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: June, 2024

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Executive Summary: Air Quality in Our Area

Air Quality in Barnsley Metropolitan Borough Council

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 Barnsley Metropolitan Borough Council area covers 32,853 hectares (127 square miles) and has an estimated population of approximately 239,300.

Barnsley Metropolitan Borough Council's air quality issues are typical of an urban location, with emissions from road transport being a major source of air pollution, and the underlying reason for declaration of the six Air Quality Management Areas (AQMAs). Emissions from industrial and domestic sources are still of importance however, and continue to be subject to the relevant regulation, where appropriate.

Previous assessment of Barnsley Metropolitan Borough Council's air quality revealed a breach (exceedance) of the annual average Air Quality Objective (standard) for nitrogen dioxide gas (NO_2) at receptors (mainly houses). Nitrogen dioxide is strongly associated with traffic emissions in particular, and contributes to respiratory symptoms[3]. There have been inter-year fluctuations of NO_2 concentrations, but there is a general downward trend and there have been no exceedances of the Air Quality Objectives in AQMA 1 or 2A over the past four years. As a result of this, the Council aims to explore revocation of AQMA 1 in the near future. These areas are close to several arterial roads and junctions near to Barnsley town centre and close to the M1 motorway. All Barnsley's current AQMAs are summarised in the table below:

AQMA No.	Adjacent Roads / Junctions	Year Declared	Estimated Number of Domestic Dwellings within AQMA
1	M1 Motorway, 100 metres either side of the central reservation within the Barnsley Borough	2001	356
2A	A628 Dodworth Road	2005	291
4	A61 Harborough Hill Road	2008	42
6	A616 passing through Langsett	2012	7
7	Junction of A61 Sheffield and A6133 Cemetery Road	2012	23

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[3] DEFRA, February 2015 – Getting to grips with air pollution – the latest evidence and techniques – A briefing for Directors of Public Health

Further details of our AQMAs can be found at [List of Local Authorities with AQMAs - DEFRA, UK](#).

The Council has an Air Quality Action Plan (AQAP), published in May 2017 (and updated in 2019) available at https://www.barnsley.gov.uk/services/pollution/air-pollution/air-quality/, which contains measures designed to improve air quality within the AQMAs and within the Council as a whole, as it is important to continually drive down emissions and reduce air pollution, even below legal standards to protect public health.

As with last year's Annual Status Report (ASR), this ASR is being written during a period of change within air quality management. The Government released the Clean Air Strategy[4] in 2019, which proposed new ways to tackle air pollution, particularly domestic emissions, and the Council await further direction from the forthcoming Environment Act on how air pollution can be further reduced. The Council is also aware of recent updates of the Environment Act 2021 and Clean Air Act 1993, concerning the Prohibition of smoke from chimneys in Smoke Control Areas (SCAs). These changes may have a significant impact on future emissions and the Council is looking at the implications of these updates. Furthermore, Clean Air Zones (CAZs) are currently being implemented, have been implemented, or considered for neighbouring cities (Leeds, Greater Manchester, Sheffield-Rotherham), and the Council will monitor these developments for any potential impacts on Barnsley Metropolitan Borough Council.

Barnsley Metropolitan Borough Council will continue to monitor concentrations in future years, and further monitoring is required in order to continue assessing longer term trends, particularly as traffic flows have levelled following Covid-19. Concentrations of other air pollutants such as PM_{10} particulate matter were not impacted significantly by the Covid-19 lockdowns, due to the greater number of particulate matter sources and the transboundary nature of this pollutant. Barnsley recorded its first year of $PM_{2.5}$ concentrations at the Defra managed Barnsley Gawber site, which showed compliance with UK air quality strategy objectives.

Further details of Barnsley's local air quality, including up-to-date local data and comparison with the Daily Air Quality Index (AQI; which tells us the daily pollution concentrations and their impacts on our health), can be found at our [Barnsley Metropolitan Borough Council air quality](#) webpage or the [Air Quality in England](#) webpage. The Council

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[4] Available at Clean Air Strategy 2019 - GOV.UK (www.gov.uk)

believes it is important that Barnsley residents are made aware of the air quality they breathe and how it may impact them.

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[5] 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 most harmful to human health. The Air Quality Strategy[6] 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[7] 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.

Key actions taken within Barnsley include:

- The South Yorkshire Enhanced Partnership, which targets increased use of public transport through fare alteration, system reliability, and improved user experience.
- Barnsley Intelligent Transport Systems, which involves the installation of intelligent systems (SCOOT / MOVA) within AQMAs. Barnsley Metropolitan Borough Council will continue to investigate the installation of new Intelligent Transport Systems where the opportunity presents, such as new developments and new road schemes.
- Electric Vehicle Infrastructure. Barnsley are reviewing the most suitable locations and technology to facilitate electric vehicle technology.

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

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

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

Conclusions and Priorities

Barnsley Metropolitan Borough Council's 2024 ASR is an update of the monitoring carried out within the last year and illustrates that there has been a general improvement in air quality across the district over several years, with levels remaining relatively stable from 2021 to 2023. This includes a noted improvement in NO_2 concentrations measured within AQMA 2A, where there has been no exceedance since 2019.

There were three exceedances of the NO_2 annual mean air quality objective identified across the 64 passive monitoring sites and two automatic monitoring sites. Two of these exceedances occurred within AQMA 4 and the third was at site 53, on Sheffield Road in the town centre. In 2023, NO_2 concentrations slightly decreased overall compared to 2022 concentrations.

The annual mean NO_2 concentration did not exceed 60 $\mu g/m^3$ at any monitoring locations during 2023, which indicates that an exceedance of the 1-hour mean objective (200 $\mu g/m^3$) is unlikely at these sites.

Barnsley Metropolitan Borough Council's priorities for the coming year are:

- To explore revocation of AQMA 1.
- Where appropriate, the Council will bid for funding for actions within our AQAP, as and when this funding become available.
- Following the successful road closure scheme aimed at improving awareness and air quality around a local school, it is planned that further schemes will be implemented following the same template. This scheme was funded by Defra and was successful as part of a joint air quality grant bid with our partners Doncaster Metropolitan Borough Council and Sheffield City Region. The scheme involved temporary road closures around a local school, along with active travel initiatives, in order to highlight the benefits of cycling and walking.
- To continue to work with developers to minimise the air quality impact of new development, and to ensure that this development takes account of future sustainable transport modes, and in particular refine the Council's requirement of LAQM Annual Status Report 2023 iv Barnsley Metropolitan Borough Council electric vehicle (EV) charge points for new developments in the Borough, in order ensure installation of the most optimum charge point schemes.

- Concerns about the Real Time monitor at Pogmor, with regards its data. We are currently working with our Partners to investigate this further, but we have to investigate replacing this monitor.

- To align the AQAP with the Council's Sustainable Energy Action Plan to ensure that the co-benefits of improved air quality and reductions in carbon emissions in the Borough are maximised.

- Continue monitoring both inside and outside of AQMAs to gauge progress with actions and ensure continued compliance outside of our AQMAs, and assess the continued direct and indirect impact of the pandemic and subsequent recovery on air pollution concentrations.

- To work with Public Health colleagues in order to raise awareness of poor air quality and actions that can be taken to reduce emissions, and develop programmes such as anti-idling and promotion of Clean Air Day.

- To work with nearby local authorities who may be required to implement Clean Air Zones, to understand the impacts these zones may have on Barnsley.

- To re-draft the Action Plan, in light of completion of the previous Action Plan 2016 to 2021 and development of the Council's Sustainable Energy Action Plan.

Local Engagement and How to get Involved

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

Find out more about your local air quality by:

- Contacting the Air Quality officer at Barnsley (details at the beginning of this report) or through BMBC's website https://www.barnsley.gov.uk/air-quality

- Contact your local Councillor with any concerns.

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

Local Responsibilities and Commitment

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

John Scott, Service Manager (Pollution Control)

This ASR has not been signed off by a Director of Public Health, but they have reviewed the contents prior to its submission.

If you have any comments on this ASR please send them to John Scott at:

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1 Local Air Quality Management

This report provides an overview of air quality in Barnsley Metropolitan 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 or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Barnsley Metropolitan 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 Barnsley Metropolitan Borough Council can be found in Table 2.1. The table presents a description of the five AQMAs that are currently designated within Barnsley Metropolitan Borough Council. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of 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;
- NO_2 1-hour mean (AQMA 6 only)

In February 2022, Barnsley Metropolitan Borough Council successfully revoked AQMA 5, originally declared in 2008 due to exceeding the NO_2 annual mean Air Quality Objective.

The Council is considering and collating the evidence for the revocation of AQMA 1. AQMA 1 covers parts of the M1 and extends to 100 m either side of the motorway carriageway. The case for revocation is based on monitoring data showing compliance with the Air Quality Objective for NO_2 for several years. Barnsley Council previously postponed the revocation process as a proposed "Smart Motorway" was planned for the stretch of M1 passing though the Borough; however, an announcement by the UK Government in April 2023 stated that "plans for new smart motorways will be cancelled in recognition of the current lack of public confidence felt by drivers and cost pressures" and so the Council is revisiting the case.

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
No.1	03/10/2001	NO_2 Annual Mean	An area encompassing residential properties one hundred metres either side of the central reservation of the M1 motorway in Barnsley	YES	46.4 µg/m^3	30.1 µg/m^3	4 years	Barnsley MBC Air Quality Action Plan	https://www.barnsley.gov.uk/media/18071/air-quality-action-plan.pdf
No.2A	16/06/2005	NO_2 Annual Mean	Residential properties along Dodworth Road between Junction 37 of the M1 motorway and Town End roundabout, including a portion of Summer Lane.	NO	49.7 µg/m^3	35.6 µg/m^3	4 years	Barnsley MBC Air Quality Action Plan	https://www.barnsley.gov.uk/media/18071/air-quality-action-plan.pdf
No.4	07/07/2008	NO_2 Annual Mean	Residential properties along the uphill carriageway of Harborough Hill Road from the gyratory	NO	58.6 µg/m^3	48.4 µg/m^3	Exceedance	Barnsley MBC Air Quality Action Plan	https://www.barnsley.gov.uk/media/18071/air-quality-action-plan.pdf

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
No.6	30/08/2012 (Amended 27/10/2016 to include NO_2 1-hour mean)	NO_2 Annual Mean NO_2 1 Hour Mean	Residential properties along the A616 Manchester Road in Langsett	YES	77.1 µg/m^3	37.3 µg/m^3	1 year	Barnsley MBC Air Quality Action Plan	https://www.barnsley.gov.uk/media/18071/air-quality-action-plan.pdf
No.7	30/08/2012	NO_2 Annual Mean	Residential properties at the junction of Sheffield Road and the A6133 Cemetery Road	NO	48.5 µg/m^3	35.8 µg/m^3	4 years	Barnsley MBC Air Quality Action Plan	https://www.barnsley.gov.uk/media/18071/air-quality-action-plan.pdf

2.2 Progress and Impact of Measures to address Air Quality in Barnsley Metropolitan Borough Council

Unfortunately, due to the late submission of last year's ASR, we have not received any comments from DEFRA with regards the 2023 ASR, thus we can not provide a response to any comments received from DEFRA. The report has thnakfully been approved.

Barnsley Metropolitan 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. 13 measures are included within Table 2.2, with the type of measure and the progress Barnsley Metropolitan 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.

Key completed measures are:

South Yorkshire Enhanced Bus Partnership

The Barnsley Bus partnership was recently replaced with the South Yorkshire Enhanced Bus Partnership. The South Yorkshire Enhanced Bus Partnership incorporates a statutory scheme, as opposed to the previous scheme which was a Voluntary Agreement. The plan targets increased use of public transport through fare alteration, system reliability, and improved user experience. A copy of the plan can be found at: https://www.southyorkshire-ca.gov.uk/getattachment/b396e5dd-eb2a-4e2a-b108-c539b658e996/South-Yorkshire-Enhanced-Partnership-Plan-FINAL.pdf

Barnsley Intelligent Transport Systems

This process involved the installation of intelligent systems (SCOOT / MOVA) within AQMAs. Several of our AQMAs now have SCOOT/MOVA installed with performance reviewed. Ongoing maintenance along with minor upgrades when funding allows. Barnsley Metropolitan Borough Council will continue to investigate the installation of new Intelligent Transport Systems where the opportunity presents, such as new developments and new road schemes.

