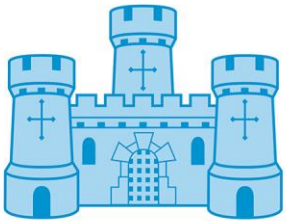

NEWCASTLE·UNDER·LYME
BOROUGH COUNCIL

2024 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: September 2024

Information	Newcastle-under-Lyme Borough Council Details
Local Authority Officer	Environmental Protection Team Business Manager
Department	Regulatory Services
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Report Reference Number	LAQM/ASR2024
Date	September 2024

Endorsement from the Director of Health & Care, Staffordshire County Council.

Staffordshire County Council (SCC) is committed to working with partners to ensure that Staffordshire will be a place where improved health and wellbeing is experienced by all. Poor air quality has a negative impact on public health, with potentially serious consequences for individuals, families, and communities. Identifying problem areas and ensuring that actions are taken to improve air quality forms an important element in protecting the health and wellbeing of Staffordshire residents. Improving air quality is often a complex issue, presenting a multi-agency challenge – so it is essential that all agencies work together effectively to deliver improvements where they are needed.

As Director of Health and Care across Staffordshire I endorse this Annual Status Report which sets out the position in all the Local Authorities across Staffordshire and Stoke-on-Trent focusing on human made pollution with particulate matter.

The Air Aware project (phase 2) ran until March 2023 with Defra funding; however, The Air Aware project continues with joint funding from SCC Public Health and Connectivity Teams to March 2025. The project delivers behaviour change to increase active travel, decrease car use, and raise awareness of air quality issues through five elements. These are business and school engagement, communications and campaigns, electric vehicles, and air quality monitoring in targeted locations. Campaigns include Anti-Idling, walking and cycle activities and Clean Air Day. These have been countywide engaging a large number of businesses and schools. The programme focuses on reducing levels of NO and PM, which are monitored at key locations.

A number of the Staffordshire Authorities are currently involved in implementing measures to reduce levels of NO_2 within their areas, which are detailed elsewhere in their ASR. Since the update of the Environment Act 2021 there is now a statutory duty imposed on Local Authorities in England to reduce $PM_{2.5}$, a number of the measures are complementary with those being undertaken to improve Air Quality. A mapping exercise completed by the Staffordshire Air Quality Forum members details the measures currently in place which are considered to have an impact in reducing $PM_{2.5}$ within the County.

Post Covid the Staffordshire and Stoke-on-Trent (SOT) Air Quality Forum has recommenced meeting on a quarterly basis. This forum involves all the Districts and Boroughs and both SCC and SOT and is chaired on a rotating basis across the Districts and Borough's.

In addition, Levelling Up Fund 2 Schemes will improve a number of major roads around the county, reduce journey times, put greener, cleaner buses on main roads, improve walking and cycling routes and reduce the impact of housing and commercial developments. They will benefit East Staffordshire, Cannock Chase, and Stafford Borough. Total package cost circa £20m.

Finally, it's worth mentioning both Climate Change and The Local Transport Plan 4 (LTP4). SCC have signed up to the Climate Emergency and since signing up have reduced its Carbon footprint by 50%. We are now also now working towards LTP4, with our Local Authority partners. LTP4 will come into effect in 2025 and will have a positive effect on Air Quality over the coming years.

Dr Richard Harling

Director of Health and Care
Staffordshire County Council
[June 2024]

Executive Summary: Air Quality in Our Area

Air Quality in Newcastle under Lyme

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year[1].

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution[2].

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

[1] UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

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

The Borough of Newcastle under Lyme is in North Staffordshire, with the town of Newcastle being the major urban area, together with the smaller town of Kidsgrove. Covering an area of 21,096 hectares (81 square miles) the Borough has a population of 129,600. The Borough is in a strategic location between roads running north from London to Carlisle, and west to Chester. Two major trunk roads pass through the Borough, along with a number of major roads which converge on the two main towns of Newcastle, and Kidsgrove.

- The M6, which is currently one of the most heavily trafficked and congested roads in the country.
- The A500, a major road linking Newcastle under Lyme and Stoke on Trent with junctions 15 and 16 of the M6. These motorway junctions are adjacent to the Borough's boundary and so contribute to traffic congestion in the area.
- A34, A52, A525, A523 and A53 pass through Newcastle.
- A50, A5011 and A34 pass through Kidsgrove.

A high proportion of traffic travels into/through the Air Quality Management Areas (AQMAs) within the Borough which have been declared for Nitrogen dioxide (NO_2). In January 2023 (i.e. the starting point of this Status Report), these were:

- AQMA 1: Liverpool Road, Kidsgrove
- AQMA 2: Newcastle-under-Lyme Town Centre
- AQMA 3: Maybank-Wolstanton-Porthill
  AQMA 4: Little Madeley

Road traffic is the most significant source of pollution to the Borough; however, other sources include industrial and domestic emissions. Certain industries (Permitted Processes) are regulated by the Borough Council in accordance with the Environmental Permitting (England and Wales) Regulations 2016 [3]. Currently there are 43 Part B

[3] The Environmental Permitting (England and Wales) Regulations 2016 (legislation.gov.uk)

processes and 3 Part A2 processes within the Borough. The Environmental Permits for processes regulated by the Borough Council can be found on the Public Register [(4)].

The Environment Agency is responsible for the regulation of Part A1 processes, also under the Environmental Permitting (England and Wales) Regulations 2016. One Part A1 process within the borough is a landfill. Over the past 4 years, intensive work has been carried out by the Borough in conjunction with the Environment Agency, UK Health Security Agency, and Staffordshire County Council Public Health, to investigate complaints concerning gaseous emissions from this landfill, situated approximately 1.3 kilometres outside of AQMA 2: Newcastle-under-Lyme Town Centre.[5] The Environmental Permits for other activities regulated by the Environment Agency can be found on their Public Register [(6)].

Complaints relating to odours from this landfill have been received from properties across the Borough. Although methane is the primary component of landfill gas, a number of other compounds, including nitric oxides are associated with the breakdown of waste substances. This site is of significant local concern but is largely out of the scope of this report. Regular updates on this issue are provided on the Borough Council website.

Mobile monitoring stations (MMF) have been established to continuously monitor air quality in the proximity of this installation. The MMF have the capability to monitor some of the pollutant species relevant to Local Air Quality Management, notably NO_2, SO_2, PM_{10}, $PM_{2.5}$ and benzene. The MMF are managed and operated by the Environment Agency national air quality team and the data from these stations is available via a dedicated Air Quality webpage.

The MMF are not intended to produce data relevant to the Local Air Quality Management process and therefore they are not discussed any further in this Annual Status Report. Nevertheless, it is noted that the content on the dedicated webpage includes the comment that *the monitoring results for particulate matter, nitrogen dioxide and sulphur dioxide were below UK air quality objectives. Levels of benzene, toluene, ethylbenzene and xylene were below health-based guidance values.*

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[4] https://www.newcastle-staffs.gov.uk/protection/environmental-permit

[5] https://consult.environment-agency.gov.uk/west-midlands/walleys-quarry-landfill-sliverdale/

[6] Public registers (data.gov.uk)

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 Plan[7] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant of most harm to human health. The Air Quality Strategy[8] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero[9] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel, and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

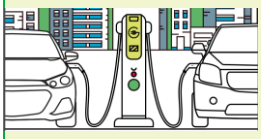
Table 1.1 - Local actions to improve air quality achieved in 2023.

PROJECT	ACTION	OUTCOME/ IMPACT
 **Ministerial Direction number 1. Mandating compliance with the EU's NO_2 annual mean limit value (which applies to the majority of areas which are publicly accessible) in the**	An options appraisal to achieve compliance with the EU's NO_2 annual mean limit value identified that a traffic management scheme involving bus gate restrictions at peak times of the day would achieve compliance in the shortest possible time when compared to a benchmark Clean Air Zone. This has been	An assessment of an alternative scheme to the originally proposed bus gate is in the process of being reviewed for effectiveness to comply with the Ministerial Direction. Subject to approval a full business case will be prepared for submission to the Defra minister in 2024. If accepted, it is anticipated that

[7] Defra. Environmental Improvement Plan 2023, January 2023

[8] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

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

PROJECT	ACTION	OUTCOME/ IMPACT
shortest possible time for the A53 from Basford Bank to Victoria Street	further reviewed to identify non traffic related alternative schemes with measures in the neighbouring city of Stoke on Trent form the basis of the North Staffordshire Local Air Quality Plan	the measures will be in place early in 2025. For up-to-date information on progress with the associated North Staffordshire Local Air Quality Plan Click here
 **Low / zero emission taxi infrastructure charging scheme**	Sites are operational and available for public use.	RAPID off-street EV Charging Infrastructure has been installed at four locations across the Borough. A total of 10 charging stations have been provided for use by the licensed taxi trade and general public. Drivers are also able to access delivery partner sites in the Stafford Borough and Stoke-on-Trent City Council areas under this joint project. It is planned to engage with the licensed taxi trade to show the business case and to demonstrate how EV can work successfully for them. For further information Click here
Air Aware' initiative	In progress. This project is being delivered by Staffordshire County Council with the support of District Councils.	For further information Click here
Walley's Quarry Landfill – NULBC and EA joint air	A network of air quality monitoring stations, part funded by the Borough Council, is in operation	Data, provided to UKHSA by the EA up to the end of 2023, have been compared to appropriate health-based air quality

PROJECT	ACTION	OUTCOME/ IMPACT
quality monitoring[10] 	around Walley's Quarry landfill in Silverdale. This follows significant complaints of odour. The monitored pollutants are hydrogen sulphide, methane, oxides of nitrogen, sulphur dioxide and different particulate matter size fractions (Total Suspended Particulate (TSP), PM_{10} and $PM_{2.5}$). The hydrogen sulphide data is compared against the World Health Organisation (WHO) guideline values for both odour annoyance and potential health impacts.	guidelines and standards or assessment levels for hydrogen sulphide, particulate matter, nitrogen dioxide, sulphur dioxide, methane and volatile organic compounds (VOCs comprising benzene, toluene, ethylbenzene and xylene (BTEX)). It should be noted that the three MMFs monitor the ambient air in the locality and not exclusively the emissions from the landfill site. Monitoring data is compared to the odour annoyance guideline and odour detection thresholds respectively.
Fixed penalty powers for smoke control area offences	The Council's Licensing & Public Protection Committee received a report on the revised statutory procedure relating to smoke control offences. The Committee has approved the recommended approach and policy on enforcement in smoke control areas.	Officers are now able to use the graduated enforcement provisions intended to secure compliance with Smoke Control Area requirements within the Borough.
Consultation on revocation of the current Smoke	Following the latest guidance from DEFRA concerning smoke control, the Borough	A report is to be presented to the Council's Public Protection Committee in 2024/5 with

[10] https://consult.environment-agency.gov.uk/west-midlands/walleys-quarry-landfill-sliverdale/#section5

PROJECT	ACTION	OUTCOME/ IMPACT
Control Area and making of a new Borough wide Smoke Control Area	Council has consulted residents on making the whole of the Borough a formal Smoke Control Area.	recommendations on the way forward.

Conclusions and Priorities

Monitoring data for 2023 shows two exceedances of the annual mean objective for NO_2 concentrations at site DT76 (11 Brunswick Street Newcastle), 42.2 µg/m^3, and DT104, (7 King Street) 40.1 µg/m^3. However, these are not monitoring locations where the objective directly applies, given that they are positioned on the building facade of offices or other places of work where public exposure is short term.

The annual mean NO_2 concentrations were more than 10% below the annual mean objective at all other monitoring locations, with the exception of site DT94, where a concentration of 37.7 µg/m^3 was measured and N145, where a concentration of 39.5 µg/m^3 was measured.

DT94 has remained consistently below the Air Quality Objective since 2020.

N145 is on the A34 near the entrance to Beata Road. Monitoring at this site commenced in 2020 and will continue although it is not a relevant location for LAQM, having been established for other purposes.

Monitoring will continue across all areas of the Borough.

In addition to working to reduce and maintain NO_2 concentrations below the annual objective in all areas of the Borough, we will continue to assess planning applications to ensure that future developments and changes to the road networks across the Borough do not lead to an increase in the NO_2 concentration above the annual mean objective of 40µg/m^3. We will also continue to regulate installations to ensure that emission limits are not exceeded and also regulate of smoke control and waste burning to reduce impacts on local air quality.

Table 1.2 - 2023 Monitoring Conclusion Summary

	CONCLUSIONS	SUMMARY
1	Two exceedances within existing AQMAs	Two exceedances of the annual mean objective for NO_2 concentrations at building façades of offices or other places of work where members of the public do not have regular access, in AQMA2 at site DT76 (11 Brunswick Street Newcastle), 42.2 µg/m^3 and DT104, (7 King Street) 40.1 µg/m^3
2	Significant trends	**AQMA 1: Liverpool Road, Kidsgrove** – Results in 2023 were significantly lower than they were in 2019. However, five years of results >10% below the UK annual mean objective for NO_2 has not yet been achieved. In 2023 there was one site within 10% of the annual mean objective in the AQMA: See Figure A-1a for trends in monitoring data for the period 2018 to 2023 and **Figure D-3**, **Figure D-4** and **Figure D-5** for the monitoring locations and boundary of the AQMA. **AQMA 2: Newcastle-under-Lyme Town Centre** – All but one of the results in 2023 were lower than they were in 2019. Five years of results >10% below the UK objective has not yet been achieved. In 2023 there were two sites where the annual mean objective was exceeded. See **Figure D-10** and **Figure D-11** for the map of monitoring locations and the AQMA map and Figure A-1b for trends for the period 2018 to 2023.

3	Revocation of AQMA 4: Little Madeley	Monitoring data for the five years 2015 to 2022 showed concentrations below 36 µg/m³ (10% of the objective). This AQMA was therefore approved by Committee for revocation in 2023.
4	Revocation of AQMA 3: Maybank-Wolstanton-Porthill	NO_2 concentrations within this AQMA for years 2019 to 2023 have been below 36µg/m³ at all long-term monitoring sites. Following the appraisal of the 2023 ASR and advice obtained from DEFRA, the revocation process has now started for this AQMA. Public consultation is to be completed in 2024, prior to revocation being reviewed.
5	Exceedances of air quality objectives outside any existing AQMAs, which have led to the amendment or designation of a new AQMA	None identified in 2023
6	New developments which may impact upon air quality	New additional town deal funds and demolition of old council building freeing up area for major development, including a multi-storey carpark. Assessments of the development showed a modelled exceedance at a relevant location. The remainder of site to have an AQIA. Kidsgrove town centre is in receipt of town deal money to be used to upgrade rail station which may increase traffic through the AQMA. Existing monitoring will monitor impacts on AQ and identify additional exceedances.
7	Air Quality Action Plan update	Actions plans for the two AQMA's AQMA 1: Liverpool Road, Kidsgrove, AQMA 2: Newcastle-under-Lyme Town Centre will

		require updating following the revocation of AQMA 3: Maybank-Wolstanton-Porthill & AQMA 4: Little Madeley in 2023. Consultation on a 2024-2029 AQAP will commence in 2024.

Local Engagement and How to get Involved.

If residents and businesses reduce the amount of fuel and chemical products used, it will improve air quality. The following ways can help:

Commute

- Visit Air Aware Staffordshire which includes;
    - Bulletins for inspiration and information on ways and initiatives to reduce pollution from travelling,
    - Leaving the car at home one day a week.
    - Turning off car engines when vehicle is idle.
    - Consider car sharing your journey - further guidance can be found at https://liftshare.com/uk
    - Using a low/ zero carbon vehicle
    - Servicing vehicles to keep them running efficiently.
    - Working from home
    - Using public transport
    - Travel planning App's are available for most smart phones. Further details can be found at https://www.travelsmartapp.com/
    - Consider an electric vehicle.

School Run

- Walking or cycling to school is not only good for health but it will save on fuel costs and help reduce local air pollution. Further guidance can be found within Travel into School https://letstalk.staffordshire.gov.uk/active-school-travel

- Take turns with friends, neighbours, or family to drive or walk the children to school. Check whether your school has a travel plan.

Workplace energy, transport and infrastructure

Bespoke workplace travelling plans to support employees and employers to use more environmentally sustainable methods of travel into work and use of vehicles for work. For further information visit https://www.staffordshire.gov.uk/Business/Workplace-health/Active-travel-and-air-quality-in-the-workplace.aspx

Grants may be available to support your business in becoming more energy efficient and towards the purchase of cleaner vehicles and support with charging infrastructure. Further information can be found from the following and also your energy supplier.

https://www.gov.uk/government/organisations/office-for-low-emission-vehicles

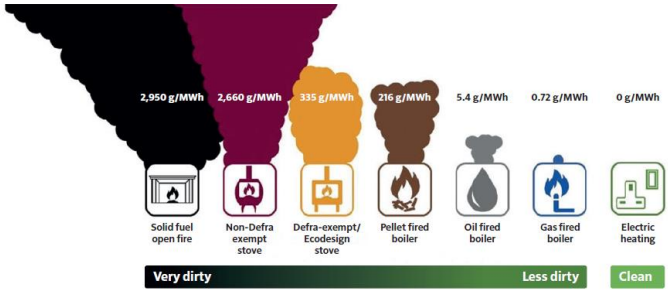
https://energysavingtrust.org.uk/

https://sben.co.uk/

Around The Home

- Use water-based or low solvent paints, glues, varnishes and wood preservatives, look for brands with a low VOC content.
- Make sure your home is well ventilated especially during DIY or cleaning.
- Have your central heating system checked regularly to avoid risking exposure to toxic carbon monoxide. Make sure you use a Gas Safe Registered engineer.
- Keep wood stoves and fireplaces well maintained, and make sure that wood burners are exempted for use in smoke control areas. Visit https://uk-air.defra.gov.uk/library/burnbetter/ for advice.

- ✓ Ready to use wood bought from a Woodsure Certified Supplier, will offer the following benefits:
  - Dry, Ready to Burn wood/logs & briquettes make any appliance more efficient. Look for the Woodsure logo.
  - Burning dry wood instead of wet wood is part of the solution to reducing the impact on our environment.
  - Burning wet wood increases emissions and has a greater impact on air quality.
  - Any appliance and chimney system will suffer from smoke produced from wet wood, which increases maintenance and repair requirements, making it harder for chimney sweeps to keep systems in safe, effective condition.



Note: The air pollution emissions will also depend on the age of the appliance, how it is maintained and used and the fuel burned (for example, dry or wet wood).

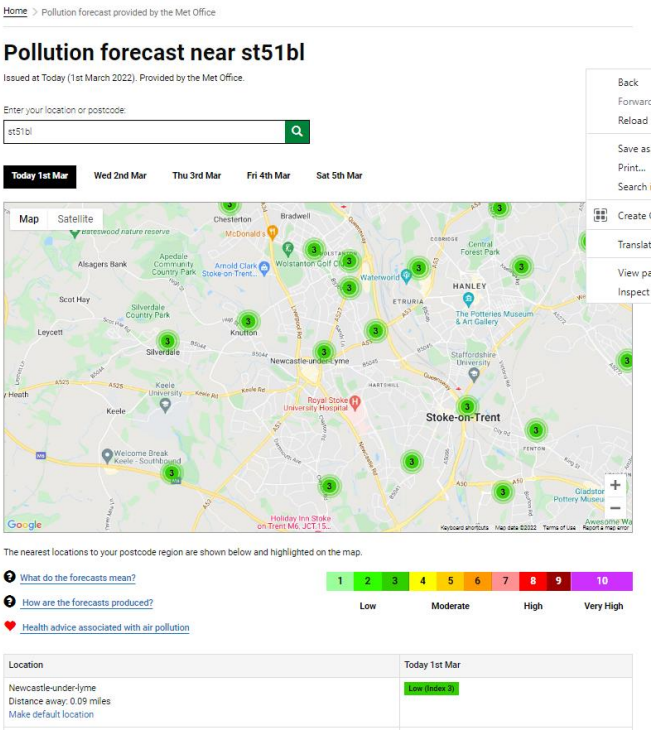
The following definitions were used: *Solid fuel open fire*: wood burned in an open fire. *Non-Defra-exempt stove*: wood in a conventional stove. *Defra-exempt/Ecodesign stove*: wood in an advanced/ecolabelled stove. *Pellet fired boiler*: wood in pellet stoves and boilers. *Oil fired boiler*: fuel oil in a medium (>50KWth <1MWth) boiler. *Gas fired boiler*: natural gas in a small (≤50kWth) boiler.

