



***North Somerset Council
Annual Status Report 2023***

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2023 Air Quality Annual Status Report (ASR)

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

Date: June, 2023

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Executive Summary: Air Quality in Our Area

North Somerset is a unitary council in the West of England, with a population of approximately 217,399¹ (2021). North Somerset is classified as 'urban with significant rural' with almost 40% of residents living in rural communities or 'rural hub towns'. The largest town is Weston-super-Mare, with other towns comprising Portishead, Clevedon and Nailsea. There are additional villages of varying sizes and character. North Somerset contains Bristol Airport, the Royal Portbury Dock and the M5 motorway.

Air Quality in North Somerset 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^{2,3}.

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages⁴, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁵.

In 2022, North Somerset Council have undertaken monitoring for nitrogen dioxide at 21 sites across the district. The monitoring results for 2022, show that the annual mean concentrations of NO₂ reported across the district were well below the Air Quality Strategy (AQS) objective (40µg/m³). The maximum concentration of NO₂ recorded in 2022 was 23.1µg/m³ at Station Road, Congresbury (DT5). Additionally, there has been no reported

¹ ONS. Estimates of the population for the UK, England, Wales, Scotland and Northern Ireland. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland>

² Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

³ Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

⁴ Defra. Air quality appraisal: damage cost guidance, January 2023

⁵ Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

exceedance of any AQS objective within North Somerset Council for the past 5 years. As such, there are no Air Quality Management Areas (AQMA) declared in North Somerset. Within the council, the main pollutant of concern is nitrogen dioxide (NO₂), being the main pollution source vehicle emissions from the existing road network, particularly from the M5, A370, A38 and A369.

Recorded concentrations of NO₂ have been increasing since 2021, following a big drop in concentration in 2020 due to the covid-19 pandemic mobility restrictions. However, 2022 concentrations of NO₂ are still lower than those recorded pre-pandemic in 2019. This is in line with national trends.

For the 2022 monitoring sites, the following pollutant sources were considered, as detailed in the DEFRA LAQM Technical Guidance (LAQM.TG22)⁶:

- Road Traffic Sources
- Non-road Traffic Sources
- Industrial Sources
- Commercial and Domestic Sources
- Fugitive and Uncontrolled Sources

No new major sources of emissions were identified within North Somerset.

These locations are constantly reviewed with respect to any hotspot area(s) of pollution being identified. The current monitoring network will remain in place and will be updated where necessary.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan⁷ sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term PM_{2.5}

⁶ DEFRA. LAQM Technical Guidance (TG22). Available at: <https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>

⁷ Defra. Environmental Improvement Plan 2023, January 2023

targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce PM_{2.5} in their areas. The Road to Zero⁸ details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

There are currently no designated AQMAs within the District and as such an Air Quality Action Plan (AQAP) is not required. Even though no formal air quality action plan is in place, the authority implements a number of measures and is part of various initiatives to ensure that levels of nitrogen dioxide remain below the air quality objectives. Some examples of these are included below:

Supporting Carbon Reduction

North Somerset Council has declared a [climate change emergency strategy](#) and is pursuing net-zero carbon policies.

North Somerset has a [Climate Emergency Action Plan](#) which underpins many strategies and measures in North Somerset to address climate change and deliver improvements in Air Quality.

Green Infrastructure Strategy

Plants and trees can be used effectively in all settings to reduce emissions of particulates and minimise erosion. Shelter belts are one or more rows of trees or shrubs planted in positions where they maximise shelter from prevailing winds and reduce runoff. They help to reduce soil erosion by slowing down the flow of water and encouraging infiltration through leaf litter. Lower wind speeds created by shelter belts prevent wind whipping of soil helping to reduce fugitive particulate emissions particularly during dusty operations such as ploughing.

Some species of plants (mainly those with broad leaves) can be effective at capturing fugitive dust emissions and help to contain fugitive dust emissions within the localised area. Other advantages of shelter belts include protection of newly planted seeds and young plants, creation of habitats and improved soil nutrition.

⁸ DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

North Somerset Council has developed the following [green infrastructure strategy](#).

Active Travel Strategy

In 2021 North Somerset Council adopted an [Active Travel Strategy](#) (ATS). This agreed the policy approach to active travel. Since then North Somerset has been developing a more detailed approach through the Place and Movement Framework resulting in Active Travel Action Plans (ATAPs). This will help North Somerset make active travel strategy commitments and interventions a reality.

Walking and Cycling

As part of North Somerset's active travel strategy the council aspires to ensure that High-quality walking and cycling networks are delivered, enabling residents and visitors to make active journeys more frequently, with improved public realm and access to local shops, facilities and green spaces.

Initiatives to promote cycling can be found [here](#).

Initiatives to promote walking can be found [here](#).

North Somerset Council generally wants to promote healthier, more active lifestyles in North Somerset and has developed a [Joint Health & Wellbeing Strategy](#) which includes a focus on the wider determinants of health, such as employment, transport and housing, alongside ways to enhance access to green spaces and to address climate change.

The action plan linked to the Health & Wellbeing Strategy aims to

- publish a physical activity strategy for North Somerset, setting out priorities and actions to be taken to increase the proportion of people who are active and to reduce inequalities in activity levels.
- continue to support the Play Your Way scheme and develop Park Play and Street Play sessions, enabling families to play together.
- continue to coordinate the existing Health Walk programme and expand and target different groups to include targeted walks from GP surgeries.

Borrow a bike scheme

The borrow a bike scheme, allows those within North Somerset to trial a bike (electric, hybrid or folding bike) for a 2-week period for free.

Go Ultra Low West

North Somerset participates in the Go Ultra Low West project, to encourage the widespread use of electric vehicles across the west of England's local authorities. The project was provided a £7 million grant funding by the Office for Low Emission Vehicles.

Electric Vehicle Strategy

The [North Somerset Electric Vehicle Strategy](#) sets out North Somerset's ambition to create a network of EV charging points capable of supporting the demands of the area's communities as the transition to zero emission vehicles continues. The strategy outlines the forecast requirements up until 2030, in line with EV uptake so far. This will make sure that North Somerset is aware of the likely demand for EVs and charging infrastructure. It will also help set out how North Somerset will integrate EVs within the wider transport hierarchy, the commercial features of the EV network and how and where EV charging should be delivered in North Somerset. Having an EV strategy is crucial in securing future funding for North Somerset for the development of the network.

North Somerset Council recently invited residents to take part in a [consultation to have their say on the electric vehicle strategy](#).

The council encourages and promotes the drivers of licensed private hire taxis and Hackney Carriages to convert to electric vehicles. At present there is no formal requirement within the taxi policy for the use of electric vehicles, however collaboration with the licensing team aims to encourage the use of electric vehicles through the taxi policy.

Electric Vehicle Charging

North Somerset Council's first Electric Vehicle (EV) rapid charging hub is now open at Portishead's Parish Wharf Leisure Centre. The site, near Portishead Marina, has two rapid chargers (50kW) and four charging bays, allowing drivers to charge their EVs in just 30 to 60 minutes. Portishead's hub comes complete with a solar canopy and is part of the West of England's Revive network of charging points. The location was chosen as it is close to the leisure centre, to shops and to other local amenities. More information can be found [here](#).

Joint Local Transport Plan

North Somerset is part of The Joint Local Transport Plan 4, led by the West of England Combined Authority (WECA), which sets out aims for a sustainable transport network and addresses poor air quality. The current plan runs up to the year 2036.

Council Fleet

North Somerset Council owns and operates a wide range of vehicles and equipment to support building/highways maintenance, waste management and delivery of other services. The council has effective vehicle procurement policies which help to ensure that the energy, carbon and air quality impacts of vehicles purchased or leased by North Somerset Council are considered as part of the fleet replacement programme or contract renewal process.

Parking management strategy

North Somerset is reviewing and developing its approach to parking management. When this is complete, the council will consult on the proposed strategy to see how it could be strengthened further.

Car Sharing

North Somerset promotes Travelwest's range of car sharing websites to help people find a suitable person to share journeys with across the West of England.

<https://n-somerset.gov.uk/my-services/parking-travel-roads/transport-travel/car-sharing>

Bus Improvement Plan

Public transport is set to be transformed over the next three years in North Somerset. The [Bus Service Improvement Plan](#) (BSIP) outlines a major investment programme by [North Somerset Council](#) in partnership with the West of England Combined Authority. The ambition is to improve the quality and provision of bus services to a level that creates an attractive alternative to the use of private vehicles. It will also accelerate the decarbonisation of transport which is a key priority for the council as part of its commitment to tackle the climate emergency.

Quality Bus Partnerships (QBP)

North Somerset has launched an enhanced partnership with the West of England Combined Authority to improve bus services across the region ([Bus Strategy](#)).

The [West of England Enhanced Partnership Plan](#) centres around a legally binding agreement with bus operators in the region to provide:

- better ticketing and passenger information
- lower fares
- investment in bus priority measures

- new and improved services

The region has secured £105.5m from the Government by creating an enhanced partnership. This will allow North Somerset to improve bus services across the area and improve key bus corridors in North Somerset, on top of the £48m already secured to improve bus travel in the region.

The funding means that North Somerset, along with the West of England Combined Authority, will:

- make changes to help buses get through traffic, so they run more reliably
- improve the frequency of buses on well-used routes
- develop demand responsive transport to meet the needs of more rural communities.

Weston Bus Hub

North Somerset Council and First Bus worked together to open [Weston-super-Mare's new town centre bus hub](#) in February 2022. Providing dedicated coach and bus pickup facilities to help alleviate traffic-related issues, reduce emissions and improve local air quality. Anti-idling signage has also helped to further reduce emissions from stationary coaches and buses.

WESTlink

[Westlink](#) is an on-demand minibus service that allows residents to book their bus journeys through an app, website, or phone. It forms part of the largest on-demand bus scheme in the UK. It aims to reconnect communities by offering people currently without a local service the opportunity to get back on the bus. More information about the bus services can be found [here](#).

WESTlink Virtual Bus Stops

People may want to be picked up or dropped off in an area that doesn't have a physical bus stop. This could be a doctor's surgery, pharmacy or a local shop. If there's a public need for an additional bus stop, the council can create a virtual one that people can choose when booking WESTlink.

Park & Ride

The Long Ashton Park & Ride is a form of integrated transport that allows private car users to park their vehicles at a large car park in Long Ashton in North Somerset and travel into

Bristol using public transport. The site is situated on the outskirts of Bristol and is designed to relieve road congestion and improve air quality in the city and along key approach roads. The user pays for the bus services and can park their car free of charge. The dedicated bus services consists of modern low floor, wheelchair accessible buses that are branded and offer a high service frequency throughout the day (particularly during peak periods).

Prioritised traffic lights and dedicated bus lanes along key routes allow Park and Ride buses to get to key destinations quickly. Generally, the Park and Ride services are much faster and cheaper than driving into the city at peak times.

Park and Ride services can also be encouraged for transport to and from events such as sports and music events, where there is expected to be a high turnout in order to reduce the number of private vehicles using the road, and therefore aid in continuously reducing congestion along the road network.