Electric Vehicle Infrastructure

Barnsley are reviewing the most suitable locations and technology to facilitate electric vehicle technology and have faced some technical challenges and will provide a progress updates in following ASRs.

Barnsley MBC does not anticipate any measures being completed over the following year. The next completion year of a measure is 2025 associated with measures 3 and 9, which are to encourage uptake of lower emission vehicles and alternative fuels and BMBC Fleet Improvements respectively.

The principal challenges and barriers to implementation that Barnsley MBC anticipates facing are significant resourcing constrains which will hinder monitoring and review of existing and development of new policies to improve air quality.

AQMA 4 is in exceedance at locations that LAQM.TG.22 box 1.1 does not class as applicable Air Quality Strategy Objectives. As such concentrations become compliant when corrected for distance between diffusion tube exposure and relevant exposure (residential buildings). Barnsley MBC anticipates that the measures stated above and in Table 2.2 will achieve compliance in AQMA 4.

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
1	Carriageway improvements	Traffic Management	UTC, Congestion management, traffic reduction	2018	2027	Local Authority Highways and Major Projects departments	South Yorkshire Mayoral Combined Authority (SYMCA)	NO	Funded		Implementation		Date of completion	Commencement of construction on the scheme	None
2	South Yorkshire Enhanced Bus Partnership	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2022	2023	LA Transport department and private company	South Yorkshire Mayoral Combined Authority (SYMCA)	NO	Funded		Completed		A cap on daily and weekly fares, free travel for under 18s. A faster, more reliable and punctual system. A better bus experience. A new zero emission bus fleet.	Ongoing	Potential impact of COVID-19 and lockdown on fleet renewal. Estimated funding cost due to funding from private source.
3	Encourage uptake of lower emission vehicles and alternative fuels	Promoting low emission transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2019	2025	Growth and sustainability, Local Authority Housing and Energy departments	Joint funding from office for zero emissions vehicles (OZEV) grant award, On-street Residential Charge point Scheme (ORCS), South Yorkshire Mayoral Combined Authority (SYMCA), BMBC Funding	NO	Funded	£100k - £500k	Implementation		Date of completion	Electric vehicle charging points to charge up to 30 vehicles at the same time have been installed at Barnsley Council's Smithies Depot, Rapid chargers are now available within the town centre. Barnsley's sustainability and Climate Change Team is working with SYMBCA on a regional EV strategy due for completion by the end of 2023 and will be followed by a policy for Barnsley in 2024.	Up to £275,384.98 funding, from South Yorkshire Mayoral Combined Authority (SYMCA), £100k from ORCS. Barnsley falls below current average UK provision for number of EV chargers per 100,000 people. The sale of new diesel and petrol engine vehicles will be banned in the UK from 2030 and residents will increasingly need to adapt to electric vehicles. The Council will need to ensure that adequate infrastructure is available to support residents to make the transition to electric vehicles.
4	Planning applications – air quality mitigation and assessment	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2015	2031	Local Authority Environmental Health and Planning departments	BMBC	NO	Funded	£10k – 50k	Implementation		Number of planning applications where AQ actions have been agreed / conditioned / recommended	17 planning applications in 2016 where AQ actions have been agreed / conditioned / recommended. 35 in 2017, 40 in 2018, 43 in 2019, 213 in 2020.	This action will be ongoing as BMBC guidance and planning documents are continually refined
5	Control over emissions from Part B and A2 processes, and act as consultees for Part A1 processes	Other	Other	2012	2032	Local Authority Environmental Health department	BMBC	NO	Funded	£10k - 50k	Implementation		N/A	Ongoing	The Environmental Bill did not have any implication for Part B and A2 processes.

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
6	Enforcement of Clean Air Act with regards to industrial smoke	Other	Other	2012	2032	Local Authority Environmental Health department	BMBC	NO	Funded	£10k - 50k	Implementation		N/A	Ongoing	
7	Enforcement of Clean Air Act with regards to domestic smoke	Other	Other	2012	2033	Local Authority Environmental Health department	BMBC	NO	Funded	£10k - 50k	Implementation		N/A	Ongoing	Schedule 12 of the Environmental Bill amends the Clean Air Act 1993 to allow local authorities to impose financial penalties in smoke control areas. The existing criminal offence of emitting smoke from a chimney in a Smoke Control Area is replaced with a civil penalty regime.
8	Investigation of nuisance complaints, including appropriate action to resolve the complaint	Other	Other	2012	2033	Local Authority Environmental Health department	BMBC	NO	Funded	£10k - 50k	Implementation		N/A	Ongoing	The use of Abatement Enforcement Notices (Under the Environmental Protection Act 1990) and Community Protection Warning / Notices (ASB, Crime and Policing Act 2014) will be utilised to help tackle antisocial burning
9	BMBC Fleet Improvements	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2016	2025	Local Authority Fleet Operations department	BMBC	NO	Funded	£1 million - £10 million	Implementation		Number of electric vehicles purchased (minimum of 30)	33 fully electric vehicles, which amount to 15 percent of the Council fleet	Vehicle Replacement Programme for 2021/2022 should see a further 5 added to the Council fleet
10	Barnsley Intelligent Transport Systems	Traffic Management	UTC, Congestion management, traffic reduction	2012	2023	Local Authority Highways department	BMBC	NO	Funded	£1 million - £10 million	Completed		Installation of intelligent systems (SCOOT / MOVA) within AQMAs. Several of our AQMAs now have SCOOT/MOVA installed with performance reviewed	Completed	Ongoing maintenance along with minor upgrades when funding allows. BMBC will continue to investigate the installation of new Intelligent Transport Systems where the opportunity presents, such as new developments and new road schemes.
11	Encourage cycling and walking (developing infrastructure and campaigns)	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2022	2040	Local Authority Highways department	South Yorkshire Mayoral Combined Authority (SYMCA)	NO	Funded	> £10 million	Planning		Completion of schemes	Successful Sheffield City Region bid for £166 million. Barnsley to submit and implement schemes to this funding with schemes completed by March 2023. River Dearne long route (RDLR) scheme is part of the South Yorkshire Mayoral Combined Authority's Transforming Cities fund. The	One scheme is designed to enhance walking and cycling routes to retail estates located close to AQMA 4. Promotion of Active Travel as part of Clean Air Day. A number of schemes which will help give people more choices to travel without relying on their cars, so we can all work towards a health more sustainable Barnsley and meet our target of a net zero carbon Barnsley by 2045.

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
														RDLR will improve active travel routes within the Dearne valley Park area between Harborough Hill Road, Pontefract Road, and Grange Lane. Where possible, the existing route will be widened to a four-metre shared use foot and cycle way.	
12	Assessment of air quality impact of major traffic schemes	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	2032	Local Authority Environmental Health department	BMBC	NO	Funded	< £10k	Implementation		Assessment of air quality impact of major road schemes with alotted timescale	Assessments completed to allotted timescales	Ongoing subject to future road schemes
13	Promoting Travel Alternatives (workplace travel planning: encourage/facilitate home-working: personalised travel planning: school travel plans)	Promoting Travel Alternatives	Workplace Travel Planning	2017	2019	Local Authority Transportation department	BMBC and developer contributions	NO	Funded	£10k - 50k	Completed		Adoption of Sustainable Travel Supplementary Planning Document (SPD)	Adoption of SPD in 2019	SPD updated in November 2021, currently in Draft available at https://www.barnsley.gov.uk/media/20294/draft-sustainable-travel-spd-2021.pdf , which now reflects latest developments in provision of electric vehicle charge points,

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[8], 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.

PM$_{2.5}$ measurements started within Barnsley MBC in 2023 at the Gawber Urban Background site and reported in the below table, however measurement started in April 2023 and subsequently the data capture is 73.5%, which is considered poor data capture to represent an annual average. In order to obtain an indication of PM$_{2.5}$ concentration trends within the Borough, we have therefore applied the procedure within paragraph 7.118 and Box 7.7 of the local authority air quality management technical guidance (LAQM TG:22). This procedure uses a national PM$_{10}$ to PM$_{2.5}$ annual mean factor (4.7 µg/m^3 at background sites and 5.9 µg/m^3 at roadside sites in 2023, 5.5 µg/m^3 at background sites and 6.4 µg/m^3 at roadside sites in 2022, and 4.9 µg/m^3 at background sites and 5.7 µg/m^3 at roadside sites in 2021). This correction factor has been applied to 2022 and 2023 data, with previous years adjustments being made through an annual mean conversion factor of (0.7). These have been applied to measurements at our roadside Barnsley Kendray monitoring station. The table below details the conversion.

Year	DC %	2019	2020	2021	2022	2023
PM$_{10}$ annual mean (µg/m^3)	n/a	20	20	19	21	20
PM$_{2.5}$ annual	n/a	14	14	13.3	14.6	14.1

mean ($\mu g/m^3$)						
PM$_{2.5}$ annual mean ($\mu g/m^3$) Barnsley Gawber	73.5					7

Whilst these indicative PM$_{2.5}$ concentrations have been obtained from a roadside monitoring site; we note that concentrations have been greater than the World Health Organisation (WHO) annual mean guideline of 10 $\mu g/m^3$.

Public Health England have created outcome framework indicators, one of these relates to fraction of mortality attributable to particulate air pollution[9].

Barnsley MBC is taking the following measures to address PM$_{2.5}$:

Reducing emissions of PM$_{2.5}$ has been addressed within Barnsley MBC's Air Quality Action Plan (AQAP) revised in 2019. AQAP Appendix G includes further evaluation of actions, including an assessment of actions with regard to their effect of reducing PM$_{2.5}$ concentrations, in accordance with Table A.1 of LAQM TG (22), Action Plan Toolbox. Applying Table A.1 therefore, all of the actions within the Plan will assist in reducing PM$_{2.5}$ concentrations, including those actions in the Plan which deal with industrial and domestic emissions, particularly actions five to eight which specifically target domestic and industrial PM$_{2.5}$ emissions. These actions are becoming increasingly important in reducing PM$_{2.5}$ emissions as domestic emissions have recently been identified as a significant source of PM$_{2.5}$ within the recently published Clean Air Strategy. The entire Barnsley borough is covered by smoke control orders.

The Clean Air Strategy, published in 2019, demonstrated further commitment to reducing PM$_{2.5}$ concentrations, particularly domestic emissions. The 2021 Environment Act updated

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[9] https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/3/gid/1000043/pat/15/par/E92000001/ati/502/are/E09000002/yrr/1/cid/4/tbm/1

targets for PM$_{2.5}$ and Barnsley MBC will use the measures indicated, as well as any other required measures, to ensure that these targets are met.

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

This section sets out the monitoring undertaken within 2023 by Barnsley Metropolitan 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

Barnsley Metropolitan Borough Council undertook automatic (continuous) monitoring at three sites during 2023. Table A.1 in Appendix A shows the details of the automatic monitoring sites. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. The Air Quality England webpage presents automatic monitoring results for Barnsley Metropolitan Borough Council, with automatic monitoring results also available through the UK-Air website.

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

3.1.2 Non-Automatic Monitoring Sites

Barnsley Metropolitan Borough Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 64 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.

Exceedances were identified at three diffusion tube locations in 2023: diffusion tube 41, 43 and 53. Locations 41 and 43 have been in exceedance for the past five years, and location 53 has been in exceedance 4 out of the last 5 years. At location 41 a decrease of 1.3 µg/m^3 was observed from 2022 to 2023, and at location 43 a decrease of 2.1 µg/m^3 was observed in the same period. Both location 41 and 43 sit within AQMA 4 and are being managed with the AQAP published in 2019.

Location 53 showed an exceedance occurring in every year of monitoring outside of 2020, and there was an increase of 0.8 µg/m^3 from 2022 to 2023. This location will continue to be monitored by the local authority to assess the situation.

Location 8 displayed an exceedance in 2022 but has since decreased by 3.6 µg/m^3 and is no longer in exceedance in 2023.

Across the local authority, measured results are relatively stable with minor increases and decreases being observed which can generally be attributed to changing traffic flows and meteorological impacts, on the most part decreases were observed. The most significant

decreases were seen at sites 30, 49, 54 and 56. These sites decreased by 4.8 µg/m^3, 4.5 µg/m^3, 6.9 µg/m^3 and 4.1 µg/m^3 respectively.

