progress to be slower than expected on M1: Upgrading of the traffic signals at "The Square" to "MOVA" (Microprocessor Optimised Vehicle Actuation) is intended.

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
1	Upgrading of the traffic signals at "The Square" to "MOVA" (Microprocessor Optimised Vehicle Actuation)	Traffic Management	UTC, Congestion management, traffic reduction		2025	DCC (Potential s106 funding)	DCC (Potential s106 funding)			£50k - £100k	Planning	0 - 2µg/m3	Improved traffic flows / less congestion	Discussions have continued between DCC and BPC regarding implementation of the measure in a way which obtains both BPC and Community support	Resolution now achieved in regards to BPC's acceptance of NDC's monitoring data as presented to Defra. To be delivered in 4/5 years' time unless alternative funding can be obtained in the meantime.
2	Consider amending the South Street one way system in relation to optimising traffic flow	Traffic Management	UTC, Congestion management, traffic reduction		N/A	DCC	DCC				Aborted	N/A	Modelling results	Cancelled	Work undertaken identified a possible 5.23% reduction in annual average daily traffic movements on Caen Street. DCC advised that the AQ benefit would be very small.
3	Consider the implementation of a comprehensive one way system around the village and / or the pedestrianisation of Caen Street	Traffic Management	UTC, Congestion management, traffic reduction		N/A	DCC	DCC				Planning	N/A	Reduced traffic volume on Caen Street	Feasibility report completed	Discontinued due to high costs predicted, land ownership and planning barriers. However, some smaller scale measures discussed regarding increased passing places on Braunton Burrows to reduce traffic on the B3231 Saunton Road.
4	Review all pedestrian movements around the village, to identify the optimal type and location of signals / crossings to maximise traffic flow. This review should include - but not be limited to - the consideration of amending signal / crossing timings, resisting / removal of the crossing outside The George Hotel, crossing patrol associated with Caen Primary School	Traffic Management	UTC, Congestion management, traffic reduction		2021	DCC	DCC				Planning	0 - 1µg/m3	Improved traffic routing	Consideration to changing the zebra crossing on Chaloners Road to a signal controlled crossing Area close to the zebra crossing on Saunton Road is to be reviewed in terms of safety	The proposed change of the Zebra Crossing on Chaloners Road to a signal controlled crossing is supported by DCC and BPC. Opinions to be sought from nearby schools in terms of access and potential benefits
5	Improving parking management,	Traffic Management	UTC, Congestion management,		Ongoing	BPC / DCC	BPC / DCC					Assessed by monitoring	Improved flow of key road links	DCC have provided a summary list of options for	Agreement to be reached between DCC and BPC concerning which measures

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
	including the prevention of parking associated with blocking bus stops		traffic reduction									on relevant road links		consideration by BPC, who have responded with their views	from DCC's summary list are to be implemented
6	Installation of a delivery hub	Traffic Management	UTC, Congestion management, traffic reduction		Ongoing	DCC	DCC				Planning	Unknown at this stage, can be assessed if the no loading restrictions are developed.	Routing of delivery vehicles	DCC have provided a summary list of options for consideration by BPC, who have responded with their views Options developed to extend the times of non-loading restrictions, possible implementation of pay and display parking to create more turnover and increase the availability of spaces for vehicles to find spaces	Discussions continue between DCC and BPC on how to implement between no loading zones or creating a formal delivery Hub outside of the AQMA by road widening measures
7	Redirecting traffic along A399	Traffic Management	UTC, Congestion management, traffic reduction		Completed	DCC	DCC				Completed	No significant change in NO2 concentration at diffusion tube monitoring sites 14 and 15	Routing of vehicles	Electronic signage has been installed to redirect traffic at peak flow times	-
8	Off peak delivery times	Traffic Management	UTC, Congestion management, traffic reduction		TBC	DCC	DCC				Planning	0 - 1µg/m3	Number of delivery vehicles and the times they work within	DCC have provided a summary list of options for consideration by BPC, who have responded with their views	Agreement to be reached between DCC and BPC concerning which how best to implement
9	Improving Public Transport	Traffic Management	Other		Ongoing	DCC	DCC				Implementation	Assessed by monitoring on transport road links	Numbers of vehicles upgraded	Upgrades to the bus fleet operating on main services through the villages were introduced in 2012/13. Further upgrades have been identified through contributions from planned developments over the local plan period	Bus operators travelling through Braunton have been prioritised for improvements in emission standards

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
10	Fleet partnerships - working with local companies to encourage lower emissions fleet vehicles	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's		Ongoing	DCC	DCC				Implementation	0 - 1µg/m3	Introduction in lower emission vehicles in fleet	Bus service improvements from Westward Ho! to Ifracombe are linked with planned development in the Bideford area	Bus operators travelling through Braunton have been prioritised for improvements in emission standards
11	Implementing school / work travel plans	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane		Complete	DCC	DCC				Completed	Unknown at this stage, information on specific travel plans would need to be known first	Reduction of personal travel and uptake in more sustainable travel modes	Confirmed that it would not be possible to embed a requirement for sustainable travel plans into current/future planning policy A travel plan would be sought from any developer for any planning application which was deemed applicable	DCC confirmed applications to be assessed on a case by case basis
12	Developing a supplementary planning document for air quality	Freight and Delivery Management	Quiet & out of hours delivery		2019/2020	NDC	NDC				Completed	Control of future emissions	Numbers of planning applications assessed in terms of AQ	Preparation of an Air Quality Supplementary Planning Document (SPD) has been completed and was formally adopted by NDC in June 2020 (and subsequently by Torridge DC) following consultation in autumn 2019.	
13	Producing travel packs for holiday accommodation	Alternatives to private vehicle use	Other		Ongoing	NDC	NDC				Implementation	Assessed by monitoring on transport road links	Numbers using public transport	Project commenced in April 2019	-
14	Installation of a "Park + Change" facility at Chivenor	Promoting Travel Alternatives	Workplace Travel Planning		Completed	NDC	NDC				Completed	Assessed by monitoring on transport road links	Number using the facility	Construction has been completed but facility is not yet open, is set to open by 2020 / 2021.	Final checks on facility to be completed before opening

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.

The current Defra 2020 background maps for North Devon Council (2018 based) show that all background concentrations of PM_{2.5} are well below the 2020 annual mean objective for PM_{2.5}. The highest concentration is predicted to be 11.3µg/m³ within the 1km x 1km grid square with the centroid grid reference of 269500, 125500 that is set to the west of South Molton containing both farmland and industrial/commercial usage.

The Public Health Outcomes Framework data tool compiled by Public Health England (PHE) quantifies the mortality burden of PM_{2.5} within England on a county and local authority scale. The 2019 fraction of mortality attributable to PM_{2.5} pollution across England is 5.1%, in contrast the fraction within North Devon is 3.5%, lower than the South West region average of 4.1%. Data for 2019 for England, the South West Region and for North Devon Council are presented in Table 2.3 below.

Table 2.3– Adult Mortality Attributable to PM_{2.5} Pollution

Area	North Devon District	South West Region	England		
			Average	Highest	Lowest
% of Adult Mortality	3.5%	4.1%	5.1%	7.0%	2.2%

It can be seen from Table 2.3 that in 2020 the percentage of adult mortality attributable to PM_{2.5} pollution within North Devon was 0.6% lower than the average fraction for the South West Region, and 1.6% lower than the average fraction for England. When compared to 2019 % data; the South West Region has decreased by 0.3% and North Devon has slightly increased by 0.1%.

Due to the health effects attributable to PM_{2.5} pollution through exposure, North Devon Council is continuing to take measures to reduce PM_{2.5} concentrations within the district.

There have not been any updates to the initiatives taken in 2020 when compared to 2019, these remain as:

- Regular inspections of industrial processes permitted by North Devon Council where combustion and non-combustion processes could lead to anthropogenic emissions of PM_{2.5}; and
- Continuing the implementation works on the action plan measures listed within Table 2.2. Although the measures have been specifically designed to reduce NO₂ concentrations within the AQMA, a number of the initiatives are related to transport sources and therefore will typically have a positive effect on the reduction of PM_{2.5} as well.

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

This section sets out the monitoring undertaken within 2020 by North Devon 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

North Devon Council undertook automatic (continuous) monitoring at 1 site during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites. Automatic monitoring results for North Devon Council are 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

North Devon Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 28 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 33%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares 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 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.