Park & Rail

A Park and Rail scheme ([Metrowest Phase 1](#)) is planned for Portishead in North Somerset. It will allow private car users to park their vehicles close to a new rail station at Portishead and use a refurbished rail track connection to travel into Bristol using a new rail service connection. The Park and Rail scheme will allow the consolidation of multiple individual car journeys into one single rail journey resulting in less congestion, lower emissions and improved air quality.

Energy and Heating

North Somerset Council provides [information to residents](#) on how best to conserve energy and [heat their homes](#). The Council will continue to promote, educate and provide advice about home energy efficiency and carbon reduction, working in partnership with organisations such as the Centre for Sustainable Energy. The council has commissioned a stock condition survey of properties in North Somerset to guide next steps for improving thermal efficiency among lower-income households. The council will support and expand the Warmer Homes, Advice and Money (WHAM) project helping the most vulnerable residents in cold homes to access advice on energy, money, benefits and carry out home repairs.

Solar Together

A key part of reaching carbon neutrality is access to green energy sources, such as solar photovoltaic (PV) panels and batteries.

With this in mind the council has partnered with an independent group-buying collective, iChoosr Ltd, as well as neighbouring West of England authorities, to make the purchase of solar panels more accessible.

[Solar Together](#) is an innovative scheme which uses the collective bargaining power of local households to access panels and installation at a competitive price.

Effective Regulation - Environmental Permitting

North Somerset Council's Regulatory teams work with operators to secure compliance, but where necessary, enforcement tools are available ranging from enforcement notices to prohibition notices and/or prosecution.

Smoke Control

North Somerset Council is not in a smoke control area however it takes robust and effective action on reports smoke nuisance, clean air offences and breaches of domestic solid fuels regulations.

Low Emission Farming

The council is launching a [rural grant programme](#) that aims to benefit both businesses and community groups. One of the key objectives is to encourage productivity through enhancing, energy efficient, low carbon technologies and techniques in rural communities including agriculture.

Procurement and decision making

The council has introduced a requirement for commissioned services and decision-making processes to incorporate actions that address climate change and improve the environment.

Conclusions and Priorities

During 2022, there were no exceedances of the annual mean air quality objective for NO₂ within North Somerset Council. Being a predominantly rural district, pollution levels continue to be low, and monitoring will continue to ensure any concentrations trends can be identified.

Notwithstanding this, North Somerset Council will continue to promote measures to improve air quality in the district and will continue to assess new developments submitted

through the planning process to ensure that any proposed developments are not detrimental to local air quality.

Local Engagement and How to get Involved

Everyone can help to improve air quality on a local scale at North Somerset and beyond. By making informed personal choices, particularly with regards to travel, we can help to improve air quality (as well as your own health and wellbeing). The following are key actions members of the public can take:

- Substitute car use. Where possible, take a bus or train, or preferably walk or cycle. Access active travel options via the council's website: <https://www.n-somerset.gov.uk/my-services/parking-travel-roads/transport-travel>
- If possible, sharing lifts with colleagues to work will save you money as well as reducing the number of cars on the road: <https://liftshare.com/uk>.
- Look into travelling outside of peak hours or work from home if that is an option.
- When looking to change your vehicle, take air pollution into consideration and opt for the cleanest vehicle you feasibly can. Low emission electric and/or hybrid vehicles are becoming more affordable and government funding and grants are available.

Whilst most air pollution in North Somerset is caused by road traffic, domestic heating or wood-burning is another source of pollution, especially of particulates (PM₁₀ and PM_{2.5}). Measures that could be considered to reduce air pollution from domestic heating include:

- Upgrading domestic boilers to newest and most fuel-efficient condensing boilers with lowest NO_x (and carbon) emissions.
- “Clean” renewable energy generation, for example solar photovoltaics or heat/air source heat pumps.
- Using DEFRA approved appliances and smokeless fuels suitable for use in a smoke control area (whether you are in a smoke control area or not)⁹. More information about wood burners/open fires can be found here: [Ready to Burn](#).

⁹ DEFRA. Exempt appliances England. Available at:

<https://smokecontrol.defra.gov.uk/appliances.php?country=england>

Local Responsibilities and Commitment

This ASR was prepared by Bureau Veritas on behalf of the Environmental Protection Department of North Somerset Council with the support and agreement of the following officers and departments:

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1 Local Air Quality Management

This report provides an overview of air quality in North Somerset Council during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

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

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

2 Actions to Improve Air Quality

Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

North Somerset Council currently does not have any declared AQMAs.

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

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

"The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports:

- 1. The Council have reported the fraction of mortality attributable to particulate air pollution in North Somerset and have also provided a comparison with regional and national averages.*
- 2. The Council has provided good reasoning for the addition and removal of monitoring sites. This demonstrates that the Council is committed to maintaining good air quality as monitoring is targeted in areas which are vulnerable.*
- 3. A COVID-19 appendix has been included within this report, highlighting the continuing effects of the pandemic on air quality. This discussion also extends into highlighting disruption in the aviation industry and relates this to the monitoring at Bristol Airport.*
- 4. All figures are clear and well-presented, with consistency between formatting. The Council could highlight the location of Bristol Airport within Figure D.1 to compliment the discussions regarding monitoring at this location.*
- 5. Overall, this report is detailed and well-presented, and satisfies the criteria of the relevant reporting standard. The Council should continue their good work in future ASRs."*

Based on Defra's appraisal of last year's ASR, North Somerset Council will continue to provide detailed ASRs in accordance with relevant Policy and Technical Guidance documents.

As discussed in Section 2.1 above, North Somerset Council does not have any AQMAs and as such has not had to derive an air quality action plan. However, there are a number of strategies and plans in place, which will have a beneficial impact on air quality and are discussed further below.

2.1.1 Climate Emergency

In 2018, North Somerset Council updated its Climate Local Agreement¹⁰, and in February 2019 passed a motion to declare a climate change emergency. The overarching goal of this strategy is for North Somerset to become carbon neutral by 2030.

A new climate emergency strategy and action plan¹¹ was adopted in November 2022. This action plan will be monitored every six months and updated each year.

The key principles of the Climate Emergency Strategy are to:

- Become a net zero carbon council
- An energy efficient built environment
- Renewable energy generation
- Repair, reuse, reduce and recycle
- Replenish our carbon stores
- Reduce emissions from transport
- Adapting to climate change

The climate action plan has additional benefits that tackle multiple issues. For example, an initiative to increase cycling in a particular community, with a primary objective of reducing carbon emissions from transport locally, will also deliver the co-benefit of improved physical and mental health for residents through increased physical activity and improved air quality. Over time, this will also result in fewer NHS interventions, saving money.

2.1.2 Active Travel Strategy

North Somerset Council has developed an Active Travel Strategy 2020-2030¹², which aims to harness the huge rise in walking and cycling seen during 2020 and increase walking and cycling trips by at least 300% by 2030.

¹⁰ North Somerset Climate Local Commitment. Available at: <https://www.n-somerset.gov.uk/sites/default/files/2020-03/Climate%20Local%20Commitment%202018.pdf>

¹¹ North Somerset plan to tackle Climate Change. Available at: <https://n-somerset.gov.uk/council-democracy/priorities-strategies/climate-emergency/our-plans-tackle-climate-change>

¹² North Somerset Active Travel Strategy 2020-2030. Available at: https://www.n-somerset.gov.uk/sites/default/files/2021-08/30511%20ATS%20book%20ACC%200821_0.pdf

The district has already delivered some flagship strategic active travel routes, for example the Festival Way commuter-route into Bristol from Nailsea and Backwell. Between March 2017 and March 2020, North Somerset saw an increase of 25% in cycling trips (pre-COVID-19, Annual Average Daily Cycle Trips), which was significantly higher than the national trend of that period.

This Strategy ties in with North Somerset's Joint Health & Wellbeing Strategy 2021 – 2024¹⁵, of which a priority theme is physical activity and mental health and wellbeing. An aim of the Joint Health & Wellbeing Strategy is to promote active travel for school journeys.

PM_{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

The Public Health Outcomes Framework data tool¹³ compiled by Public Health England quantifies the mortality burden of PM_{2.5} within England on a county and local authority scale. The 2021 estimates of the fraction of mortality attributable to PM_{2.5} pollution range from 3.5% in the Isles of Scilly to 7.2% in the City of London. Within North Somerset the estimate is 5.0%¹³. This remains lower than average for England as a whole (5.5%), yet comparable to the Southwest region average (5.1%). When compared to historical data (since 2018), the estimated fractions of mortality attributable to particulate air pollution have continually decrease, for example the estimated fraction for North Somerset was 6.1% in 2018 and on a national level it was 7.1%.

North Somerset Council continues to recognise that local authorities are expected to work towards reducing emissions and concentrations of PM_{2.5} in their area. PM_{2.5} includes both local and distant sources. Currently, there is no regulatory standard applied to PM_{2.5} for

¹³ PHE. Public Health Outcomes Framework. Available at: <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data>

local authorities to assess. There is currently no monitoring of PM₁₀ or PM_{2.5} within the district of North Somerset. As such, no concentration values can be reported or estimated.

The current Defra background maps¹⁴ for North Somerset (2018 reference year) show that all 2022 background concentrations of PM_{2.5} are far below the recommended annual mean AQS objective¹⁵ for PM_{2.5} of 20µg/m³. The highest concentration is predicted to be 9.04µg/m³ within the 1km x 1km grid square with the centroid grid reference of 351500, 176500. This is an area northwest to Pill, comprising the east port parking slots and the M5. For 2022, the annual average background level of PM_{2.5} in North Somerset was 7.3µg/m³. In September 2021 the WHO Air Quality Guidelines¹⁶ set out a new recommended level annual average concentration of PM_{2.5} of 5µg/m³.

North Somerset Council is taking the following measures to address PM_{2.5}:

- Measures that are already in place, such as The Joint Local Transport Plan and the Active Travel Strategy, will reduce emissions of particulates from transport.
- Continue to work with the Director of Public Health to promote measures to improve air quality, including promotion of active transport, implementation of measures to increase healthy, active lifestyles and ensures measures are implemented through improved urban planning e.g. improved cycle highways.
- Ensure that air quality continues to be considered as part of the Joint Strategic Needs Assessment (JSNA).
- Dust Management Plans, which are usually incorporated into Construction Environmental Management Plans (CEMPs), are routinely conditioned on major development planning permissions to control and minimise the risk of construction dust impacts, and therefore PM_{2.5}, to nearby receptors.
- Regular inspections of industrial processes permitted by the Council where combustion and non-combustion processes lead to anthropogenic emissions of PM_{2.5}.

¹⁴ Defra UK Air. Background maps. Available at: <https://uk-air.defra.gov.uk/data/laqm-background-home>

¹⁵ Defra UK Air. Air quality objectives. Available at: https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update.pdf

¹⁶ WHO. What are the air quality guidelines? Available at: <https://www.who.int/news-room/feature-stories/detail/what-are-the-who-air-quality-guidelines>

- Promotion of The Air Quality (Domestic Solid Fuels Standards) England Regulations 2020, created to reduce concentrations of particulate matter from the domestic burning of solid fuels. The restrictions will remove the most polluting fuels from sale.

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

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

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

North Somerset Council did not undertake automatic (continuous) monitoring during 2022. National continuous monitoring results are available on the DEFRA UK- Air website¹⁷. There are also no national automatic monitoring sites within the council. The closest national automatic monitoring sites are in Bristol.