Sites within AQMA 1 have been compliant for five years and Barnsley MBC has plans to apply for revocation of this AQMA due to long term compliance. No site within the local authority has exceeded 60 µg/m^3 during 2022, indicating that an exceedance of the 1-hour mean objective is unlikely to have occurred at any site.

3.2.2 Particulate Matter (PM$_{10}$)

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM$_{10}$ annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

Automatic monitoring of PM$_{10}$ annual mean displayed a mean consistently below the 40 µg/m^3 objective for the past five years.

Table A.7 in Appendix A compares the ratified continuous monitored PM$_{10}$ daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

Automatic monitoring of PM$_{10}$ 24 hour mean shows that the 24 hour mean has not exceeded the objective more than 35 times each year for the past five years, with the number of exceedances each year remaining well below levels indicated by the Air Quality Objectives.

3.2.3 Particulate Matter (PM$_{2.5}$)

Monitoring of PM$_{2.5}$ started in 2023 and a concentration of 7 µg/m^3 was recorded at an Urban Background site.

3.2.4 Sulphur Dioxide (SO$_2$)

Table A.9 in Appendix A compares the ratified continuous monitored SO$_2$ concentrations for 2023 with the air quality objectives for SO$_2$.

No exceedances of the 15-minute mean, 1-hour mean, and 24-hour mean occurred in 2022 at the one automatic monitoring location. Data capture was below 85% so percentiles were calculated as follows: 99.9[th] for the 15-minute mean, 99.7[th] percentile for the 1-hour mean and 99.2[nd] percentile for the 24-hour mean. The percentiles all indicated that had there been 100% data capture, there would still have been no exceedances.

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)
BAR9	Barnsley A635 Kendray Roadside	Roadside	436298	405691	PM_{10}	No	Beta Attenuation	N/A	5	1.45
BAR11	Barnsley A628 Roadside 2 (began September 2021)	Roadside	432584	406085	NO_2	Yes, 2A	Chemiluminescent	N/A	7	1.8
BAR3	Barnsley Gawber	Urban Background	432525	407475	NO_2, SO_2, O_3, PM_{10} and $PM_{2.5}$	No	Chemiluminescent, UV Fluorescence, UV Absorption	N/A	N/A	4.0 (estimated)

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)
1	Midhopestones Eastbound	Roadside	423621	399817	NO2	No	3.0	2.5	No	2.9
2	Langsett, Stanley Cottages	Roadside	421102	400496	NO2	Yes, AQMA 6	0.0	1.5	No	3.0
3	Footpath Sign, School House, Langsett	Roadside	421143	400481	NO2	Yes, AQMA 6	0.0	3.5	No	1.9
4	Langsett, School House	Roadside	421126	400485	NO2	Yes, AQMA 6	0.0	2.0	No	2.8
5	Langsett, Café	Roadside	421291	400482	NO2	Yes, AQMA 6	0.0	2.0	No	2.9
6	Langsett, Wagon and Horses	Roadside	421282	400471	NO2	Yes, AQMA 6	0.0	3.0	No	2.6
7	Gilbert Hill - Langsett	Roadside	421117	400501	NO2	Yes, AQMA 6	7.5	2.5	No	2.6
8	Langsett - Footpath Sign Bus Stop	Roadside	421215	400475	NO2	Yes, AQMA 6	2.0	2.0	No	2.1
9	Claycliffe Road / Barugh Lane	Kerbside	431482	408572	NO2	No	0.0	1.5	No	2.8
11	23 Dodworth Road	Roadside	434000	406292	NO2	Yes, AQMA 2A	0.0		No	2.7

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)
12	53 Dodworth Road	Roadside	433910	406290	NO2	Yes, AQMA 2A	0.0		No	2.8
13	Traffic Lights Dodworth Road	Roadside	433820	406278	NO2	Yes, AQMA 2A	2.5	2.5	No	2.9
14	Dodworth Road - SE of Cross Roads	Roadside	432702	406160	NO2	Yes, AQMA 2A	13.0	3.0	No	2.7
15, 16, 17	Pogmoor Crossroads	Roadside	432674	406180	NO2	Yes, AQMA 2A	0.0	7.0	Yes	1.7
18	Pogmoor Road	Roadside	432603	406312	NO2	No	0.0	5.3	No	2.8
20	Dodworth Road - Outbound - LC 54	Roadside	432535	406071	NO2	Yes, AQMA 2A	7.5	1.5	No	3.0
21	305 Dodworth Road	Roadside	432402	406013	NO2	Yes, AQMA 2A	8.0	3.0	No	2.9
22	315 Dodworth Rd, Pogmoor	Kerbside	432351	405985	NO2	Yes, AQMA 2A	11.5	2.5	No	2.9
23	329 Dodworth Rd, Pogmoor	Roadside	432262	405950	NO2	Yes, AQMA 1	8.0	2.0	No	3.0
24	Cross Keys, Hoyland	Kerbside	435274	400384	NO2	No	6.5	1.0	No	2.8
25	25 Sheffield Road, Birdwell	Roadside	434832	400405	NO2	No	3.0	1.5	No	2.9
26	20 Sheffield Road, Birdwell	Roadside	434820	400421	NO2	No	3.0	1.5	No	2.8

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)
27	Aetherius Temple, Birdwell	Roadside	434823	400398	NO2	No	0.0		No	2.9
29	5, Moor Lane, Birdwell	Urban Background	434721	400352	NO2	Yes, AQMA 1	0.0		No	2.7
31	Sheffield Rd, Birdwell - LC 32	Roadside	434595	401107	NO2	No	3.5	2.5	No	3.0
32	Corner Sheffield Rd – Chapel Street, Birdwell	Roadside	434559	401274	NO2	No	0.0		No	2.8
34	Wakefield Road / Carlton Road	Roadside	435011	408281	NO2	No	7.0	2.0	No	3.5
35	Wakefield Road - South of Carlton Road	Roadside	435027	408190	NO2	No	0.0		No	2.8
36	Wakefield Road / Smithies Lane (North)	Roadside	435027	408104	NO2	No	6.5	2.0	No	2.7
37	Wakefield Rd – app. Burton Rd junc.	Roadside	435174	407499	NO2	No	5.8	1.7	No	2.8
38	Old Mill Lane / Honeywell Street	Kerbside	434757	406995	NO2	No	3.0	0.3	No	2.8
39	Burton Road – opp Rotherham Rd junc.	Kerbside	436072	407320	NO2	No	2.5	0.5	No	2.7

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)
40	Grange Lane, near to Cundy Cross junc.	Roadside	437122	406557	NO2	No	6.0	1.4	No	2.8
41	49 Harborough Hill Road	Roadside	434933	406695	NO2	Yes, AQMA 4	8.0	2.0	No	2.7
42	11 Eldon Street North	Roadside	434733	406774	NO2	No	4.0	0.5	No	2.7
43	Harborough Hills Road – near to bakery	Roadside	434955	406769	NO2	Yes, AQMA 4	5.0	2.0	No	2.9
44	119 Harborough Hills	Roadside	435049	407047	NO2	Yes, AQMA 4	0.0		No	2.9
46	Tesco, Wwell Lane	Kerbside	437554	405291	NO2	No	4.0	0.7	No	3.2
47	Sheffield Road / Park Road Xrds	Roadside	434958	405672	NO2	No	0.0		No	2.8
48	Sheffield Road / Cemetery Road Xrds	Roadside	434964	405709	NO2	Yes, AQMA 7	1.5	2.0	No	2.7
49	Doncaster Road, Ardsley	Kerbside	437528	405675	NO2	No	3.9	0.5	No	2.8
50	Carlton Road (W'fd Road junction) uphill	Roadside	435062	408244	NO2	No	5.5	1.5	No	2.8
52	Wakefield Road / Bar Lane junction	Roadside	434112	409625	NO2	No	2.8	1.6	No	2.7

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)
53	Sheffield Road, town centre	Roadside	434809	406023	NO2	No	2.5	0.3	No	2.7
55	Wombwell Lane, adj. Keel Inn	Roadside	437367	405458	NO2	No	2.4	1.6	No	1.2
57	Grange Lane, Stairfoot, northbound	Roadside	437242	405772	NO2	No	1.5	1.5	No	3.0
58	Grange Lane, Stairfoot, southbound	Roadside	437250	405813	NO2	No	2.3	2.3	No	2.9
59	Entrance to Horizon, sign	Roadside	432882	406259	NO2	Yes, AQMA 2A	52.0	3.0	No	2.9
60	LC41, opp Horizon Entrance	Roadside	432817	406244	NO2	Yes, AQMA 2A	90.0	3.0	No	2.1
61	LC16, Sheffield Road	Roadside	434780	406055	NO2	No	40.0	1.5	No	3.1
62	LC22, Quarry St/Sheffield Rd	Roadside	434855	405957	NO2	No	5.1	1.4	No	3.0
63	LC35, Sheffield Road	Roadside	434912	405817	NO2	No	0.0	4.6	No	2.9
64	LC32, Sheffield Road	Roadside	434931	405781	NO2	No	12.0	4.6	No	3.2
65	48-50 Sheffield Road, Barnsley	Roadside	434831	406001	NO2	No	5.0	3.0	No	2.9
70	60 Gawber Road, Gawber	Roadside	433563	406982	NO2	No	0.0		No	2.6

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)
71	67 Gawber Road, Gawber	Roadside	433351	407074	NO2	No	0.0		No	2.8
72	LC 9, 2 Pogmoor Road, Gawber	Roadside	433299	406873	NO2	No	0.0		No	2.7
73	Don Villas, Barnsley Road, Penistone	Roadside	424388	403694	NO2	No	0.0		No	2.7
74	Dodworth Rd / Shaw Ln, Barnsley	Roadside	433431	406272	NO2	Yes, AQMA 2A	8.1	1.8	No	2.7
75	Hoyland Common Primary School	Roadside	435481	400222	NO2	No	6.0	1.4	No	2.8
76	Bridge Street, Penistone	Roadside	424424	403587	NO2	No	0.0	15.0	No	2.5
77	10 Thurlstone Rd, Penistone	Roadside	424313	403645	NO2	No	0.0	12.0	No	2.8

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
BAR11	432584	406085	Roadside	96.6	96.6	-	-	24	19	16
BAR3	432525	407475	Urban Background	96	96	17	12	13	13	12

Notes:

The annual mean concentrations are presented as µg/m³.

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

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
1	423621	399817	Roadside	100	100.0	29.3	18.1	19.3	19.7	19.8
2	421102	400496	Roadside	100	100.0	33.8	23.5	23.5	26.8	25.7
3	421143	400481	Roadside	92.30769231	92.3	49.0	31.2	34.4	37.2	37.3
4	421126	400485	Roadside	100	100.0	48.8	31.5	34.8	37.5	35.1
5	421291	400482	Roadside	100	100.0	31.9	21.1	22.5	24.7	23.7
6	421282	400471	Roadside	100	100.0	38.8	24.2	27.7	26.7	27.1
7	421117	400501	Roadside	100	100.0	28.3	18.6	18.8	21.7	20.8
8	421215	400475	Roadside	100	100.0	55.6	36.2	36.3	40.2	36.6
9	431482	408572	Kerbside	100	100.0	31.7	19.2	20.0	21.2	20.5
11	434000	406292	Roadside	100	100.0	39.1	26.5	29.1	28.2	30.7
12	433910	406290	Roadside	100	100.0	38.9	25.3	29.0	29.7	29.9
13	433820	406278	Roadside	100	100.0	43.3	29.3	31.8	31.6	32.7
14	432702	406160	Roadside	100	100.0	40.5	26.6	29.7	26.3	26.2

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 2023 (%) [2]	2019	2020	2021	2022	2023
15, 16, 17	432674	406180	Roadside	100	100.0	31.9	24.6	26.6	19.3	18.6
18	432603	406312	Roadside	100	100.0	30.3	16.2	17.3	17.3	17.1
20	432535	406071	Roadside	90.38461538	90.4	39.6	29.3	31.0	29.7	30.0
21	432402	406013	Roadside	100	100.0	46.2	29.5	31.8	32.8	32.2
22	432351	405985	Kerbside	100	100.0	48.1	32.6	34.6	35.8	35.6
23	432262	405950	Roadside	92.30769231	92.3	47.0	28.9	31.5	31.6	30.1
24	435274	400384	Kerbside	90.38461538	90.4	30.3	20.6	24.4	23.1	20.8
25	434832	400405	Roadside	100	100.0	38.6	26.0	32.4	27.8	27.3
26	434820	400421	Roadside	90.38461538	90.4	40.3	25.7	32.5	29.1	28.7
27	434823	400398	Roadside	100	100.0	39.8	23.9	27.4	27.8	25.1
29	434721	400352	Urban Background	100	100.0	28.3	17.8	19.0	20.3	18.7
31	434595	401107	Roadside	82.69230769	82.7	29.7	19.1	21.7	21.5	19.9
32	434559	401274	Roadside	67.30769231	67.3	35.5	23.0	24.7	25.9	23.3
34	435011	408281	Roadside	82.69230769	82.7	32.2	21.6	24.3	23.8	24.0