Source: Emission factors taken from EMEP 2019 Guidebook[12] (1A4 small combustion tables). Adapted from the Clean Air Strategy[13] with updated data

- ✓ Be energy efficient- make sure your house is well insulated and use energy efficient appliances. Your energy supplier may offer grants to insulate your home. Staffordshire County Council currently offers targeted grants. To make you home warmer and more energy efficient https://www.staffordshire.gov.uk/Warmer-Homes/Staffordshire-Warmer-Homes.aspx

- ✓ Purchase "Green Power" for the electricity in your home. (Contact your energy supplier or Staffordshire Warmer Homes)
- ✓ Avoid using bonfires to dispose of waste and never burn household waste, especially plastics, rubber and treated timber. See our webpages for advice on recycling, household rubbish and garden waste.

- ✓ Before organising days out, check the DEFRA air pollution forecast



For general information and air quality forecasts, Defra provide information at the following website: https://uk-air.defra.gov.uk. Forecasting uses a user-friendly index band to quickly demonstrate general short term air levels in a localised area, and supplements this with advice for 'at risk individuals' and the general public.

Newcastle-under- Lyme Borough Council's air quality reports and action plan documents are accessible from the following link https://www.newcastle-staffs.gov.uk/airquality

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Protection Team of Newcastle-under-Lyme Borough Council with the support and agreement of the following departments:

- Regulatory Services
- Planning and Development Services
- Staffordshire County Council Public Health and Highways Departments

This ASR has been approved by:

- Councillor David Hutchinson – Portfolio Holder for Sustainable Environment

This ASR has been signed off by the County Council Director of Public Health, Dr Richard Harling.

If you have any comments on this ASR, please send them to:

Environmental Protection Team, Regulatory Services, Newcastle under Lyme Borough Council, Castle House, Barracks Road, Newcastle under Lyme. ST5 2BL

01782 717717

Environmental_health@newcastle-staffs.gov.uk

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Tables

1 Local Air Quality Management

This report provides an overview of air quality in Newcastle-under-Lyme Borough Council during 2023. 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 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 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 Newcastle-under-Lyme Borough 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 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.

A summary of AQMAs declared by Newcastle-under-Lyme Borough Council can be found in Table 2.1. The table presents a description of the four AQMAs that were designated within Newcastle-under-Lyme Borough Council at the start of 2023. Appendix D provides maps of the AQMAs and also the air quality monitoring locations in relation to the AQMAs.

The air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 annual mean

Newcastle Under Lyme Borough Councils Licensing & Public Protection Committee approved the revocation of AQMA4 Little Madeley at its meeting on 5th September 2023. The Revocation Order under Section 83 (2)(b) of the Environment Act to complete this process has been drafted and is currently waiting to be sealed which will complete the statutory process of revocation. Reference to this AQMA has been included here for the purposes of completeness.

Newcastle Under Lyme Borough Council is also considering the revocation of AQMA 3: Maybank-Wolstanton-Porthill. A report seeking approval to commence public consultation on the revocation of this AQMA is programmed to go before the Borough Councils Licensing & Public Protection Committee in March 2024.

An updated AQAP 2024-2029 is under development to prevent and reduce polluting activities. The current Air Quality Action Plan (2019-2024) is available at AQAP; AIR QUALITY ACTION PLAN (newcastle-staffs.gov.uk)

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	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 1: Liverpool Road, Kidsgrove	Jan-15	NO2 Annual Mean	Exceedance of the NO_2 annual mean objective along Liverpool Road A50, Kidsgrove.	NO	48	30.1	4	Newcastle under Lyme Air Quality Action Plan 2019 – 2024	www.newcastle-staffs.gov.uk/environment/air
AQMA 2: Newcastle-under-Lyme Town Centre	Jan-15	NO2	Exceedance of the NO_2 annual mean objective. Covers Newcastle under Lyme Town Centre including the ring road A53, King Street, George Street and London Road to the boundary with the City	YES	58.8	42.2	0	Newcastle under Lyme Air Quality Action Plan 2019 – 2024	www.newcastle-staffs.gov.uk/environment/air

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	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
			of Stoke on Trent AQMA						
AQMA 3: Maybank-Wolstanton-Porthill	Jan-15	NO_2 Annual Mean	Principal routes between Maybank, Wolstanton and Porthill. due to exceedances of the NO_2 annual mean in Maybank High Street and in the Porthill area	YES	46.5	27.3	6	Newcastle under Lyme Air Quality Action Plan 2019 – 2024	www.newcastle-staffs.gov.uk/environment/air
AQMA 4: Little Madeley	Jan-15	NO_2 Annual Mean	Two properties at Little Madeley. Exceedance of the NO_2 annual mean arising from the M6 motorway.	YES	52.1	19.4	8	Newcastle under Lyme Air Quality Action Plan 2019 – 2024	www.newcastle-staffs.gov.uk/environment/air

☒ **Newcastle under Lyme Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **Newcastle under Lyme Borough Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in Newcastle-under-Lyme Borough Council

Defra's appraisal of last year's ASR concluded: *On the basis of the evidence provided by the local authority the conclusions reached are **accepted** for all sources and pollutant. Following the completion of this report, Newcastle-Under-Lyme Borough Council should submit an Annual Progress Report in 2024.*

The main comments from the appraisal of the 2023 Annual Status Report were as follows:

DEFRA Comment	NULBC Response
Confirmation of the revocation of AQMA4: Little Madeley should be reported in next year's ASR.	Revocation approved by Committee on 05/09/2023) and Revocation Order has been drafted for sealing.
The Council is advised to consider revocation of AQMA3: Maybank-Wolstanton-Porthill	A proposed consultation on the revocation will go to the NULBC Licensing & Public Protection Committee in March 2024.
The bias adjustment factor is quoted incorrectly. This should be rectified to 0.86 before publication of the report	Corrected in this report
Table B.1 shows distance corrected results for three diffusion tube locations. However, the 'NO2 Fall-off with Distance from the Road' calculation has not been presented in the report for diffusion tubes under QA/QC section	Corrected in this report
A national bias adjustment factor has been used to adjust the monitoring data. It would be beneficial for the Council to derive a local bias adjustment factor using the automatic monitor and the co-located triplicate diffusion tube site DT89 at Queen's Garden	A national bias adjustment factor has been used in this report due to uncertainties with the local bias adjustment which is discussed in Appendix C.

Newcastle-under-Lyme Borough Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of

all measures completed, in progress or planned are set out in Table 2.2. with the type of measure and the progress Newcastle-under-Lyme Borough Council have made during the reporting year of 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in the Action Plan 2019-2024. Key completed measures are:

- The Kidsgrove Local Transport Package.
- Wayfinding strategy in Newcastle-under-Lyme.
- Cycle route improvements on A34 and A527, and between Newcastle and Stoke.
- Ring-road enhanced signage and subway.
- Car park variable messaging.
- Bus retrofit scheme for public bus service between Sandy Lane and A500/A53.
- Improvements to Wolstanton and Porthill Junctions on A500.
- Licensing policy review to reduce tail pipe emissions.
- Transition vehicle fleet to zero and low emission vehicle technology.
- Consultation on, and Committee approval of the Revocation of AQMA 4 Little Madeley in 2023.

Newcastle under Lyme's priorities for the coming year are:

- Priority 1: Working to reduce and maintain NO_2 concentrations below the annual objective in all areas of the Borough.
- Priority 2: Continue to support behaviour change to promote Active Travel and reduce reliance on car travel for short journeys.
- Priority 3: Continue to assess planning applications to ensure that future developments and changes to the road networks across the Borough do not lead to an increase in the NO_2 concentration above the annual mean objective of 40µg/m^3.
- Priority 4: Continue to regulate installations to ensure that emission limits are not exceeded.
- Priority 5: Regulation of smoke control and waste burning to reduce impacts on local air quality.

- Priority 6: to prepare and submit an update AQAP 2024-2029.
- Priority 7: to progress the public consultation on revocation of AQMA 3: Maybank-Wolstanton-Porthill.

Newcastle-under-Lyme Borough Council worked to implement these measures in partnership with the following stakeholders during 2023:

- Neighbouring local authorities.
- National Highways
- Staffordshire County Council

The principal challenges and barriers to implementation that Newcastle-under-Lyme Borough Council anticipates facing are community support and funding.

Newcastle-under-Lyme Borough Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in AQMA 1 Liverpool Road, Kidsgrove and AQMA 2 Newcastle-under-Lyme Town Centre.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
K1	Kidsgrove Railway Station Transport hub including parking and improved bus/rail interchange with new bus facilities closer to the station, Real Time Passenger Information provided at Kidsgrove station and at the bus stops, disabled/cycle parking, drop off and taxi facilities, and safer pedestrian and cycle access routes to the station	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2015	2025	Kidsgrove Town Deal Board & East Midlands Trains	Developers & highway infrastructure funding	NO	Partially Funded	£1 million - £10 million	Planning	Has potential to increase patronage / increased use of public transport and private car	Delivery of measure	Business Case and approval from DCLG required	Business case requires approval and funding to deliver project
K2	Traffic light optimisation to reduce congestion along Liverpool Road and prevention of right turn into Heathcote Street from A50	Traffic Management	UTC, Congestion management, traffic reduction	2016	2021	Staffordshire County Council	Staffordshire CC	NO	Funded	£50k - £100k	Completed	Reduced vehicle emissions	Delivery of measure	Completed	Community support / Funding. Scheme to be revised from original proposal to allow right turn.
K3	Review location of bus stops to facilitate traffic flow around Liverpool Road / The Avenue	Traffic Management	UTC, Congestion management, traffic reduction	2018	2020	Staffordshire County Council	Staffordshire County Council	NO	Funded	£10k - 50k	Aborted	Reduced vehicle emissions	Delivery of measure	Postponed pending review of monitoring results	Community support Objection from a resident has caused the scheme to be withdrawn for time being. We will monitor the impact of the Heathcote Street scheme on air quality, before we decide whether we need to pursue delivery of this proposal

N3	Wayfinding strategy Newcastle under Lyme Town Centre and outlying areas for walking and cycling	Promoting Travel Alternatives	Promotion of walking	2016		Lead by Newcastle under Lyme Borough Council with support from Staffordshire County Council, Sustrans and Town Centre Business Improvement District	Future High Street Fund	NO	Funded	£50k - £100k	Planning	Not quantified	Delivery of strategy	Business Case and approval from DCLG required	Business case requires approval and funding to deliver project
N7	Ring-Road enhanced signage & subway improvements	Traffic Management	Other	2016	2021	Lead by Newcastle under Lyme Borough Council with support from Staffordshire County Council, Sustrans and Town Centre Business Improvement District	Staffordshire CC	NO	Funded	£10k - 50k	Completed	Reduced vehicle emissions	Delivery of strategy	Strategy and plans still under development. Improvements in air quality and congestion considered as a priority along with walking cycling and public transport connectivity.	Completed signage and partial subway enhancements
N9	RTPI and subsidised bus travel / green travel plans sought for large-scale multi occupancy residential accommodation. Town centre expected to accommodate 3000 students for local universities	Policy Guidance and Development Control	Other policy	2016	2022	Staffordshire County Council with support via conditions on planning applications for inclusion in high occupancy student / keyworker accommodation	Staffordshire County Council through Section 106 contributions and Future High Street Fund	NO	Partially Funded	£100k - £500k	Implementation	Increased bus journeys from stops	Reduced vehicle emissions	A number of developments within the town centre are capitalising on proximity to public transport links, cycling infrastructure improvement on development and in network sought through planning. Travel planning sought via planning and monitored via county highways. Reduced rate bus passes for university students promoted.	Financial viability of development schemes to support required S106 / Resistance from developers.
MD 1	Ministerial Direction to implement bus retrofit scheme for public bus service using A53 between Sandy Lane and A500/A53 Roundabout at latest by 2021 and in the soonest possible timeframe	Promoting Low Emission Transport	Other	2018	2020	NULBC / First PMT / JAQU	DEFRA grant (100%)	YES	Funded	£100k - £500k	Completed	EU NO2 Annual mean exceedance non-compliance reduced by 1 year.	23 Buses retrofitted by end of 2020	Completed	

MD 2	Ministerial Directions served on NULBC and SOTCC requiring Further Evaluation of measures to achieve compliance with the Ambient Air Quality Directive requirements for Nitrogen Dioxide in the soonest possible timeframe	Traffic Management	Other	2019	2026	National Highways / Staffs County Council / Stoke on Trent City Council and Newcastle under Lyme Borough Council Environmental Health	DEFRA grant (100%)	YES	Funded	£1 million - £10 million	Planning	EU NO2 Annual mean achieved in shortest possible timescale	Compliance with EU NO2 limit value	Covid 19 has affected initial compliance date. Several options appraisal undertaken, and preferred option of non-traffic management solution agreed for progression by JAQU	Preferred option of non-traffic related solution is subject to approval of full business case. .
W1	Improvements to Wolstanton and Porthill Junctions on A500 to reduce congestion	Traffic Management	UTC, Congestion management, traffic reduction	2016	2021	National Highways	Highways Agency	NO	Funded	> £10 million	Completed	Reduction in congestion / improved journey times	Modelling of air quality impacts and monitoring	Completed in 2021	Funding identified by HE. Project flagged as high risk for air quality along A500 due to exceedance of EU action level
W2	Short term routing strategy to mitigate impact of congestion associated with works to A500	Traffic Management	UTC, Congestion management, traffic reduction	2019	2021	National Highways / Staffs County Council / Stoke on Trent City Council and NULBC Environmental Health	Highways Agency	NO	Funded	£100k - £500k	Completed	Potential short term negative impact during build	Modelling of air quality impacts and monitoring	No negative impacts identified during build	Negative impacts not identified through monitoring or congestion impacts
W3	Evaluate the impact of the Etruria Valley Link Road in the May Bank, Porthill, Wolstanton area and provide appropriate mitigation	Traffic Management	Strategic highway improvements,	2010	2022	Lead by Stoke on Trent City Council with planning application to Newcastle under Lyme Borough Council/ Staffordshire County Council involved	Stoke on Trent City Council scheme	NO	Partially Funded	£10k - 50k	Implementation	unclear	Modelling of air quality impacts and monitoring	Minor adverse impact but no exceedances identified in 2023	Potential negative effects on Maybank Porthill, Wolstanton AQMA. Potential to improve AQ in Stoke on Trent at Basford Bank where hourly mean NO2 is being exceeded. Scheme has the potential to add a positive contribution to mitigation measures in this area Monitoring will continue in both areas for at least 5 years post opening to evaluate success.
M1	Continue to monitor NO2 at relevant location in Little Madeley	Other	Other	2010	2023	Newcastle under Lyme Borough Council Environmental Health	Newcastle under Lyme Borough Council	NO	Funded	< £10k	Completed	As per reported results	Monitoring	Compliance demonstrated since 2016. Consultation on the AMQA revocation is complete and the Revocation Order drafted.	Nil

M2	Engage with NH concerning proposals to introduce smart managed motorway / hard shoulder running in Madeley area between junctions 15 and 16 of the M6 motorway	Traffic Management	Other	2010	2032	Lead by National Highways	National Highways	NO	Not Funded	< £10k	Not taken forward	Has potential to reduce congestion and vehicle emissions	Project delivered	Not yet commenced	Scheme not yet identified. Sections either side of junctions 15 and 16 of the M6 are being smart managed with hard shoulder running. Local geography is an issue to identifying appropriate solutions
BW 1	Borough Wide Air Quality Strategy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2025	Newcastle under Lyme Borough Council Environmental Health	Newcastle under Lyme Borough Council	NO	Not Funded	< £10k	Planning	Reduction in emissions	Strategy in place	Funding secured, planning phase	To launch alongside Local Plan
BW 2	Air Quality Planning Guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2016	2025	Newcastle under Lyme Borough Council Environmental Health	Newcastle under Lyme Borough Council	NO	Not Funded	< £10k	Postponed	Reduction in emissions	Strategy in place	Postponed	The Council has decided to develop its own Local Plan and the planning guidance will sit alongside this as a material document.
BW 3	Inclusion of air quality related policies in the Newcastle under Lyme Local Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2016	2025	Newcastle under Lyme Borough Council Environmental Health and Planning	Newcastle under Lyme Borough Council	NO	Not Funded	< £10k	Plan under development	Reduction in emissions	Policies in JLP	Plan under development	The Council has decided to develop its own Local Plan and relevant polices are being identified. https://www.newcastle-staffs.gov.uk/planning-policy/local-plan
BW 4	Staffordshire and Stoke on Trent Eco-Stars	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2015	2020	Staffordshire Local Authorities	Staffordshire LA's	YES	Funded	£500k - £1 million	Completed	Reduction in emissions	Reduced vehicle emissions	Scheme has come to an end in Staffordshire. Several local and national operators including LA's have been appraised under the initiative	Slow take up by operators across County
BW 5	Eco Stars award for Council Street-Scene and Waste fleet	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2015	2019	Newcastle under Lyme Borough Council Street Scene Division	Staffordshire LA's	Yes	Funded	£500k - £1 million	Completed	Reduced vehicle emissions	Fleet achieves 5* rating	Implementation on-going	4* Ecostars award with action plan to move to 5*
BW 6	Green Travel Plan for new Civic Hub development in Town Centre	Promoting Travel Alternatives	Workplace Travel Planning	2015	2017	Lead by Staffordshire County Council as building owner in conjunction with Borough Council, Police, Library Service, Social Services, Aspire Housing	Newcastle under Lyme Borough Council	NO	Not Funded	< £10k	Completed	Reduced vehicle emissions	Completed	Completed 2019.	Now in monitoring phase https://publicaccess.newcastle-staffs.gov.uk/online-applications/applicationDetails.do?activeTab=externalDocuments&keyVal=OUTZZDBM01S00

BW 7	Voluntary Quality Network Partnership with bus operators	Alternatives to private vehicle use	Other	2016	2019	Staffordshire County Council / Stoke on Trent City Council/ Local Bus Companies	Staffordshire County Council as Highways Authority	NO	Not Funded	£50k - £100k	Aborted	Reduced vehicle emissions /	Voluntary quality network operative across area	Aborted	Requires commitment from bus operators and councils. Decline in bus passenger numbers and services affects financial viability for improvements. Local operators use older fleet vehicles across area.
BW 8	Develop policies to promote EV charging infrastructure and support alternative vehicle fuelling technologies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019		Newcastle under Lyme Borough Council / Staffordshire County Council	Newcastle under Lyme Borough Council	NO	Not Funded	< £10k	Aborted	Reduction in emissions	Planning Related EV policies in place	Policy drafted	Superseded by changes to Building Regulations in May 2022
BW 9	Support and participate in appropriate initiatives to encourage uptake of Zero and Low Emission Vehicle Technologies	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2016	2026	Newcastle under Lyme Borough Council, Staffordshire Districts and Staffordshire County Council	OLEV, National Highways & 3rd party funded	YES	Funded	£500k - £1 million	Underway	Reduction in emissions	Details of technologies and initiatives	Successful bid to OLEV LETIS. Rollout of EV chargers across several sites. Plan to be fully operational by end of 2022 and provider to engage with taxi and PHV trade	Slow rollout of programme and impacts from Covid 19
BW 10	Review the Borough Council's Hackney Carriage and Private Hire Licensing Policy to reduce tail pipe emissions from this sector	Promoting Low Emission Transport	Taxi emission incentives	2016	2019	Newcastle under Lyme Borough Council	Newcastle under Lyme Borough Council	NO	Not Funded	< £10k	Completed	Reduction in emissions	Policies updated with conditions	Policy approved in spring 2019	Policy adopted 2019 to 2025. Policies to support air quality improvement and improvements to latest emission standards and reduction in licence vehicle age not taken forward. Vehicles can be no older than 7 years old at date of first licence with council and no upper limit on age, subject to six months testing from 10 years old. If fails a retest will no longer be licensed.
BW 11	Transition the Council Vehicle fleet to Zero and Low Emission Vehicle Technologies	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2016	2030	Newcastle under Lyme Borough Council	Newcastle under Lyme Borough Council	NO	Partially Funded	£1 million - £10 million	Underway	Reduction in emissions	Policies updated	EURO IV refuse fleet and recycling vehicles delivered March 2020. 14% of council light fleet transferred to	Requires budget for capital expenditure by council

														EV. EV chargers installed and operational for council fleet vehicles at Knutton Depot. HGV vehicles have changed to HVO fuel.	
HS2 Phase 2a route	Ensure that emissions associated with construction and operation including off network effects do not cause exceedances of objectives or limit values	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2017	2032	HS2 and contractors / Newcastle under Lyme Borough Council	HS2 and contractors	NO	Funded	£1 million - £10 million	Aborted	Emissions do not breach objectives or limit values	Emissions do not breach objectives or limit values	Discussion to date have identified that HS2 and contractors have assessed air quality impacts and have Environmental Minimum Standards, Construction Plans and monitoring plans in place	Advance works to commenced in 2021 with route construction anticipated to commence by 2026 and coming into operation by 2033

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations.