3.1.2 Non-Automatic Monitoring Sites

North Somerset Council undertook non-automatic (i.e. passive) monitoring of NO₂ at 21 sites during 2022. Table A.1 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D: Maps of Monitoring Locations. 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.

In 2022, monitoring has ceased at five locations: Yatton High Street, Beechwood Road in Easton-in-Gordano, Pill (Railway Line) between Avon Road and the railway, Backwell School and Downside Road (Homelea) north to the Bristol Airport. It was considered suitable to cease monitoring at these locations as recorded NO₂ concentrations were consistently well below the annual mean objective since implemented.

¹⁷ DEFRA UK Air. Air Information Resources. Monitoring Networks. Available at: <https://uk-air.defra.gov.uk/networks/>

In 2022, two new non-automatic monitoring locations were implemented in Cleve (DT25 and DT26). The new monitoring locations were selected in order to provide monitoring data where there previously was none, as well as to target busy roads.

Individual Pollutants

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

3.1.3 Nitrogen Dioxide (NO₂)

Table A.1 and Table A.2 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 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Results show that all NO₂ annual mean concentrations are below the AQS objective of 40µg/m³ in 2022. The maximum recorded NO₂ annual mean concentration is 23.1µg/m³ reported at DT5, which is at Station Road, Congresbury. Annual mean concentrations reported are similar to that in 2021, with most sites showing a slight decrease (up to 3.4µg/m³ in DT23) and other sites showing an increase (DT1, DT2, DT18, DT19, DT20 and DT21, up to 3.2µg/m³ in DT18). Despite this, all concentrations reported in 2022 are below that reported in 2019.

It is hypothesised that the impacts of COVID-19 on traffic levels and patterns and local NO₂ concentrations are still present in 2022 having long-standing impacts on local air quality.

As per [LAQM.TG\(22\)](#), an annual mean NO₂ concentration greater than 60µg/m³ can be used as a proxy to indicate whether there is an exceedance of the NO₂ 1-hour mean AQS objective (no more than 18 hourly mean concentrations in exceedance of 200µg/m³). None

of the monitoring locations reported an annual mean concentration greater than $60\mu\text{g}/\text{m}^3$, therefore it is not believed that there has been an exceedance of the hourly objective within North Somerset.

3.1.4 Other Monitoring – Bristol Airport

Bristol Airport is located within the district of North Somerset. In 2011, the airport was granted planning permission to expand and accommodate 10 million passengers per annum. As part of this planning permission, a Section 106 agreement was put in place, which amongst other things required the airport to undertake air quality monitoring in the vicinity of the airport.

In 2012, the airport installed a continuous air quality monitoring station, monitoring NO_2 and PM_{10} , as well as nine NO_2 diffusion tube monitoring locations.

Figures Figure 3-1 and Figure 3-2 below show the monitoring results for Bristol Airport from 2012 to 2022. The monitoring locations are shown in Appendix D: Maps of Monitoring Locations, Figure D.19. Results show that the concentrations for all pollutants remain below the air quality objectives.

Figure 3-1 – Bristol Airport NO_2 Diffusion Tube Monitoring Results

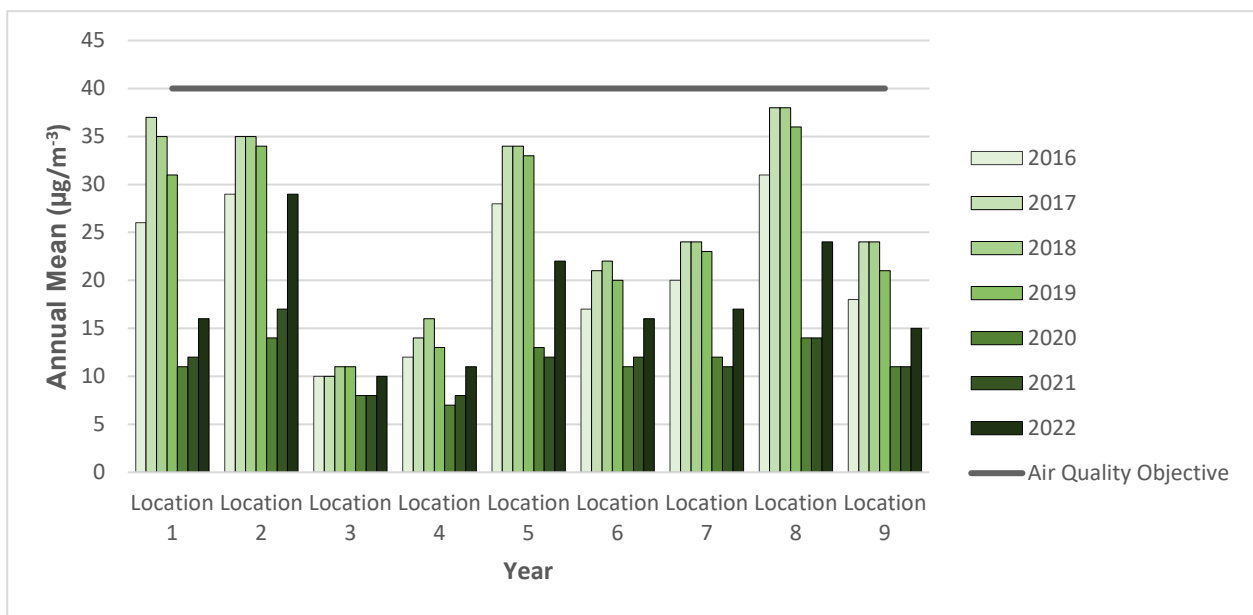
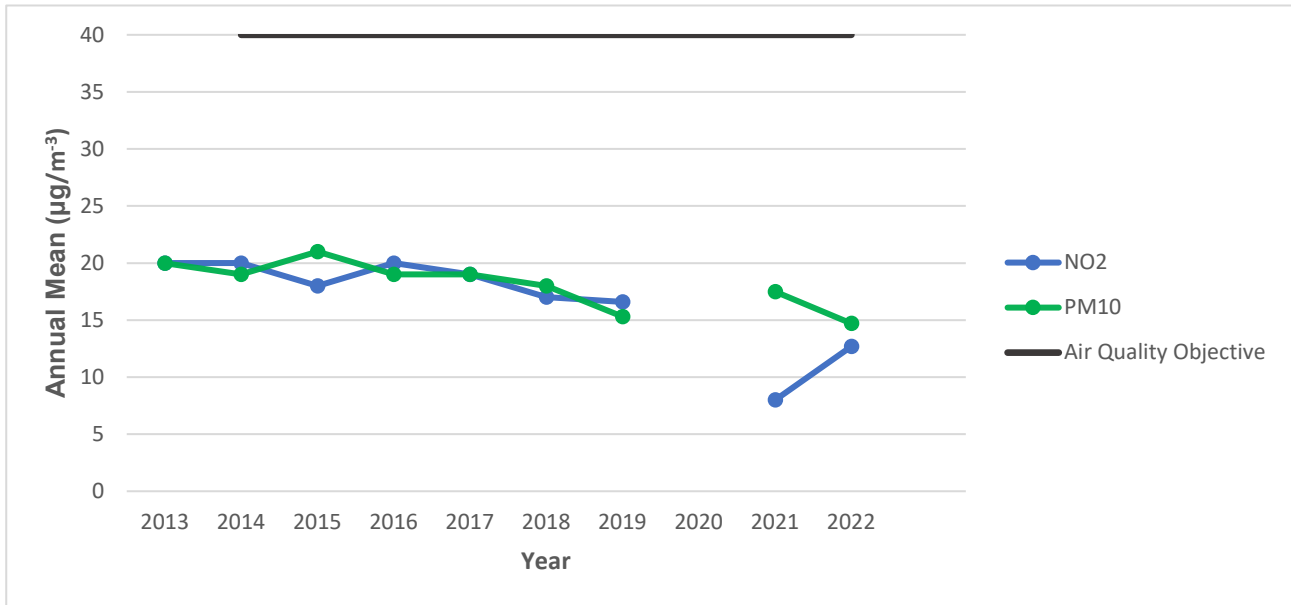


Figure 3-2 – Bristol Airport Continuous Monitoring Results



Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT1	Drove Road	Roadside	332653	160737	NO ₂	N/A	3.0	1.0	No	2.5
DT2	Winterstoke Road	Kerbside	333515	160069	NO ₂	N/A	17.0	3.0	No	2.5
DT3	Worle Community College	Roadside	335489	162434	NO ₂	N/A	24.0	1.0	No	2.5
DT4	St Annes (A370)	Roadside	339753	164204	NO ₂	N/A	8.0	1.5	No	2.5
DT5	Congresbury (Station Road)	Kerbside	343662	163860	NO ₂	N/A	6.0	1.0	No	2.5
DT7	Mary Elton School, Clevedon	Roadside	339878	170252	NO ₂	N/A	28.0	2.0	No	2.5
DT8	Bristol Rd, Portishead	Roadside	347054	175534	NO ₂	N/A	25.0	3.0	No	2.5
DT11	Pill (A369)	Roadside	353177	174620	NO ₂	N/A	15.0	2.0	No	2.5
DT12	Long Ashton Road, Long Ashton	Kerbside	353544	170088	NO ₂	N/A	15.0	2.0	No	2.5
DT13	Flax Bourton (A370)	Kerbside	350773	169334	NO ₂	N/A	7.0	1.0	No	2.5

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)
DT14	Wraxall School	Kerbside	348941	171877	NO ₂	N/A	34.0	4.0	No	2.5
DT15	Nailsea	Roadside	347641	170943	NO ₂	N/A	10.0	5.0	No	2.5
DT18	Downside Road (Top 8)	Kerbside	351054	165665	NO ₂	N/A	4.0	3.0	No	2.5
DT19	Winford Primary School	Roadside	353978	165103	NO ₂	N/A	13.0	8.5	No	2.5
DT20	Lulsgate Bottom	Kerbside	351391	165698	NO ₂	N/A	10.0	2.0	No	2.5
DT21	Sandford	Kerbside	342603	159682	NO ₂	N/A	18.0	2.0	No	2.5
DT22	Banwell Primary	Roadside	342603	159682	NO ₂	N/A	8.0	1.0	No	2.5
DT23	Centre of Banwell	Kerbside	339802	159151	NO ₂	N/A	3.0	1.0	No	2.5
DT24A, DT24B, DT24C	Bowling Green	Other	339838	159166	NO ₂	N/A	N/A	N/A	No	2.5
DT25	Cleeve site 1	Kerbside	345592	165597	NO ₂	N/A	20.4	2.0	No	2.5
DT26	Cleeve site 2	Kerbside	345507	165538	NO ₂	N/A	17.0	2.0	No	2.5

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 – 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 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
DT1	332653	160737	Roadside	100.0	100.0	22.4	23.3	18.1	19.8	20.2
DT2	333515	160069	Kerbside	92.6	92.6			18.8	19.6	20.6
DT3	335489	162434	Roadside	100.0	100.0				15.9	15.5
DT4	339753	164204	Roadside	100.0	100.0	22.5	22.4	17.2	18.7	17.6
DT5	343662	163860	Kerbside	100.0	100.0	26.7	29.0	20.1	24.1	23.1
DT7	339878	170252	Roadside	100.0	100.0			11.3	13.4	11.9
DT8	347054	175534	Roadside	100.0	100.0			14.3	15.8	13.7
DT11	353177	174620	Roadside	100.0	100.0	24.3	25.5	17.0	19.0	18.6
DT12	353544	170088	Kerbside	100.0	100.0			15.9	17.9	16.4
DT13	350773	169334	Kerbside	100.0	100.0	24.6	26.6	19.5	19.5	17.6
DT14	348941	171877	Kerbside	100.0	100.0			16.1	18.1	17.0
DT15	347641	170943	Roadside	100.0	100.0			16.5	16.6	16.2
DT18	351054	165665	Kerbside	100.0	100.0	23.9	23.1	13.6	13.9	17.1

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 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
DT19	353978	165103	Roadside	100.0	100.0			14.1	13.3	15.1
DT20	351391	165698	Kerbside	92.3	92.3			19.5	19.3	20.3
DT21	342603	159682	Kerbside	100.0	100.0	16.0	14.3	11.3	10.8	12.0
DT22	342603	159682	Roadside	92.3	92.3	22.1	19.8	14.9	15.5	15.2
DT23	339802	159151	Kerbside	84.9	84.9	24.8	24.7	16.8	18.7	15.3
DT24A, DT24B, DT24C	339838	159166	Other	100.0	100.0			8.5	10.1	8.3
DT25	345592	165597	Kerbside	92.6	92.6					12.8
DT26	345507	165538	Kerbside	100.0	100.0					14.5

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.