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 2023 (%) [2]	2019	2020	2021	2022	2023
35	435027	408190	Roadside	92.30769231	92.3	35.9	25.7	28.9	26.6	25.9
36	435027	408104	Roadside	100	100.0	40.3	27.4	31.7	31.3	29.4
37	435174	407499	Roadside	100	100.0	32.3	21.0	23.7	23.0	21.8
38	434757	406995	Kerbside	100	100.0	37.8	24.7	29.5	29.5	28.2
39	436072	407320	Kerbside	100	100.0	41.9	28.9	34.8	32.6	31.9
40	437122	406557	Roadside	100	100.0	42.2	30.0	35.4	33.1	31.4
41	434933	406695	Roadside	100	100.0	60.3	42.4	51.3	49.7	48.4
42	434733	406774	Roadside	92.30769231	92.3	28.1	21.9	28.2	29.6	28.2
43	434955	406769	Roadside	100	100.0	58.9	41.4	47.9	50.1	48.0
44	435049	407047	Roadside	100	100.0	39.1	27.4	30.3	32.8	30.8
46	437554	405291	Kerbside	100	100.0	42.2	29.0	29.4	33.1	30.3
47	434958	405672	Roadside	100	100.0	33.5	22.5	24.9	26.6	24.4
48	434964	405709	Roadside	100	100.0	47.4	32.1	33.6	36.9	35.8
49	437528	405675	Kerbside	75	75.0	41.9	30.2	31.2	33.9	29.4

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 2023 (%) [2]	2019	2020	2021	2022	2023
50	435062	408244	Roadside	100	100.0	37.4	25.0	27.1	27.9	26.3
52	434112	409625	Roadside	100	100.0	35.4	24.3	25.0	26.3	25.5
53	434809	406023	Roadside	90.38461538	90.4	59.0	38.6	45.0	43.6	44.4
55	437367	405458	Roadside	100	100.0	42.6	27.0	30.2	30.1	28.3
57	437242	405772	Roadside	84.61538462	84.6	38.9	29.1	27.9	31.7	28.8
58	437250	405813	Roadside	100	100.0	37.4	26.1	26.6	27.3	25.6
59	432882	406259	Roadside	100	100.0	-	-	22.2	20.1	18.9
60	432817	406244	Roadside	84.61538462	84.6	-	-	23.0	19.2	19.0
61	434780	406055	Roadside	92.30769231	92.3	-	-	38.9	36.7	36.1
62	434855	405957	Roadside	100	100.0	-	-	42.6	39.1	36.3
63	434912	405817	Roadside	100	100.0	-	-	24.2	25.4	24.2
64	434931	405781	Roadside	84.61538462	84.6	-	-	26.4	26.4	23.5
65	434831	406001	Roadside	100	100.0	-	-	-	34.0	33.6
70	433563	406982	Roadside	75	75.0	-	-	-	-	20.7

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 2023 (%) [2]	2019	2020	2021	2022	2023
71	433351	407074	Roadside	100	100.0	-	-	-	-	19.5
72	433299	406873	Roadside	75	75.0	-	-	-	-	20.9
73	424388	403694	Roadside	67.30769231	67.3	-	-	-	-	18.6
74	433431	406272	Roadside	67.30769231	67.3	-	-	-	-	22.5
75	435481	400222	Roadside	100	100.0	-	-	-	-	19.4
76	424424	403587	Roadside	67.30769231	67.3	-	-	-	-	12.7
77	424313	403645	Roadside	75	75.0	-	-	-	-	14.4

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

☒ **Diffusion tube data has been bias adjusted.**

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

Notes:

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

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

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

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

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

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

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations in AQMA 1
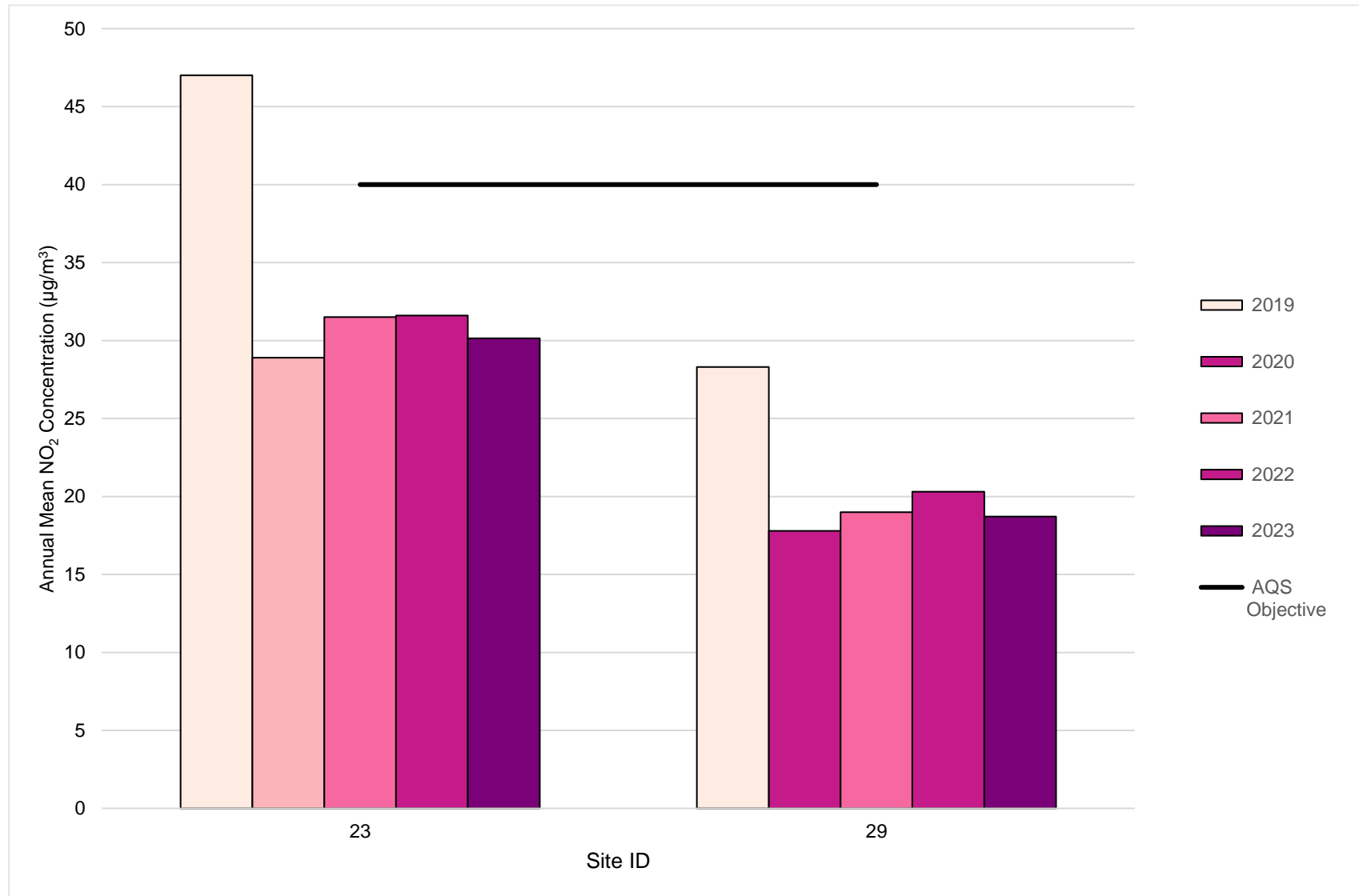
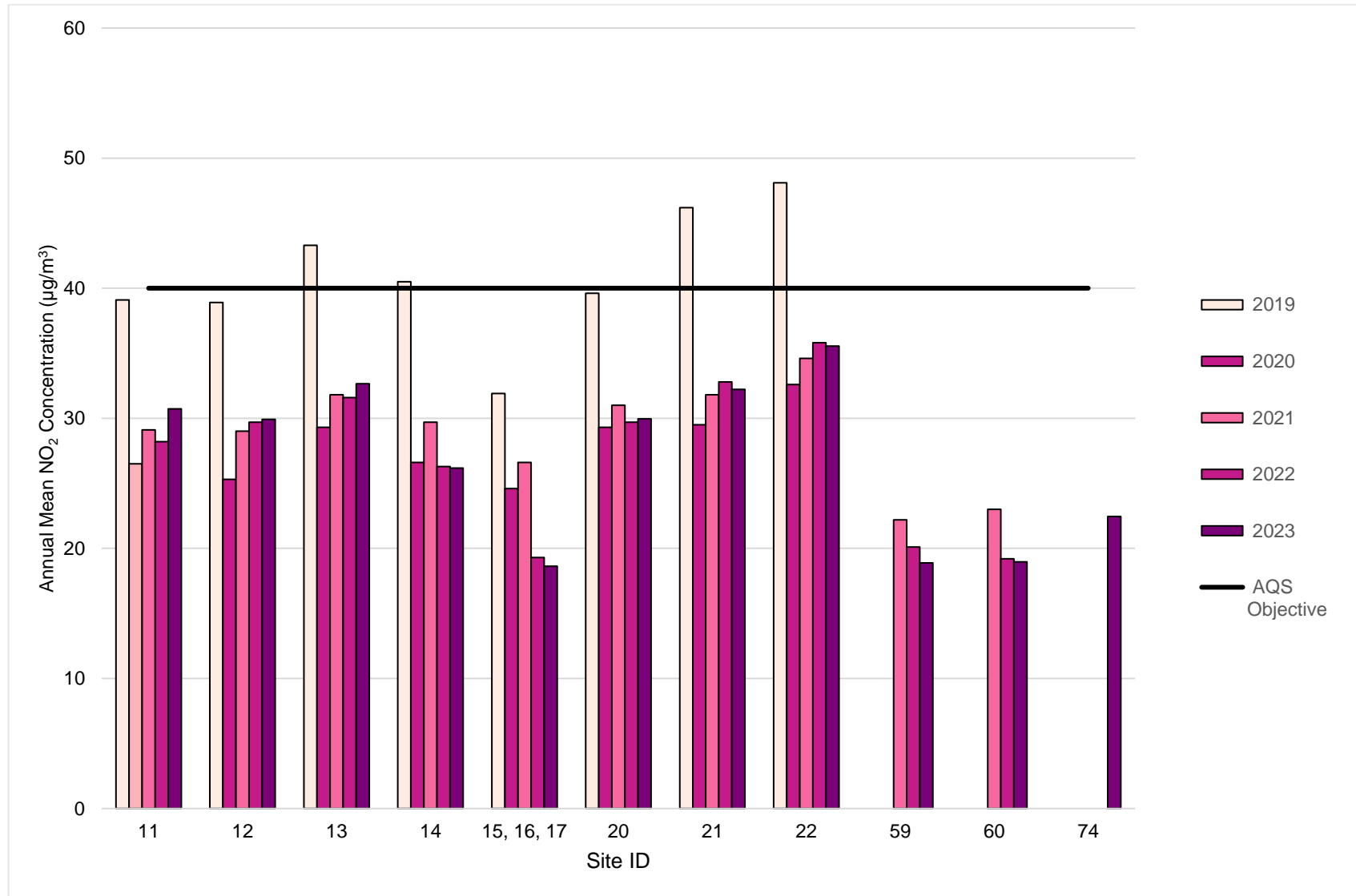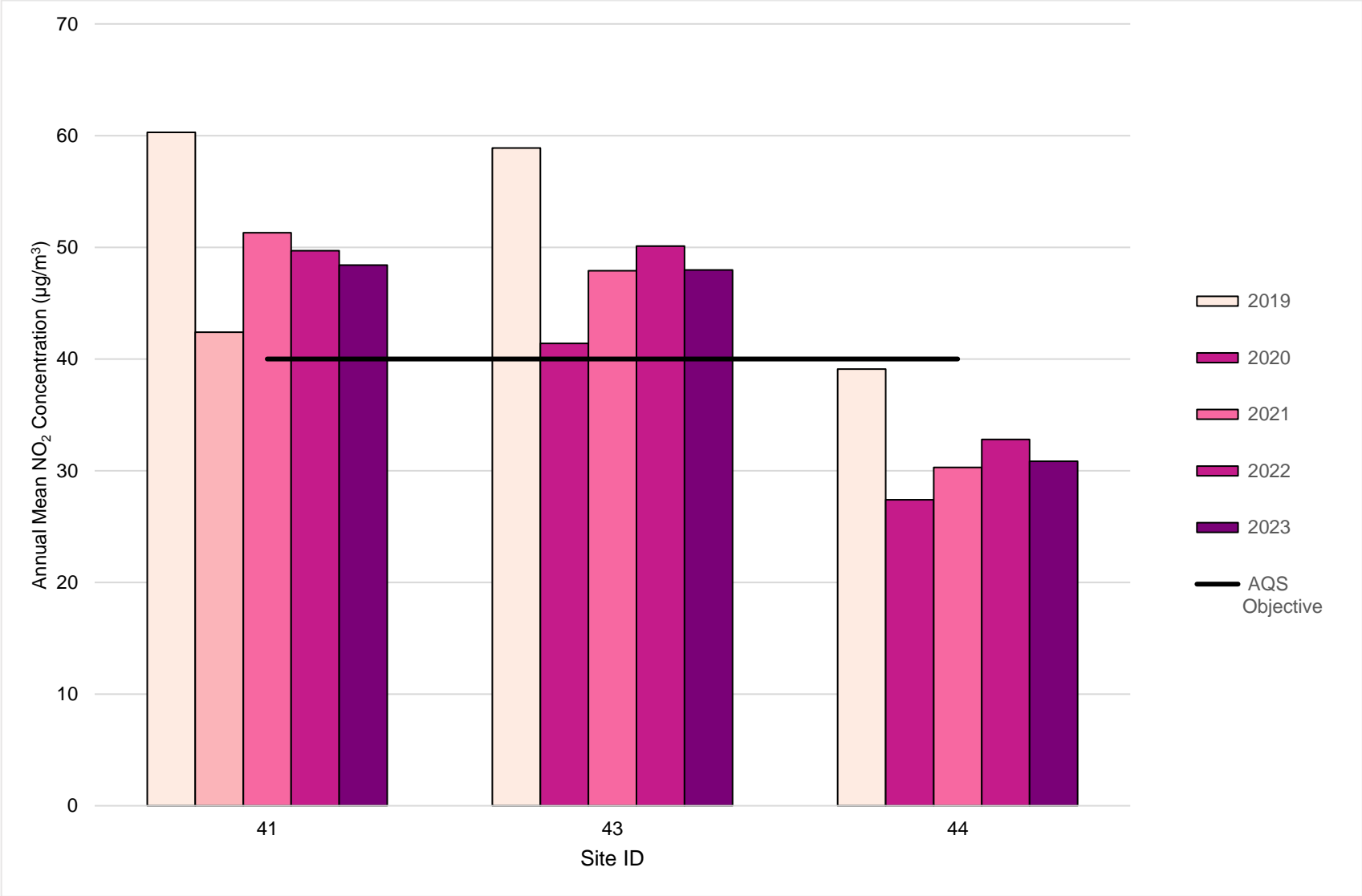**Figure A.2 – Trends in Annual Mean NO₂ Concentrations in AQMA 2A**