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[11], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$). There is clear evidence that $PM_{2.5}$ (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Within Staffordshire it is estimated that in 2021 (5.0% of all deaths) can be attributed to exposure to $PM_{2.5}$, compared to 5.5% across England (29,850 deaths annually)[7]. Overall, the estimated cost to individuals and society is more than £20 billion annually for the UK.

Particulate Matter ($PM_{2.5}$) Levels in Staffordshire and Stoke-on-Trent

Only Stoke on Trent monitor locally for PM_{10}.

However, several authorities, including Newcastle under Lyme, have been approached by Defra to host an Automatic Urban and Rural Network (AURN), which if suitable sites can be found would mean that these councils will have PM data specific to their area rather than having to rely on the $PM_{2.5}$ background maps provided by Defra. Currently the nearest AURN station to Newcastle under Lyme is in the centre of Stoke on Trent.

As Newcastle under Lyme Borough does not monitor $PM_{2.5}$ or PM_{10}, a map indicating the areas with the highest four levels of background annual mean $PM_{2.5}$ concentrations and the areas with the lowest four levels of minimum background annual mean $PM_{2.5}$ has been derived from the Defra Background maps. Newcastle under Lyme Borough Council has determined that the highest background PM_{10} concentration in 2023 is 9.1 µg/m^3, located in the 1km grid square which includes the M6 motorway at Keele. The lowest PM_{10} concentration is 5.9 µg/m^3, located in the rural part of the Borough at Tyrley.

[11] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

$PM_{2.5}$ and Mortality in Staffordshire & Stoke-on-Trent

Although the levels of $PM_{2.5}$ within the County and City of Stoke on Trent are below the 2020 EU Limit value, the impact on adult mortality directly attributable to $PM_{2.5}$ is nonetheless still an important public health issue within Staffordshire and Stoke-on-Trent. This is revealed in data obtained from UK Health Security Agency (UKHSA) used to inform Public Health Outcomes Framework indicator D01.

The percentage estimated number of deaths attributable to $PM_{2.5}$ in adults over 30 has been translated into the estimated number of attributable deaths for each local authority area within Staffordshire and are shown below. The data presented to 2021 is the latest data available at time of publication of this report. Approximately 5.8% of deaths between 2018 to 2021 within the County can be attributed to $PM_{2.5}$. (Note the method for calculating this figure changed in 2022 and we have only the data for 2018,2019,2020 & 2021 using this new method. As the 2020 data for this indicator includes the period from March 2020 onwards, the mortality data used in its calculation will reflect effects of the COVID-19 pandemic).

Estimated average number of deaths by local authority area attributable to $PM_{2.5}$ within Staffordshire for adults over 30 - 2018 to 2021.

District/County	Percentage
Newcastle-under-Lyme	5.5%
Stafford	5.5%
East Staffordshire	6.0%
South Staffordshire	5.8%
Lichfield	6.0%
Staffordshire Moorlands	5.3%
Cannock Chase	6.0%
Tamworth	6.4%
Stoke on Trent	5.9%
Staffordshire County	5.8%
England	6.3%

Public Health Outcomes Framework Indicator 3.01- Fraction of annual all cause adult mortality attributable to anthropogenic (human made) particulate air pollution (measured as fine particulate matter, $PM_{2.5}$) for Staffordshire Authorities 2018 to 2021

	2018			2019			2020			2021		
District/County	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths
Newcastle-under-Lyme	1334	5.7	80	1282	6.8	90	1548	4.7	70	1409	5.5	70
Stafford	1336	5.8	80	1315	6.8	90	1565	4.5	70	1432	4.8	70
East Staffordshire	1093	6.3	70	1128	7.3	80	1355	5.1	70	1287	5.1	70
South Staffordshire	1211	6.3	80	1212	7.0	90	1418	4.9	70	1333	5.1	70
Lichfield	1087	6.4	70	1093	7.2	80	1272	5.2	70	1129	5.1	60
Staffordshire Moorlands	1108	5.2	60	1080	6.6	70	1276	4.5	60	1133	4.7	50
Cannock Chase	976	6.4	60	908	7.2	70	1046	5.1	50	1089	5.2	60
Tamworth	653	6.9	50	678	7.7	50	752	5.6	40	730	5.4	40
Stoke on Trent	2746	6.1	170	2490	7.2	180	3034	5.0	150	2790	5.2	150
Staffordshire	8798	6.1	530	8692	7.0	610	10227	4.9	500	9539	5	480

Actions being taken within Staffordshire to reduce $PM_{2.5}$

A number of the Staffordshire Authorities are currently involved in implementing measures to reduce levels of NO_2 within their areas, which are detailed elsewhere in this report. Whilst there is currently no statutory duty imposed on Local Authorities in England to reduce $PM_{2.5}$, many of the measures are complementary.

Newcastle-under-Lyme Borough Council is taking the following measures as outlined below in conjunction with our partners at the County Council and other partners identified in the table to address $PM_{2.5}$.

Measures being undertaken within Newcastle under Lyme to reduce PM_{10} and $PM_{2.5}$

Category	Measure Classification	Effect on reducing NOx and PM_{10} emissions	Reduce $PM_{2.5}$ emissions	Existing Measure	Measure in Newcastle under Lyme
Traffic Management	Urban Traffic Control systems, Congestion management, traffic reduction	low	✓	✓	UTC in areas of AQMA 1: Liverpool Road, Kidsgrove and AQMA 2: Newcastle-under-Lyme Town Centre
Promoting Travel Alternatives	Workplace Travel Planning	low	✓	✓	www.staffordshire.gov.uk/Transport/Air-quality/Businesses.aspx
	Encourage / Facilitate home-working	low	✓	✓	Agile working policy adopted by Council
	School Travel Plans	low	✓	✓	Funded School Travel Plans for school expansions: 14 Newcastle Borough,
	Promotion of cycling	low	✓	✓	The Local Cycling and Walking Infrastructure Plan is currently under development by SCC
	Promotion of walking	low	✓	✓	
	Staffordshire Share a Lift Scheme		✓	✓	A new provider is currently being sought for the Staffordshire Lift Scheme
Transport Planning & Infrastructure	Local Transport Plans and District Strategies	high	✓	✓	The transport strategy for Newcastle-under-Lyme can be found HERE
	Public transport improvements- interchanges stations and services	low	✓	✓	Kidsgrove Station interchange plans
	Cycle network	low	✓	✓	SCC currently looking to implement improved mapping software for future developments
	Bus route improvements	high	✓	✓	RTPI routes 3 & 4 Newcastle Town Centre. Improved future bus services to Chatterley Valley
Policy Guidance and Development Control	Planning applications to require assessment of exposure / emissions for development requiring air quality impact assessment	high	✓	✓	Local Validation list draws attention to requirements
	Planning Policies		✓	✓	Local plan under development to include policies which will benefit air quality

	STOR Sites (Short Term Operating Reserve) Energy Generation. Regulation via planning / permitting regime	high	✓	✓	1 STOR site regulated for emissions via Environmental Permit – Norkier Power Holditch
	Route Management Plans/ Strategic routing strategy for HGV's	high	✓	✓	The Local Transport Strategy for Newcastle-under-Lyme can be found HERE
Vehicle Fleet Efficiency	Promoting low emission public transport	high	✓	✓	Planned promotion of retrofitted buses on routes 3 / 4 and 4a in preference to private car
	Vehicle retrofitting programmes	medium	✓	✓	£370,000 DEFRA grant to retrofit 23 buses running on routes 3/ 4 and 4a to latest EURO IV. Completed November 2020
Regulatory & Policy	Active regulation of permitted installations and identification of unregulated activities requiring permit		✓	✓	Regulation permitted installations and identification of unregulated activities requiring permit
	Clean Air Act enforcement,		✓	✓	Smoke Control, Cable burning, Dark Smoke, Chimney heights
	Environmental Protection Act 1990 / Anti-Social Behaviour (Crime and Policing) Act 2014		✓	✓	Enforcement of Duty of Care in respect of trade waste burning (EPA s33 & S34) Statutory nuisance and CPW/CPN application for frequent burning

$PM_{2.5}$ in Staffordshire & Stoke-on-Trent - Next steps

As $PM_{2.5}$ is an issue requiring collaboration between the district, county and city authorities within Staffordshire. The following actions are proposed in addition to those outlined in the Action Plan. Progress on these and the action plan will be detailed in the 2024-2029 AQAP and 2025 ASR.

- To maintain compliance with the 2020 EU limit value of 25µg/m^3.
- To include Public Health Outcome Framework Indicator D01 in the Staffordshire and District Authority and City Council Joint Strategic Needs Assessment onwards and to report progress to the relevant Health and Wellbeing Boards.
- To continue to identify risks affecting $PM_{2.5}$ which need to be addressed at a national and local level.
- Undertaking a comprehensive review of current smoke control areas with a view to revoking and putting in place a single smoke control area to cover the Borough and areas being targeted for development. We anticipate that this will be completed by the early part of 2025.
- Undertaking a data gathering exercise to map out where solid fuel burning stoves have been installed in accordance with current Building Regulations requirements and supplementing this with complaint and observational information.

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

This section sets out the monitoring undertaken within 2023 by Newcastle-under-Lyme Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Newcastle-under-Lyme Borough Council undertook automatic (continuous) monitoring at 1 site during 2023. Table A.1 in Appendix A shows the details of the automatic monitoring sites.

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

Newcastle-under-Lyme Borough Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 77 sites during 2023 Table A.2 in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater

than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2023 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

See Table 1.2 (p. viii) for 2023 monitoring conclusion summary.

3.2.2 Particulate Matter (PM_{10})

Particulate Matter is not measured in Newcastle under Lyme.

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)
CM1	Newcastle under Lyme Queen's Gardens	Roadside	385054	346134	NO_2	YES. AQMA2	Chemiluminescent	2	3	2

Notes:

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

(2) N/A if not applicable

Table A.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)
DTK1	A34 Holy Trinity	Kerbside	385051	345726	NO_2	YES - AQMA 2	22.0	3.0	No. Site closed in Feb 2024	2.5
DTK2	76 King St, N/C	Urban Centre	385469	346362	NO_2	YES - AQMA 2	0.2	3.0	No	2.5
DTUB1	Wolstanton, Hartington St	Kerbside	384739	348326	NO_2	NO	7.0	2.0	No	2.5
DTUB2	Westlands, 4 Sneyd Crescent	Kerbside	383916	345059	NO_2	NO	23.0	2.0	No	2.5
DT3	Collingwood, 3 Newcastle Rd	Rural	378116	345488	NO_2	YES – AQMA 4	0.2	128.0	No. Site closed in Jan 2023	2.5
DT6	106 Liverpool Rd	Suburban	384014	354429	NO_2	YES - AQMA 1	0.2	4.0	No	2.5
DT9	32 Porthill Bank	Suburban	385519	349055	NO_2	YES – AQMA 3	0.2	6.0	No	2.5
DT11	34 London Road, N/C	Suburban	385112	345636	NO_2	YES - AQMA 2	0.3	3.0	No	2.5
DT24	26 High St, May Bank	Roadside	385574	347530	NO_2	YES – AQMA 3	0.2	3.0	No	2.5
DT28	Limbrick Cottage Shraleybrook	Rural	377994	350105	NO_2	NO	0.3	45.0	No. Site closed in Jan 2023	2.5
DT34	15 Barracks Road	Urban Centre	385059	345840	NO_2	YES - AQMA 2	1.0	4.0	No	2.5
DT39	4/6 Liverpool Road, Kidsgrove	Suburban	383560	354739	NO_2	YES - AQMA 1	0.2	2.0	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)
DT40	Banktop Court, Porthill	Suburban	385128	348811	NO_2	YES – AQMA 3	0.2	20.0	No	2.5
DT46	1 London Road (Trinity Court)	Urban Centre	385073	345685	NO_2	YES - AQMA 2	0.2	4.0	No	2.5
DT47	1 London Rd (Brook La)	Urban Centre	385023	345678	NO_2	YES - AQMA 2	0.3	5.0	No	2.5
DT49	2 Vale View, Porthill	Urban Centre	385595	349129	NO_2	YES – AQMA 3	0.3	6.0	No	2.5
DT64	Kidsgrove Carpets 57 - 59 Liverpool Road	Urban Centre	383950	354445	NO_2	YES - AQMA 1	0.2	10.0	No	2.5
DT72	134 High Street Newcastle	Roadside	384981	345750	NO_2	YES - AQMA 2	0.2	3.0	No	2.5
DT73	21 London Road Newcastle	Roadside	385070	345738	NO_2	YES - AQMA 2	0.2	4.0	No	2.5
DT74	39 London Road Newcastle	Roadside	385132	345640	NO_2	YES - AQMA 2	0.2	4.0	No	2.5
DT76	11 Brunswick Street Newcastle	Roadside	385226	346156	NO_2	YES - AQMA 2	0.2	2.0	No	2.5
DT84	102 King Street Newcastle	Roadside	385548	346400	NO_2	YES - AQMA 2	0.2	2.0	No	2.5
DT85	106 King Street Newcastle	Urban Centre	385575	346413	NO_2	YES - AQMA 2	0.2	5.0	No	2.5
DT86	Hassell C.P. School Barracks Road N/C	Urban Centre	385075	345910	NO_2	YES - AQMA 2	0.2	5.0	No	2.5
DT87	Blue Chilli 1 King Street Newcastle	Urban Centre	385105	346225	NO_2	YES - AQMA 2	0.2	5.0	No	2.5
DT88	27 Lower Street Newcastle	Urban Centre	384709	345881	NO_2	YES - AQMA 2	0.2	5.0	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)
DT89A, DT89B, DT89c	Queens Gardens	Urban Centre	385054	346134	NO_2	YES - AQMA 2	1.0	5.0	Yes	2.5
DT92	41/43 Liverpool Road Kidsgrove	Urban Centre	383890	354461	NO_2	YES - AQMA 1	1.0	5.0	No	2.5
DT93	118 Liverpool Road Kidsgrove	Urban Centre	384056	354393	NO_2	YES - AQMA 1	0.2	2.0	No	2.5
DT94	116 Liverpool Road Kidsgrove	Urban Centre	384030	354416	NO_2	YES - AQMA 1	0.2	4.0	No	2.5
DT95	76 London Road Newcastle	Roadside	385171	345539	NO_2	YES - AQMA 2	0.2	2.0	No	2.5
DT96	On Lamppost Next JJ Design London Road Newcastle	Roadside	385131	345601	NO_2	YES - AQMA 2	0.2	3.0	No	2.5
DT97	Blackfriars/ Lower Street	Roadside	384795	345796	NO_2	YES - AQMA 2	0.2	2.0	No	2.5
DT98	Newcastle Taxis Brunswick Street	Roadside	385327	346148	NO_2	YES - AQMA 2	0.2	2.0	No	2.5
DT100	Sainsbury's Carpark Near to Courts	Roadside	384689	346284	NO_2	YES - AQMA 2	0.2	2.0	No	2.5
DT101	Blackburn House Lower Street Newcastle	Roadside	384806	345842	NO_2	YES - AQMA 2	0.2	2.0	No	2.5
DT102	Maxims Lower Street Newcastle	Roadside	384609	346007	NO_2	YES - AQMA 2	0.2	2.0	No	2.5
DT103	Grange Lange/High Street Wolstanton	Roadside	385682	347909	NO_2	YES – AQMA 3	0.2	2.0	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)
DT104	7 King Street Newcastle	Roadside	385213	346270	NO_2	YES - AQMA 2	0.2	2.0	No	2.5
DT105	The Avenue Kidsgrove	Urban Centre	383991	354418	NO_2	YES - AQMA 1	3.0	1.0	No	2.5
DT107abc (N1)	Knutton Lane	Roadside	384495	346298	NO_2	NO	4.0	2.0	No	2.5
DT108abc (N2)	24A Clayton Road, Newcastle	Roadside	384961	345346	NO_2	NO	5.0	2.0	No	2.5
DT109abd (N3)	Clayton Road (Opp Nuffield)	Roadside	385190	343318	NO_2	NO	10.0	3.0	No	2.5
DT110abc (N4)	Holiday Inn Layby	Roadside	385110	342314	NO_2	NO	49.0	2.0	No	2.5
DT111abc (N5)	Talke Road A34 Bradwell	Roadside	383882	349558	NO_2	NO	25.0	2.0	No	2.5
DT112abc (N6)	A53 Whitmore Road	Roadside	382286	341956	NO_2	NO	120.0	2.0	No	2.5
DT113abc (N7)	A53 Whitmore Road/ Seabridge Lane	Roadside	383052	343666	NO_2	NO	107.0	2.0	No	2.5
DT114abc (N8)	9 Sneyd Avenue	Roadside	383953	344832	NO_2	NO	5.0	2.0	No	2.5
DT115abc (N9)	Newcastle Community School Layby	Roadside	383545	345195	NO_2	NO	20.0	2.0	No	2.5
DT116abc (N10)	Gallowstree Lane	Roadside	383157	345431	NO_2	NO	40.0	2.0	No	2.5
DT117abc (N11)	Clough Hall Drive	Roadside	383199	352740	NO_2	NO	10.0	2.0	No	2.5
DT118abc (N12)	154 Newcastle Road	Roadside	382934	353388	NO_2	NO	10.0	2.0	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)
DT119abc (N13)	Butt Lane Primary School	Roadside	382600	354062	NO_2	NO	15.0	2.0	No	2.5
DT120abc (N14)	Pets and Pastimes, Butt Lane	Roadside	382707	354305	NO_2	NO	2.0	2.0	No	2.5
DT121abc (N15)	One-Sure Insurance, Butt Lane	Roadside	382736	354385	NO_2	NO	10.0	2.0	No	2.5
DT122abc (N16)	Aldi Bus Stop, Liverpool Road, Kidsgrove	Roadside	384261	354207	NO_2	NO	10.0	3.0	No	2.5
DT123abc (N17)	Skate Park, Liverpool Road, Kidsgrove	Roadside	384638	354133	NO_2	NO	20.0	2.0	No	2.5
DT124abc (N18)	49 Kidsgrove Bank	Roadside	385019	353832	NO_2	NO	20.0	2.0	No	2.5
DT125abc (N19)	Adlington House Care Home, Wolstanton	Roadside	385387	348389	NO_2	NO	5.0	2.0	No	2.5
DT126abc (N20)	Morris Square, Wolstanton	Roadside	385556	348224	NO_2	NO	20.0	2.0	No	2.5
DT127abc (N21)	Victoria Public House, May Bank	Roadside	385416	347424	NO_2	NO	10.0	2.0	No	2.5
DT128abc (N22)	34 Brampton Road	Roadside	385512	347373	NO_2	NO	20.0	2.0	No	2.5
DT129abc (N23)	Ebenezer House, Newcastle	Roadside	384968	346228	NO_2	YES - AQMA 2: Newcastle-under-Lyme Town Centre	30.0	2.0	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)
DT130abc (N24)	St Georges Church, Brampton	Roadside	385098	346395	NO_2	NO	20.0	2.0	No	2.5
DT131abc (N25)	25 King Street, Newcastle	Roadside	385463	346374	NO_2	YES - AQMA 2: Newcastle-under-Lyme Town Centre	5.0	2.0	No	2.5
DT132abc (N26)	120 Etruria Road	Roadside	385612	346436	NO_2	YES - AQMA 2: Newcastle-under-Lyme Town Centre	5.0	2.0	No	2.5
DT133abc (N27)	Charlotte House, Etruria Road	Roadside	385926	346580	NO_2	YES - AQMA 2: Newcastle-under-Lyme Town Centre	5.0	2.0	No	2.5
DT134abc (N28)	526 Etruria Road, Basford	Roadside	386009	346600	NO_2	YES - AQMA 2: Newcastle-under-Lyme Town Centre	7.0	2.0	No	2.5
DT135abc (N29)	Andrew Place	Roadside	385518	346128	NO_2	YES - AQMA 2: Newcastle-under-Lyme Town Centre	20.0	2.0	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)
DT136abc (N30)	No 1 London Road Trinity Court	Roadside	385078	345687	NO_2	YES - AQMA 2: Newcastle-under-Lyme Town Centre	4.0	2.0	No	2.5
DT137abc (N31)	Old Garage site, Cemetery Road	Roadside	382795	346011	NO_2	NO	0.0	2.0	No	2.5
DT138abc (N32)	Post Office Depot, Church Lane	Roadside	383113	346592	NO_2	NO	20.0	2.0	No	2.5
DT139abc (N33)	Church Lane/ Acacia Gardens	Roadside	383302	346727	NO_2	NO	20.0	2.0	No	2.5
DT140abc (N34)	Lower Milehouse Lane	Roadside	383930	347273	NO_2	NO	10.0	2.0	No	2.5
DT141abc (N35)	Lower Milehouse Lane near to Milehouse Restaurant	Roadside	384337	347534	NO_2	NO	5.0	2.0	No	2.5
DT142abc (N36)	A34 Bus stop by Bakery	Roadside	384207	347915	NO_2	NO	50.0	2.0	No	2.5
DT143abc (N37)	Rosendale Avenue	Roadside	384021	348925	NO_2	NO	10.0	2.0	No	2.5
DT144abc (N38)	A34 Parkhouse Industrial West	Roadside	383764	349912	NO_2	NO	0.0	2.0	No	2.5
DT145abc (N39)	Entrance to Beta Way	Roadside	383670	350326	NO_2	NO	20.0	2.0	No	2.5
DT146abc (N40)	High Carr Business Park.	Roadside	383587	350790	NO_2	NO	80.0	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.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site 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)	2019	2020	2021	2022	2023
CM1	385054	346134	Roadside	99.9	99.9	25.6	18	23.2	26.0	26.5