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**.

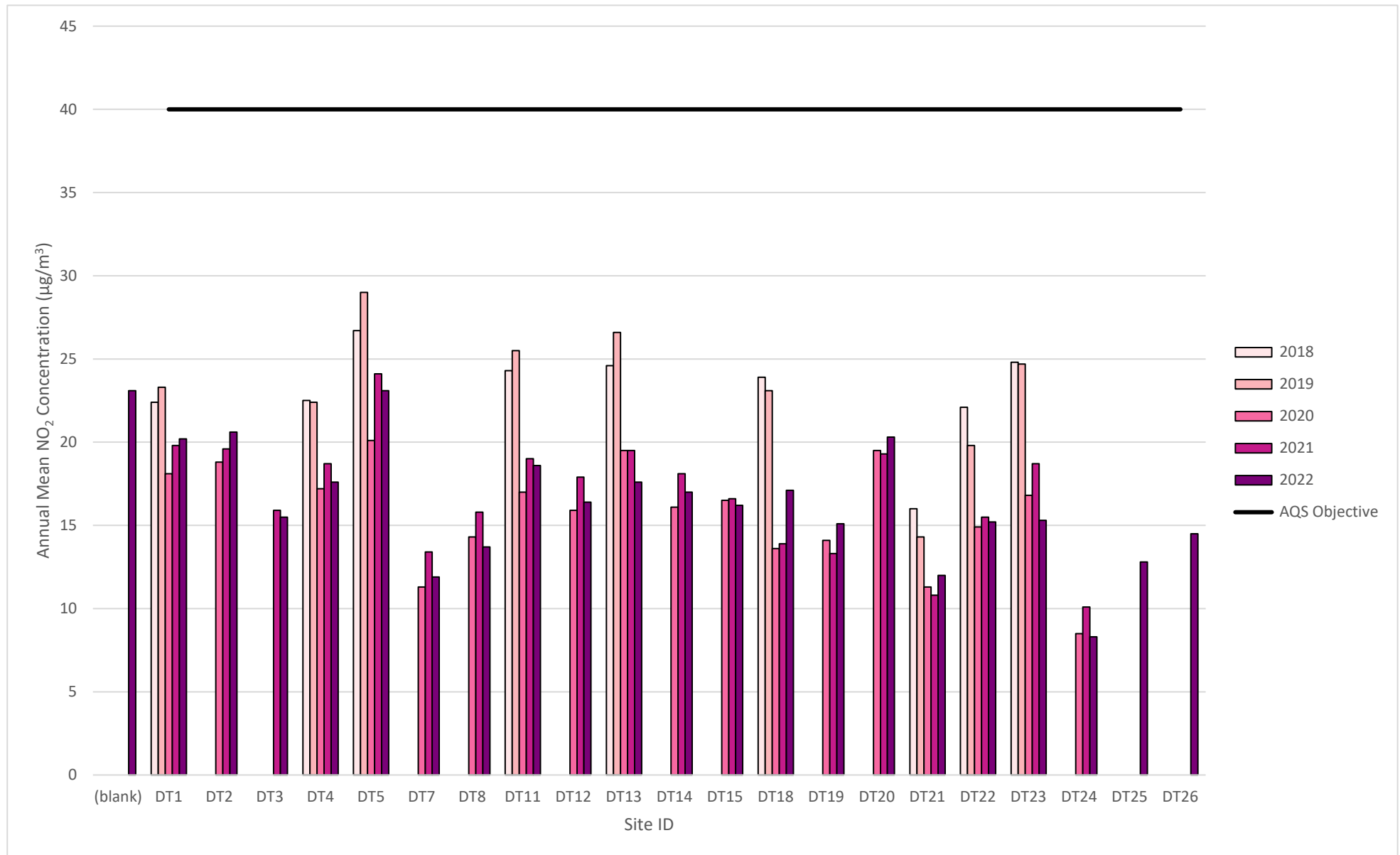
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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



Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO₂ 2022 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT1	332653	160737	36.0	12.6	28.3	23.0	15.6	15.6	19.9	25.8	23.4	22.7	22.2	41.7	24.3	20.2	-	
DT2	333515	160069	36.5	15.5	32.0	23.3	18.2	16.5	19.6	24.4		25.5	23.2	35.5	24.8	20.6	-	
DT3	335489	162434	31.6	20.7	22.8	15.7	13.5	12.5	15.2	14.8	15.1	17.0	19.7	25.5	18.7	15.5	-	
DT4	339753	164204	29.8	17.6	23.8	20.6	18.0	17.4	16.8	21.2	20.4	20.4	20.7	26.5	21.2	17.6	-	
DT5	343662	163860	37.0	25.3	31.1	25.9	23.3	23.7	27.6	28.4	27.9	26.1	29.8	28.8	27.8	23.1	-	
DT7	339878	170252	9.7	8.7	23.1	14.4	10.2	9.5	12.9	18.0	15.5	12.2	12.5	23.2	14.4	11.9	-	
DT8	347054	175534	29.9	12.7	21.4	17.6	13.5	12.0	15.9	17.8	17.1	16.6	19.3	6.7	16.5	13.7	-	
DT11	353177	174620	28.4	18.8	25.1	19.2	20.6	18.8	24.1	21.4	21.6	24.1	24.3	23.1	22.4	18.6	-	
DT12	353544	170088	31.0	17.9	24.0	18.1	16.4	16.4	18.6	17.3	18.2	15.9	20.0	23.6	19.7	16.4	-	
DT13	350773	169334	31.6	23.3	26.1	17.7	20.3	15.0	19.8	20.3	19.2	18.3	23.3	21.8	21.2	17.6	-	
DT14	348941	171877	31.9	18.0	25.8	21.5	15.9	14.8	20.8	18.5	19.5	15.8	17.4	24.7	20.4	17.0	-	
DT15	347641	170943	34.7	15.1	25.2	16.0	13.8	19.0	13.9	15.6	17.0	17.5	19.0	26.6	19.5	16.2	-	
DT18	351054	165665	28.2	11.8	24.0	19.5	19.4	13.1	19.7	22.5	20.4	24.4	21.4	22.1	20.6	17.1	-	
DT19	353978	165103	25.4	13.8	19.2	16.7	12.6	28.3	15.7	17.5	17.1	16.2	16.9	19.6	18.2	15.1	-	
DT20	351391	165698		16.3	19.2	24.8	26.7	10.0	30.4	32.0	28.4	27.6	22.9	28.8	24.5	20.3	-	
DT21	342603	159682	21.6	9.8	18.0	13.9	9.2	15.5	11.5	14.3	13.1	13.0	13.0	18.9	14.4	12.0	-	
DT22	342603	159682	23.5	12.9		19.0	14.3	13.2	17.7	19.7	20.5	17.1	19.4	22.4	18.3	15.2	-	
DT23	339802	159151	36.5			16.3	14.6	6.1	15.8	16.4	17.0	18.6	21.8	21.5	18.4	15.3	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT24 A	339838	159166	17.7	8.2	11.3	8.3	6.2	5.9	6.7	7.7	8.5	10.0	11.5	14.7	-	-	-	Triplicate Site with DT24A, DT24B and DT24C - Annual data provided for DT24C only
DT24 B	339838	159166	20.1	7.9	11.9	8.0	6.4	5.9	6.8	7.6	8.0	9.3	12.0	15.5	-	-	-	Triplicate Site with DT24A, DT24B and DT24C - Annual data provided for DT24C only
DT24 C	339838	159166	19.1	8.7	11.5	8.6	6.4		6.9	7.7	8.6	9.7	11.2	15.5	10.0	8.3	-	Triplicate Site with DT24A, DT24B and DT24C - Annual data provided for DT24C only
DT25	345592	165597	22.8		19.8	13.3	13.5	11.7	13.0	14.9	13.4	13.6	16.2	18.7	15.5	12.8	-	
DT26	345507	165538	22.3	12.8	18.7	18.8	18.3	15.0	17.1	20.2	18.6	14.2	14.3	19.5	17.5	14.5	-	

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

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.

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 Somerset confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within North Somerset Council During 2022

North Somerset Council has not identified any new sources relating to air quality within the reporting year of 2022.

Additional Air Quality Works Undertaken by North Somerset Council During 2022

North Somerset Council has not undertaken additional air quality works during 2022.

QA/QC of Diffusion Tube Monitoring

In 2022, North Somerset Council's diffusion tubes were supplied and analysed by Gradko International Ltd., using the 20% Triethanolamine (TEA) in water preparation method. Gradko's laboratory is UKAS accredited, participating in the [AIR-PT Scheme](#) (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO₂ tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. In the latest available AIR-PT results, AIR PT AR042 (January – June 2022), Gradko scored 100%. No results have been published for the rest of 2022 at the time of writing. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$, which indicates satisfactory laboratory performance.

The precision of the current 27 local authority co-location studies in 2022 which use tubes supplied by Gradko with the 20% TEA in water preparation method were rated as 'good', as shown by the [precision summary results](#). This precision reflects the laboratory's performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Tubes are considered to have a "good"

precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more monitoring periods during a year is less than 20%.

Further information on the precision summary results can be found on the [LAQM website](#).