Figure A.3 – Trends in Annual Mean NO₂ Concentrations in AQMA 4

Figure A.4 – Trends in Annual Mean NO₂ Concentrations in AQMA 6
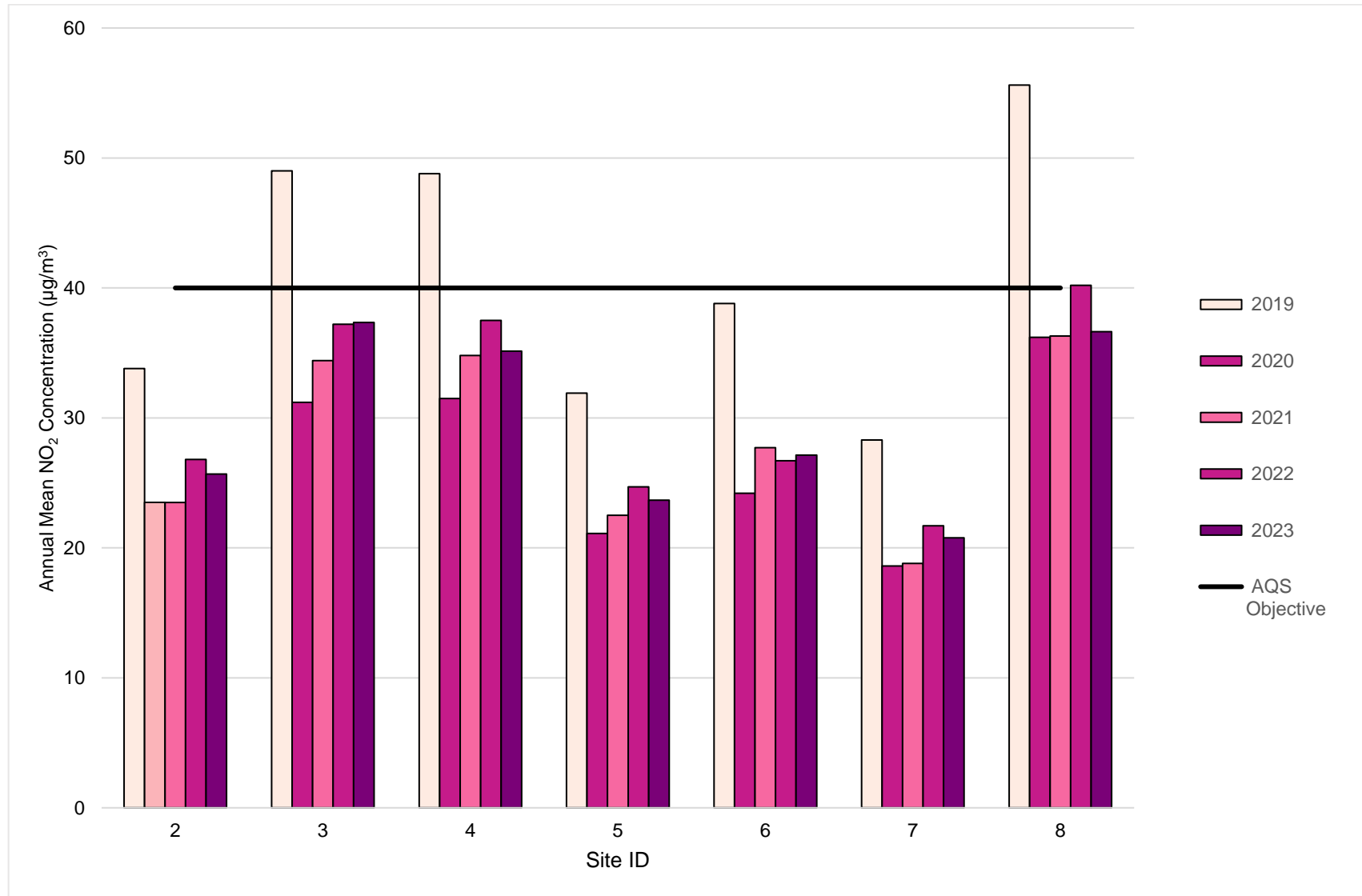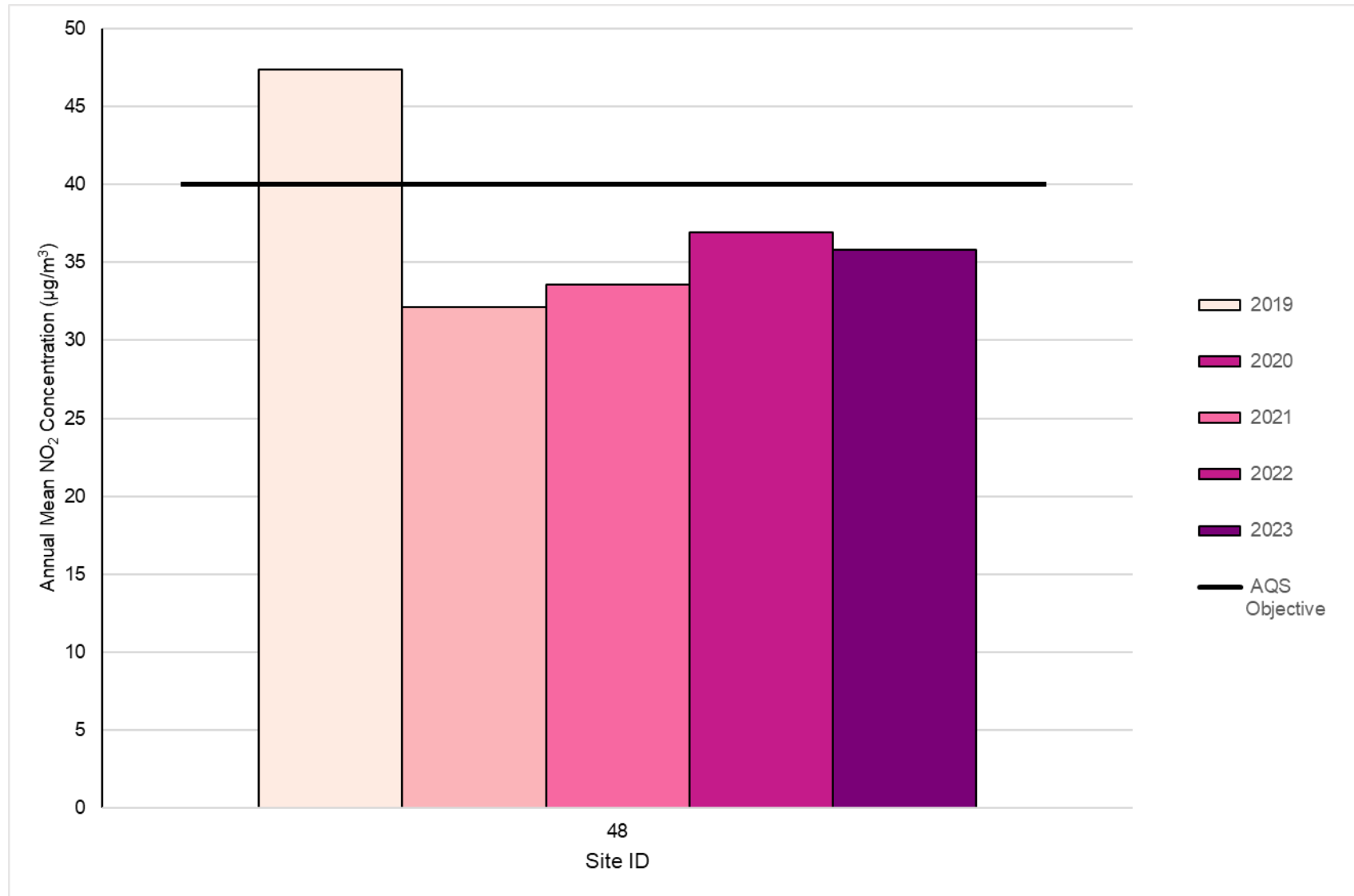
Figure A.5 – Trends in Annual Mean NO₂ Concentrations in AQMA 7