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

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

☒ **Where exceedances of the NO_2 annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2023.**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

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.

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

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]	2019	2020	2021	2022	2023
DTK1	385051	345726	Kerbside	100	100.0	**47.4**	27.4	31.4	33.5	Closed
DTK2	385469	346362	Urban Centre	100	100.0	28.9	20.1	21.4	24.9	24.5
DTUB1	384739	348326	Kerbside	100	94.2	17.9	12.3	13.6	14.3	12.5
DTUB2	383916	345059	Kerbside	100	94.2	15.0	9.9	10.8	11.2	9.9
DT3	378116	345488	Rural	100	88.5	27.3	18.4	18.3	19.4	Closed
DT6	384014	354429	Suburban	100	100.0	38.6	27.3	30.6	31.7	30.1
DT9	385519	349055	Suburban	100	100.0	33.2	24.6	26.9	28.4	27.3
DT11	385112	345636	Suburban	100	90.4	**56.5**	25.7	29.6	30.4	25.5
DT24	385574	347530	Roadside	100	90.1	34.8	22.9	25.3	26.7	27.1
DT28	377994	350105	Rural	100	100.0	25.9	18.1	21.3	19.3	Closed
DT34	385059	345840	Urban Centre	100	100.0	33.7	21.2	25.4	26.3	26.0
DT39	383560	354739	Suburban	100	100.0	34.9	23.6	26.9	27.3	28.5
DT40	385128	348811	Suburban	100	100.0	26.5	19.4	20.5	20.9	21.1
DT46	385073	345685	Urban Centre	100	92.3	28.3	18.6	21.7	24.2	21.8
DT47	385023	345678	Urban Centre	100	100.0	28.0	19.2	23.6	23.0	22.1
DT49	385595	349129	Urban Centre	100	92.3	31.9	21.9	25.1	25.7	24.7
DT64	383950	354445	Urban Centre	100	100.0	36.7	24.5	28.9	29.8	26.2
DT72	384981	345750	Roadside	100	92.3	36.7	24.3	27.4	30.5	28.0
DT73	385070	345738	Roadside	100	100.0	32.6	27.7	30.8	31.9	31.3
DT74	385132	345640	Roadside	100	100.0	35.7	22.6	27.2	29.3	33.3
DT76	385226	346156	Roadside	100	65.4	37.7	27.1	35.0	35.3	**42.2**
DT84	385548	346400	Roadside	100	100.0	37.1	27.0	28.5	30.3	28.2
DT85	385575	346413	Urban Centre	100	92.3	**44.2**	27.9	34.9	34.4	34.4
DT86	385075	345910	Urban Centre	100	100.0	28.6	21.3	22.0	22.3	21.1
DT87	385105	346225	Urban Centre	100	100.0	39.4	25.6	32.2	34.9	31.2
DT88	384709	345881	Urban Centre	100	100.0	30.8	20.8	23.1	25.0	23.8
DT89A, DT89B, DT89c	385054	346134	Urban Centre	100	100.0	30.1	20.9	24.5	25.7	24.1
DT92	383890	354461	Urban Centre	100	90.1	33.3	22.5	26.3	27.8	26.8
DT93	384056	354393	Urban Centre	100	100.0	31.5	21.7	24.7	26.0	25.9
DT94	384030	354416	Urban Centre	100	100.0	**47.2**	30.2	37.5	36.2	37.7
DT95	385171	345539	Roadside	100	71.2	33.2	24.6	27.9	27.9	25.2
DT96	385131	345601	Roadside	100	100.0	39.5	28.9	28.1	29.6	27.6
DT97	384795	345796	Roadside	100	100.0	29.8	19.7	16.9	19.7	19.7
DT98	385327	346148	Roadside	100	100.0	38.8	24.3	30.1	35.5	30.8
DT100	384689	346284	Roadside	100	100.0	30.4	20.1	22.8	23.5	22.1

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]	2019	2020	2021	2022	2023
DT101	384806	345842	Roadside	100	100.0	32.9	21.6	26.0	26.6	25.6
DT102	384609	346007	Roadside	100	100.0	**44.8**	31.4	32.5	35.3	34.9
DT103	385682	347909	Roadside	100	100.0	23.1	17.1	16.6	19.5	18.5
DT104	385213	346270	Roadside	100	100.0	**58.8**	34.5	37.8	37.8	**40.4**
DT105	383991	354418	Urban Centre	100	100.0	29.7	18.7	21.2	21.3	22.2
DT107abc (N1)	384495	346298	Roadside	100	100.0		19.7	22.3	21.7	21.5
DT108abc (N2)	384961	345346	Roadside	100	100.0		19.5	20.9	22.3	20.0
DT109abd (N3)	385190	343318	Roadside	100	92.3		17.5	19.6	20.8	21.3
DT110abc (N4)	385110	342314	Roadside	100	100.0		21.1	23.5	25.2	21.5
DT111abc (N5)	383882	349558	Roadside	100	23.1		24.0	24.3	24.4	
DT112abc (N6)	382286	341956	Roadside	100	100.0		14.8	16.2	17.1	15.4
DT113abc (N7)	383052	343666	Roadside	100	92.3		13.5	17.3	17.6	16.0
DT114abc (N8)	383953	344832	Roadside	100	100.0		16.1	17.5	19.3	17.5
DT115abc (N9)	383545	345195	Roadside	100	100.0		11.1	11.9	13.4	14.0
DT116abc (N10)	383157	345431	Roadside	100	100.0		16.4	17.1	18.5	18.3
DT117abc (N11)	383199	352740	Roadside	100	100.0		25.1	27.8	28.8	27.5
DT118abc (N12)	382934	353388	Roadside	100	100.0		18.5	20.8	21.4	19.7
DT119abc (N13)	382600	354062	Roadside	100	100.0		18.0	20.6	21.6	21.2
DT120abc (N14)	382707	354305	Roadside	100	100.0		24.2	28.7	29.1	29.0
DT121abc (N15)	382736	354385	Roadside	100	100.0		20.4	21.4	21.6	21.3
DT122abc (N16)	384261	354207	Roadside	100	100.0		20.8	23.0	22.4	23.3
DT123abc (N17)	384638	354133	Roadside	100	100.0		20.5	22.1	22.6	24.5
DT124abc (N18)	385019	353832	Roadside	100	100.0		32.3	31.7	33.0	33.4
DT125abc (N19)	385387	348389	Roadside	100	100.0		20.5	22.9	24.9	23.1
DT126abc (N20)	385556	348224	Roadside	100	100.0		18.3	19.8	21.5	20.5
DT127abc (N21)	385416	347424	Roadside	100	100.0		17.7	19.8	21.6	19.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2019	2020	2021	2022	2023
DT128abc (N22)	385512	347373	Roadside	100	100.0		22.7	24.5	25.8	24.9
DT129abc (N23)	384968	346228	Roadside	100	100.0		19.8	23.6	24.8	22.5
DT130abc (N24)	385098	346395	Roadside	100	100.0		24.9	27.4	29.6	29.1
DT131abc (N25)	385463	346374	Roadside	100	100.0		28.9	28.2	30.4	30.8
DT132abc (N26)	385612	346436	Roadside	100	100.0		25.2	27.7	28.8	30.2
DT133abc (N27)	385926	346580	Roadside	100	100.0		31.9	29.5	33.0	31.6
DT134abc (N28)	386009	346600	Roadside	100	100.0		24.0	25.0	28.1	29.2
DT135abc (N29)	385518	346128	Roadside	100	57.7		22.8	25.7	28.1	25.1
DT136abc (N30)	385078	345687	Roadside	100	90.4		22.2	25.9	28.4	26.4
DT137abc (N31)	382795	346011	Roadside	100	83.0		15.8	17.2	19.8	18.8
DT138abc (N32)	383113	346592	Roadside	100	88.5		19.5	19.9	21.0	20.9
DT139abc (N33)	383302	346727	Roadside	100	100.0		13.7	13.9	14.7	13.7
DT140abc (N34)	383930	347273	Roadside	100	100.0		21.9	23.5	25.2	24.6
DT141abc (N35)	384337	347534	Roadside	100	100.0		26.1	28.6	27.5	28.5
DT142abc (N36)	384207	347915	Roadside	100	100.0		20.8	21.9	24.9	22.7
DT143abc (N37)	384021	348925	Roadside	100	90.4		30.7	33.9	34.6	34.8
DT144abc (N38)	383764	349912	Roadside	100	100.0		16.7	17.7	18.3	17.6
DT145abc (N39)	383670	350326	Roadside	100	100.0		38.0	38.6	**40.5**	39.5
DT146abc (N40)	383587	350790	Roadside	100	100.0		21.9	24.2	25.5	23.5

☒ **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 µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

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.

Figure A-1 – a) Trends in annual mean NO2 concentrations 2019 to 2023 – AQMA 1 Kidsgrove.

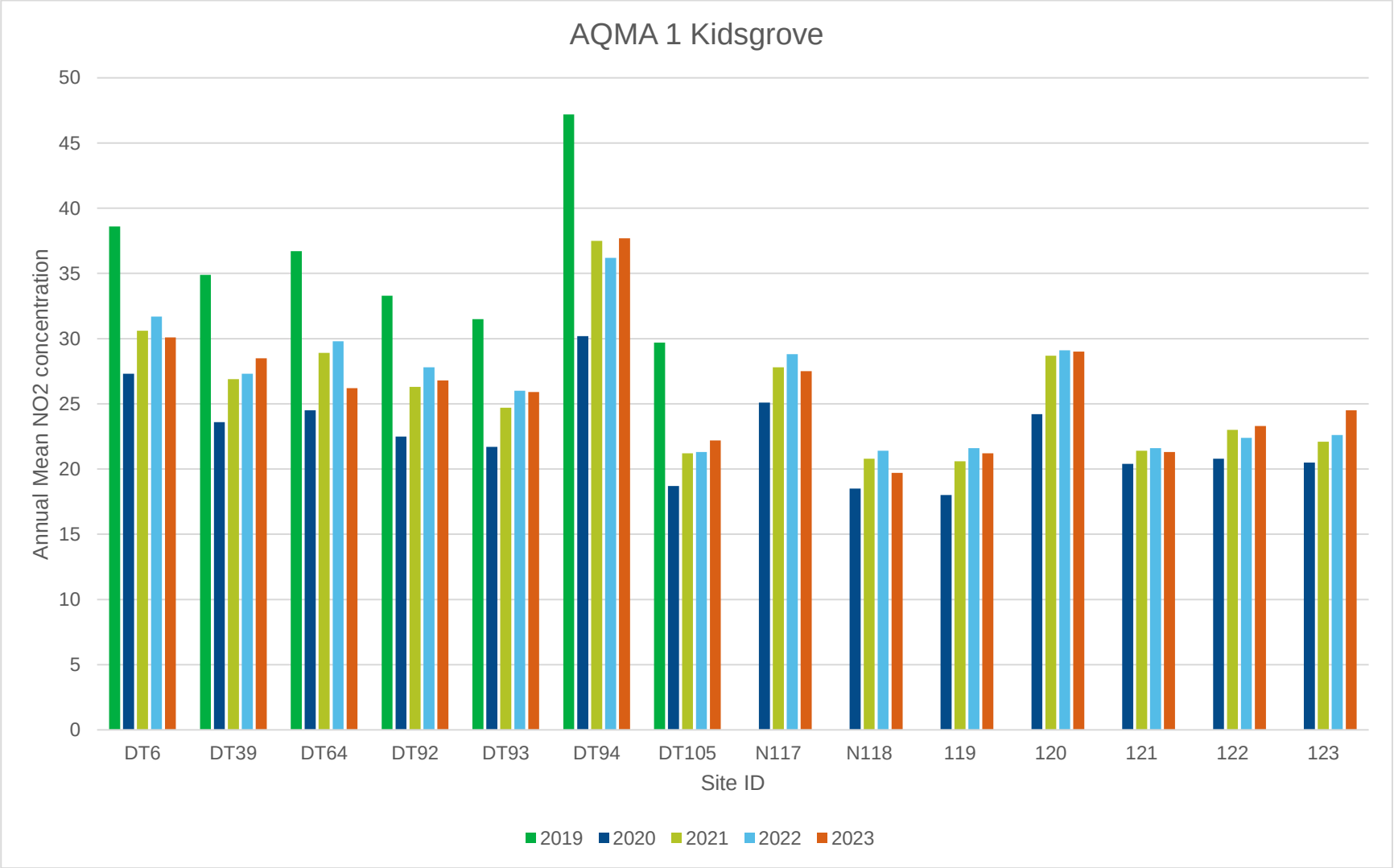


Figure A-2 – b) Trends in annual mean NO_2 concentrations 2019 to 2023 – AQMA 2 Newcastle Town

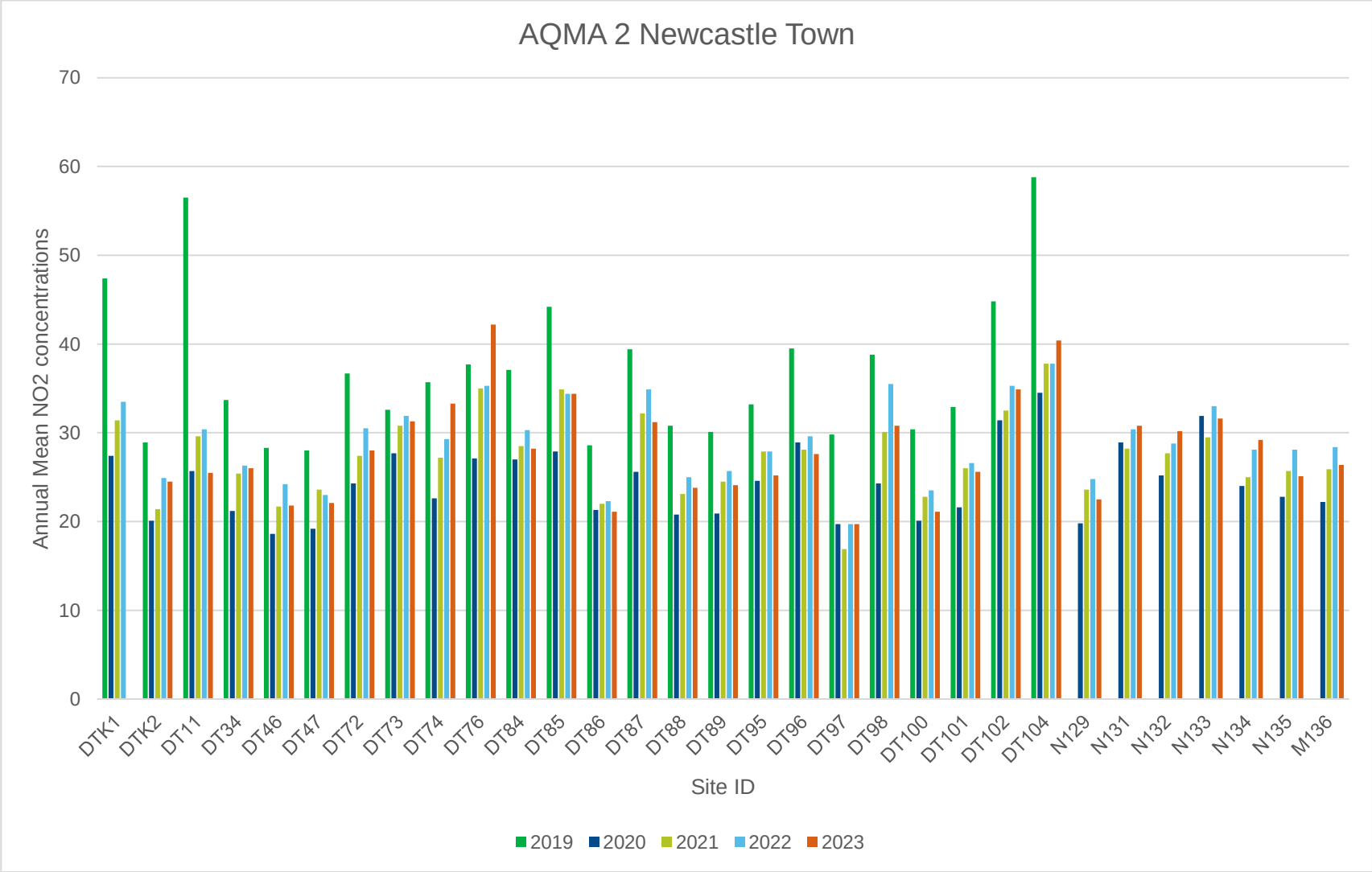


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
CM1	385054	346134	Roadside	100	100	0	0	0	0	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