It is noted that diffusion tube monitoring dates do not coincide with the [Diffusion Tube Monitoring Calendar](#) for a number of months during the 2022 survey period. As such, there is a degree of uncertainty surrounding the monitoring results provided. Table C.1 Diffusion Tubes exposure dates in North Somerset Council during 2022 below shows the actual diffusion tube deployment dates

Table C.1 Diffusion Tubes exposure dates in North Somerset Council during 2022

Monitoring Month	Tube Colocation Date	Tube Extraction Date
Jan	04/01/2022	01/02/2022
Feb	01/02/2022	28/02/2022
Mar	28/02/2022	28/03/2022
Apr	28/03/2022	09/05/2022
May	09/05/2022	06/06/2022
Jun	06/06/2022	05/07/2022
Jul	05/07/2022	02/08/2022
Aug	02/08/2022	30/08/2022
Sep	30/08/2022	26/09/2022
Oct	26/09/2022	31/10/2022
Nov	31/10/2022	28/11/2022
Dec	28/11/2022	04/01/2023

Diffusion Tube Annualisation

As per [LAQM.TG\(22\)](#), annualisation is required for any site with data capture less than 75% but greater than 25%. All monitoring sites within North Somerset had more than 75% of data capture during 2022, consequently, no site required annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂

continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

North Somerset Council have applied a national bias adjustment factor of 0.83 to the 2022 monitoring data. A summary of bias adjustment factors used by North Somerset Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.83
2021	National	03/22	0.84
2020	National	03/21	0.93
2019	National	03/20	0.93
2018	National	03/19	0.89

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website.

No diffusion tube NO₂ monitoring locations within North Somerset required distance correction during 2022.