During 2020, North Devon Council had no exceedances in NO₂ annual mean objectives. 1-hour NO₂ mean concentrations were not measured, however, no exceedances were predicted, as the annual mean is <60 µg/m³. The annual mean concentrations at site 12 and 13 within North Devon's AQMA are below the annual mean objective and have been for the past five years. Although the concentrations are below the annual mean objective, the Council don't intend to revoke the AQMA yet due to uncertainties in concentration fluctuations.

3.2.2 Particulate Matter (PM₁₀)

Table A.4 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.

Table A.5 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.

During 2020, North Devon Council have had no exceedances in PM₁₀ annual mean or 24-hour mean. The concentrations of the annual and 24-hour means have both decreased from 2019 concentrations.

3.2.3 Particulate Matter (PM_{2.5})

Table A.6 in Appendix A presents the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past five years.

The PM_{2.5} annual mean concentration is 8.4µg/m³, which is slightly higher than last year's concentration of 8.1 and is the highest PM_{2.5} annual mean concentration since 2016.

Although PM_{2.5} concentrations seem to have crept up from 2018 to 2020, they still remain low.

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)
Barnstaple 1	AURN – Barnstaple A39 (UKA00574)	Roadside	257048	132591	PM ₁₀ and PM _{2.5}	No	BAM 1020 Heated	20	3	3.5

Notes:

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

(2) N/A if not applicable

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

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)
Site 1	Pilton Causeway, Barnstaple	Kerbside	255774	133732	NO ₂	No	7.0	1.0	No	2.6
Site 2	Rolle Street , Barnstaple	Kerbside	255556	133583	NO ₂	No	2.2	1.3	No	2.5
Site 4	Lower Sticklepath Roundabout, Barnstaple	Kerbside	255651	132808	NO ₂	No	34.0	2.8	No	2.8
Site 5	Sticklepath School, Barnstaple	Kerbside	254197	132354	NO ₂	No	2.0	1.7	No	2.7
Site 6	Cedars Roundabout, Barnstaple	Urban Background	253886	132394	NO ₂	No	25.0	1.6	No	2.5
Site 7	Newport Road, Barnstaple	Kerbside	256706	132253	NO ₂	No	0.5	1.2	No	2.6
Site 8	South Street, Newport,	Kerbside	256683	132130	NO ₂	No	2.5	1.2	No	2.4
Site 9	Castle Street, Barnstaple	Kerbside	255661	133179	NO ₂	No	0.0	1.7	No	2.4
Site 10	Alexandra Road, Barnstaple	Kerbside	256186	133164	NO ₂	No	2.2	1.6	No	2.5
Site 11	Belle Meadow Road, Barnstaple	Kerbside	255967	132985	NO ₂	No	12.0	1.6	No	2.5
Site 12	The Square, Braunton – Café Bistro	Kerbside	248731	136617	NO ₂	Yes	0.0	6.0	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
Site 13	The London Inn, Braunton	Kerbside	248732	136592	NO ₂	Yes	0.0	1.1	No	2.4
Site 14	Traffic Lights, Church Street, Ilfracombe	Kerbside	251533	147330	NO ₂	No	0.5	1.6	No	2.6
Site 15	High Street, Ilfracombe	Kerbside	251971	147689	NO ₂	No	0.0	2.5	No	3.0
Site 17	Picston House, Bickington	Kerbside	253595	132433	NO ₂	No	10.2	2.8	No	2.7
Site 18	Babbages, Bickington	Kerbside	253053	132541	NO ₂	No	6.5	0.6	No	2.7
Site B1	Exeter Road 1, Braunton (Vellator)	Kerbside	249042	135903	NO ₂	No	11.0	1.3	No	2.7
Site B2	Exeter Road 2, Braunton (Wingate)	Kerbside	248969	136060	NO ₂	No	6.8	2.9	No	2.7
Site B3	Exeter Road 3, Braunton (Parklyn)	Kerbside	248863	136403	NO ₂	No	3.9	1.7	No	2.4
Site B4	Exeter Road 4, Braunton (Kaya)	Kerbside	248766	136437	NO ₂	No	6.1	2.6	No	2.3
Site B5	Exeter Road 5, Braunton (Paint a Pot)	Kerbside	248862	136372	NO ₂	No	3.9	0.5	No	2.5
Site B6	South Street 1, Braunton (Barton Lane)	Kerbside	248716	136067	NO ₂	No	7.0	0.0	No	3.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
Site B7	South Street 2, Braunton (Village End)	Kerbside	248787	136498	NO ₂	No	2.4	0.0	No	2.8
Site B8	Chaloners Road, Braunton (Parish Hall)	Kerbside	248791	136621	NO ₂	No	30.0	1.3	No	2.4
Site B9	Caen Gardens, Braunton (J Benning)	Kerbside	248615	136596	NO ₂	No	0.0	3.8	No	2.7
Site B10	Saunton Road 1, Braunton (Field Lane)	Kerbside	248417	136610	NO ₂	No	3.4	1.5	No	2.5
Site B11	Saunton Road 2, Braunton (Sharlands)	Kerbside	248363	136630	NO ₂	No	9.8	1.4	No	3.9
Site B12	Caen Street - Salt	Kerbside	248771	136591	NO ₂	No	0.6	1.0	No	2.3

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: 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
Site 1	255774	133732	Kerbside	58.3	58.0	33.2	22.7	27.8	25.6	20.4
Site 2	255556	133583	Kerbside	58.3	58.0	27.2	26.2	26.6	23.8	20.4
Site 4	255651	132808	Kerbside	50	50.0	15.2	19.9	21.2	22.1	18.5
Site 5	254197	132354	Kerbside	50	48.4	24.4	22.8	23.9	23.9	20.8
Site 6	253886	132394	Urban Background	50	50.0	18.9	16.4	18.9	15.7	14.0
Site 7	256706	132253	Kerbside	58.3	58.0	25.9	25.3	26.4	25.8	22.3
Site 8	256683	132130	Kerbside	58.3	58.0	24.9	28.0	22.1	26.0	19.2
Site 9	255661	133179	Kerbside	58.3	58.0	15.2	14.0	15.6	13.7	10.7
Site 10	256186	133164	Kerbside	58.3	58.0	20.6	25.6	25.7	25.2	21.5
Site 11	255967	132985	Kerbside	50	50.5	25.8	26.1	26.1	21.3	19.6
Site 12	248731	136617	Kerbside	58.3	58.0	39.8	39.4	39.9	30.0	18.8
Site 13	248732	136592	Kerbside	58.3	58.0	32.5	30.0	36.5	31.1	26.4
Site 14	251533	147330	Kerbside	58.3	58.0	19.7	17.1	20.6	18.5	14.9

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
Site 15	251971	147689	Kerbside	58.3	58.0	14.9	18.0		17.6	15.1
Site 17	253595	132433	Kerbside	58.3	58.0	-	29.5	32.8	26.5	23.5
Site 18	253053	132541	Kerbside	58.3	58.0	-	22.7	19.6	18.3	15.1
Site B1	249042	135903	Kerbside	33.3	33.0	17.4	14.4	17.1	19.7	17.4
Site B2	248969	136060	Kerbside	58.3	58.0	16.2	15.4	17.8	16.1	13.7
Site B3	248863	136403	Kerbside	33.3	33.0	22.7	19.9	22.0	20.2	15.9
Site B4	248766	136437	Kerbside	58.3	58.0	18.1	15.1	16.8	16.0	11.1
Site B5	248862	136372	Kerbside	50	48.1	38.7	36.7	36.4	35.2	26.4
Site B6	248716	136067	Kerbside	41.7	40.1	11.6	10.4	11.0	10.0	8.1
Site B7	248787	136498	Kerbside	41.7	42.6	16.9	14.3	17.7	13.1	11.0
Site B8	248791	136621	Kerbside	58.3	58.0	21.8	18.9	26.6	22.3	18.7
Site B9	248615	136596	Kerbside	50	50.5	15.5	14.0	14.6	12.4	10.9
Site B10	248417	136610	Kerbside	58.3	58.0	27.4	22.5	25.8	23.5	18.9
Site B11	248363	136630	Kerbside	58.3	58.0	23.0	18.2	21.1	18.0	14.9

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
Site B12	248771	136591	Kerbside	58.3	58.0	-	-	-	36.1	29.3

Annualisation has been conducted where data capture is <75% and >33% 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.