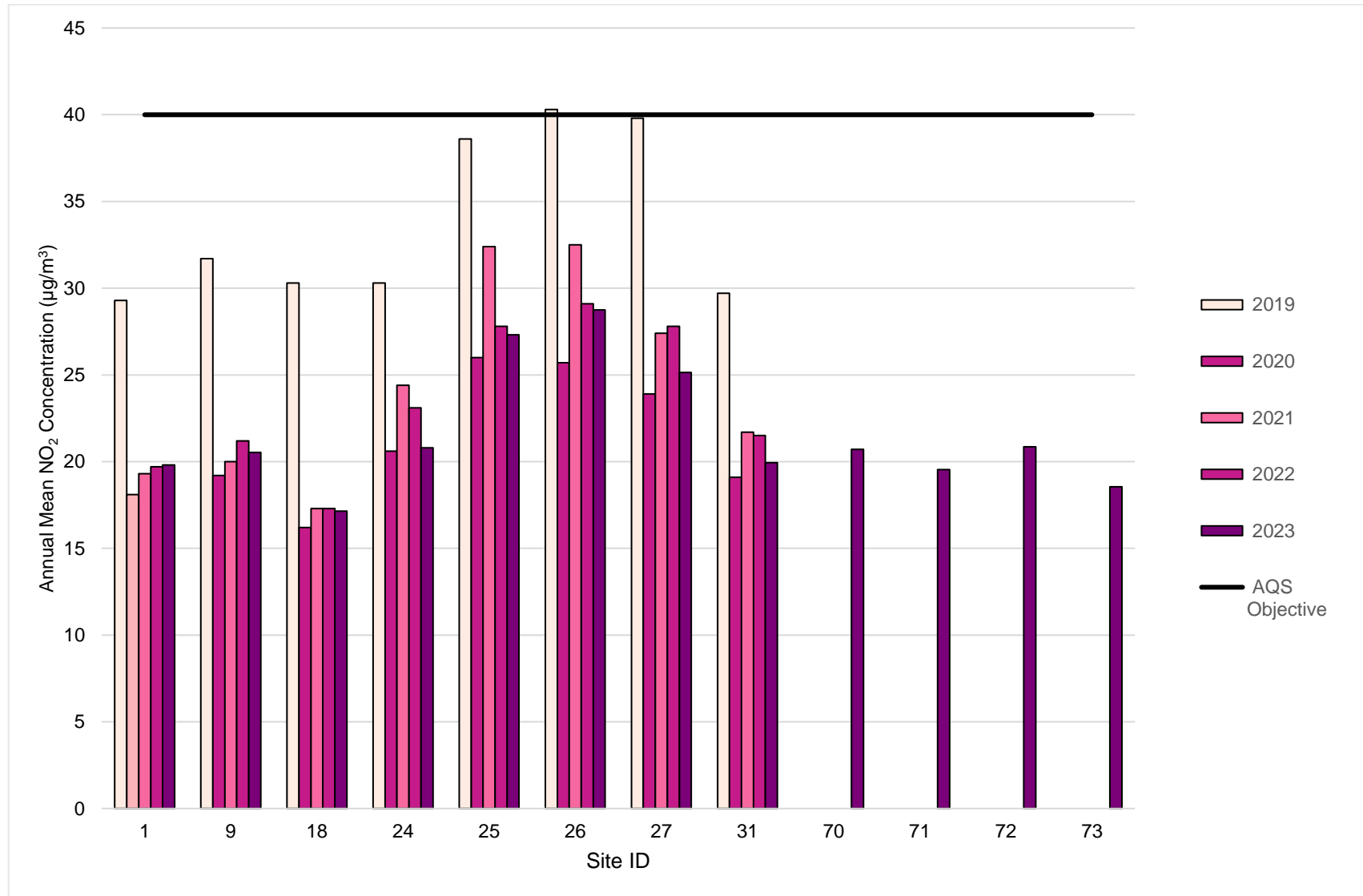**Figure A.6 – Trends in Annual Mean NO₂ Concentrations outside of AQMAs - 1**

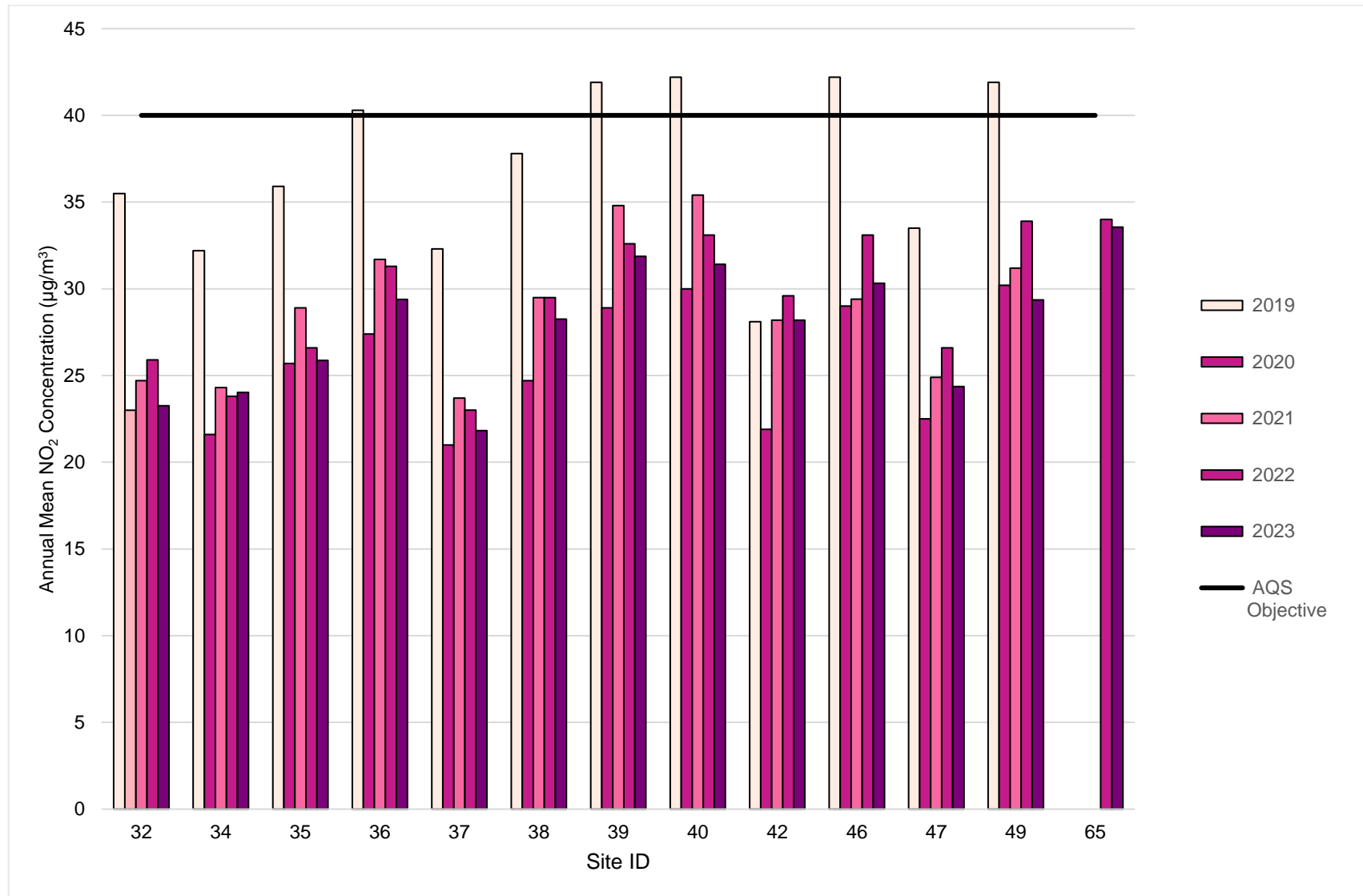**Figure A.7 – Trends in Annual Mean NO₂ Concentrations outside of AQMAs - 2**

Figure A.8 – Trends in Annual Mean NO₂ Concentrations outside of AQMAs - 3
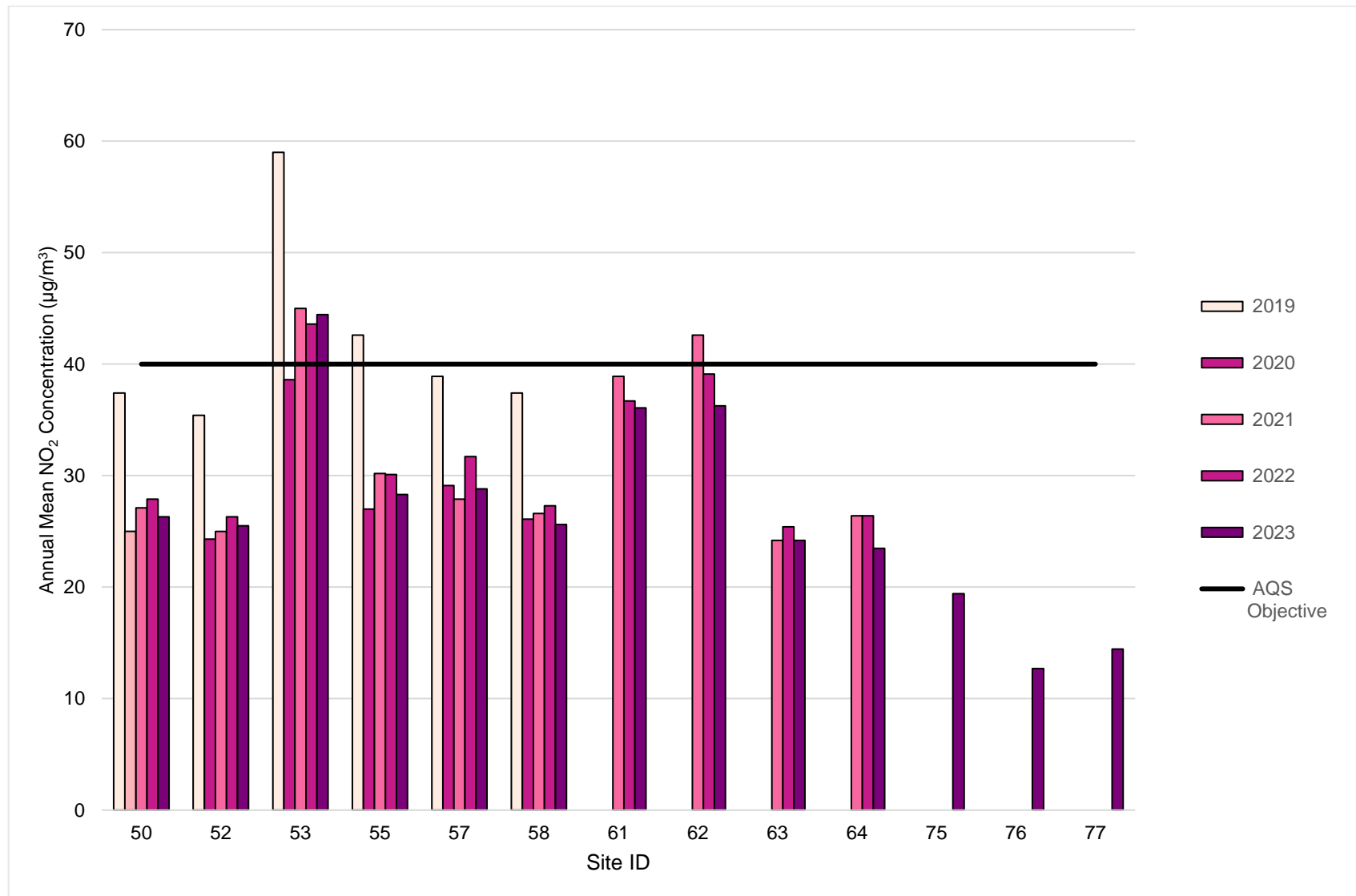
Table A.5 – 1-Hour Mean NO$_2$ Monitoring Results, Number of 1-Hour Means > 200µg/m^3

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
BAR11	432680	406174	Roadside	96.6	96.6	-	-	0	0	0
BAR3	432525	407475	Urban Background	96	96	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.

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

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

Table A.6 – Annual Mean PM$_{10}$ Monitoring Results (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 2023 (%) [2]	2019	2020	2021	2022	2023
BAR9	436298	405691	Roadside	95.8	95.8	20	20	19	21	20
BAR3	432524	407478	Urban Background	73.5	73.5					12

Notes:

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

Exceedances of the PM$_{10}$ 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.