Appendix D: Maps of Monitoring Locations

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

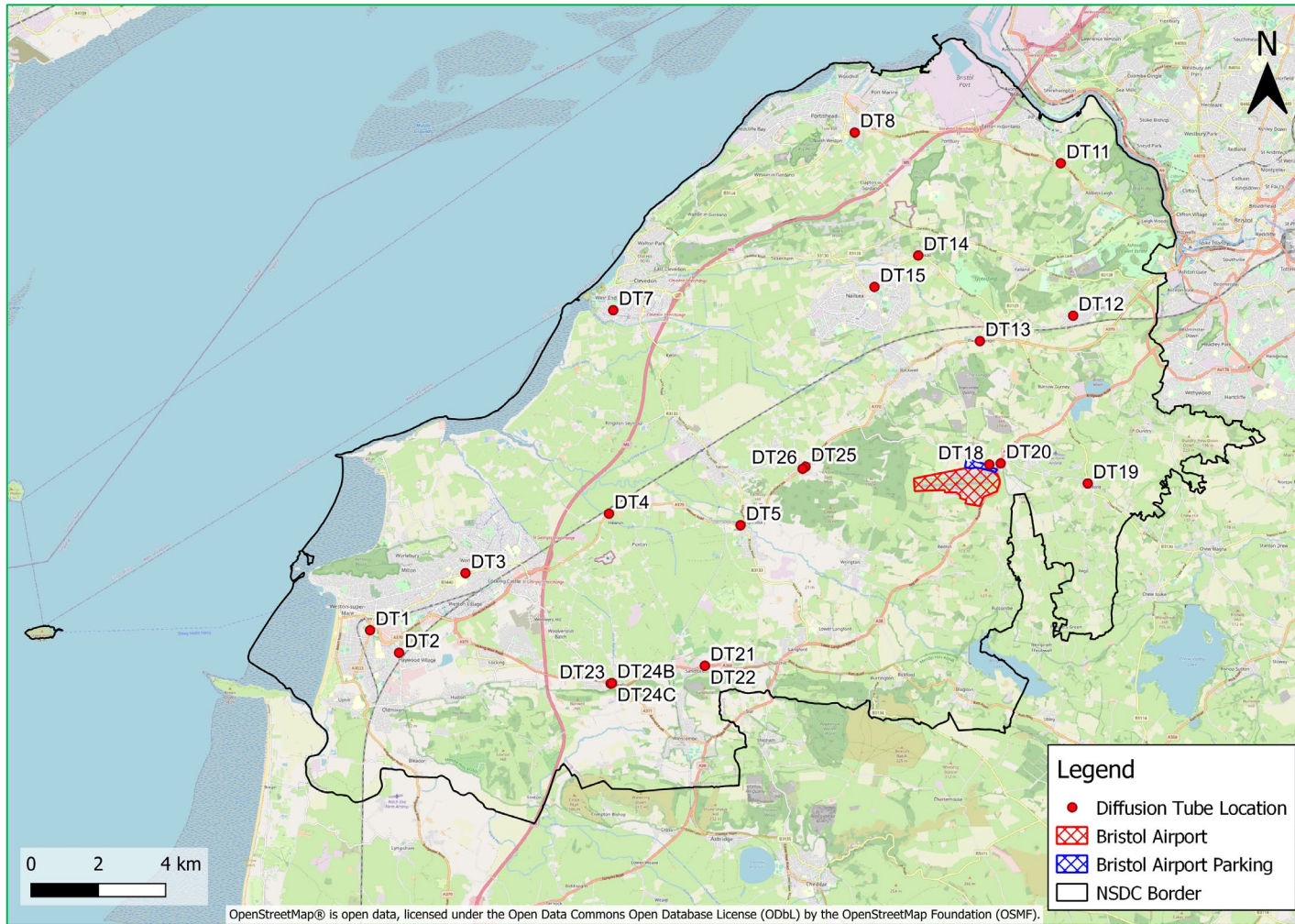


Figure D.2 – Map of DT1 Monitoring Site

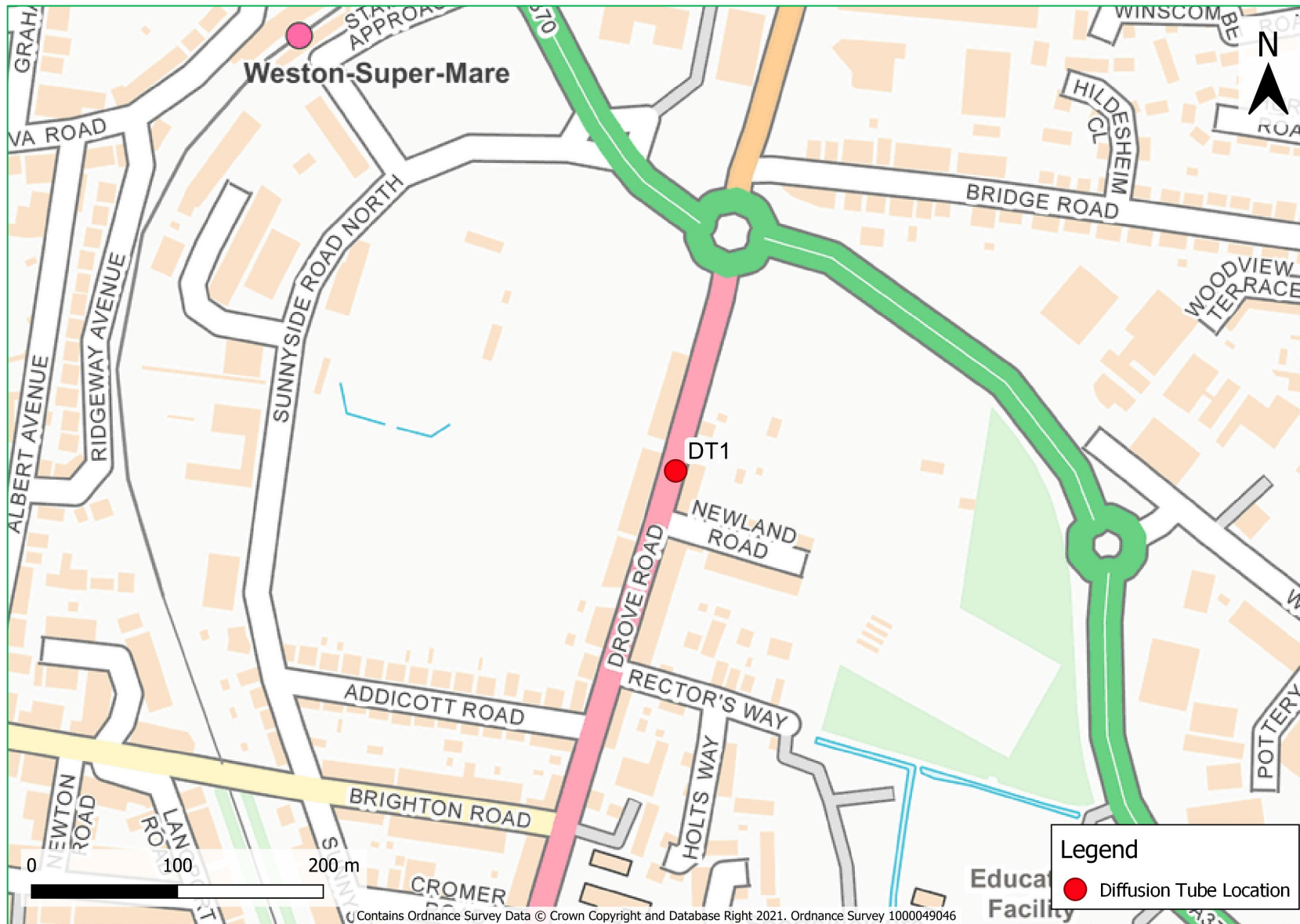


Figure D.3 – Map of DT2 Monitoring Site

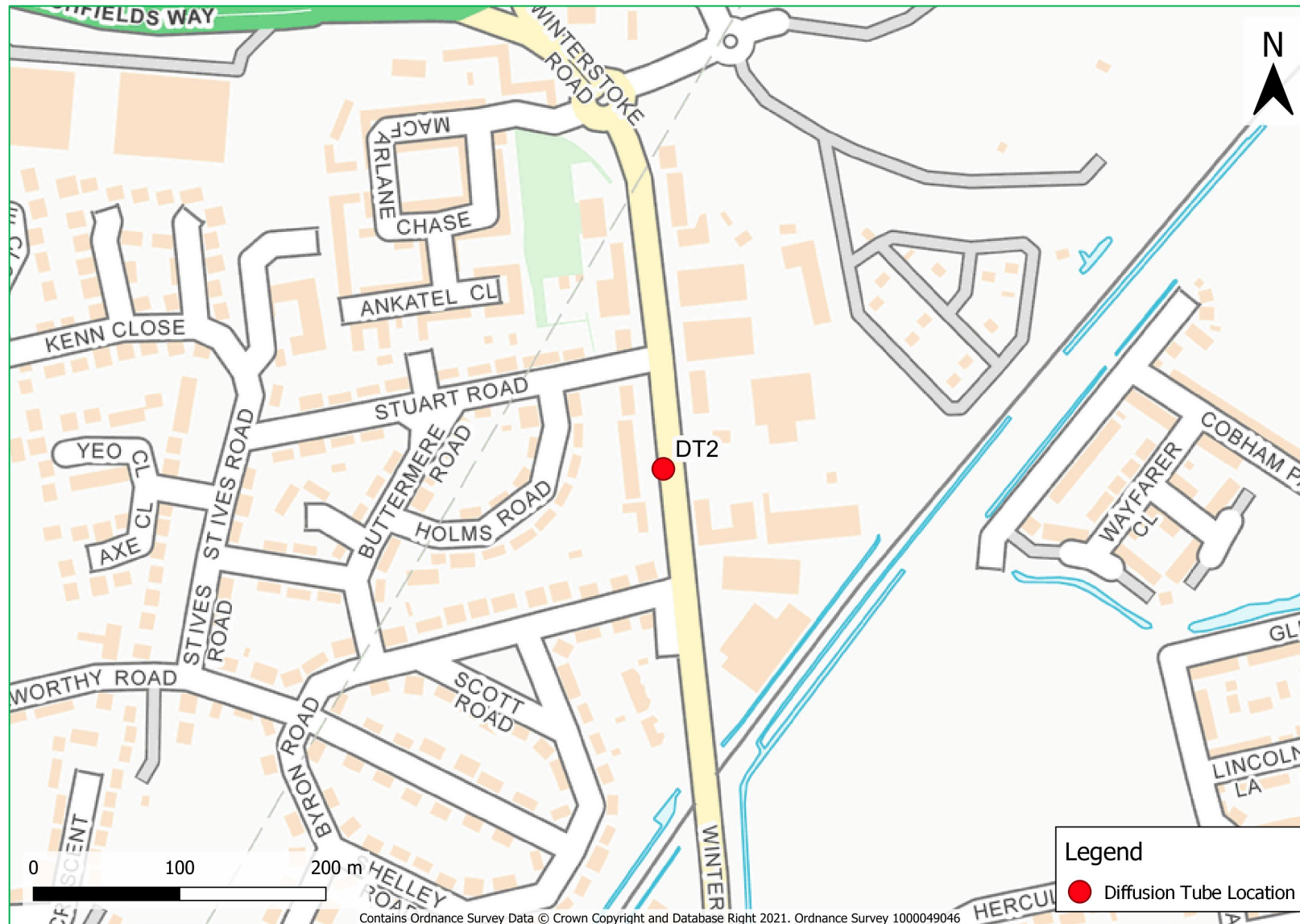


Figure D.4 – Map of DT3 Monitoring Site

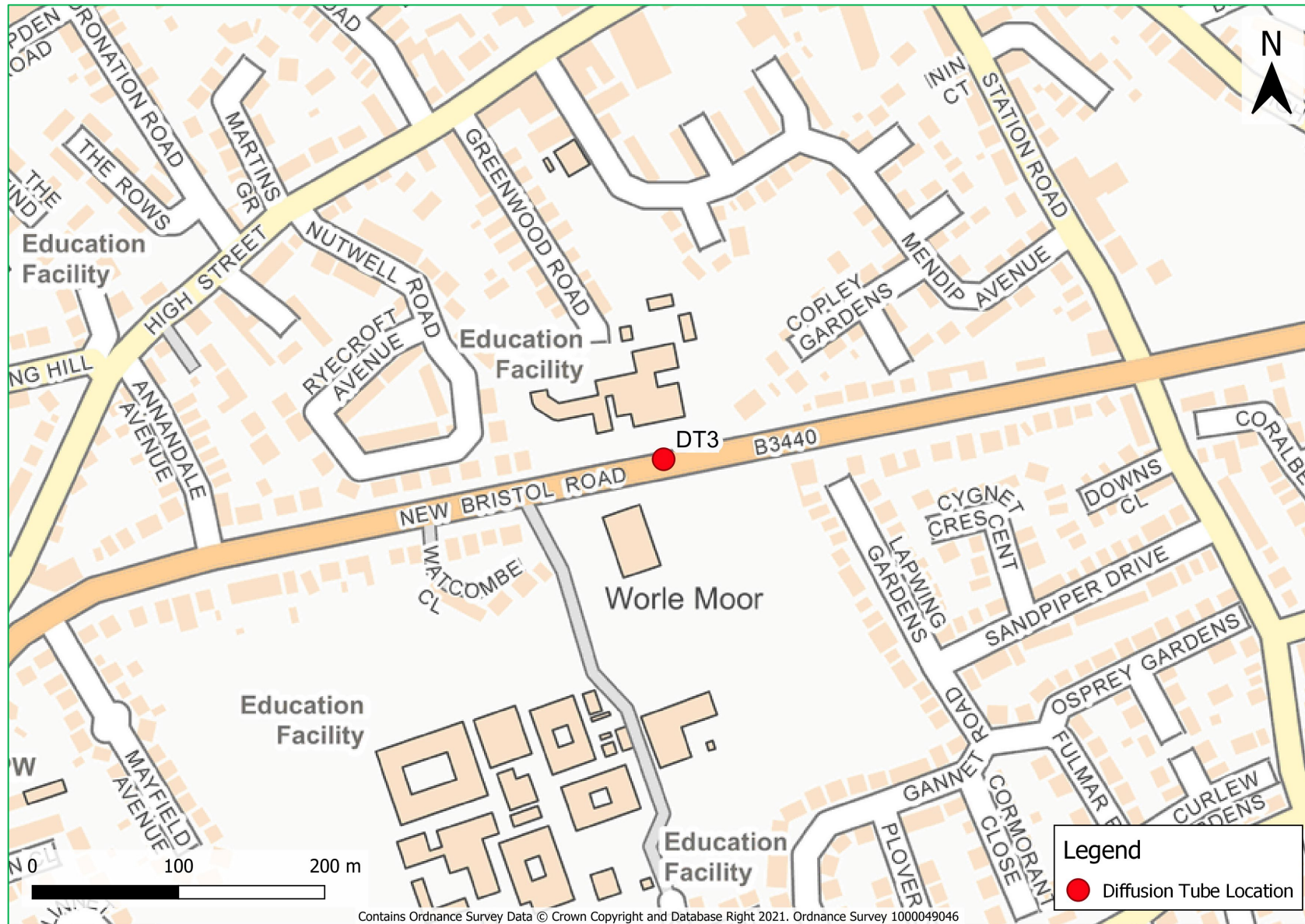


Figure D.5 – Map of DT4 Monitoring Site



Figure D.6 – Map of DT5 Monitoring Site

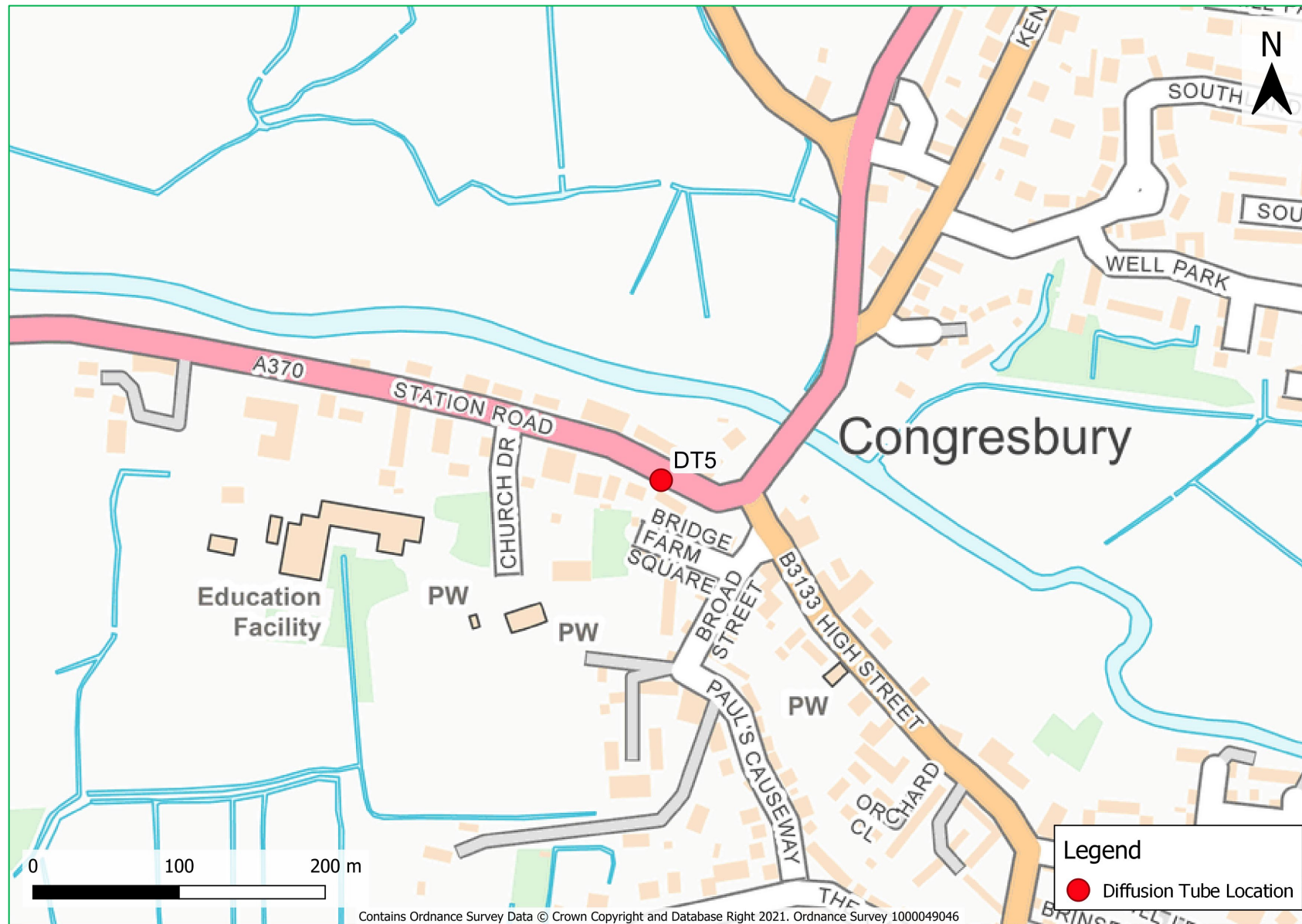


Figure D.7 – Map of DT8 Monitoring Site



Figure D.8 – Map of DT11 Monitoring Site

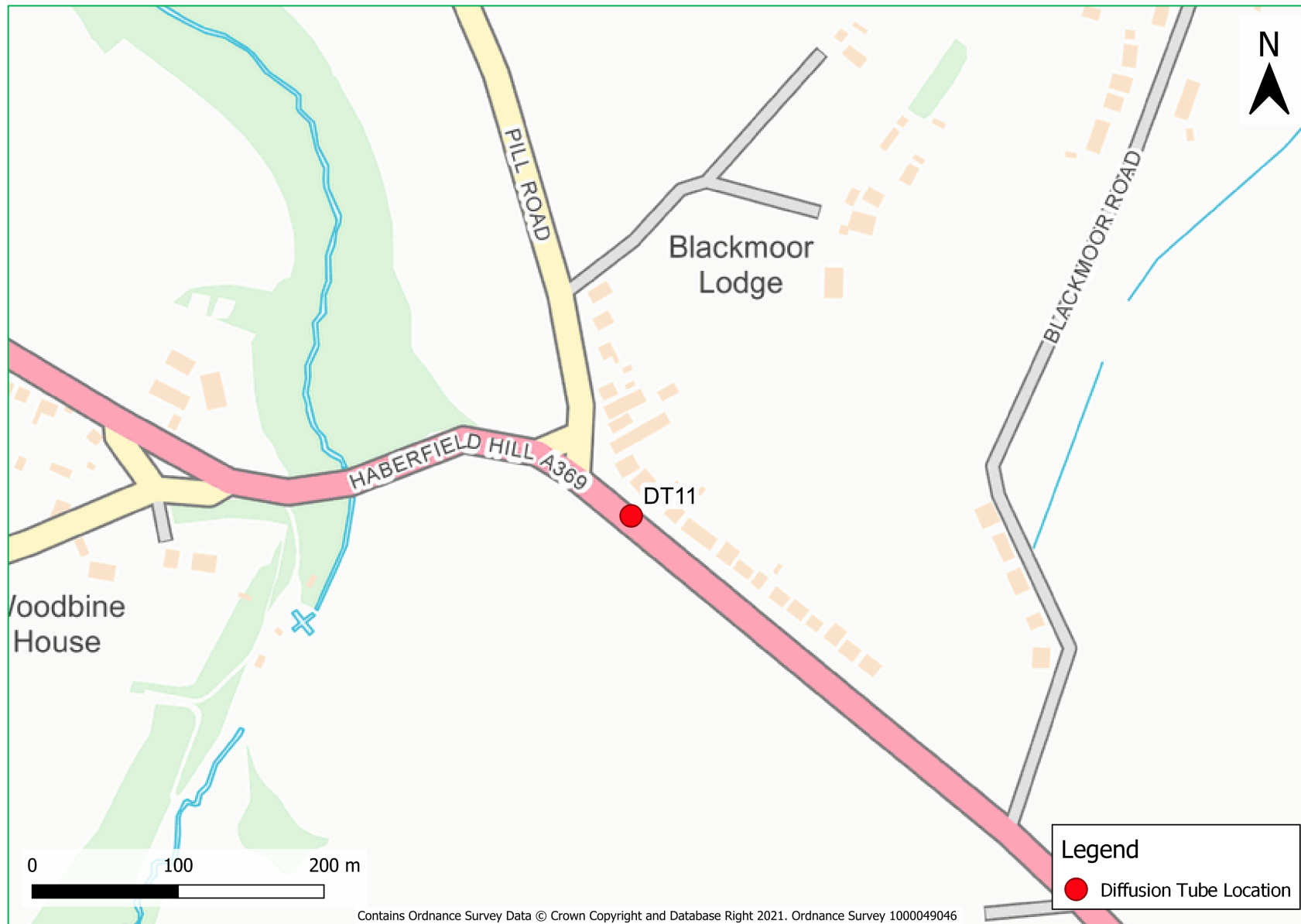