Notes:

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

Exceedances of the NO₂ annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO₂ annual means exceeding $60\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO₂ 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 in Barnstaple

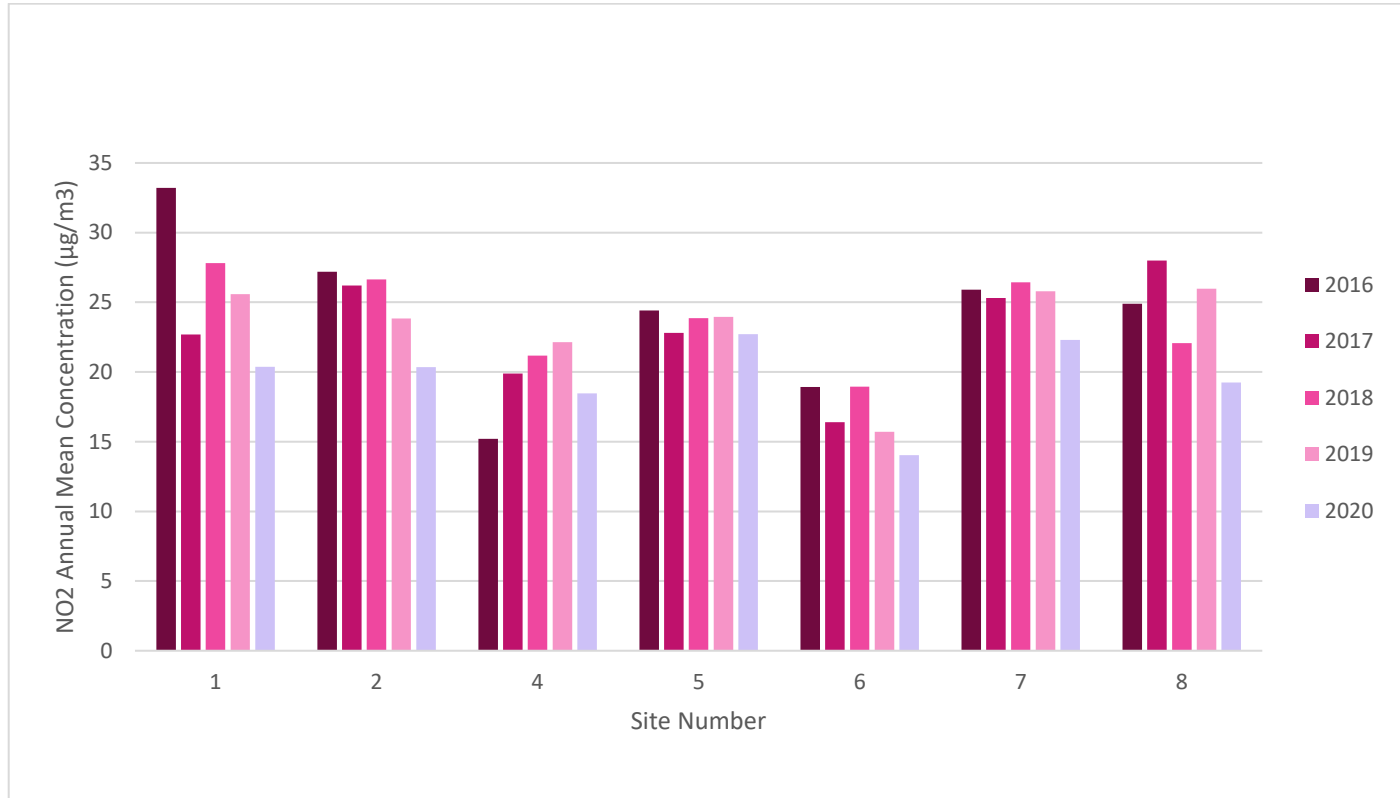


Figure A.2 – Trends in Annual Mean NO₂ Concentrations in Braunton, Barnstaple and Ilfracombe