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

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

Figure A.9 – Trends in Annual Mean PM$_{10}$ Concentrations
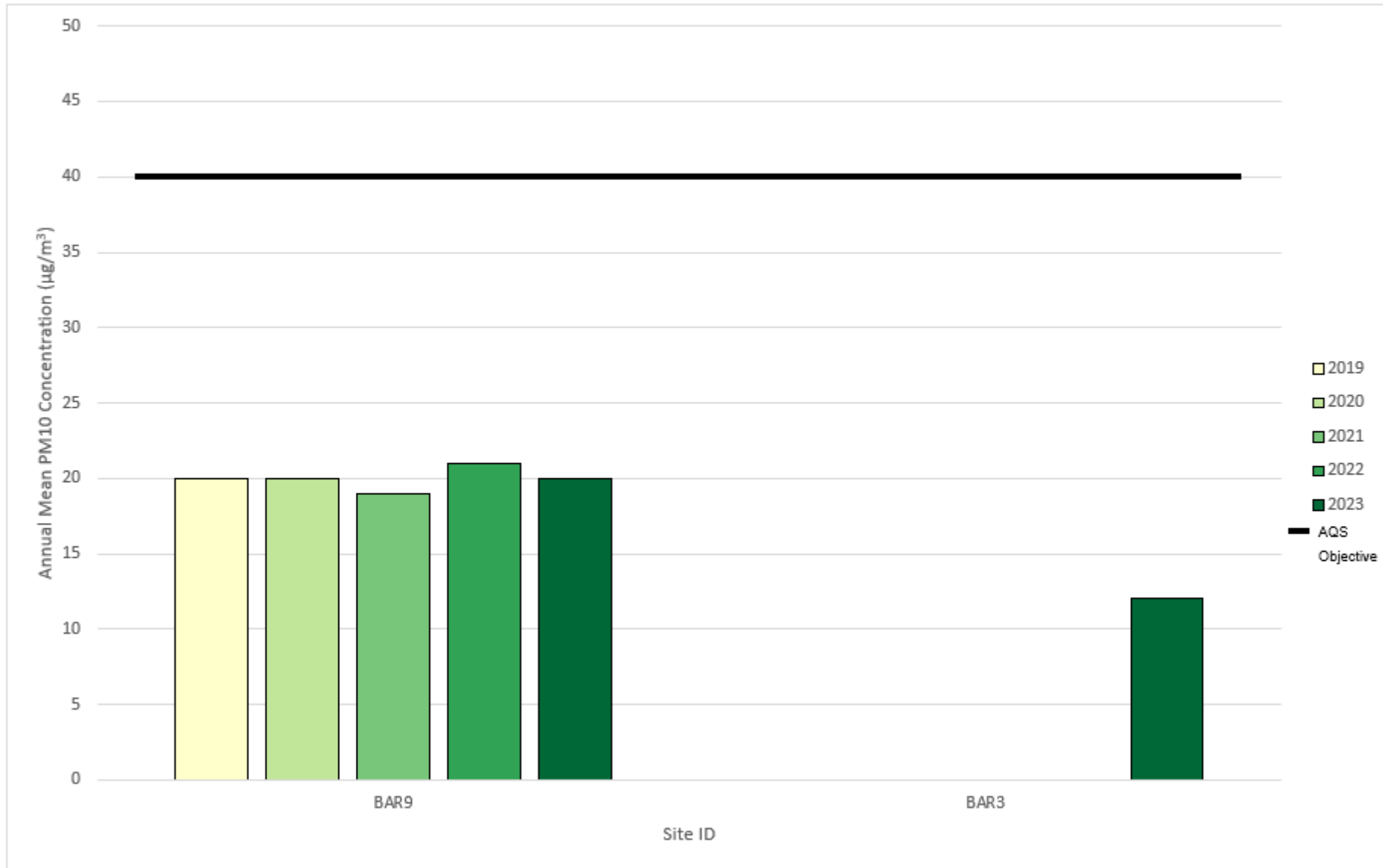
Table A.7 – 24-Hour Mean PM$_{10}$ Monitoring Results, Number of PM$_{10}$ 24-Hour Means > 50µg/m^3

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
BAR9	436298	405691	Roadside	95.8	95.8	11	3	1	7	1
BAR3	432524	407478	Urban Background	73.5	73.5					0

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m^3 have been recorded.

Exceedances of the PM$_{10}$ 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

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

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

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

Figure A.10 – Trends in Number of 24-Hour Mean PM$_{10}$ Results > 50µg/m^3
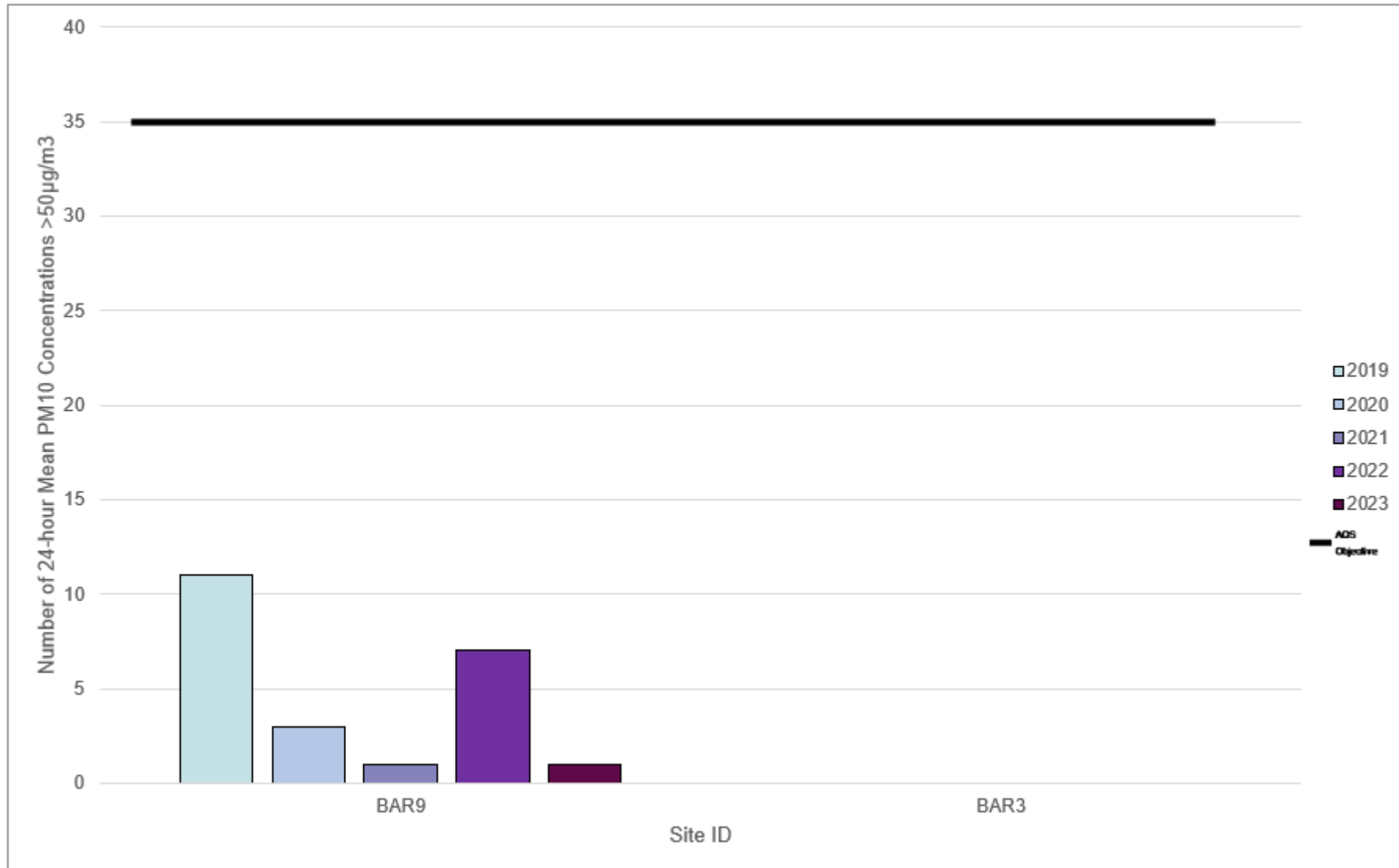
Table A.8 – Annual Mean PM$_{2.5}$ Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
BAR3	432524	407478	Urban Background	73.5	73.5					7

Table A.9 – SO₂ 2023 Monitoring Results, Number of Relevant Instances

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]	Number of 15-minute Means > 266µg/m³	Number of 1-hour Means > 350µg/m³	Number of 24-hour Means > 125µg/m³
BAR3	432525	407475	Urban Background	53	53	**0**	**0**	**0**

Notes:

Results are presented as the number of instances where monitored concentrations are greater than the objective concentration.

Exceedances of the SO₂ objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year).

If the period of valid data is less than 85%, the relevant percentiles are provided in brackets.

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO₂ 2023 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	423621	399817	23.3	27.4	23.9	26.4	27.0	26.9	20.6	23.6	24.4	23.2	21.4	18.2	23.9	19.8		
2	421102	400496	26.0	29.8	31.0	33.2	34.9	38.1	28.9	29.9	37.0	31.1	27.0	24.2	30.9	25.7		
3	421143	400481	42.1		38.5	47.3	57.0	52.3	44.3	47.4	49.3	38.9	45.9	31.7	45.0	37.3		
4	421126	400485	46.6	45.2	43.3	42.5	40.0	53.1	43.2	44.2	44.9	30.9	40.3	33.9	42.3	35.1		
5	421291	400482	28.8	26.4	27.1	32.1	34.5	29.7	26.5	28.5	31.2	27.6	29.1	20.6	28.5	23.7		
6	421282	400471	32.9	33.7	28.8	38.2	43.4	35.8	26.7	33.2	32.7	32.3	32.1	22.6	32.7	27.1		
7	421117	400501	27.1	23.8	24.2	23.4	22.4	24.7	25.8	26.6	27.0	25.8	26.7	22.7	25.0	20.8		
8	421215	400475	49.2	47.5	38.7	39.0	47.9	42.4	37.5	48.9	48.6	47.6	45.4	36.9	44.1	36.6	31.7	
9	431482	408572	26.4	25.8	27.6	27.0	25.9	23.9	18.6	21.2	25.1	24.6	29.0	21.6	24.7	20.5		
11	434000	406292	39.8	41.3	34.8	38.1	40.9	34.6	27.4	33.3	41.1	40.8	40.0	32.3	37.0	30.7		
12	433910	406290	39.9	42.9	34.8	38.7	39.4	37.1	24.3	31.8	38.6	34.3	40.8	30.1	36.0	29.9		
13	433820	406278	44.7	39.5	42.0	41.6	37.3	38.2	29.6	36.0	42.7	47.6	40.2	32.8	39.3	32.7		
14	432702	406160	36.3	37.9	31.6	31.3	29.8	28.0	26.9	28.2	32.6	32.9	35.6	27.2	31.5	26.2		
15	432674	406180	26.7	24.7	26.1	26.3	18.0	18.5	17.4	19.3	25.0	24.3	21.6	22.9	-	-		Triplicate Site with 15, 16 and 17 - Annual data provided for 17 only
16	432674	406180	23.5	27.4	26.2	25.8	19.2	18.9	17.3	18.7	22.6	23.9	24.1	22.3	-	-		Triplicate Site with 15, 16 and 17 - Annual data provided for 17 only
17	432674	406180	22.5	27.3	26.4	24.4	18.7	19.2	16.9	18.2	23.8	25.6	23.0	21.5	22.5	18.6		Triplicate Site with 15, 16 and 17 - Annual data provided for 17 only
18	432603	406312	26.1	24.1	21.7	21.2	18.5	16.2	15.7	16.5	21.5	23.8	22.4	20.1	20.7	17.1		
20	432535	406071	41.3	41.8		37.8	32.4	35.9	29.8	33.5	38.5	37.6	37.9	30.5	36.1	30.0		