Figure D.9 – Map of DT12 Monitoring Site

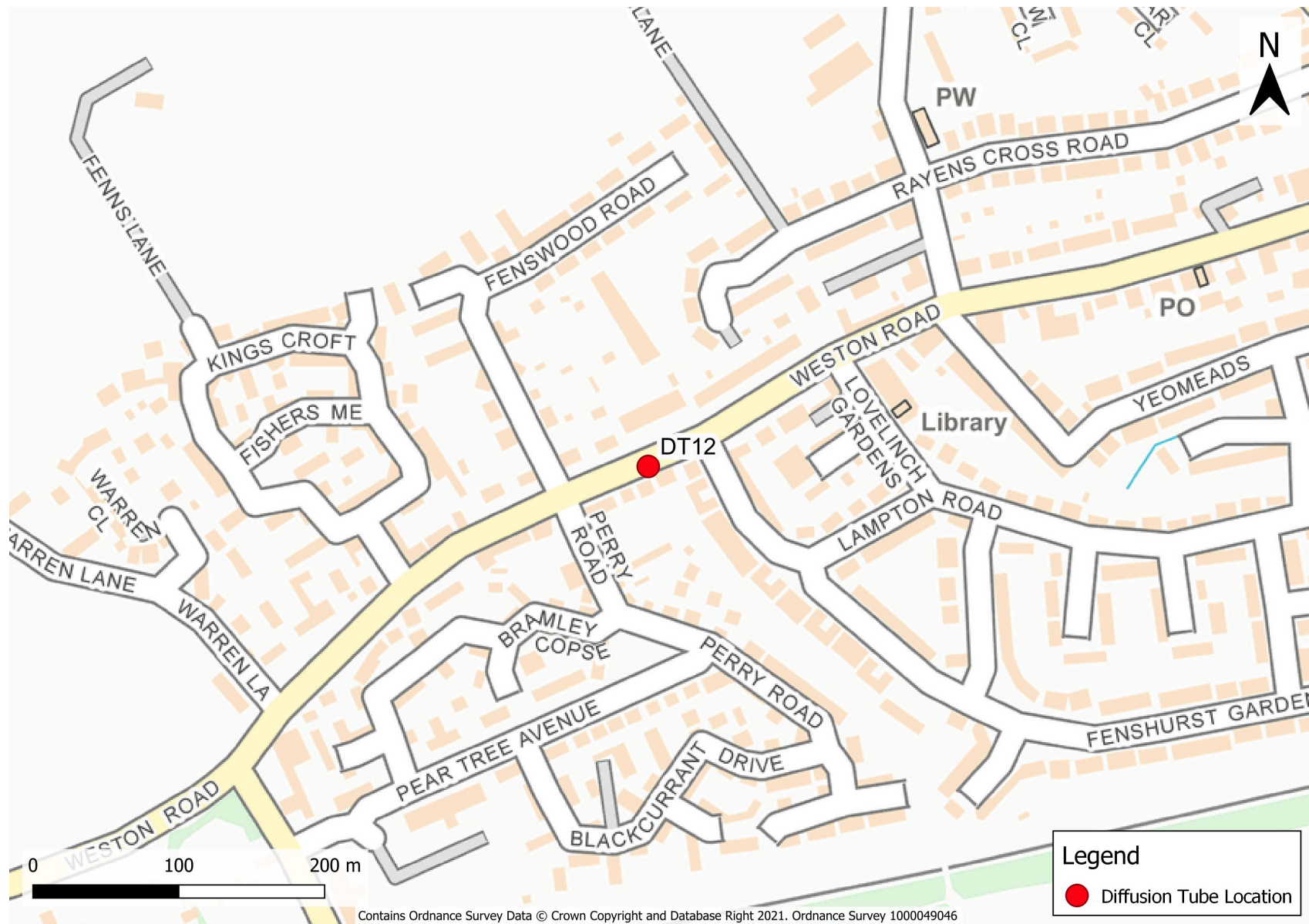


Figure D.10 – Map of DT13 Monitoring Site

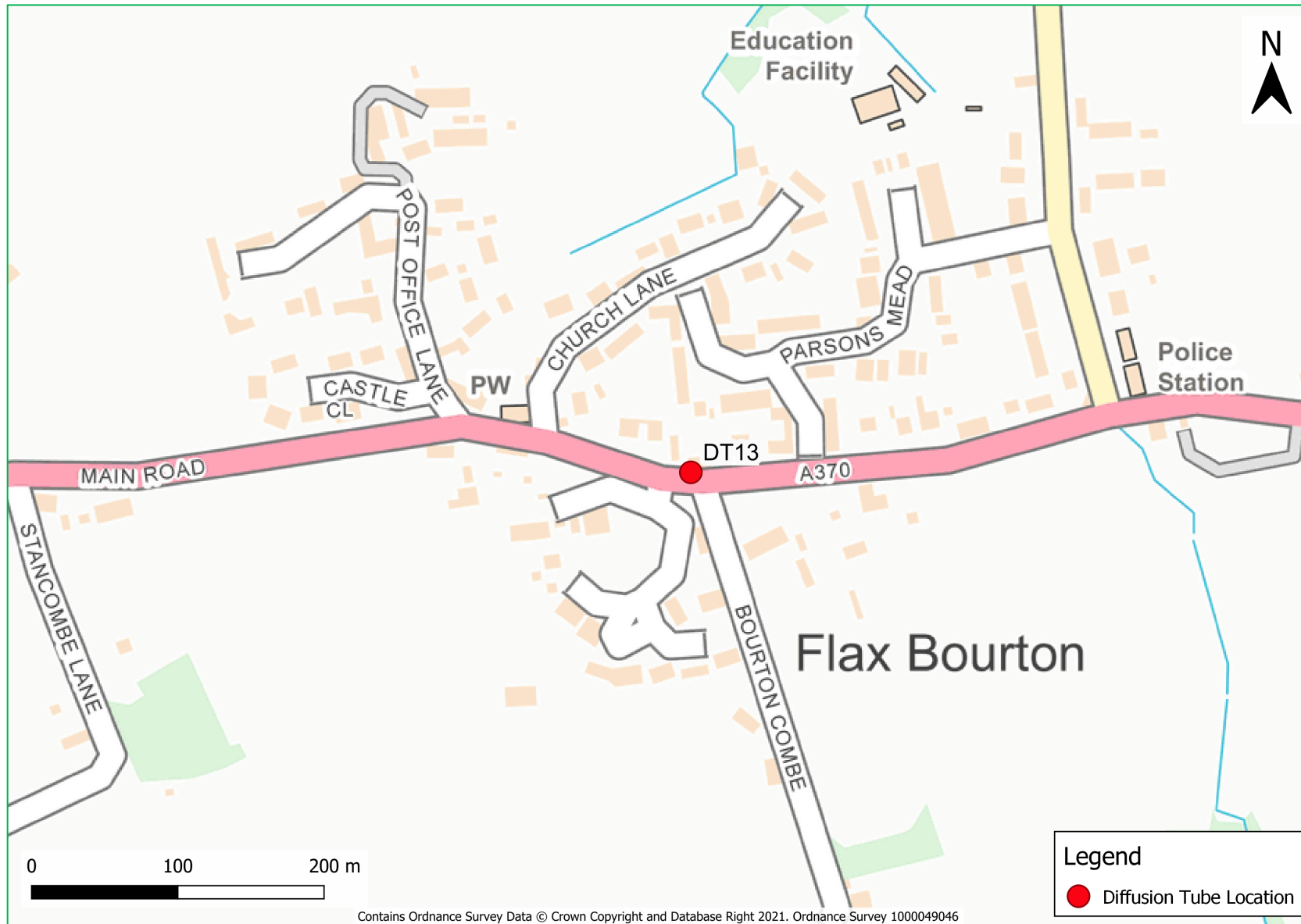


Figure D.11 – Map of DT14 Monitoring Site



Figure D.12 – Map of DT15 Monitoring Site



Figure D.14 – Map of DT18 and DT20 Monitoring Sites

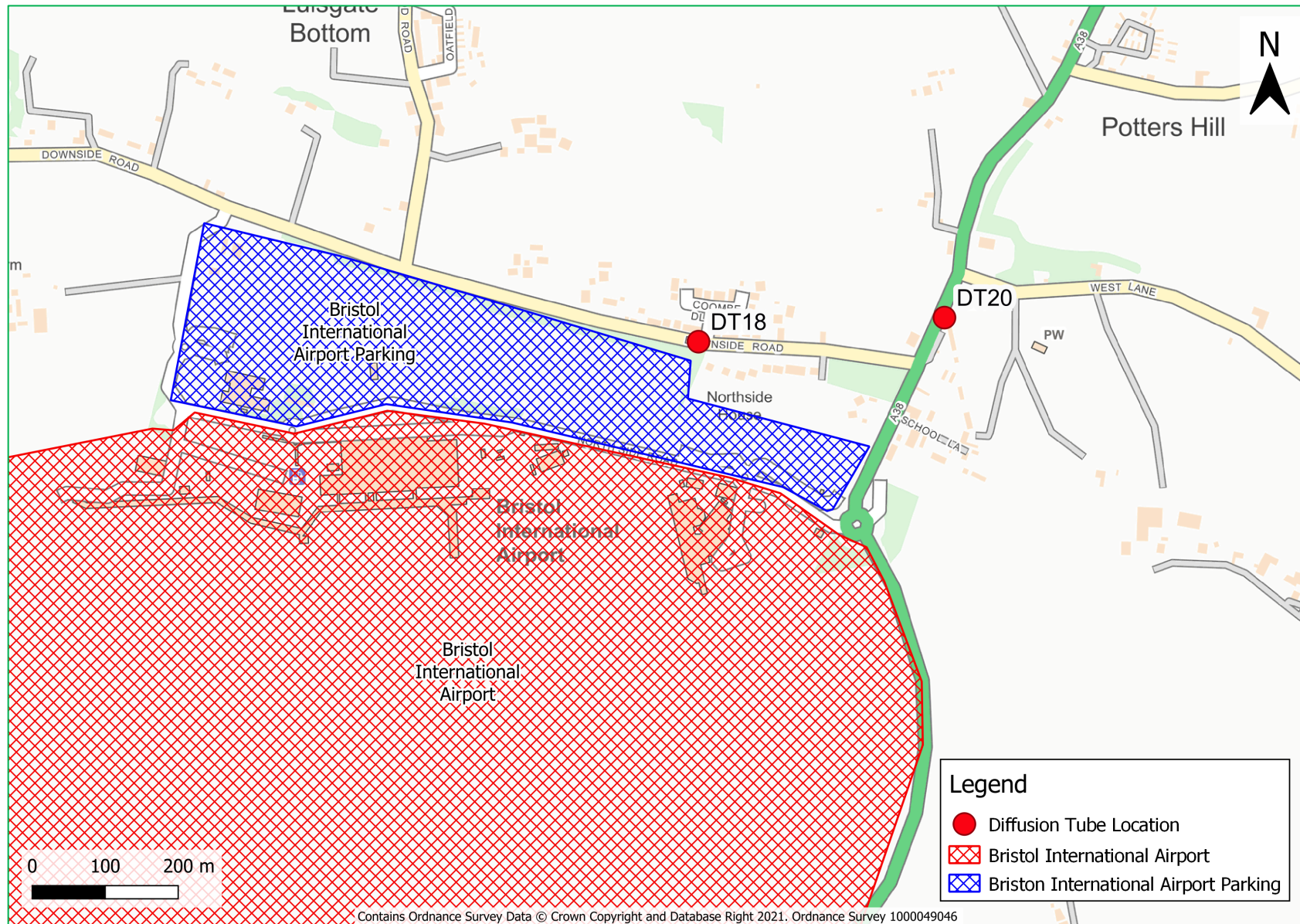


Figure D.15 – Map of DT19 Monitoring Site



Figure D.16 – Map of DT21 and DT22 Monitoring Sites



Figure D.17 – Map of DT23 and DT24 Monitoring Sites

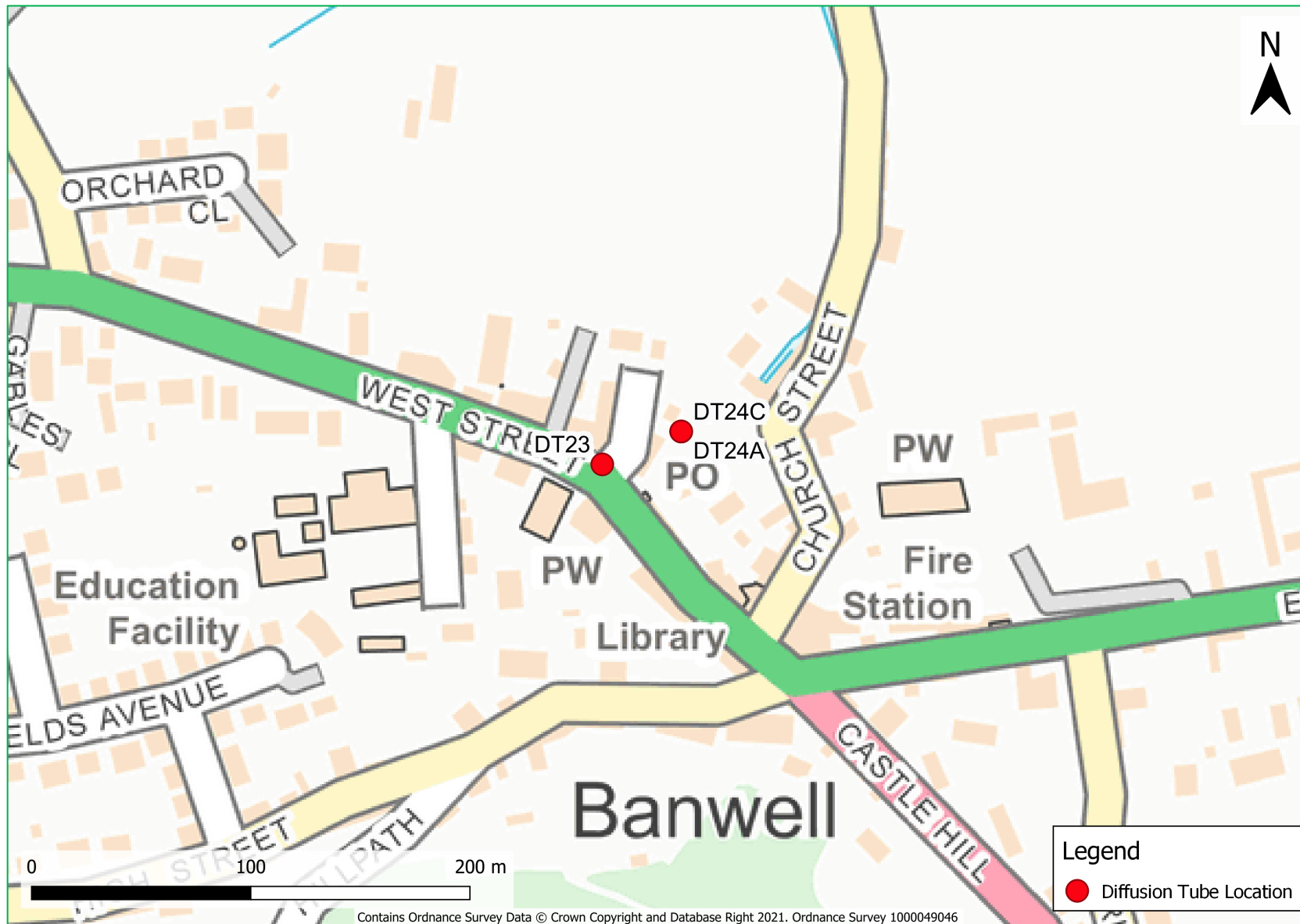


Figure D.18 – Map of DT25 and DT26 Monitoring Sites