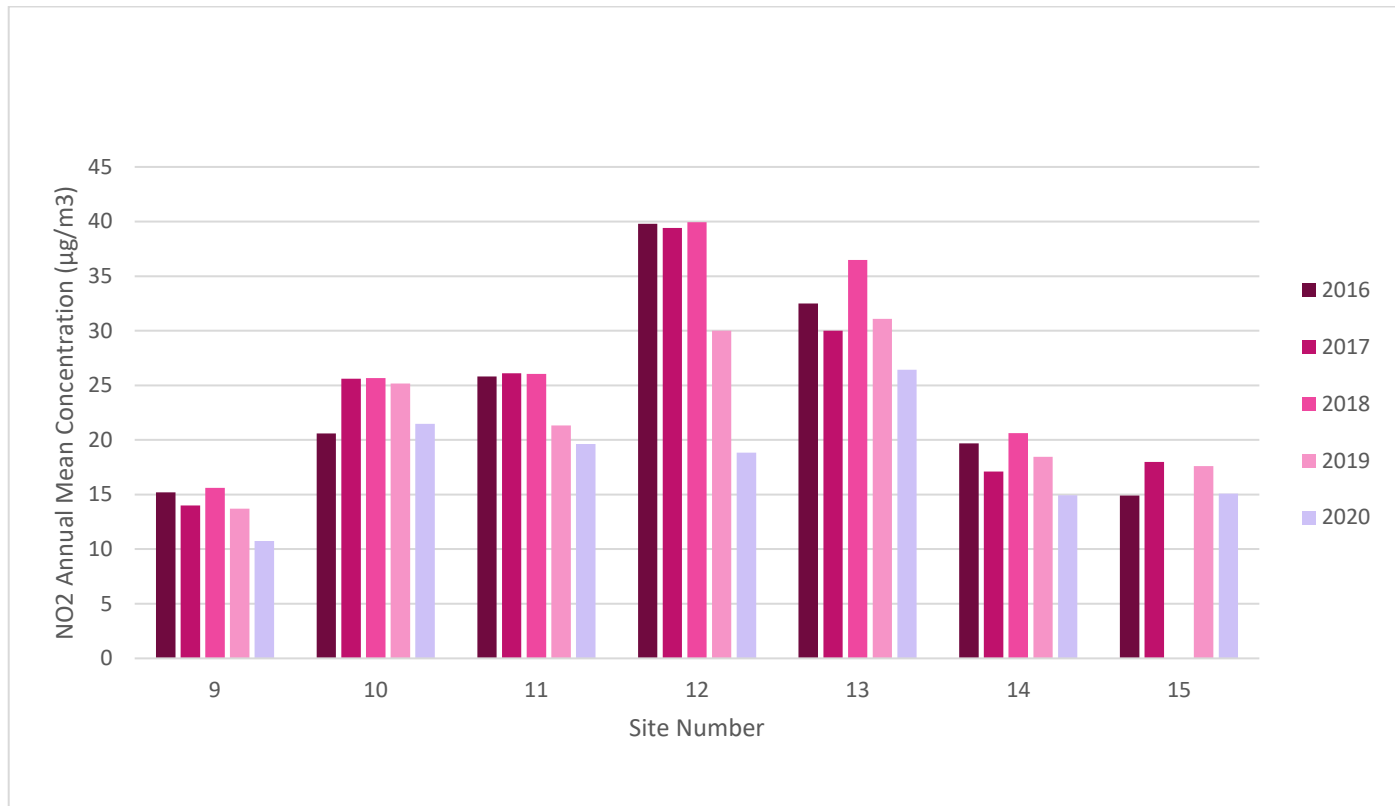


Figure A.3 – Trends in Annual Mean NO₂ Concentrations in Braunton and Barnstaple

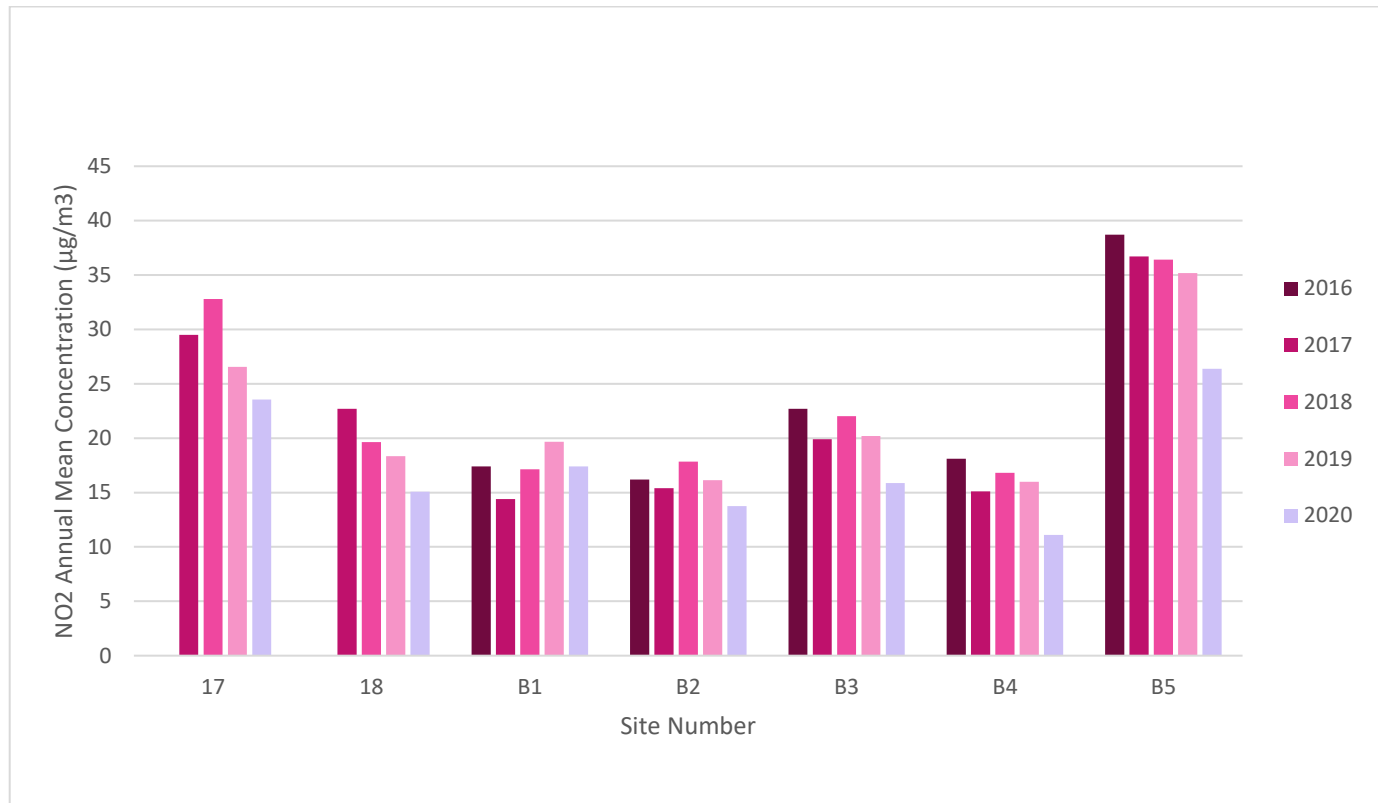


Figure A.4 – Trends in Annual Mean NO₂ Concentrations in Braunton and Barnstaple

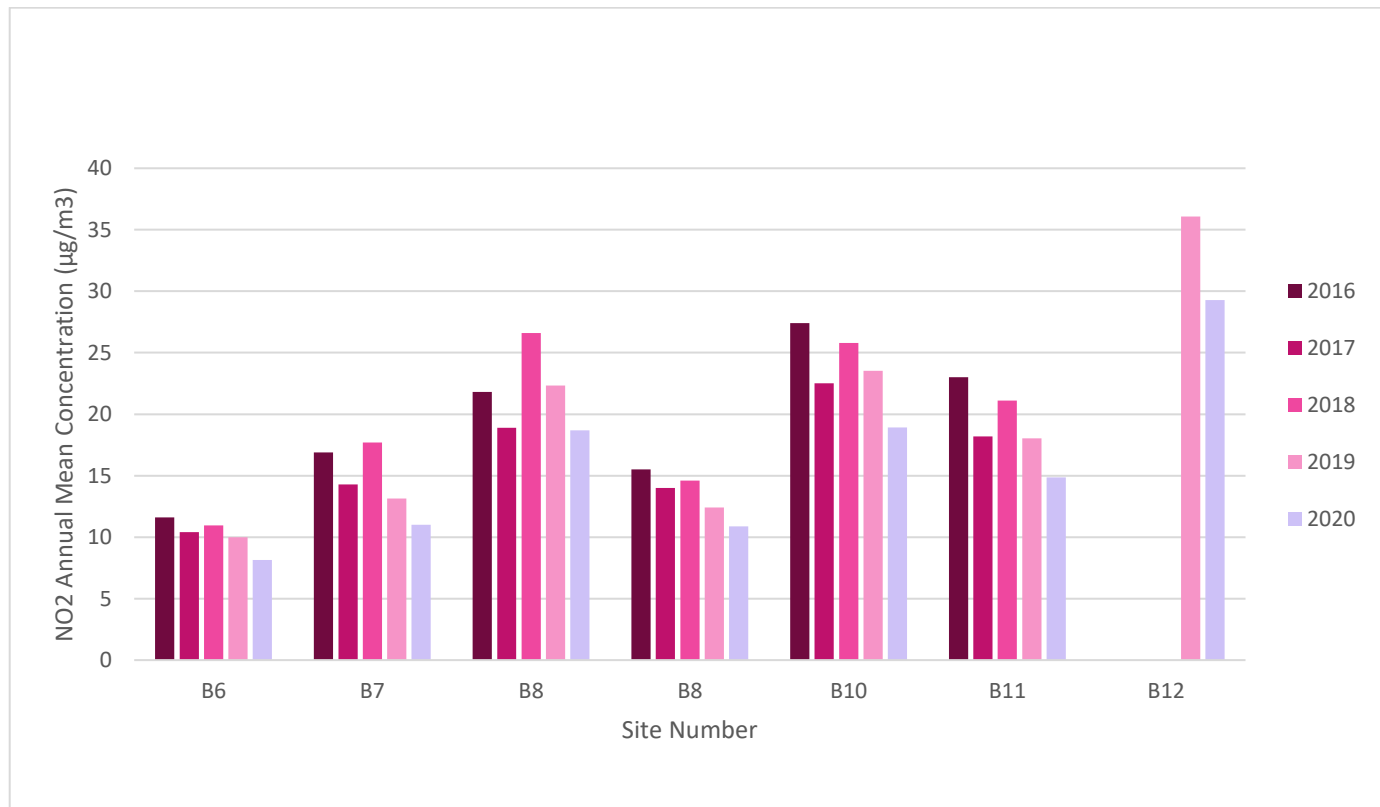


Table A.4– Annual Mean PM₁₀ Monitoring Results (µg/m³)

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
Barnstaple 1	257048	132591	Roadside	93.0	95.4	16.9	15.6	14.9	16.6	14.2

Annualisation has been conducted where data capture is <75% and >33% 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.5 – Trends in Annual Mean PM₁₀ Concentrations