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

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m^3)												Simple Annual Mean (µg/m3)		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.86) and Annualised	Distance Corrected to Nearest Exposure
DTK1	385051	345726	34.0	45.9											40.0	34.4	
DTK2	385469	346362	29.3	33.5	29.3	27.1	23.6	25.8	21.8	24.2	30.2	30.4	38.4	27.7	28.4	24.5	
DTUB1	384739	348326	17.9	21.4	16.3	12.8	12.2	10.1	9.7	12.2	14.6	17.0		15.2	14.5	12.5	
DTUB2	383916	345059	16.2	16.0	11.4	11.0	10.7	8.3	8.0	9.1	11.1	13.6		11.5	11.5	9.9	
DT3	378116	345488															
DT6	384014	354429	34.0	39.7	35.2	38.9	38.8	38.3	31.8	20.9	40.8	32.4	47.6	21.4	35.0	30.1	
DT9	385519	349055	39.2	39.3	32.9	31.9	28.8	26.8	26.5	27.0	31.1	29.8	36.3	30.7	31.7	27.3	
DT11	385112	345636	34.7	35.6	29.4	25.8	26.8	22.3	23.7	26.2	33.1	31.2	39.8	27.9	29.7	25.5	
DT24	385574	347530	37.2	36.9	30.3	29.3	29.3	22.2	25.8	25.8	33.4	31.4	46.4	30.5	31.5	27.1	
DT28	377994	350105															

DT34	385059	345840			29.2	36.8	28.2		20.9	20.0	38.7	29.8	44.2	24.5	30.3	26.0	
DT39	383560	354739	33.8	39.2	30.0	35.3	36.6	34.2	23.7	28.8	35.2	30.4	44.9	25.0	33.1	28.5	
DT40	385128	348811	28.3	30.4	22.3	24.4	20.6	20.9	17.3	20.3	23.8	26.2	35.4	24.7	24.6	21.1	
DT46	385073	345685	33.4	30.7	23.3	21.3	21.1	18.0	20.7	22.3	24.8	26.3	36.5	25.4	25.3	21.8	
DT47	385023	345678	23.0	31.1	25.0	29.6	25.9	26.6	15.7	22.1	27.1	33.0	29.5	20.1	25.7	22.1	
DT49	385595	349129	34.3	34.9	25.6	24.9	23.2	20.5	24.6	25.8	32.8	28.4	42.6	26.7	28.7	24.7	
DT64	383950	354445	27.2	35.6	32.4	30.1	26.8	27.3	29.1	29.7	34.6	30.5		31.9	30.5	26.2	
DT72	384981	345750	31.0	37.9	30.9	35.0	31.9	30.5	25.2	27.3	36.7	33.2	41.6	29.4	32.6	28.0	
DT73	385070	345738		36.9	33.6	34.3	36.5	30.1	24.9	31.0	64.6	34.4	45.8	28.6	36.4	31.3	
DT74	385132	345640	33.6	36.6	30.5	23.0	33.1	26.8	31.1	22.2	55.8	44.5	52.0	75.7	38.7	33.3	
DT76	385226	346156	28.2	40.7	44.7	45.9	38.8	37.4	45.0	36.8	52.0	103.4	56.4	59.0	49.0	**42.2**	**41.5**
DT84	385548	346400	36.1	39.2	33.1	33.9	17.0	30.7	27.7	30.4	38.2	33.4	44.4	29.1	32.8	28.2	
DT85	385575	346413	36.4	42.0	34.9	43.7	43.3	40.1	35.4	38.8	42.4	41.6	48.6	32.9	40.0	34.4	
DT86	385075	345910		25.8	24.9	30.1	21.9	15.8	17.0		23.4	24.6	40.3	22.1	24.6	21.1	
DT87	385105	346225	39.7	41.0	36.5	39.1	38.5	31.7	35.2	31.8	41.1	26.6	42.8	31.9	36.3	31.2	
DT88	384709	345881	34.4	32.4	27.7	25.7	25.1	21.6	21.0	24.8	26.1	27.8	38.6	27.3	27.7	23.8	
DT89A	385054	346134	27.1	32.2	28.4	30.4	27.2	27.9	19.4	25.4	30.2	28.5	36.9	24.6	-	-	
DT89B	385054	346134	28.6	32.7	28.0	28.7	26.8	28.9	18.9	23.8	29.7	29.5	30.9	24.1	-	-	
DT89c	385054	346134	29.7	32.2	28.2	30.2	26.1	28.3	20.3	24.7	30.9	29.2	35.1	25.4	28.0	24.1	
DT92	383890	354461	33.7	35.2	31.3	30.1	28.2	30.3	24.8	26.9	33.2	29.3	41.9	28.7	31.1	26.8	
DT93	384056	354393	31.2	34.8	27.7	28.9	33.0	30.7	25.4	27.7	32.4	28.2	30.3	30.5	30.1	25.9	
DT94	384030	354416	54.7	46.8	39.7	49.3	48.6	48.1	34.8	36.6	46.0	41.4	41.2	38.2	43.8	37.7	37.3
DT95	385171	345539	37.5	34.3	26.3	28.1	27.7	20.9	23.6	25.2	27.3	29.6	43.6	26.9	29.3	25.2	

DT96	385131	345601	38.3	38.0	31.0	33.8	28.2	23.3	25.2	27.8	33.0	29.3	48.1	29.5	32.1	27.6	
DT97	384795	345796	24.3	28.3	22.2	21.8	18.9	15.8	14.0	17.8	21.1	28.8	40.7	21.1	22.9	19.7	
DT98	385327	346148	40.2	43.1	35.2	33.3	26.9	32.4	31.4	33.1	37.6	36.0	44.0	36.5	35.8	30.8	
DT100	384689	346284	27.1	30.5	25.3	24.8	21.9			22.3	25.1	26.8	27.0		25.6	22.1	
DT101	384806	345842	28.8	37.5	30.5	35.9	33.7	30.4	19.9	27.3	31.5	23.1	34.6	24.0	29.8	25.6	
DT102	384609	346007	45.6	44.7	38.3	36.9	36.6	34.9	36.3	35.1	45.0	39.2	53.9	40.7	40.6	34.9	
DT103	385682	347909			41.1	22.7	17.9	17.7	11.4	15.4	20.0	20.4	31.9	16.3	21.5	18.5	
DT104	385213	346270	37.1		55.6	32.7	33.3	27.7	29.3	29.7	85.9	47.9	47.5	90.1	47.0	**40.4**	39.8
DT105	383991	354418	27.6	30.3	24.8	22.9	21.4	20.6	19.9	33.7	25.7	24.8	33.8	24.3	25.8	22.2	
N107a	384495	346298	22.5	23.5	21.6	24.9	19.8	22.9	12.7	17.7	21.3	22.7	32.5	22.1	-	-	
N107b	384495	346298	22.7	26.9	20.5	24.3	20.3	21.6	13.2	18.0	21.2	21.9	43.1	21.9	-	-	
N107c	384495	346298	21.8	25.2	20.6	23.9	20.1	21.3	12.2	16.8	23.3	20.9	I/S	24.6	22.5	19.3	
N108a	384961	345346	26.6	32.4	27.5	24.4	22.4	I/S	17.7	21.3	24.2	22.0	I/S	26.9	-	-	
N108b	384961	345346	32.0	32.2	21.9	23.7	23.1	I/S	18.4	21.1	24.8	25.2	I/S	27.0	-	-	
N108c	384961	345346	32.3	I/S	26.5	25.4	23.1	I/S	17.7	21.6	25.1	24.0	I/S	26.6	25.0	21.5	
N109a	385190	343318	26.2	29.2	26.0	21.1	21.0	I/S	18.3	18.9	24.2	21.2	41.7	18.9	-	-	
N109b	385190	343318	28.4	27.7	22.6	22.5	18.9	14.8	17.8	18.9	24.0	21.4	I/S	19.2	-	-	
N109c	385190	343318	29.3	27.4	23.8	20.4	I/S	14.2	I/S	I/S	I/S	I/S	I/S	18.6	23.2	20.0	
N110a	385110	342314	32.9	31.5	25.8	21.9	23.6	20.7	5.8	26.4	30.2	24.4	I/S	22.7	-	-	
N110b	385110	342314	30.4	32.0	20.0	23.0	23.8	20.3	25.1	26.2	32.4	< 1.2	I/S	23.7	-	-	
N110c	385110	342314	31.9	31.7	26.4	22.9	25.1	20.5	6.8	26.4	33.3	< 1.2	I/S	21.4	24.8	21.3	
N111a	383882	349558															
N111b	383882	349558															

N111c	383882	349558															
N112a	382286	341956	18.5	21.9	16.4	18.4	15.4	14.0	13.5	15.2	19.7	18.0	23.9	17.4	-	-	
N112b	382286	341956	19.2	22.0	19.1	17.7	15.5	16.2	14.4	15.8	20.3	17.0	25.9	14.7	-	-	
N112c	382286	341956	18.7	22.1	15.1	18.3	15.3	15.4	13.7	15.9	21.3	17.7	I/S	16.2	17.9	15.4	
N113a	383052	343666	21.8	22.1	15.9	16.4	16.2	18.4	17.6	18.3	22.2	12.4	24.0	17.2	-	-	
N113b	383052	343666	22.7	22.0	17.0		14.9	18.4	17.1	17.0	24.0	15.8		21.3	-	-	
N113c	383052	343666	21.6	21.7	17.7	15.6	14.5	19.0	15.7	16.2	21.9			16.6	18.6	16.0	
N114a	383953	344832	23.7	25.4	19.1	20.4	18.3	16.4	13.5	15.5	20.7	39.7		19.3	-	-	
N114b	383953	344832	25.5	23.6	20.4	22.0	17.2	15.7	13.8	15.4	21.7	22.6		21.8	-	-	
N114c	383953	344832	24.1	25.1	20.3	20.8	17.9	16.5	12.3	14.6	18.8	29.1		19.3	20.3	17.5	
N115a	383545	345195	18.0	18.6	13.0	14.1	14.2	18.3	23.0	11.3	12.7	14.5	27.6	11.1	-	-	
N115b	383545	345195	18.7	17.3	12.8	13.6	14.3	18.3	22.9	10.9	12.9	11.8		10.5	-	-	
N115c	383545	345195	19.0		14.0			18.1			12.5	13.9		11.2	16.2	14.0	
N116a	383157	345431	23.5	25.5	31.1	19.3	20.5	23.4	14.8	15.8	20.6	21.8	31.7	16.8	-	-	
N116b	383157	345431	20.7	25.6	19.6	18.6	20.4	23.5	15.4	15.6	20.4	21.9		17.1	-	-	
N116c	383157	345431	22.8	23.7	18.3	19.9	20.6	23.9	14.5	15.7	20.6	20.9		16.9	21.2	18.3	
N117a	383199	352740	35.8	37.0	29.2	30.7	29.5	26.9	29.8	28.9	36.5	28.9	44.7	28.1	-	-	
N117b	383199	352740	36.1	38.2	28.6	23.4	28.1	25.4	29.3	29.0	35.2	26.9	48.7	28.2	-	-	
N117c	383199	352740	37.4	40.5	31.9	28.8	31.7	25.1	30.0	27.8	34.5	32.1	41.6	26.8	32.0	27.5	
N118a	382934	353388	24.3	26.9	22.7	25.1	23.3	20.9	17.5	19.8	18.9	23.2	32.9	19.4	-	-	
N118b	382934	353388	25.4	27.4	23.1	23.7	23.4	21.2	19.0	18.9	24.9	22.9	16.0	19.9	-	-	
N118c	382934	353388	25.1	27.4	23.4	24.3	22.5	21.2	19.0	20.3	24.2	22.1	33.4	20.6	22.9	19.7	
N119a	382600	354062	24.3	30.3	23.9	26.0	23.4	22.8	17.7	19.3	25.8	24.8	36.3	18.8	-	-	

N119b	382600	354062	24.4	32.2	24.2	24.3	24.0	23.1	17.8	19.7	26.9	24.0	37.4	18.7	-	-	
N119c	382600	354062	23.4	31.5	22.4	27.7	23.0	23.2	17.4	20.2	27.1	25.1		17.9	24.6	21.2	
N120a	382707	354305	38.0	41.5	33.4		30.0	26.5	28.2	29.7	35.7	33.8	48.4	30.3	-	-	
N120b	382707	354305	35.6	40.6	32.9	32.7	30.9	27.1	28.3	29.3	35.4	33.4	44.6	30.7	-	-	
N120c	382707	354305	38.0	39.8	33.1	33.1	30.7	26.4	29.3	30.1	33.0	33.9	48.2	28.8	33.7	29.0	
N121a	382736	354385	29.6	24.0	22.4	22.7	21.4	17.3		18.9	22.7	22.1	40.1	21.3	-	-	
N121b	382736	354385	28.3	31.0	22.1	20.9	22.4	17.4		31.1	23.7	23.6	40.8	21.3	-	-	
N121c	382736	354385	28.8	30.7	21.2	22.9	21.8	16.0			23.4			20.8	24.8	21.3	
N122a	384261	354207	37.4	34.2	25.6	31.1	29.6	29.4	16.7	21.3	24.5	25.6	34.6	22.7	-	-	
N122b	384261	354207	29.2	33.3	25.5	30.7	29.3	29.4	17.7	21.2	23.8	24.7	31.5	23.9	-	-	
N122c	384261	354207	28.6	32.2	26.7	29.4	28.9	28.3	17.2	21.7	25.1	23.6		26.8	27.1	23.3	
N123a	384638	354133	30.8	I/S	28.0	23.7	21.0	22.3	26.4	25.1	31.7	34.5	35.5	31.5	-	-	
N123b	384638	354133	32.6		27.1	23.2	21.9	22.3	28.7	25.3	31.8	27.3	40.3	32.2	-	-	
N123c	384638	354133	31.8		28.2	22.4	21.6	23.7			32.5	35.2		31.6	28.5	24.5	
N124a	385019	353832	46.5	43.2	40.6	36.3	33.0	31.5	33.8		37.3	35.0	45.9	41.7	-	-	
N124b	385019	353832	39.7	40.8	38.5	35.2	32.9	31.2	32.3	32.2	40.8	40.8	43.1	42.6	-	-	
N124c	385019	353832	40.6	41.6	38.4	34.7	34.5	30.9	31.7	32.3	79.2	35.6	51.2	39.4	38.8	33.4	
N125a	385387	348389	31.5	33.0	24.0	23.7	22.3	19.0	21.5	22.8	28.5	27.0	38.7	22.7	-	-	
N125b	385387	348389	31.1	31.5	25.2	23.2		33.8	20.7	21.1	27.0	29.0	40.5	27.1	-	-	
N125c	385387	348389	31.8	33.0	26.6	23.6	22.1	20.2	21.7	22.5	25.1	28.8	I/S	25.7	26.9	23.1	
N126a	385556	348224	29.2	28.2	22.2	20.8	20.1	17.3	18.2	21.0	23.1	25.2	36.9	22.5	-	-	
N126b	385556	348224	28.7	25.6	24.5	19.8	20.4	16.7	17.6	19.8	23.8	26.0	38.5	22.3	-	-	
N126c	385556	348224	27.9	25.2	23.2	22.0	20.9	17.6			24.4	24.5	38.5	25.3	23.8	20.5	

N127a	385416	347424	24.0	25.7	22.3	23.4	17.9	18.5	15.2	19.3	25.5	24.9	37.3	20.2	-	-	
N127b	385416	347424	22.8	28.5	23.1	23.4	19.8	16.7	15.2	19.2	25.1	24.6	37.1	19.4	-	-	
N127c	385416	347424	24.2	26.5	20.8	22.1	21.1	18.6	15.8	19.9	24.7	24.4	36.2	19.5	22.9	19.7	
N128a	385512	347373				31.4	30.3	29.5	22.4	25.9	29.9	29.5	37.7	25.6	-	-	
N128b	385512	347373				30.2	27.9	29.2	19.7	25.3	35.8	29.4	37.3	23.8	-	-	
N128c	385512	347373				31.1	31.1	27.5	22.0	27.4	27.4	30.0	39.6	24.3	28.9	24.9	
N129a	384968	346228	27.4	29.4	18.8	28.8	19.8	21.2		22.7	27.4	26.5	37.3	28.6	-	-	
N129b	384968	346228	27.4	31.1	25.3	28.5	22.9	25.1	19.5	23.3	27.2	30.7	36.2	25.3	-	-	
N129c	384968	346228	26.6	28.7	26.2	30.5	23.0		19.2	22.7	21.8	29.4	37.3	23.9	26.2	22.5	
N130a	385098	346395	34.9	34.1	36.8	38.7	33.3	27.9	18.6	28.8	34.1	30.3	44.1	23.4	-	-	
N130b	385098	346395	32.0	36.2	35.3	38.8	34.9	28.4	27.2	30.5	38.7	32.7	44.7	27.5	-	-	
N130c	385098	346395	35.3	38.7	31.2	36.5	35.4	28.9	27.0	45.3	41.0	37.6	43.9	24.9	33.8	29.1	
N131a	385463	346374	41.7	40.9	32.9	35.6	32.2	29.8	27.9	30.7	37.0	29.9	54.7	31.8	-	-	
N131b	385463	346374	37.3	41.7	34.5	35.0	32.1	30.1	27.1	31.1	36.1	35.7	52.0	37.1	-	-	
N131c	385463	346374	35.1	41.9	34.3	36.8	31.2	31.7	27.6	31.3	40.4	35.9		33.8	35.8	30.8	
N132a	385612	346436	38.1	38.9	29.5	26.1	27.3	25.2	30.0	30.2	35.1	33.4	46.2	33.8	-	-	
N132b	385612	346436	41.6	41.4	30.7	26.8	29.0	26.5	29.4	30.8	37.4	33.4	110.0	34.6	-	-	
N132c	385612	346436	41.2	38.9	28.9	26.1					35.6	31.7	50.1	32.2	35.1	30.2	
N133a	385926	346580	33.0	41.3	38.2	38.4	29.6	34.1	31.8	35.1	43.0	36.8	43.6	32.5	-	-	
N133b	385926	346580	41.0	39.2	36.9	37.6	30.6	35.1	31.2	32.4	44.4	38.3	43.9	36.0	-	-	
N133c	385926	346580	39.0	39.6		36.6	30.5	33.6	30.9	31.6	43.0	38.1	42.7	36.5	36.8	31.6	
N134a	386009	346600	37.1	38.0	32.3	31.1	25.7	29.0	26.0		29.9	32.2	42.0	31.5	-	-	
N134b	386009	346600	35.3	37.7	31.4	31.5	27.8	28.6	25.8		31.2	31.7	101.8	32.5	-	-	