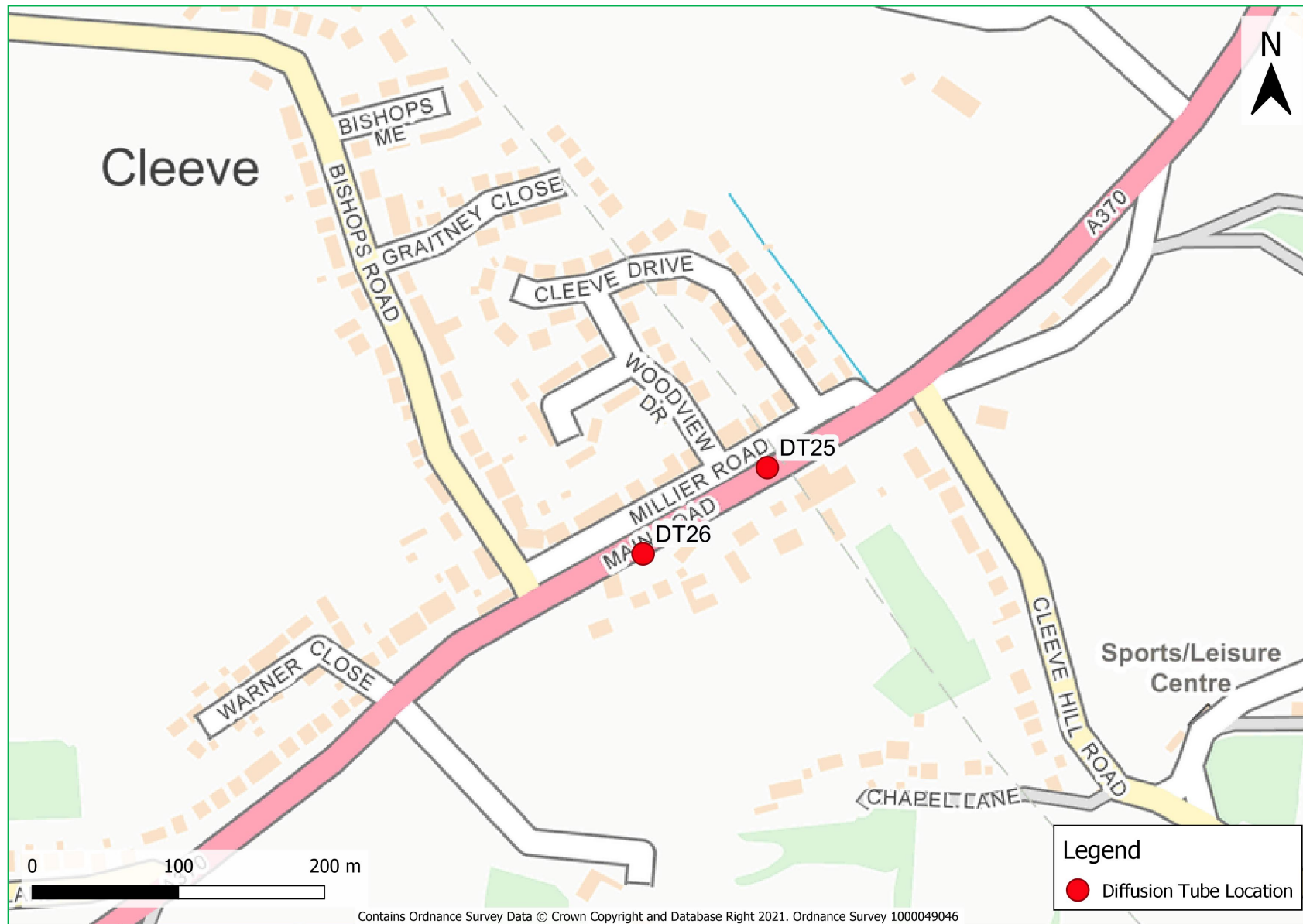


Figure D.19 – Bristol Airport Monitoring Locations



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England¹⁸

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

¹⁸ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NSC	North Somerset Council
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.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 03/23. Published in March 2023.
- North Somerset Council Air Quality Reports – 2019, 2020, 2021, 2022 ASRs. Available at: <https://n-somerset.gov.uk/my-services/nuisances-pollution-environmental-issues/pollution-nuisances/air-quality>