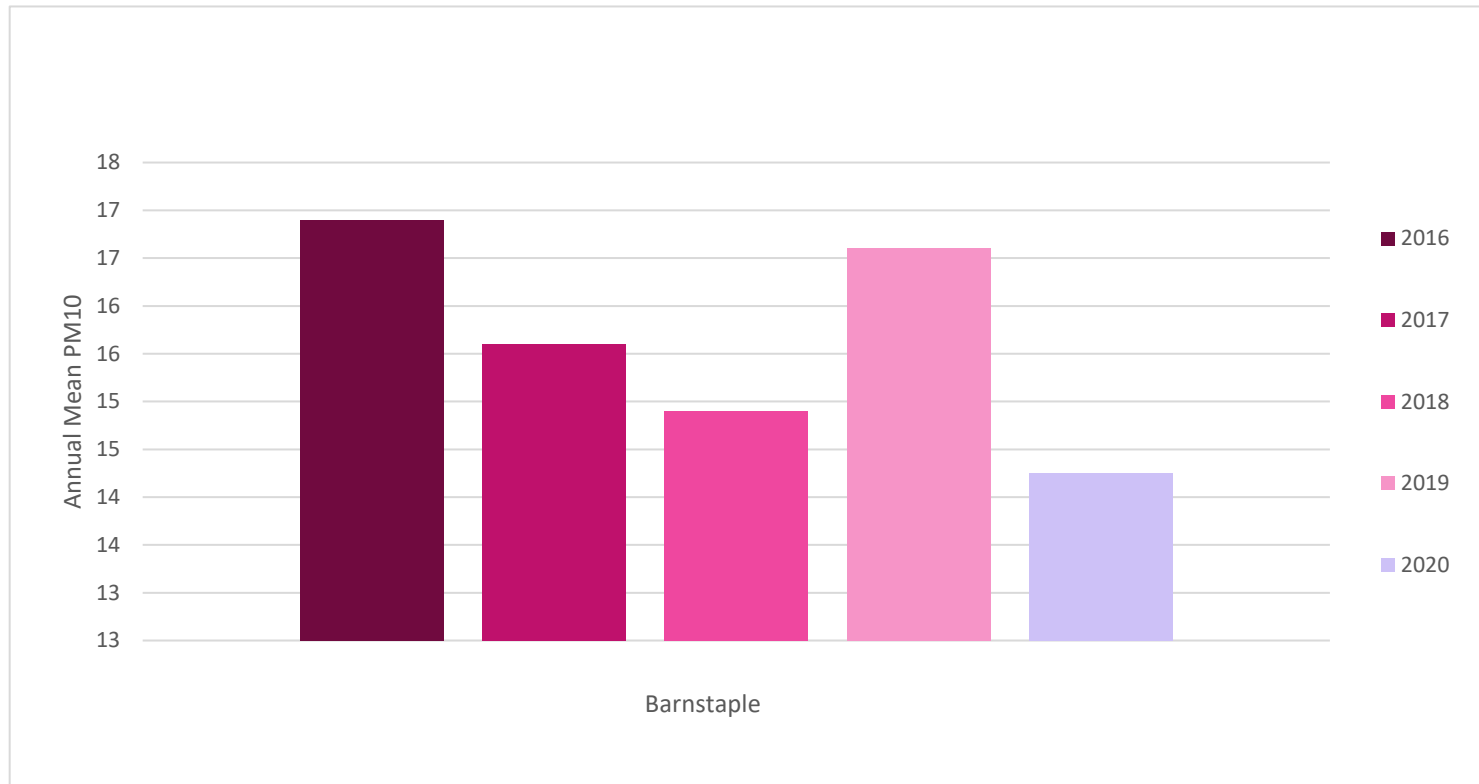


Table A.5– 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

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
Barnstaple 1	257048	132591	Roadside	93.0	95.3	0	0 (28.5)	0 (22.1)	2	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%).

Table A.6 – Annual Mean PM_{2.5} 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
Barnstaple 1	257048	132591	Roadside	94.4	95.3	10.7	7.8	6.9	8.1	8.4

Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16.

Notes:

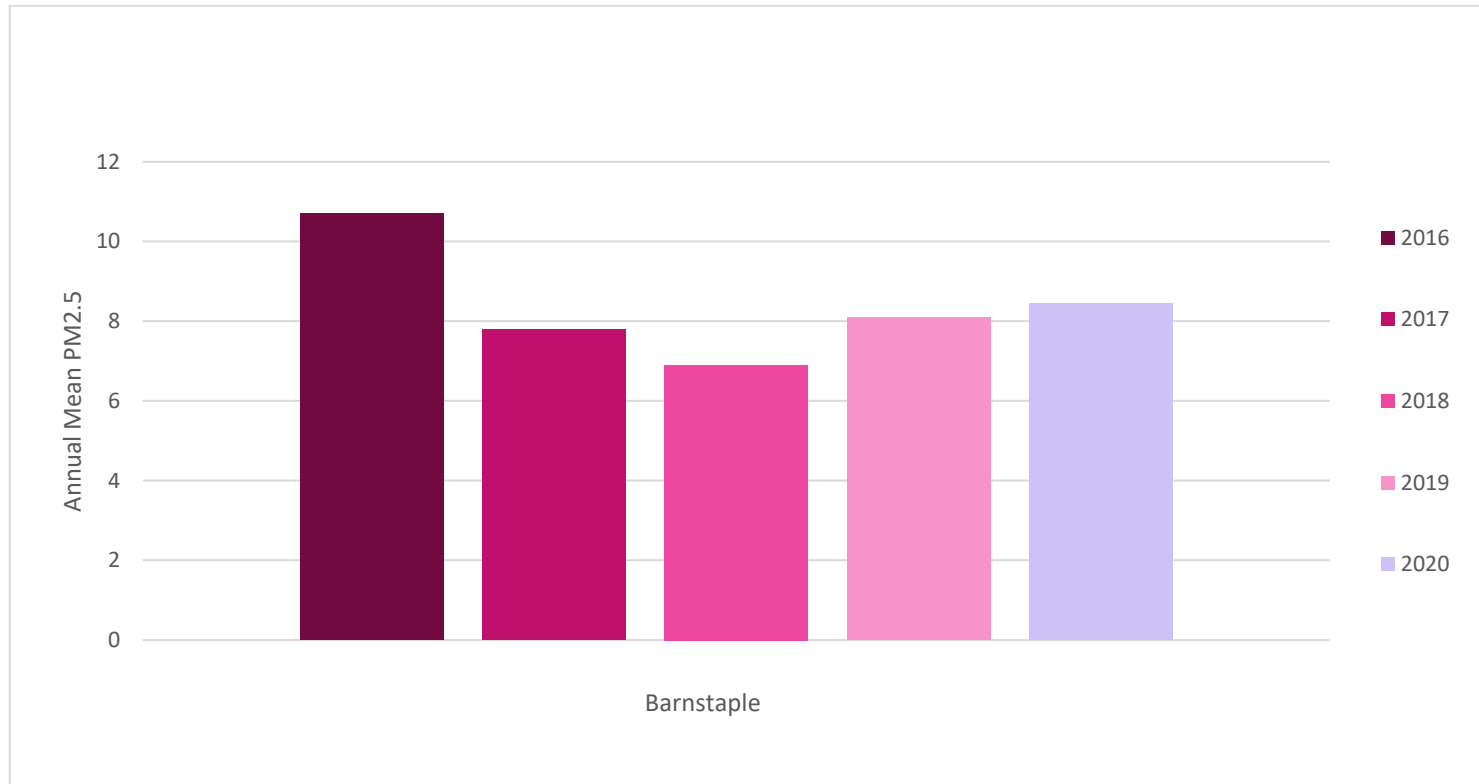
The annual mean concentrations are presented as µg/m³.

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%).

Figure A.6 – Trends in Annual Mean PM_{2.5} Concentrations



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	
Site 1	255774	133732	32.6	21.8					12.5	22.5	26.6	25.5	30.7		24.5	20.4	-	
Site 2	255556	133583	28.0	24.9					17.0	21.4	27.3	26.9	26.5		24.5	20.4	-	
Site 4	255651	132808	25.7	18.9					12.7	18.4	22.9	22.1			20.1	18.5	-	
Site 5	254197	132354	29.2	22.3					16.3	22.5	23.0				22.6	20.8	-	
Site 6	253886	132394	22.7	14.5					9.3	13.9	16.4	15.3			15.2	14.0	-	
Site 7	256706	132253	36.2	27.7					18.4	21.2	27.0	27.9	31.2		26.9	22.3	-	
Site 8	256683	132130	28.5	22.4					19.0	19.7	22.7	23.9	26.9		23.2	19.2	-	
Site 9	255661	133179	17.1	12.7					7.0	11.1	13.4	13.4	16.3		12.9	10.7	-	
Site 10	256186	133164	32.2	24.9					15.7	23.6	24.5	26.2	34.3		25.8	21.5	-	
Site 11	255967	132985		23.1					15.7	19.5	26.3	23.3	26.3		22.3	19.6	-	
Site 12	248731	136617	27.3	18.6					14.8	23.4	25.2	22.2	27.5		22.7	18.8	-	
Site 13	248732	136592	34.4	25.6					29.8	33.0	35.0	30.6	34.6		31.8	26.4	-	
Site 14	251533	147330	20.1	16.0					10.8	19.8	20.0	17.4	21.6		18.0	14.9	-	
Site 15	251971	147689	18.6	20.5					16.5	17.4	19.9	16.5	18.5		18.2	15.1	-	
Site 17	253595	132433	33.9	22.7					24.5	27.0	32.8	26.9	31.9		28.3	23.5	-	
Site 18	253053	132541	23.8	14.7					11.9	17.4	20.5	17.5	22.0		18.2	15.1	-	
Site B1	249042	135903	23.4	17.2					13.4	19.1					18.3	17.4	-	
Site B2	248969	136060	21.1	14.1					12.0	15.7	17.5	15.8	20.2		16.5	13.7	-	