N134c	386009	346600	35.6	37.4	31.3						30.5		39.1	33.2	34.0	29.2	
N135a	385518	346128	32.3	33.9	25.5	26.1	26.1	25.5	22.6	26.9	28.4	31.0	40.6	28.6	-	-	
N135b	385518	346128	33.8	33.1	27.0	27.6	24.6	23.4	22.8	27.3	29.4	29.7	39.1	34.0	-	-	
N135c	385518	346128	25.8	38.1	28.4	27.5	26.0	25.2	22.5	28.0	29.4	29.5	44.2	27.7	29.2	25.1	
N136a	385078	345687	40.7	38.9	30.2	25.8	28.5	24.0	23.0	23.0	34.0	31.3	45.5	28.3	-	-	
N136b	385078	345687	37.5	36.3	29.7	25.3	25.0	22.3	26.2	26.6	30.8	33.0	43.9	30.7	-	-	
N136c	385078	345687	36.3	36.0	29.8	28.8	25.6	21.8						29.3	30.7	26.4	
N137a	382795	346011	19.9	22.5	21.4	27.8	20.9		15.6	21.9	23.0	24.4	28.0	18.6	-	-	
N137b	382795	346011	17.7	24.8	20.9	26.4	21.8		14.7	20.9	23.4	22.9	30.0	17.8	-	-	
N137c	382795	346011	20.3	23.3	20.9	27.8	21.2		15.1	20.9	23.0	19.3		17.0	21.9	18.8	
N138a	383113	346592	26.0	27.0	24.9	23.8	19.7		20.5	21.9	29.8	23.5	29.6	22.2	-	-	
N138b	383113	346592	24.3	30.3	26.0	23.3	18.8	19.3	20.6	21.4	31.1	25.4	31.6	23.0	-	-	
N138c	383113	346592	24.8	28.5	24.2	23.8	19.2	19.5			30.7	24.2	31.9	21.9	24.3	20.9	
N139a	383302	346727	16.3	20.0	16.3	15.1	13.7	13.1	11.0	12.6	17.3	16.3	21.8	14.5	-	-	
N139b	383302	346727	17.2	20.8	16.4	15.8	12.9	12.8	11.1	13.1	19.0	17.7	23.8	14.8	-	-	
N139c	383302	346727	16.6	19.8	15.7	16.5	12.4	12.9	10.7	12.6	17.3	17.7		16.4	16.0	13.7	
N140a	383930	347273	31.9	32.4	24.8	29.8	27.9	26.5	20.6	24.1	31.8	27.7	39.1	25.2	-	-	
N140b	383930	347273	29.7	33.7	26.3	28.4	26.7	26.5	21.5	24.0	30.8	28.0	40.6	25.2	-	-	
N140c	383930	347273	30.0	34.5	27.6	28.7	27.0	27.2	20.0	23.7	30.8	28.0		27.7	28.6	24.6	
N141a	384337	347534	30.3	39.8	33.9	33.6	32.1	28.5	24.8	28.4	36.4	31.1	48.7	30.6	-	-	
N141b	384337	347534	35.2	37.3	32.4	33.7	32.5	29.3	25.6	28.9	34.3	31.7	46.5	31.0	-	-	
N141c	384337	347534	36.7	37.7	30.8	32.6	32.1	29.2	25.4	28.7	34.9	32.2		27.1	33.1	28.5	
N142a	384207	347915	27.1	30.5	24.9	24.7	22.4	20.9	17.5	21.5	27.6	27.5	43.0	25.7	-	-	

N142b	384207	347915	32.3	32.9	23.8	25.4	22.5	21.0	18.4	21.6	26.0	27.1		25.2	-	-	
N142c	384207	347915	26.8	31.6	24.9	26.1	21.9	20.4	19.1	22.6	26.6	27.0		27.8	26.4	22.7	
N143a	384021	348925	42.0	45.9	36.1	42.0	43.1	39.6	32.5	38.7	46.2	37.0	49.9	32.4	-	-	
N143b	384021	348925	42.4	45.6	38.1	40.1	41.2	36.4	32.4	39.2	44.7	37.9	51.5	34.1	-	-	
N143c	384021	348925	40.7	45.5	36.9	42.1	42.8	38.7	32.2	38.0	42.8	37.8	50.8	37.9	40.4	34.8	
N144a	383764	349912	20.0	26.4	19.3	22.1	19.2	18.8	11.9	17.8	21.1	22.5	30.9	15.4	-	-	
N144b	383764	349912	13.6	27.1	19.9	22.7	20.1	20.6	11.7	17.3	17.1	20.7	33.0	16.2	-	-	
N144c	383764	349912	20.5	28.2	18.0	22.7	19.4	21.2	12.9	17.0	21.9	20.4		15.2	20.4	17.6	
N145a	383670	350326	39.1	49.5	41.1	47.0	45.9	42.5	40.2	40.1	56.9	43.3	59.6	36.2	-	-	
N145b	383670	350326	44.2	48.4	42.7	48.5	43.7	45.6	44.7	41.3	52.9	45.9	61.4	40.8	-	-	
N145c	383670	350326	47.4	47.2	45.6	48.3	43.2		44.8	38.0	52.4	44.2	58.3	40.0	46.0	39.5	24.7
N146a	383587	350790	30.3	30.3	24.6	23.7	22.2		26.1	27.5	31.7	27.7	41.5	22.6	-	-	
N146b	383587	350790	28.8	29.3	24.5	22.1	25.2	21.5	27.5	26.4	31.4	25.8	40.2	23.1	-	-	
N146c	383587	350790	31.7	31.4	25.2	23.7	25.9	21.9	25.7	27.6	30.6	27.2	36.7	22.2	27.4	23.5	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1**

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

☒ **Newcastle under Lyme BC confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 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

QA/QC of Diffusion Tube Monitoring

Staffordshire Scientific Services Laboratory supplied and analysed diffused tubes for Newcastle under Lyme Borough Council using the 20% TEA in water preparation method. The laboratory is UKAS accredited to ISO/IEC 17025:2017 [12] and participates in the AIR-PT scheme run by LGC [13] and the Field Intercomparison Scheme run by NPL.[14]

Monitoring has been completed in accordance with the 2023 Diffusion Tube Calendar [15],

The subsequent valid data capture for the whole monitoring period was 100%.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Newcastle-under-Lyme Borough Council recorded data capture in excess of 75% therefore it was not required to annualise any monitoring data. Three sites were closed during early 2023. Insufficient data (<25%) was collected during the 2023 calendar year to enable reliable annualisation of the data to be derived for these sites. Reference to these is nevertheless included in the tables in Appendix A and Appendix B for completeness.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 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/NO_2

12 https://www.ukas.com/wp-content/uploads/schedule_uploads/00002/0719Testing-Multiple.pdf

13 https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html

14 https://laqm.defra.gov.uk/air-quality/air-quality-assessment/precision-and-accuracy/

15 https://laqm.defra.gov.uk/air-quality/air-quality-assessment/diffusion-tube-monitoring-calendar/

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

Newcastle-under-Lyme Borough Council have applied a national bias adjustment factor of 0.86[16] to the 2023 monitoring data. A summary of bias adjustment factors used by Newcastle-under-Lyme Borough Council over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	06/24	0.86
2022	National	06/23	0.86
2021	National	09/22	0.85
2020	National	09/21	0.85
2019	National	03/20	0.93
2018	National	03/18	0.93

The DEFRA ASR Appraisal Report for 2023 made the recommendation that “It would be beneficial for the Council to derive a local bias adjustment factor using the automatic monitor and the co-located triplicate diffusion tube site DT89 at Queen’s Garden”.

A comparison of the data from the real-time analyser and from the triplicate diffusion tubes at monitoring location DT89 from the last five calendar years is provided in the table below.

Monitoring Method	Monitoring Year				
	2019	**2020**	**2021**	**2022**	**2023**
Chemiluminescent (CM1)	25.6	18	23.2	26	26.5
Triplicate Diffusion Tube (DT89)	30.1	20.9	24.5	25.7	24.1
Local Bias Correction	0.85	0.86	0.95	1.01	1.10

16 https://laqm.defra.gov.uk/air-quality/air-quality-assessment/national-bias/ spreadsheet version number 09/23 for Staffordshire Scientific Services

The local bias in 2019 and 2020 is broadly consistent with the observed national bias for Staffordshire Scientific Services Laboratory 20% TEA in water preparation method. However there appears to be an upward drift in this local factor from 2019 onwards to the extent that NULBC officers are not satisfied that the calculated local bias correction can be used with confidence. For this reason, NULBC has continued to use the national bias correction for the purposes of this ASR. Further investigations into the relative merits of using a local bias adjustment factor or the continued use of the national factor will be carried out during 2024.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where is not possible, the NO_2 concentration at the nearest location relevant for exposure has this been estimated using the Diffusion Tube Data Processing Tool available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1

Table C.2 – Non-Automatic NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
DT76	2.0	2.2	42.2	12.9	41.5	Predicted concentration at Receptor above AQS objective.
DT94	4.0	4.2	37.7	9.4	37.3	Predicted concentration at Receptor within 10% the AQS objective.
DT104	2.0	2.2	40.4	12.9	39.8	Predicted concentration at Receptor within 10% the AQS objective.
N145a, N145b, N145c	2.0	22.0	39.5	13.1	24.7	Receptor is more than 20m further from the kerb than your monitor - treat result with caution.

QA/QC of Automatic Monitoring

Air quality measurements from the automatic instruments are validated and ratified by Air Quality Data Management (AQDM) http://www.aqdm.co.uk to the standards described in the Local Air Quality Management – Technical Guidance LAQM (TG22) https://laqm.defra.gov.uk/technical-guidance

Validation

This process operates on data during the data collection stage. All data are continually screened algorithmically and manually for anomalies. There are several techniques designed to discover spurious and unusual measurements within a very large dataset. These anomalies may be due to equipment failure, human error, power failures, interference or other disturbances. Automatic screening can only safely identify spurious results that need further manual investigation.

Raw data from the gaseous instruments (e.g. NOx, O_3, SO_2 and CO) are scaled into concentrations using the latest values derived from the manual and automatic calibrations. These instruments are not absolute and suffer drifts. Both the zero baseline (background) and the sensitivity may change over time. Regular calibrations with certified gas standards are used to measure the zero and sensitivity. However, these are only valid for the moment of the calibration since the instrument will continue to drift. The original raw data are always preserved intact while the processed data are dynamically scaled and edited.

Ratification

This is the process that finalises the data to produce the measurements suitable for reporting. All available information is critically assessed so that the best data scaling is applied, and all anomalies are appropriately edited. Generally, this operates at three-, six- or twelve-month intervals. However, unexpected faults can be identified during the instrument routine services or independent audits which are often at 6-monthly intervals. In practice, therefore, the data can only be fully ratified in 12-month or annual periods. The data processing performed during the three- and six-monthly cycles helps build a reliable dataset that is finalised at the end of the year.

There is a diverse range of additional information that can be essential to the correct understanding and editing of data anomalies. These may include:

- the correct scaling of data

- ignoring calibrations that were poor e.g. a spent zero scrubber.
- closely tracking rapid drifts or eliminating the data
- comparing the measurements with other pollutants and nearby sites
- corrections due to span cylinder drift
- corrections due to flow drifts for the particulate instruments
- corrections for ozone instrument sensitivity drifts
- eliminating measurements for NO_2 conversion inefficiencies
- eliminating periods where calibration gas is in the ambient dataset.
- identifying periods where instruments are warming-up after a power cut.
- identification of anomalies due to mains power spikes
- correcting problems with the date and time stamp
- observations made during the sites visits and services.

The identification of data anomalies, the proper understanding of the effects and the application of appropriate corrections requires expertise gained over many years of operational experience. Instruments and infrastructure can fail in numerous ways that significantly and visually affect the quality of the measurements. There are rarely simple faults that can be discovered by computer algorithms or can be understood without previous experience.

Further information about air quality data management, expert data ratification and examples of bad practices are given on the Air Quality Data Management (AQDM) website http://www.aqdm.co.uk

Automatic Monitoring Annualisation

The automatic monitoring location within Newcastle-under-Lyme Borough Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D1 – Map of AQMAs and Monitoring sites.