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	
Site B3	248863	136403	21.7	16.8								17.7	32.6		22.0	15.9	-	
Site B4	248766	136437	17.5	9.7					7.4	13.7	14.9	13.1	17.6		13.4	11.1	-	
Site B5	248862	136372	30.8	33.7					35.5		37.3	35.8	22.4		32.7	26.4	-	
Site B6	248716	136067	13.8						5.7		10.5	9.6	13.6		10.6	8.1	-	
Site B7	248787	136498							8.4	13.1	16.3	12.7	14.2		12.9	11.0	-	
Site B8	248791	136621	24.7	19.8					17.0	22.8	25.1	22.3	26.1		22.5	18.7	-	
Site B9	248615	136596		10.0					9.2	13.1	15.2	12.3	14.3		12.3	10.9	-	
Site B10	248417	136610	24.8	16.6					18.0	25.2	29.5	21.9	23.5		22.8	18.9	-	
Site B11	248363	136630	20.7	15.3					12.5	19.2	21.2	16.1	20.4		17.9	14.9	-	
Site B12	248771	136591	39.5	30.9					24.2	35.7	39.3	37.4	39.6		35.3	29.3	-	

- 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 >33% 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.
- North Devon Council confirm that all 2020 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**.

November's NO₂ concentration for Site 5 has been removed as it was anomalous (54.4µg/m³)

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 North Devon Council During 2020

North Devon Council considered a total of 510 planning applications during 2020. Where relevant, air quality assessments were reviewed and or requested and mitigation measures agreed or secured. The decisions on the level of assessment and mitigation for potential air quality impacts took account of guidance contained in the EPUK & IAQM document: Land-use Planning and Development Control: Planning for Air Quality - January 2017 and the NDC Air Quality SPD.

Additional Air Quality Works Undertaken by North Devon Council During 2020

North Devon Council has not completed any additional works within the reporting year of 2020.

QA/QC of Diffusion Tube Monitoring

Gradko International Ltd supply and analyse North Devon Council's diffusion tubes. The tubes were prepared using the 20% TEA in water preparation method. The 2020 national bias adjustment factor for Gradko 20% TEA in water is 0.81 (based on 18 studies, version 03/21) as derived from the national bias adjustment factor spreadsheet.

During 2020, North Devon Council's diffusion tube monitoring was not completed in adherence with the 2020 Diffusion Tube Monitoring Calendar due to Covid-19 disruptions. The March diffusion tubes were exposed for 4 months and December tubes were exposed for 2 months. All overexposed tubes were eliminated from the 2020 results as it is considered the concentration data is unreliable.

Diffusion Tube Annualisation

Annualisation was required for all twenty-eight of North Devon Council's non-automatic monitoring (diffusion tube) sites, as the data capture for all sites was <75% but >33%. Annualisation was conducted using an average annualisation factor calculated using background concentrations from the four closest AURN sites to North Devon. Raw diffusion tube data was then annualised using the average annualisation factor to provide annual annualised mean concentrations (an annualisation summary is provided in Table C.2).

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.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.

North Devon Council have applied a national bias adjustment factor of 0.81 to the 2020 monitoring data. A summary of bias adjustment factors used by North Devon Council over the past five years is presented in Table C.1.

There are no co-located tube sites in North Devon thus the national bias adjustment factor for 2020 has been used (based on 18 studies, version 03/21).

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.81
2019	National	09/20	0.93
2018	National	06/19	0.93
2017	National	09/18	0.89
2016	National	06/17	0.92

NO₂ Fall-off with Distance from the Road

No diffusion tube NO₂ monitoring locations within North Devon Council required distance correction during 2020.

QA/QC of Automatic Monitoring

The Barnstaple automatic monitoring site is part of the UK Automatic Urban and Rural Network (AURN) that is run by the Environmental Agency. It is the largest automatic monitoring network within the UK, and is the main network used for compliance reporting against the Ambient Air Quality Directives. As such the PM₁₀ and PM_{2.5} monitoring is completed in line with the strict operational procedures set out by the Central Management and Co-ordination Unit (CMCU) for the AURN, with data ratification completed by the by Quality Assurance and Control Unit (QA/QC Unit).

North Devon Council regularly attend the monitoring site acting as the Local Site Operators (LSO) to complete routine site calibrations and maintenance ensuring a consistent, accurate data flow. Six monthly equipment servicing is completed by an Equipment Support Unit (ESU) for the site, and the QA/QA unit completed scheduled site operating audits in accordance with the AURN Site Operators Manual.

Due to the monitoring site being operated by the Environmental Agency, North Devon Council do not have first-hand access to any data that has been manipulated or removed through the QA/QC procedure completed. The data presented within the 2021 ASR has been downloaded from the UK-Air website and is all shown as ratified.

PM₁₀ and PM_{2.5} Monitoring Adjustment

PM₁₀ and PM_{2.5} monitors utilised within North Devon Council do not require the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within North Devon 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 33% do not require annualisation.

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

Site ID	Annualisation Factor Yarner Wood	Annualisation Factor Plymouth	Annualisation Factor Honiton	Annualisation Factor Charlton Mackrell	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
Site 1	1.1077	0.9750	0.9709	1.0481	1.0254	24.5	25.1	
Site 2	1.1077	0.9750	0.9709	1.0481	1.0254	24.5	25.1	
Site 4	1.2536	1.0339	1.0413	1.2201	1.1372	20.1	22.8	
Site 5	1.2282	1.0322	1.0520	1.2425	1.1387	22.6	25.7	
Site 6	1.2536	1.0339	1.0413	1.2201	1.1372	15.2	17.3	
Site 7	1.1077	0.9750	0.9709	1.0481	1.0254	26.9	27.5	
Site 8	1.1077	0.9750	0.9709	1.0481	1.0254	23.2	23.7	
Site 9	1.1077	0.9750	0.9709	1.0481	1.0254	12.9	13.3	
Site 10	1.1077	0.9750	0.9709	1.0481	1.0254	25.8	26.5	
Site 11	1.1366	1.0222	1.0556	1.1366	1.0877	22.3	24.2	
Site 12	1.1077	0.9750	0.9709	1.0481	1.0254	22.7	23.3	
Site 13	1.1077	0.9750	0.9709	1.0481	1.0254	31.8	32.6	
Site 14	1.1077	0.9750	0.9709	1.0481	1.0254	18.0	18.4	
Site 15	1.1077	0.9750	0.9709	1.0481	1.0254	18.2	18.6	

Site ID	Annualisation Factor Yarner Wood	Annualisation Factor Plymouth	Annualisation Factor Honiton	Annualisation Factor Charlton Mackrell	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
Site 17	1.1077	0.9750	0.9709	1.0481	1.0254	28.3	29.1	
Site 18	1.1077	0.9750	0.9709	1.0481	1.0254	18.2	18.6	
Site B1	1.2520	1.1049	1.0882	1.2619	1.1767	18.3	21.5	
Site B2	1.1077	0.9750	0.9709	1.0481	1.0254	16.5	17.0	
Site B3	0.9771	0.8946	0.8270	0.8625	0.8903	22.0	19.6	
Site B4	1.1077	0.9750	0.9709	1.0481	1.0254	13.4	13.7	
Site B5	1.1008	0.9513	0.9260	1.0093	0.9968	32.7	32.5	
Site B6	1.0734	0.9120	0.8861	0.9320	0.9509	10.6	10.0	
Site B7	1.1151	0.9921	1.0324	1.0678	1.0518	12.9	13.6	
Site B8	1.1077	0.9750	0.9709	1.0481	1.0254	22.5	23.1	
Site B9	1.1366	1.0222	1.0556	1.1366	1.0877	12.3	13.4	
Site B10	1.1077	0.9750	0.9709	1.0481	1.0254	22.8	23.4	
Site B11	1.1077	0.9750	0.9709	1.0481	1.0254	17.9	18.3	
Site B12	1.1077	0.9750	0.9709	1.0481	1.0254	35.3	36.2	

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

Figure D.1 – Map of Non-Automatic Monitoring Sites: Barnstaple

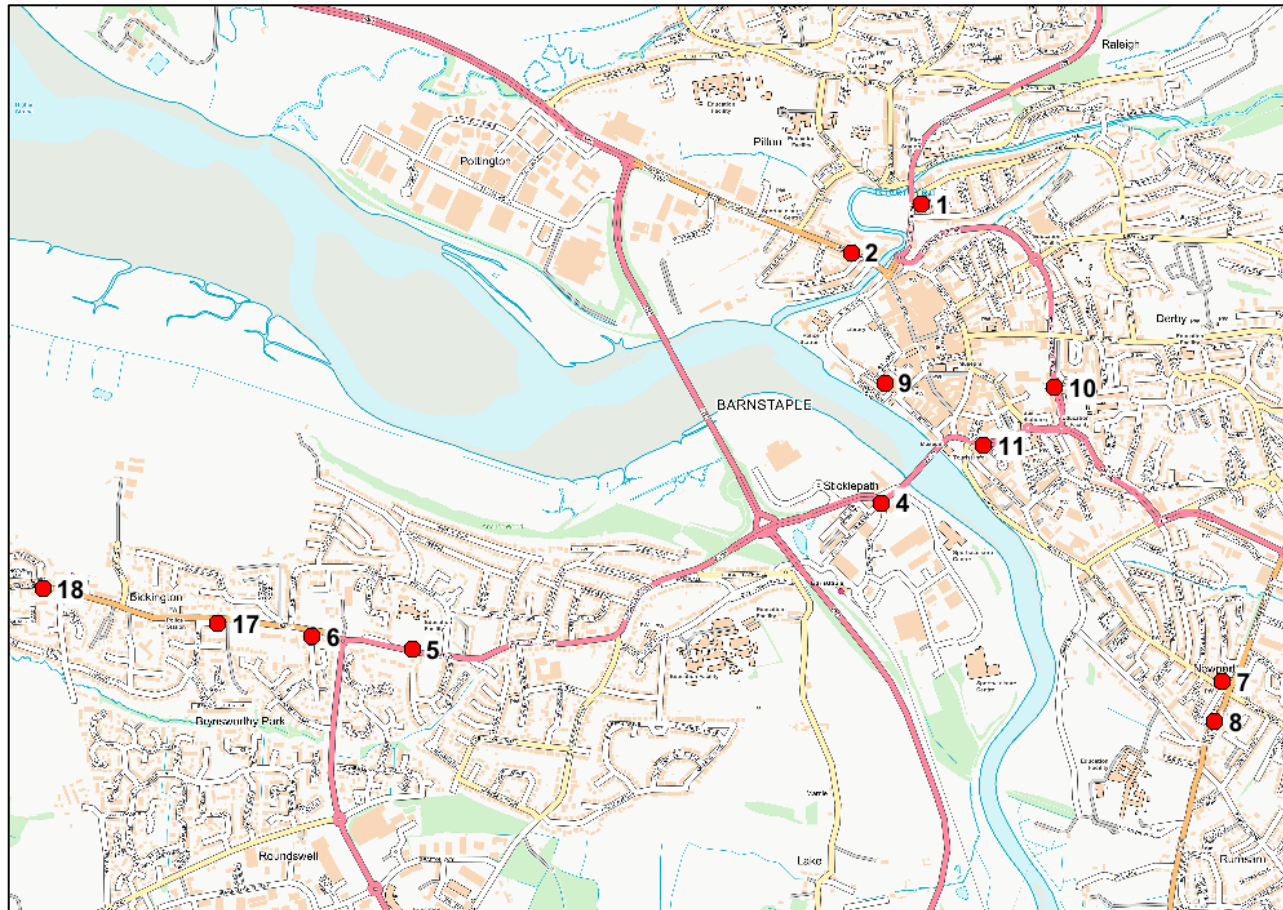


Figure D.2 – Map of AQMA and Non-Automatic Monitoring Sites: Braunton

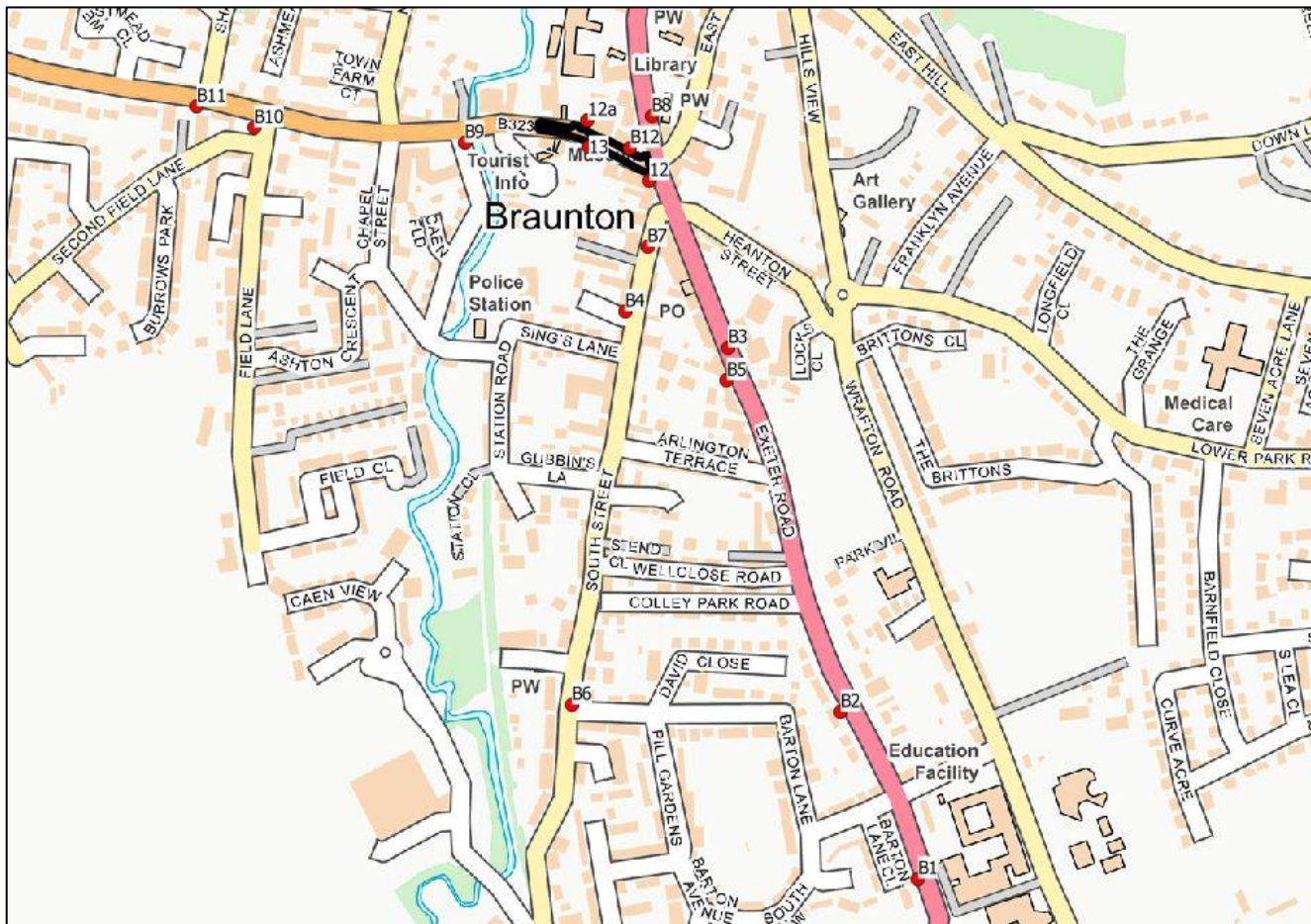


Figure D.3 – Map of AQMA and Non-Automatic Monitoring Sites: Braunton

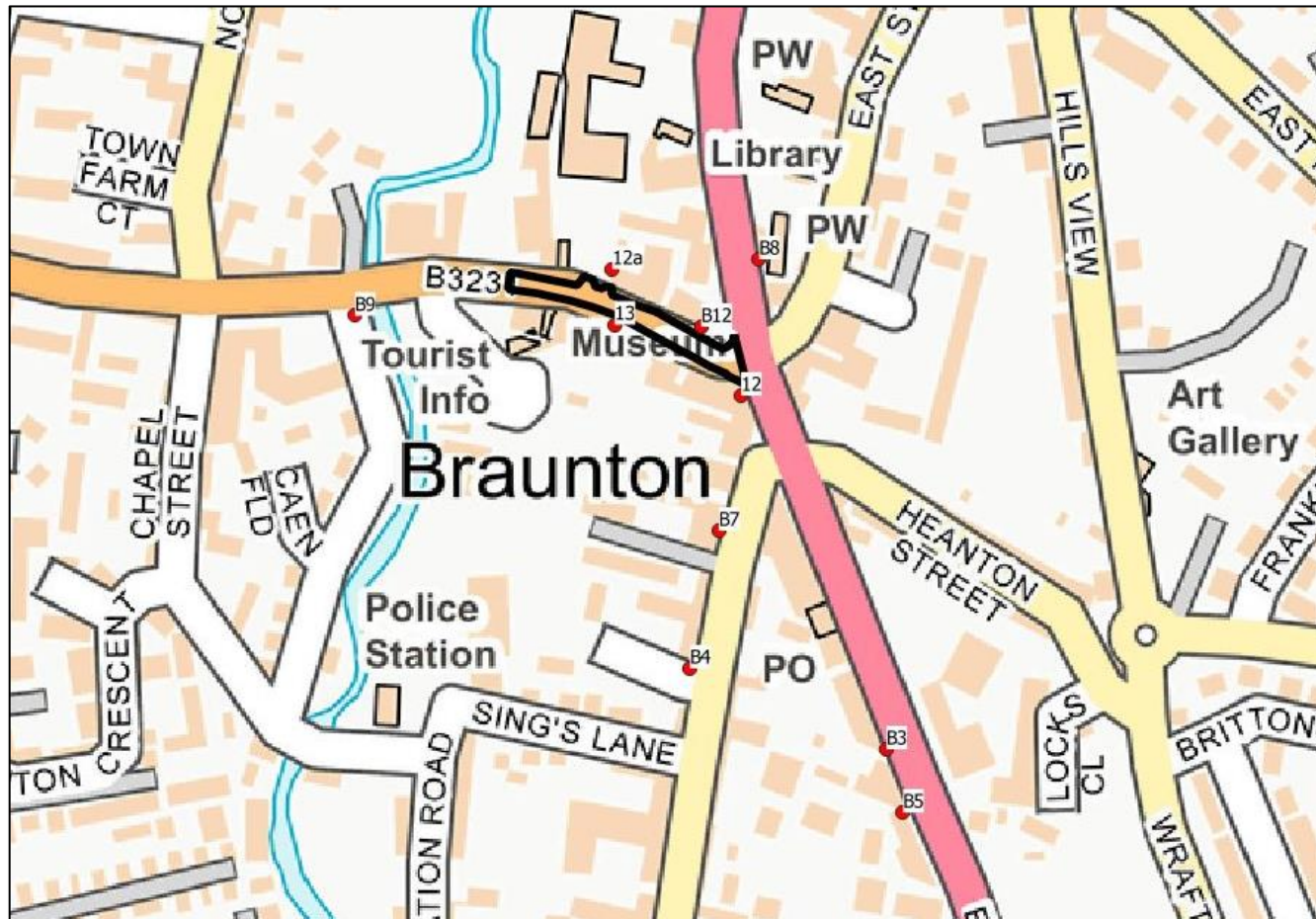
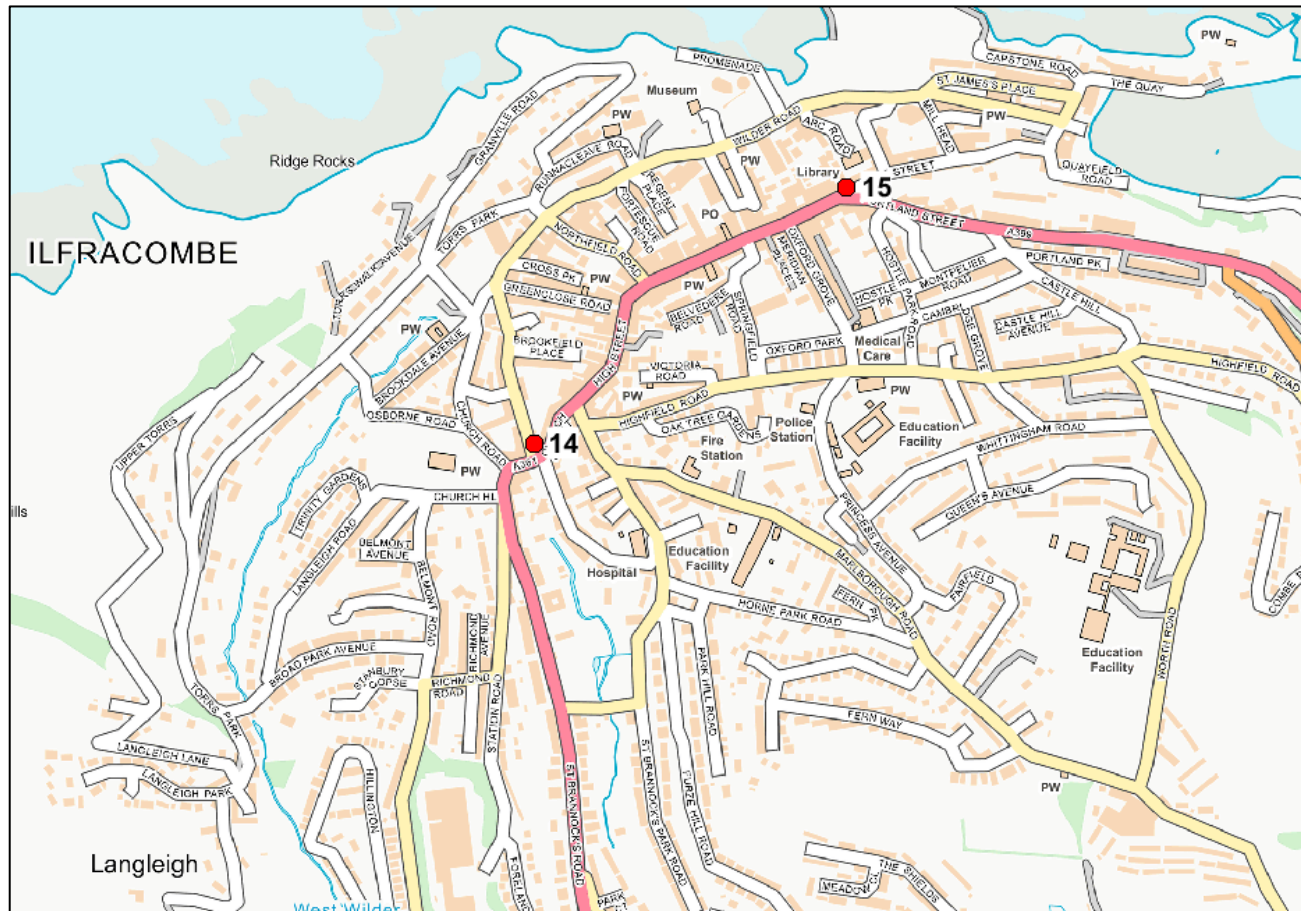


Figure D.4 – Map of Non-Automatic Monitoring Sites: Ilfracombe



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁷

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

⁷ 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) data⁸ 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)⁹ 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

⁸ Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

⁹ 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 20 $\mu\text{g}/\text{m}^3$ if expressed relative to annual mean averages. During this period, changes in $\text{PM}_{2.5}$ concentrations were less marked than those of NO_2 . $\text{PM}_{2.5}$ 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 $\text{PM}_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5 $\mu\text{g}/\text{m}^3$ 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 North Devon Council

Owing to Covid-19 restrictions, North Devon Council were unable to carry out regular monthly diffusion tube collections during the Spring and Autumn Covid-19 lockdowns. As a result, 6 months of diffusion tube data is missing from 2020 data. In line with Table F.1, this is considered a **small** impact.

Opportunities Presented by COVID-19 upon LAQM within North Devon Council

No LAQM related opportunities have arisen as a consequence of COVID-19 within North Devon Council.

Challenges and Constraints Imposed by COVID-19 upon LAQM within North Devon Council

No challenges or constraints relating to LAQM have arisen during 2020 as a consequence of COVID-19 within North Devon Council.

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: High
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.
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- North Devon Council Air Quality Annual Status Report. June 2017.
- North Devon Council Air Quality Annual Status Report. October 2016.
- North Devon District Council Appraisal Letter. November 2020.
- North Devon Council LAQM Air Quality Action Plan 2016.
- UK Air Defra Interactive Monitoring Networks Map.
- UK Air AQMA Interactive Map.