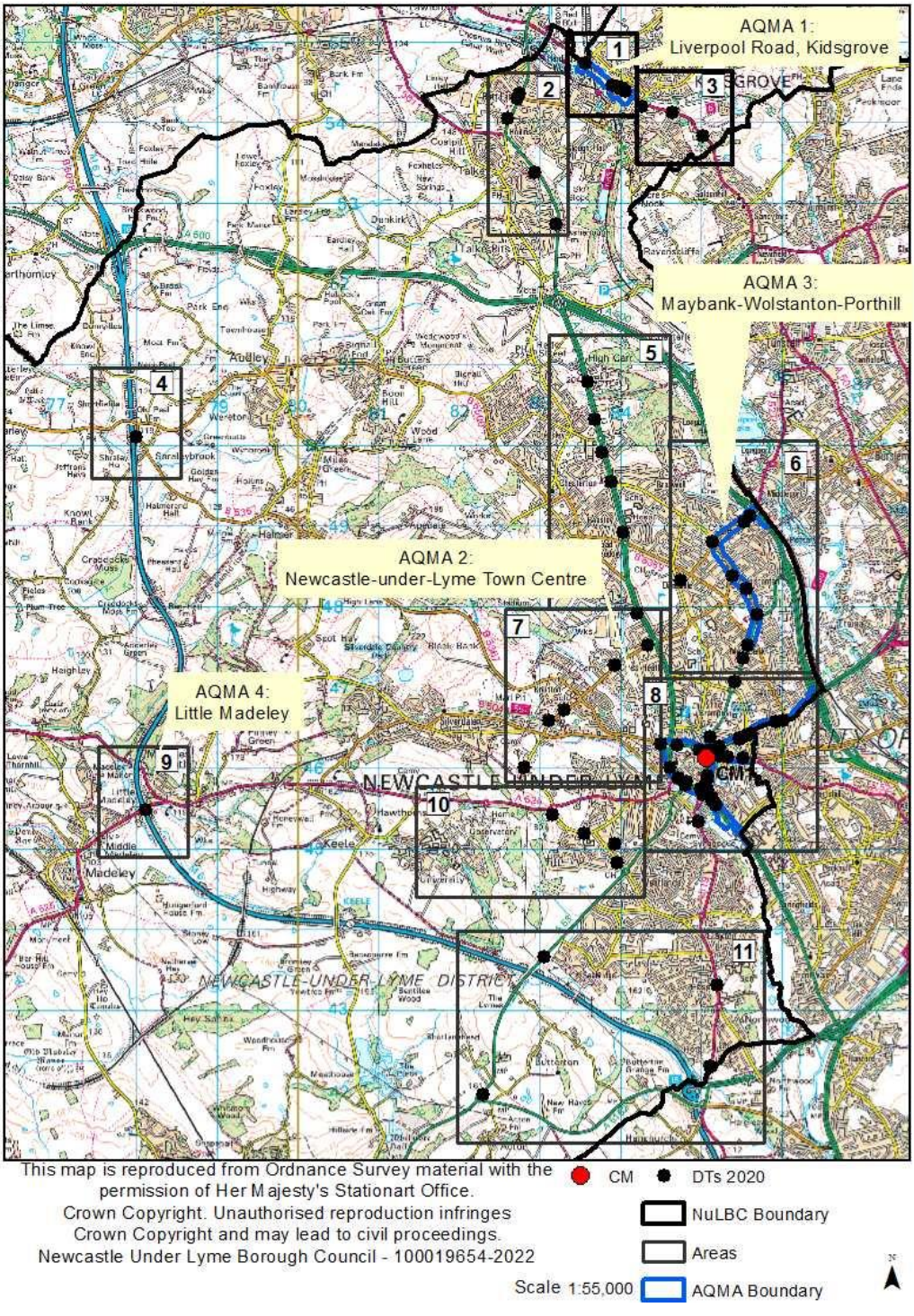


Figure D-3 – Map of monitoring area AQMA 1: Liverpool Road, Kidsgrove

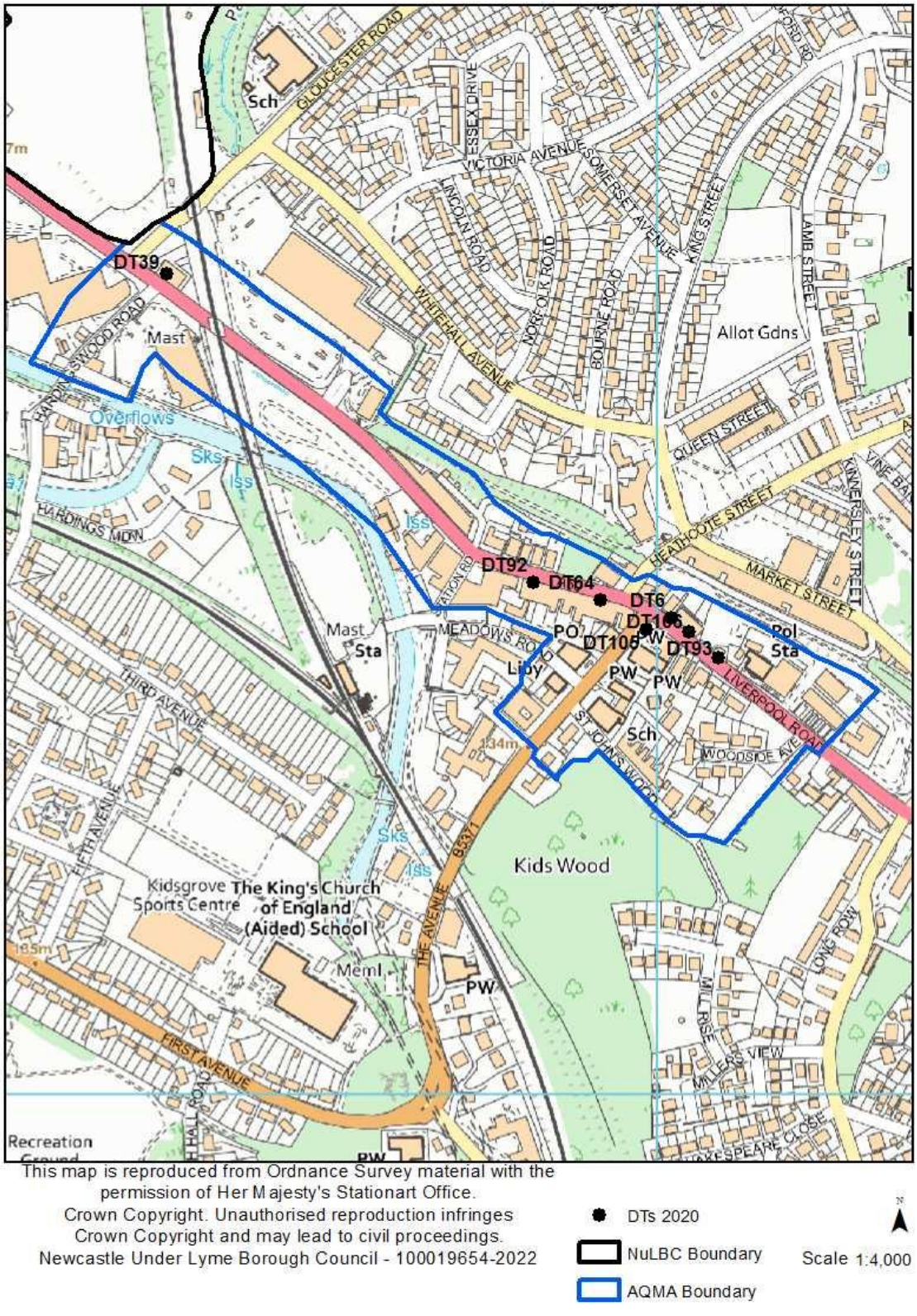


Figure D-4 – Map of monitoring area Kidsgrove 2 - Outside Kidsgrove AQMA

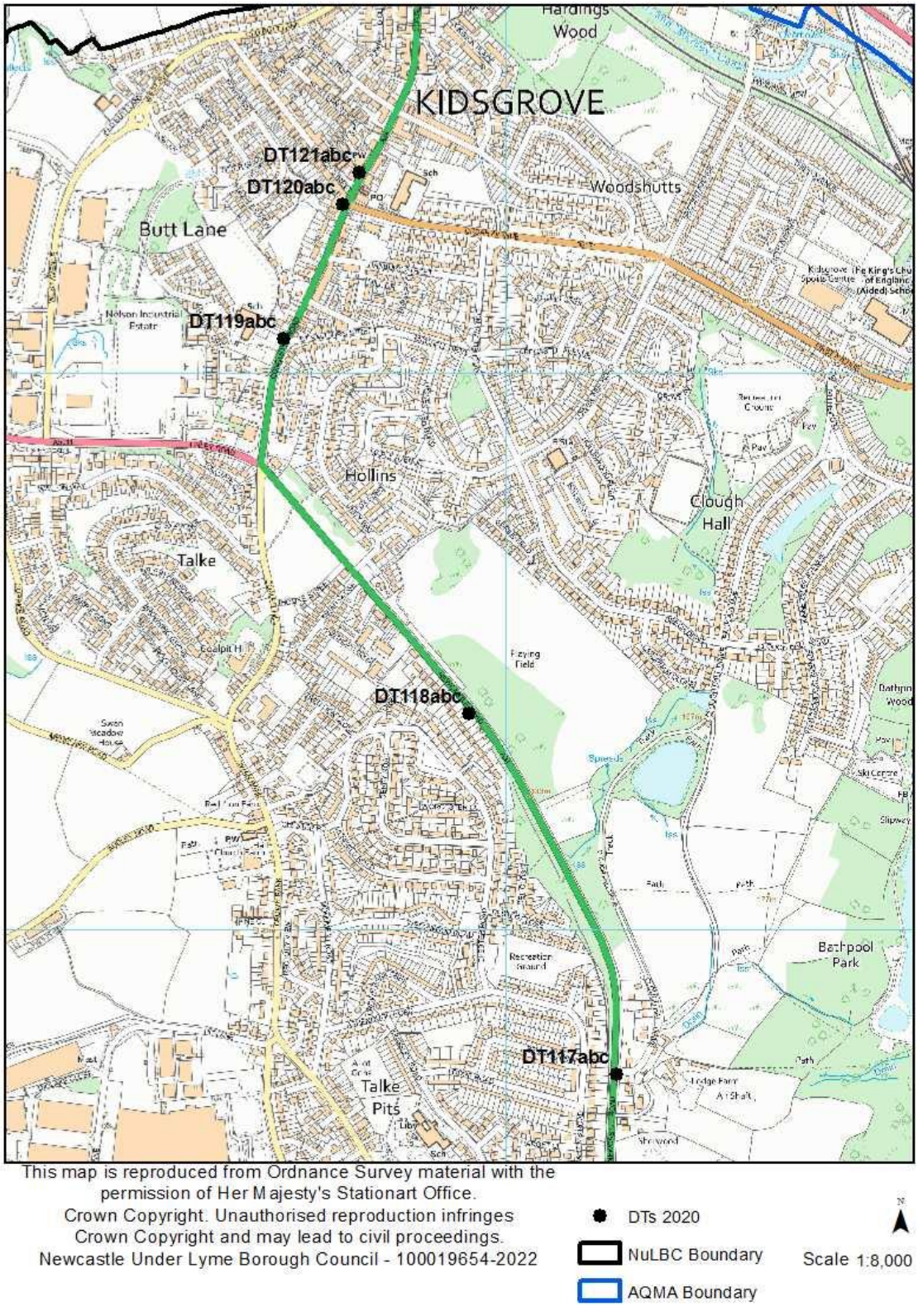


Figure D-5 - Map of monitoring area Kidsgrove 3 - Outside current AQMA.

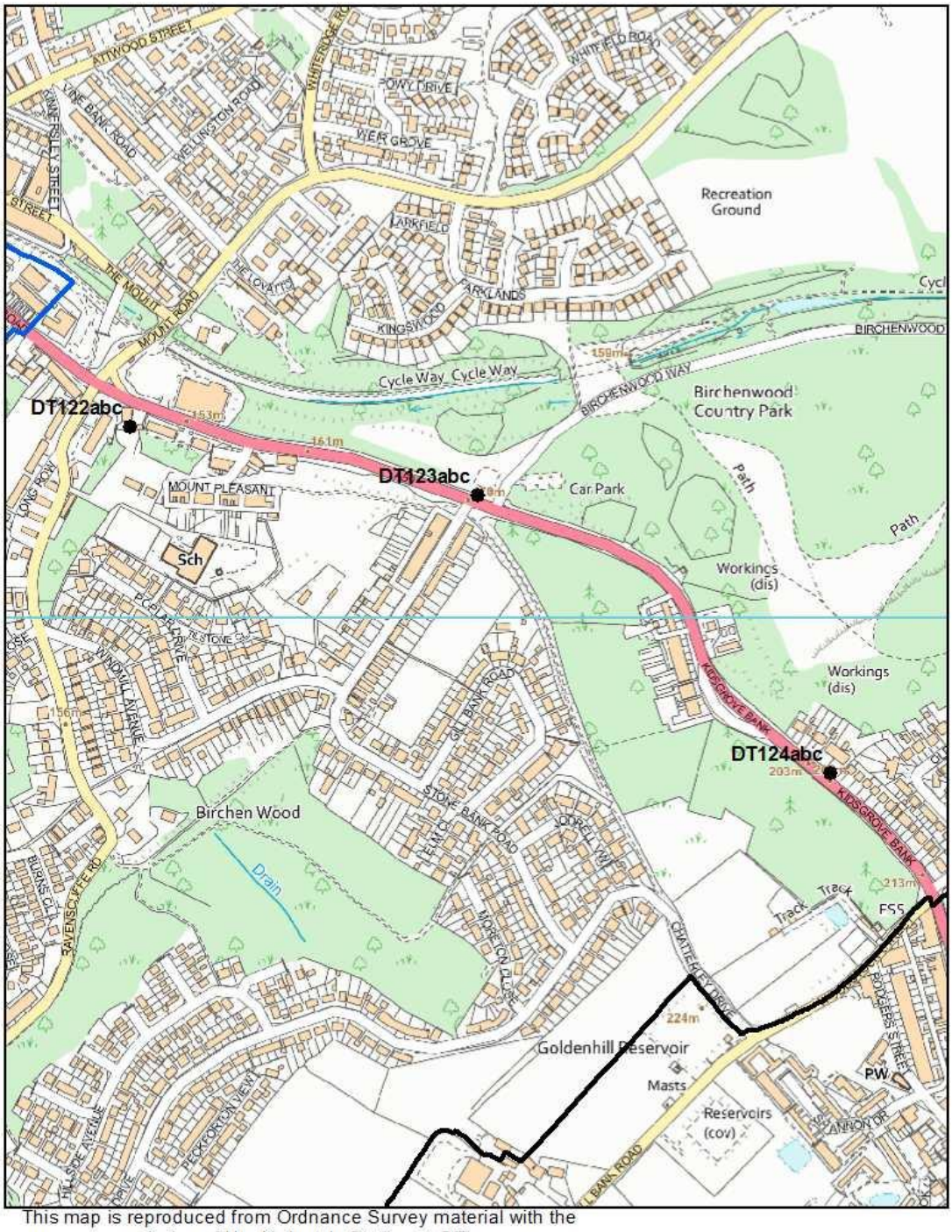


Figure D-6 - Map of monitoring Area 4 – Shirley Brook (not within an AQMA)

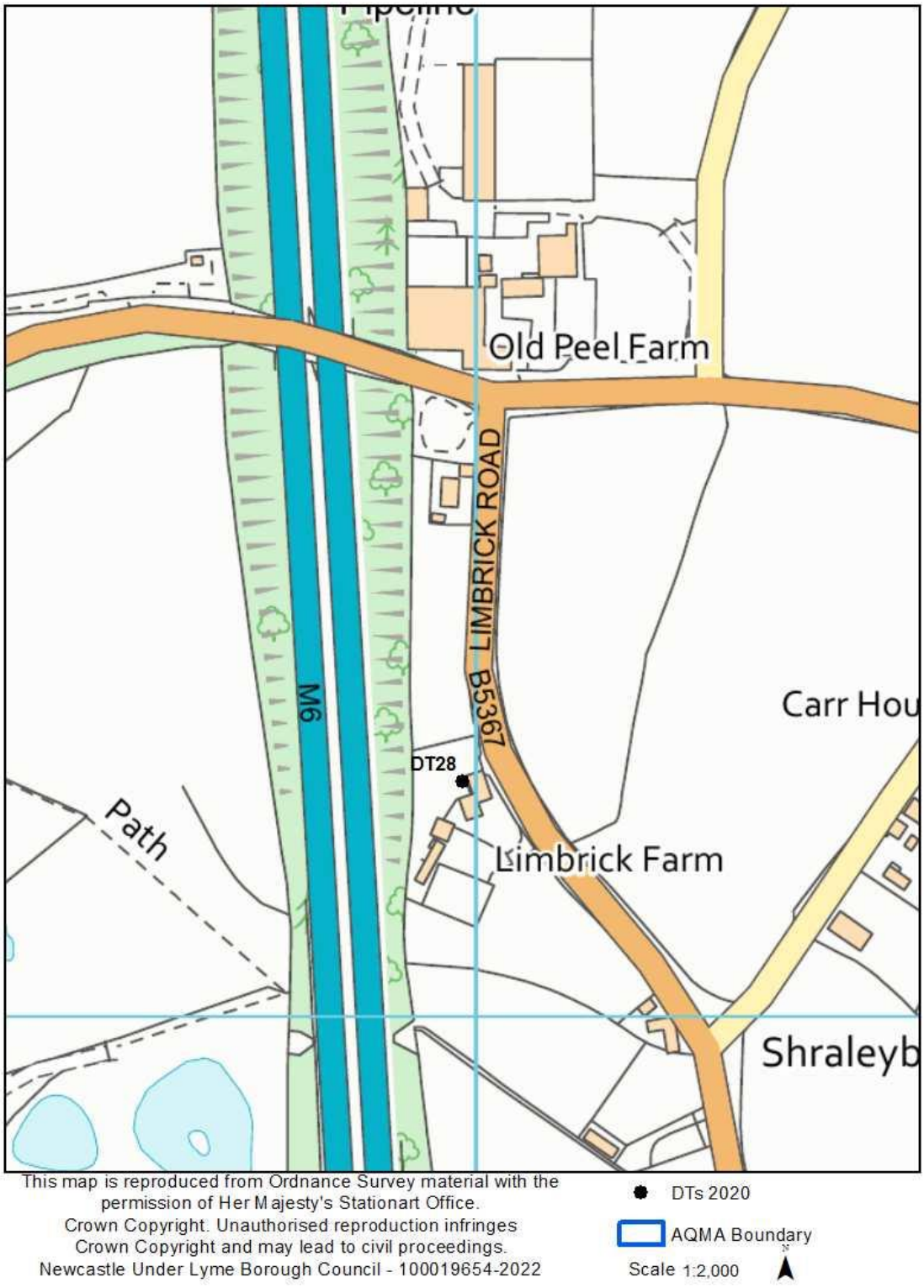


Figure D-7 - Map of monitoring Area 5 - Chesterton (not within an AQMA)

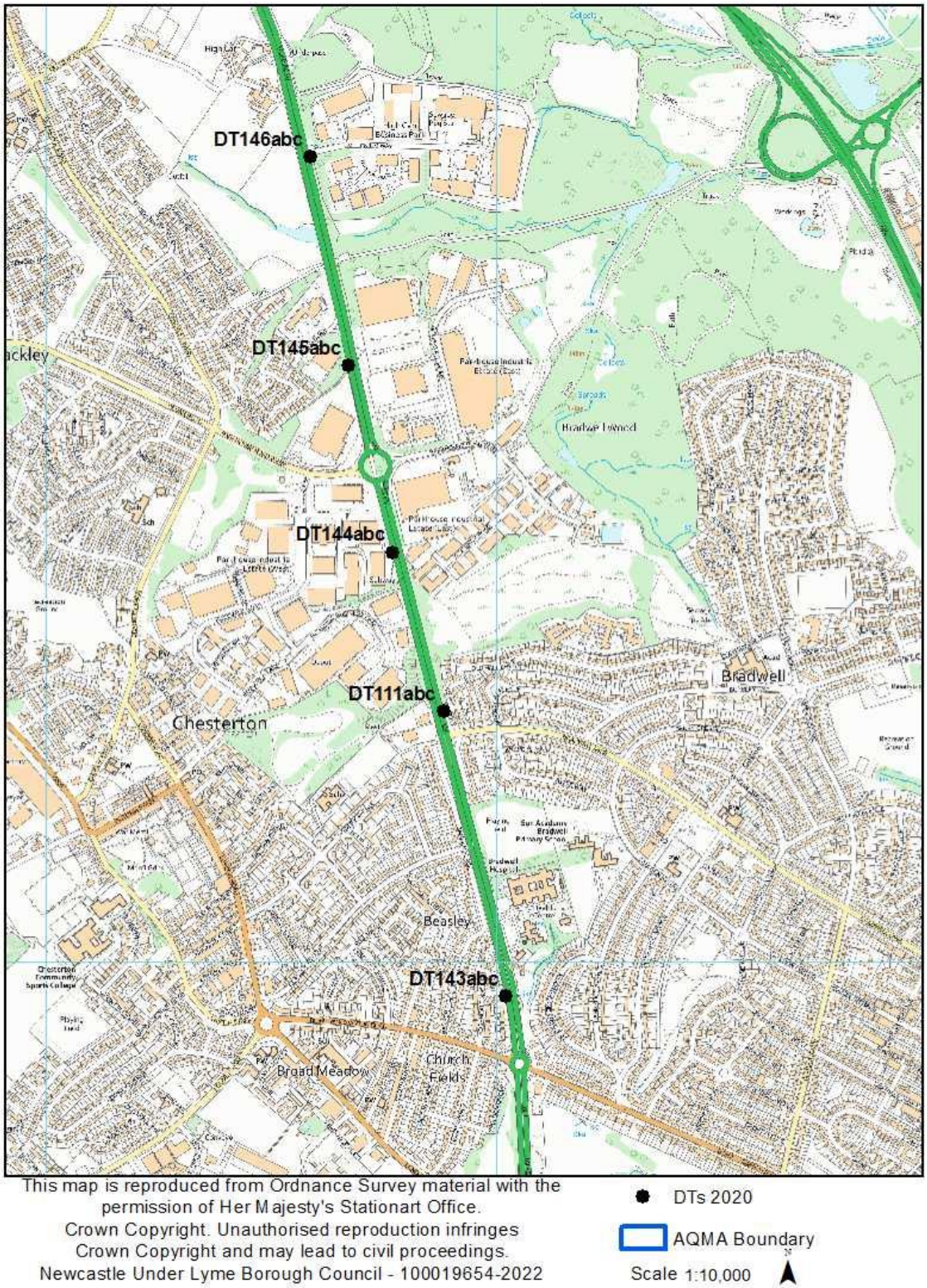


Figure D-8 - Map of monitoring Area – AQMA 3: Maybank-Wolstanton-Porthill

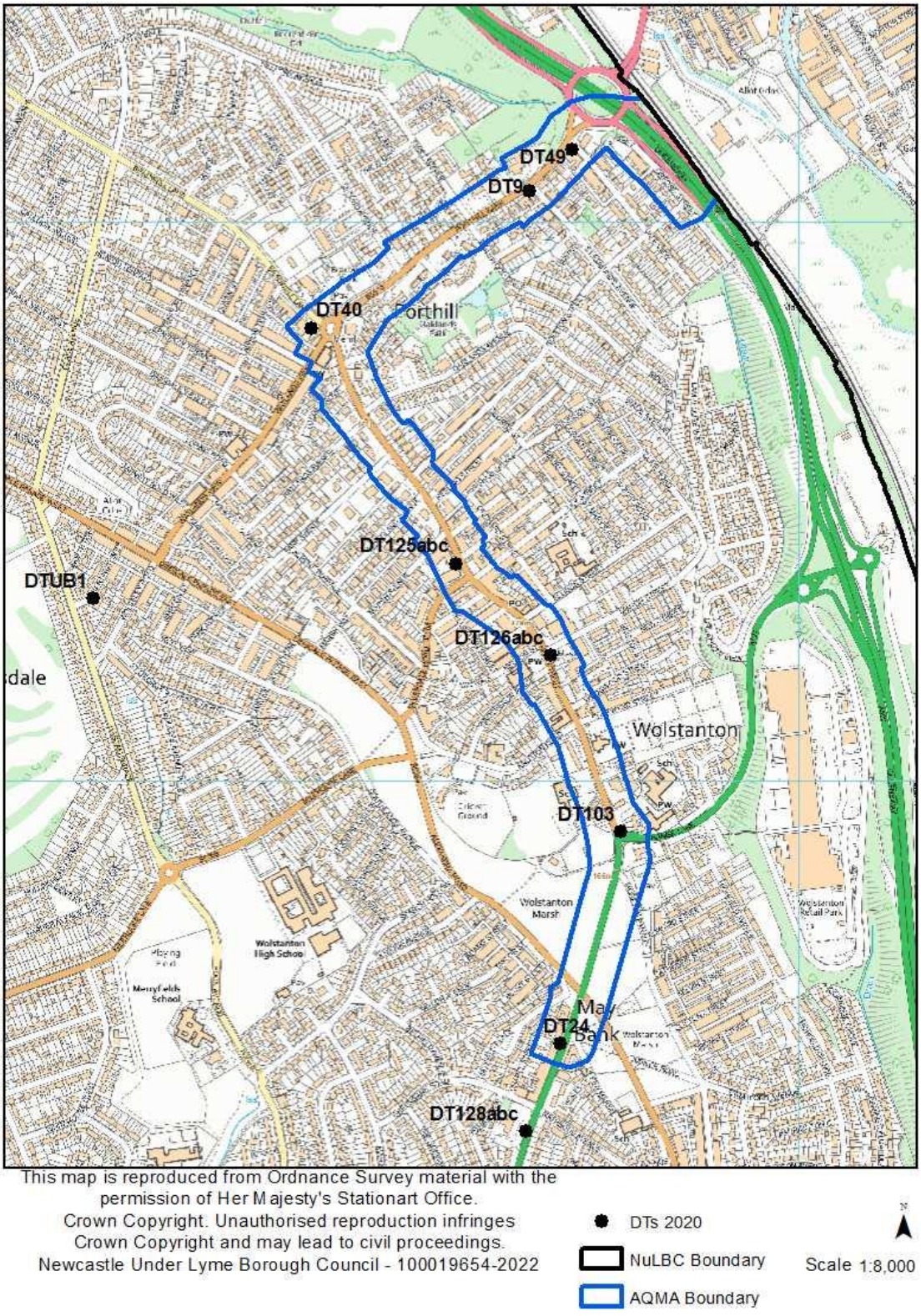


Figure D-9 - Map of monitoring Area 7 – Knutton (not within an AQMA)

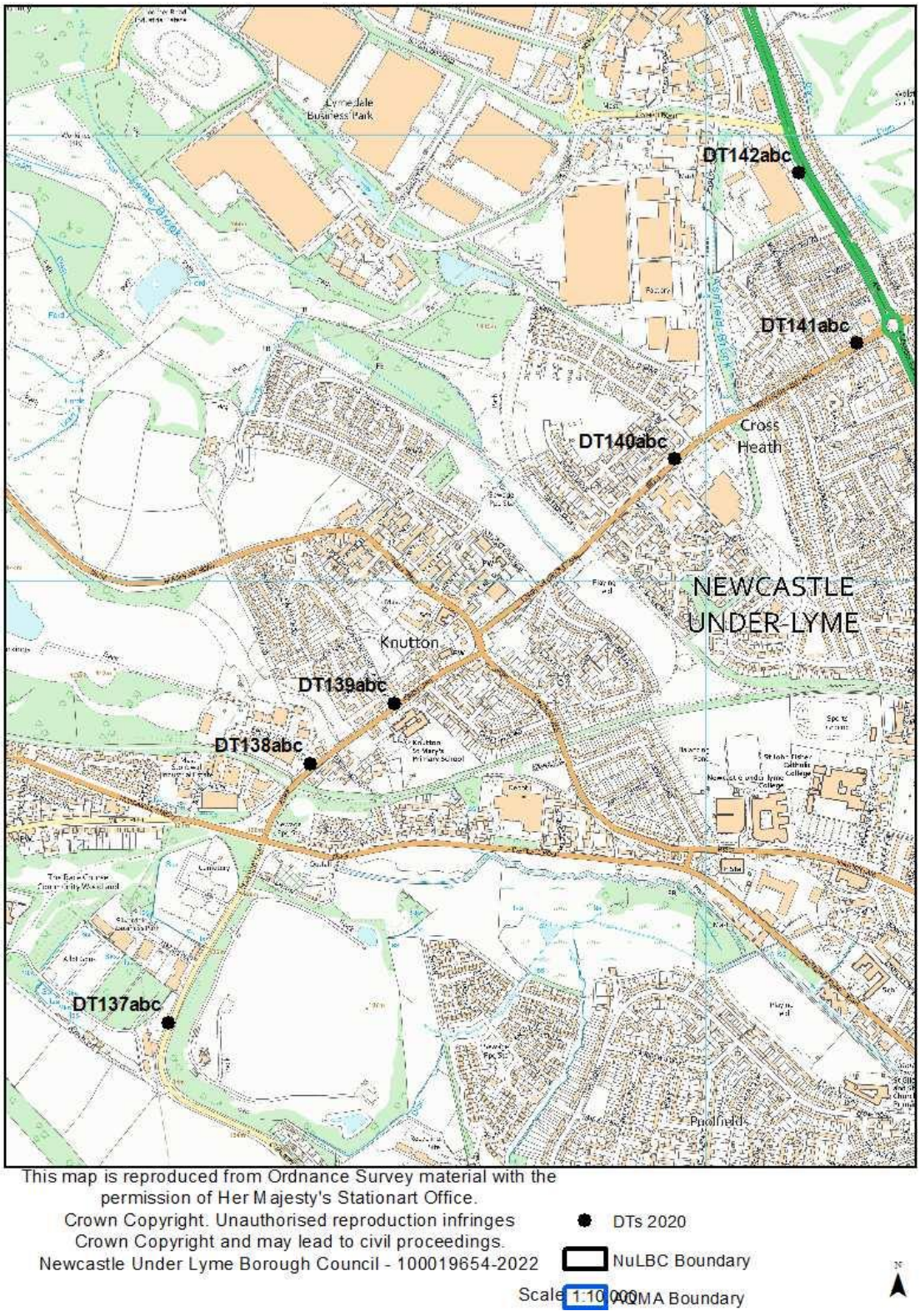


Figure D-10 - Map of monitoring Area 8 - AQMA 2: Newcastle-under-Lyme Town Centre (west)

Figure D-11 - Map of monitoring Area 8 - AQMA 2: Newcastle-under-Lyme Town Centre (east)

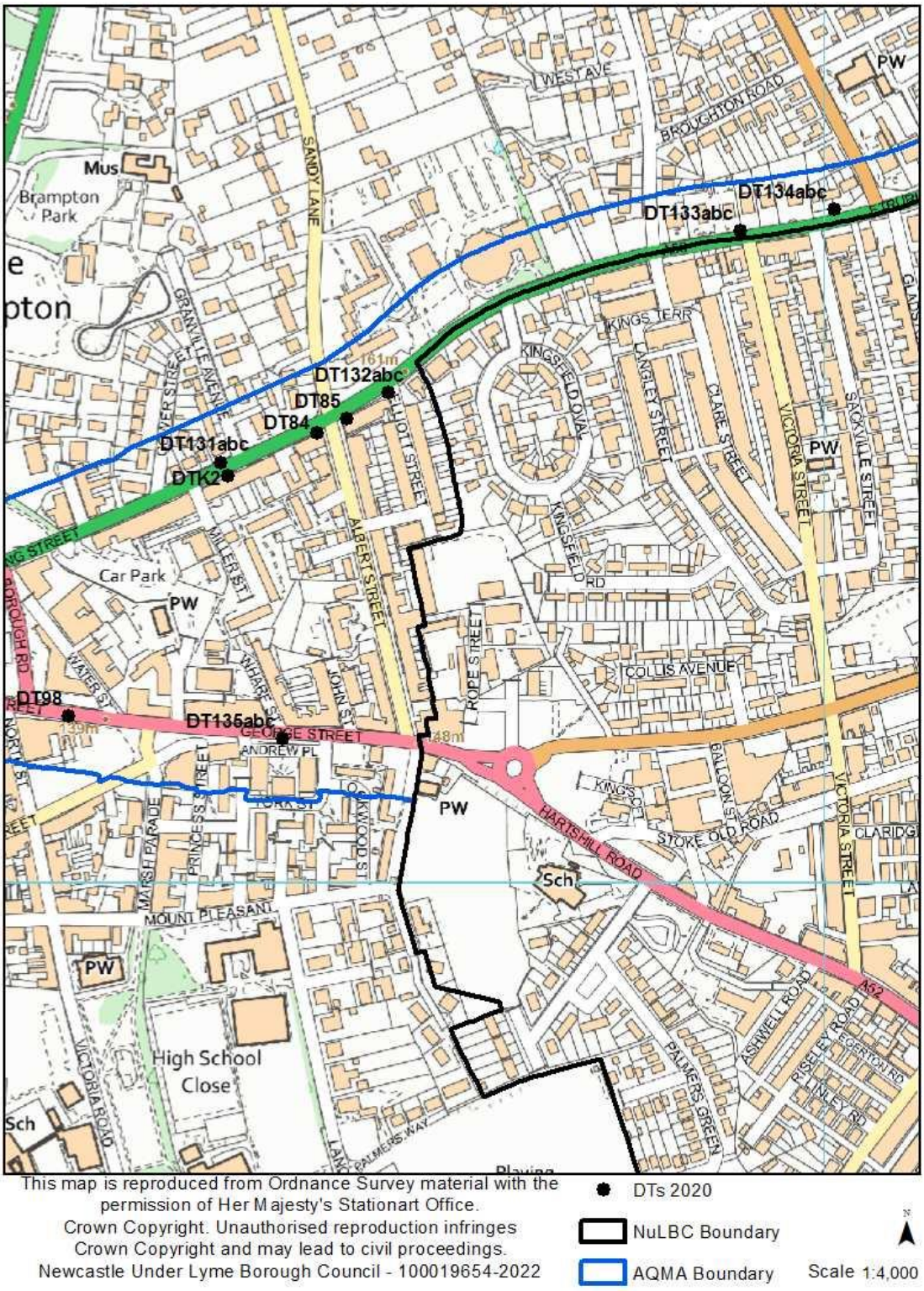


Figure D-12 - Map of monitoring Area 9 – Former AQMA 4: Little Madeley

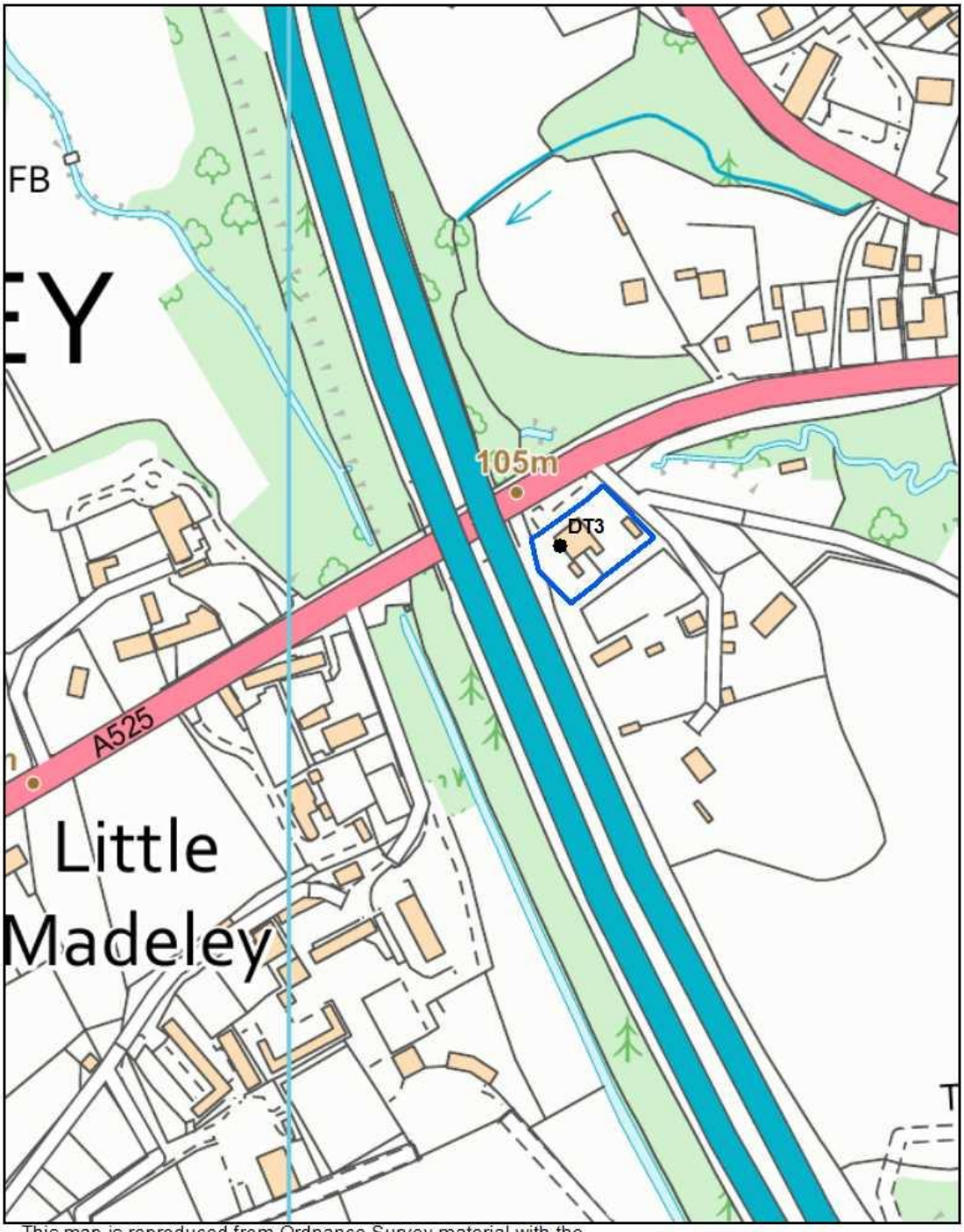


Figure D-13 - Map of monitoring Area 10 – Thistleberry (Not within an AQMA)

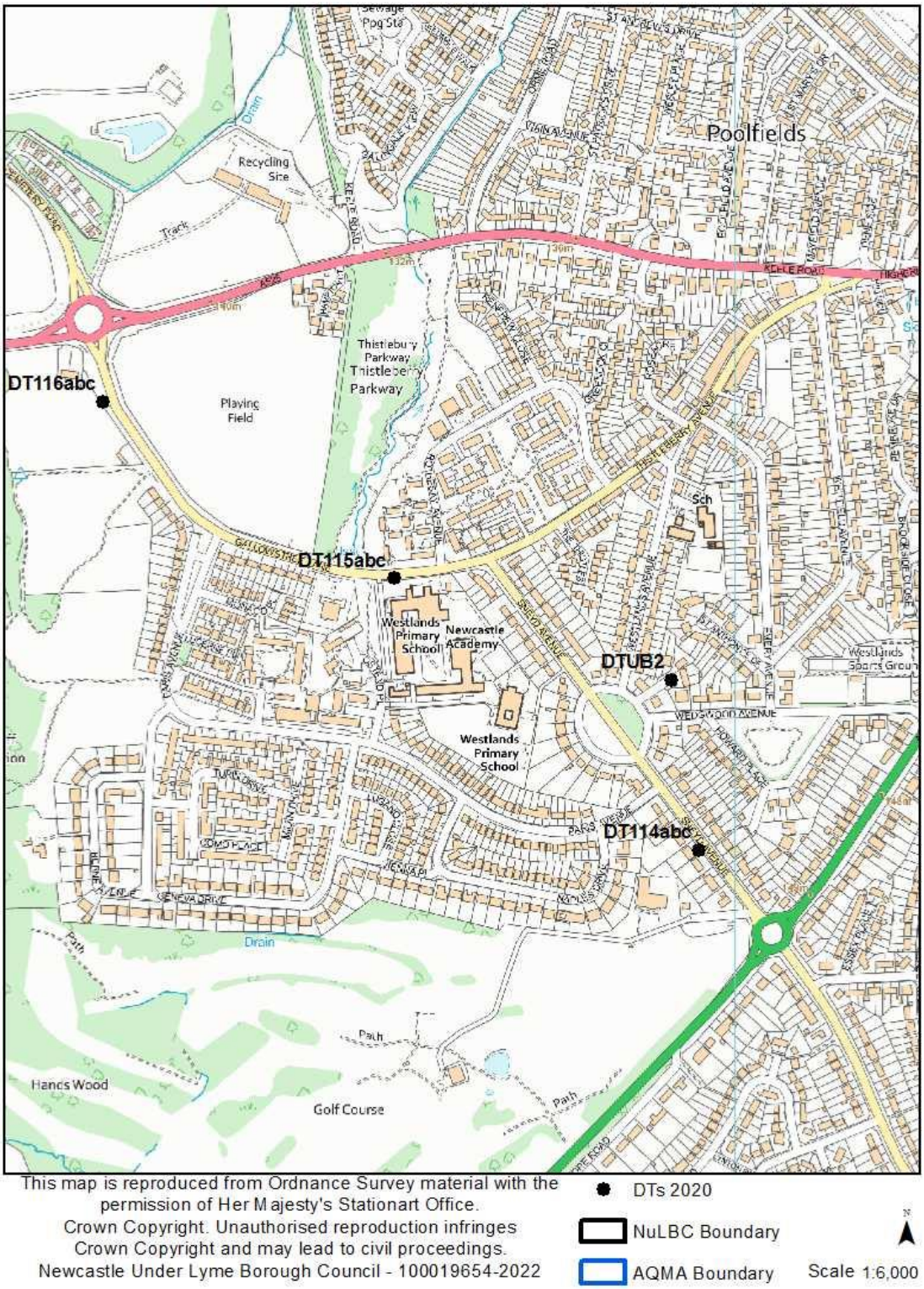
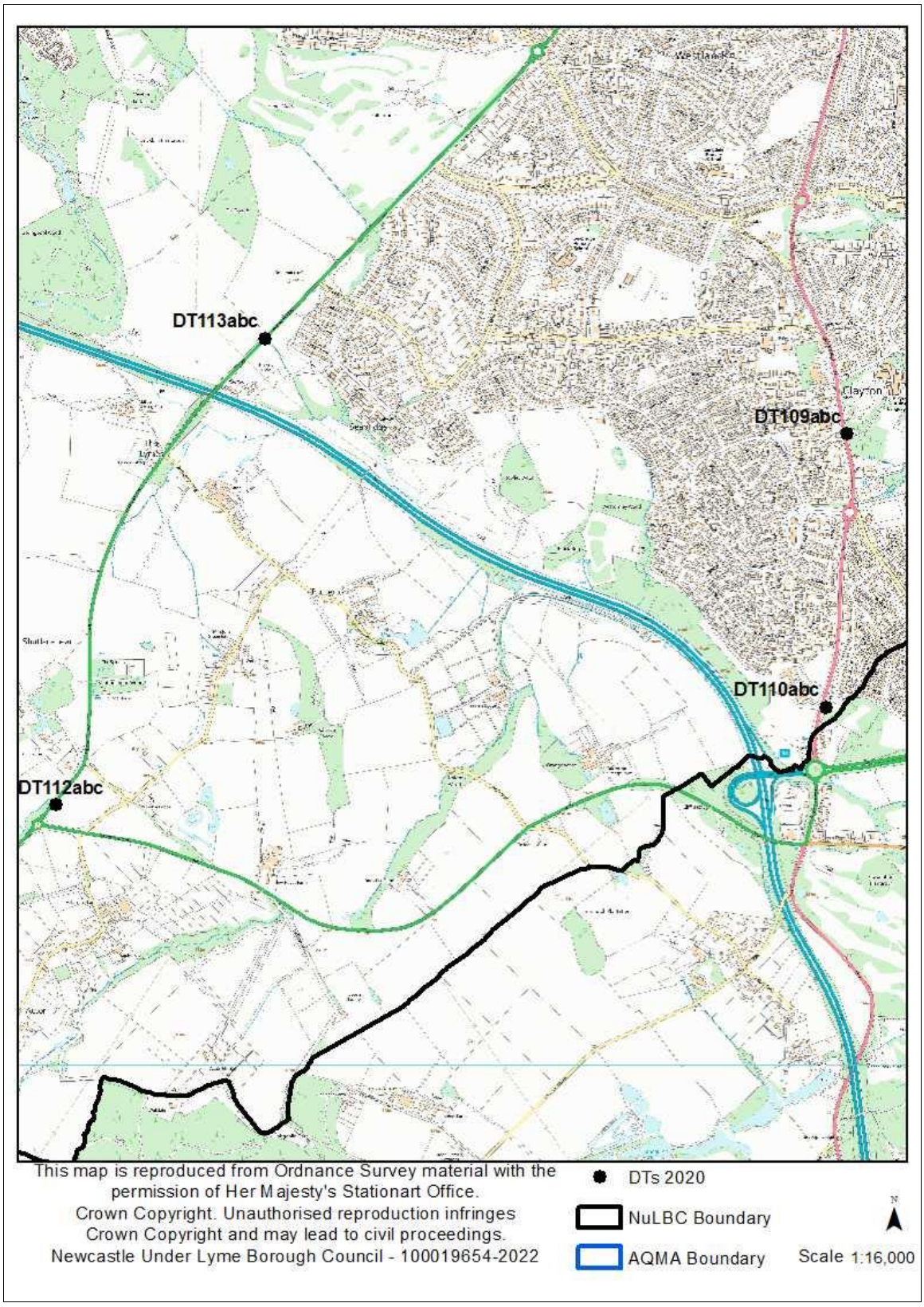


Figure D-14 - Map of monitoring Area 11 – Clayton / Seabridge (Not within an AQMA)



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[17]

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

[17] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.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.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.