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
21	432402	406013	42.6	40.6	38.7	40.2	38.7	36.8	33.7	38.3	41.0	42.1	37.8	35.2	38.8	32.2		
22	432351	405985	46.3	44.0	44.0	44.6	41.1	44.0	41.9	41.4	43.5	43.9	41.4	38.0	42.8	35.6		
23	432262	405950	38.2	44.5	24.1		38.8	35.1	36.2	36.9	40.8	38.3	37.2	29.6	36.3	30.1		
24	435274	400384	26.6	31.5		21.6	21.8	17.6	24.3	20.7	24.7	30.9	31.6	24.4	25.1	20.8		
25	434832	400405	33.1	35.2	35.8	37.7	34.4	35.0	26.2	29.8	34.6	35.4	33.2	24.4	32.9	27.3		
26	434820	400421	33.3	37.5		40.0	37.1	40.8	25.2	28.6	36.8	38.4	35.9	27.4	34.6	28.7		
27	434823	400398	28.5	33.6	32.3	33.0	30.0	24.7	27.0	28.7	33.5	35.8	34.8	21.8	30.3	25.1		
29	434721	400352	25.8	27.2	25.4	21.5	20.1	17.4	19.3	20.5	24.5	22.9	27.6	18.5	22.6	18.7		
31	434595	401107	26.5	24.7	25.7	26.1	22.0			18.1	25.9	25.0	27.4	18.8	24.0	19.9		
32	434559	401274	33.7	36.0	31.9	29.6	23.7		18.7	25.9			32.9		29.1	23.3		
34	435011	408281	31.8	28.8	33.0	27.3	25.0			24.6	30.5	29.0	33.5	26.0	28.9	24.0		
35	435027	408190	39.9		34.0	32.6	30.4	26.9	26.1	28.9	32.4	26.7	35.7	29.3	31.2	25.9		
36	435027	408104	37.5	41.2	36.3	36.4	37.3	32.1	30.9	33.0	35.8	38.1	35.9	30.5	35.4	29.4		
37	435174	407499	31.3	33.0	28.1	27.2	23.5	22.3	22.2	22.9	26.4	25.3	32.1	21.5	26.3	21.8		
38	434757	406995	41.5	40.8	35.7	35.1	34.9	30.1	27.7	28.8	35.2	34.2	35.3	29.1	34.0	28.2		
39	436072	407320	39.1	46.3	36.1	42.8	43.0	44.6	29.1	32.6	41.4	38.6	36.8	30.3	38.4	31.9		
40	437122	406557	36.1	47.0	41.0	45.7	39.8	34.3	30.1	33.7	36.7	42.3	40.7	26.6	37.8	31.4		
41	434933	406695	57.7	63.2	58.1	61.3	60.2	68.9	53.2	57.2	60.7	66.4	55.3	37.7	58.3	48.4	35.4	
42	434733	406774	34.9		37.5	38.3	32.0	31.3	29.5	28.5	41.3	34.1	35.6	30.5	34.0	28.2		
43	434955	406769	52.8	63.5	63.0	63.6	62.0	53.1	52.6	57.5	67.8	58.2	56.4	43.0	57.8	48.0	38.0	
44	435049	407047	41.2	41.8	39.2	36.8	39.0	35.4	32.0	35.9	38.7	36.3	39.9	29.7	37.2	30.8		

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
46	437554	405291	40.3	40.8	36.7	35.4	35.0	30.7	32.1	36.3	40.0	31.1	42.5	37.5	36.5	30.3		
47	434958	405672	32.3	32.7	33.4	32.6	28.1	24.6	25.5	25.3	31.5	27.0	32.6	26.8	29.4	24.4		
48	434964	405709	39.1	47.2	46.4	52.2	50.2	42.0	33.5	38.3	44.9	45.7	46.1	32.1	43.1	35.8		
49	437528	405675	38.2	39.7			36.0	37.6	29.2	32.8	42.1		35.6	27.3	35.4	29.4		
50	435062	408244	33.3	28.1	31.2	34.3	33.8	33.3	28.8	30.0	33.3	30.5	35.3	28.4	31.7	26.3		
52	434112	409625	32.1	31.2	31.8	31.9	33.2	30.9	24.4	27.6	32.2	34.2	32.6	26.7	30.7	25.5		
53	434809	406023	45.4	60.6	57.4	60.2	62.4	58.1	43.8	48.2	55.6	55.5		41.6	53.5	44.4	33.4	
55	437367	405458	34.5	37.4	35.4	33.9	36.3	30.5	29.9	34.3	38.2	36.7	40.1	21.9	34.1	28.3		
57	437242	405772	36.4	41.6	37.7	35.3	27.5	25.2		27.0	37.4		40.5	38.3	34.7	28.8		
58	437250	405813	33.1	38.7	33.6	36.5	32.3	26.2	23.0	25.7	31.3	29.0	31.9	28.9	30.9	25.6		
59	432882	406259	30.1	25.5	22.5	21.9	15.9	17.5	16.9	19.6	23.1	25.9	31.5	22.7	22.7	18.9		
60	432817	406244	24.5	25.8	24.4	23.1	16.5	20.0		18.1	25.7		25.9	24.2	22.8	19.0		
61	434780	406055	40.7	54.7	48.6	42.8	41.0	37.2	41.5	43.4	41.2		47.2	39.5	43.5	36.1	19.9	
62	434855	405957	45.6	44.0	47.4	52.3	43.6	43.4	34.4	37.3	50.7	49.0	43.5	33.0	43.7	36.3	28.0	
63	434912	405817	30.8	33.0	34.1	32.7	28.4	22.8	23.5	23.7	29.8	32.4	34.4	24.1	29.1	24.2		
64	434931	405781			30.7	34.9	30.4	26.4	19.6	23.8	30.2	32.3	31.9	22.7	28.3	23.5		
65	434831	406001	34.7	36.3	41.2	48.8	48.3	43.6	32.5	39.2	45.6	45.5	41.5	28.1	40.4	33.6		
70	433563	406982				46.5	18.5	20.6	19.6	20.3	22.0	26.4	28.9	21.7	24.9	20.7		
71	433351	407074	28.5	26.0	24.0	24.4	18.2	17.6	21.1	20.6	22.8	26.5	27.2	25.6	23.5	19.5		
72	433299	406873				23.1	25.5	21.0	21.9	22.3	23.3	30.6	31.6	26.8	25.1	20.9		
73	424388	403694					19.4	19.4	16.2	17.9	22.8	24.8	24.2	17.7	20.3	18.6		

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
74	433431	406272					27.8	24.4	19.4	22.9	30.3	33.4	15.5	22.8	24.6	22.5		
75	435481	400222	23.6	28.4	26.3	23.9	21.6	16.1	20.4	20.5	24.6	26.8	27.4	21.0	23.4	19.4		
76	424424	403587					15.1	14.0	9.5	12.0	16.5	15.7	15.0	13.4	13.9	12.7		
77	424313	403645				23.8	18.1	18.4	12.6	13.4	18.7	18.1	17.9	15.4	17.4	14.4		

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

New or Changed Sources Identified Within Barnsley Metropolitan Borough Council During 2023

Air quality assessments have been undertaken in support of various planning applications which have potential to impact on local air quality. In addition, following adoption of the Councils' Local Plan in 2019, the Council has been developing Masterplan Frameworks as Barnsley's Local Plan includes some site allocations which require the production of such a framework. Masterplan frameworks are subject to public consultation and approval by the Council prior to the determination of any planning applications on the affected sites. Air quality impact has been included within these frameworks in order to ensure that this is considered appropriately at subsequent planning stage. The Council has its own Air Quality and Emissions Good Practice Planning Guidance which requires that air quality impact from future development are reasonably mitigated.

Specifically, in 2020, the following significant planning applications were assessed for air quality impact: 2020/0647 - Hybrid planning application for a development up to 103,086sqm of employment uses (use classes B1/B2 and B8) 2020/0027 and 2020/0028 - Hybrid planning application for a development up to 103,086sqm of employment uses (use classes B1/B2 and B8) 2020/1005 - Outline planning permission (with all matters reserved except access) for redevelopment of the site to include up to 500 residential units.

In 2021 a planning application was approved by Barnsley MBC for the MU1 development at land south of Barugh Green Road and east of Higham Common Road. The development comprises of 1,760 dwellings and business parks with an estimated operational year of 2026. An air quality assessment was submitted demonstrating that air quality impacts would be negligible within all AQMAs. However, additional traffic would potentially cause adverse effects at properties close to roads with increased traffic flow.

In December 2023, a hybrid planning application for the construction of up to 204,000 sqm of industrial and logistics floorspace on land south of Dearne Valley Parkway was submitted. The accompanying air quality assessment investigated the impact of construction and operational road traffic on NO_2, PM_{10} and $PM_{2.5}$ concentrations at sensitive receptor locations, as well as considering nitrogen and acid deposition at the

Dearne Valley Park SSSI – Gypsy Marsh. The investigation demonstrated that air quality impacts for the construction and operational phases would be negligible in the local area and all AQMAs after suitable mitigation. This application is still under consideration as of May 2024.

Additional Air Quality Works Undertaken by Barnsley Metropolitan Borough Council During 2023

Due to extreme resource limitations Barnsley Council has not completed any additional works within the reporting year of 2023.

QA/QC of Diffusion Tube Monitoring

Nitrogen dioxide diffusion tubes for 2023 were analysed by Gradko. The Gradko lab used the analytical technique of the grid adsorbent being 50% triethanolamine (TEA) in acetone. Gradko International Ltd is a UKAS accredited laboratory and participates in laboratory performance and proficiency testing schemes. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre.

The laboratory follows the procedures set out in the Harmonisation Practical Guidance and participates in the AIR proficiency-testing (AIR-PT) scheme. Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the AIR-PT scheme. Laboratory performance in the AIR-PT is also assessed by the National Physical Laboratory (NPL), alongside laboratory data from the monthly NPL Field Inter-Comparison Exercise.

In the 2023 AIR-PT results, Gradko scored 100% in AIR-PT AR059 (September – October 2023)[10]. At the time of writing this ASR, there were no results available for November 2023 onwards. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

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[10] Available at https://laqm.defra.gov.uk/wp-content/uploads/2023/11/LAQM-NO2-Performance-data_Up-to-Oct-2023_V1_Final.pdf

The diffusion tube calendar was adhered to for the whole of the schedule, with only small variations of ±1 day.

Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%. This was conducted for four sites in 2023.

Table C.1 – Annualisation Summary (concentrations presented in µg/m³)

Site ID	Annualisation Factor Barnsley Gawber	Annualisation Factor Dewsbury Ashworth Grange	Annualisation Factor Sheffield Tinsley	Annualisation Factor Barnsley A628 Roadside Site 2	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
32	0.9782	0.9467	0.9490	0.9834	0.9643	29.1	28.0
73	1.0516	1.1459	1.1013	1.1067	1.1014	20.3	22.4
74	1.0516	1.1459	1.1013	1.1067	1.1014	24.6	27.1
76	1.0516	1.1459	1.1013	1.1067	1.1014	13.9	15.3

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

Barnsley Metropolitan Borough Council have applied a national bias adjustment factor of 0.83 to the 2023 monitoring data. A summary of bias adjustment factors used by Barnsley Metropolitan Borough Council over the past five years is presented in Table C.2.

The local bias adjustment factor was calculated for the 2023 monitoring data. However, as this was 0.71, the national adjustment factor was chosen as it is more reliable in cases where the national and local factors differ significantly according to TG22 section 7.224[11].

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	March 2024	0.83
2022	Local	-	0.83
2021	Local	-	0.87
2020	Local	-	0.84
2019	Local	-	0.98

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	12				
Bias Factor A	0.71 (0.66 - 0.78)				
Bias Factor B	40% (28% - 52%)				
Diffusion Tube Mean (µg/m³)	22.5				
Mean CV (Precision)	3.8%				
Automatic Mean (µg/m³)	16.0				
Data Capture	96%				
Adjusted Tube Mean (µg/m³)	16.0 (15-18)				

Notes:

The local bias adjustment factor was not used for the 2023 results as it differed significantly from the national factor.

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[11] Available at https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

NO₂ Fall-off with Distance from the Road

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

Table C.4 – Non-Automatic NO₂ Fall off With Distance Calculations (concentrations presented in µg/m³)

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
8	2.0	4.0	36.6	6.1	31.7	
41	2.0	10.0	48.4	13.9	35.4	
43	2.0	7.0	48.0	13.9	*38.0*	*Predicted concentration at Receptor within 10% the AQS objective.*
53	0.3	2.8	44.4	13.92	33.4	
61	1.5	41.5	36.1	13.92	19.9	*Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution.*
62	1.4	6.5	36.3	11.3	28.0	

QA/QC of Automatic Monitoring

PM₁₀ and PM₂.₅ Monitoring Adjustment

The type of PM₁₀ monitors utilised within Barnsley MBC do not require the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within Barnsley MBC 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.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO_2 concentrations corrected for distance are presented in Table A.3.

No automatic NO_2 monitoring locations within Barnsley MBC required distance correction during 2023.

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

Figure D.1 – Map of Non-Automatic Monitoring Sites
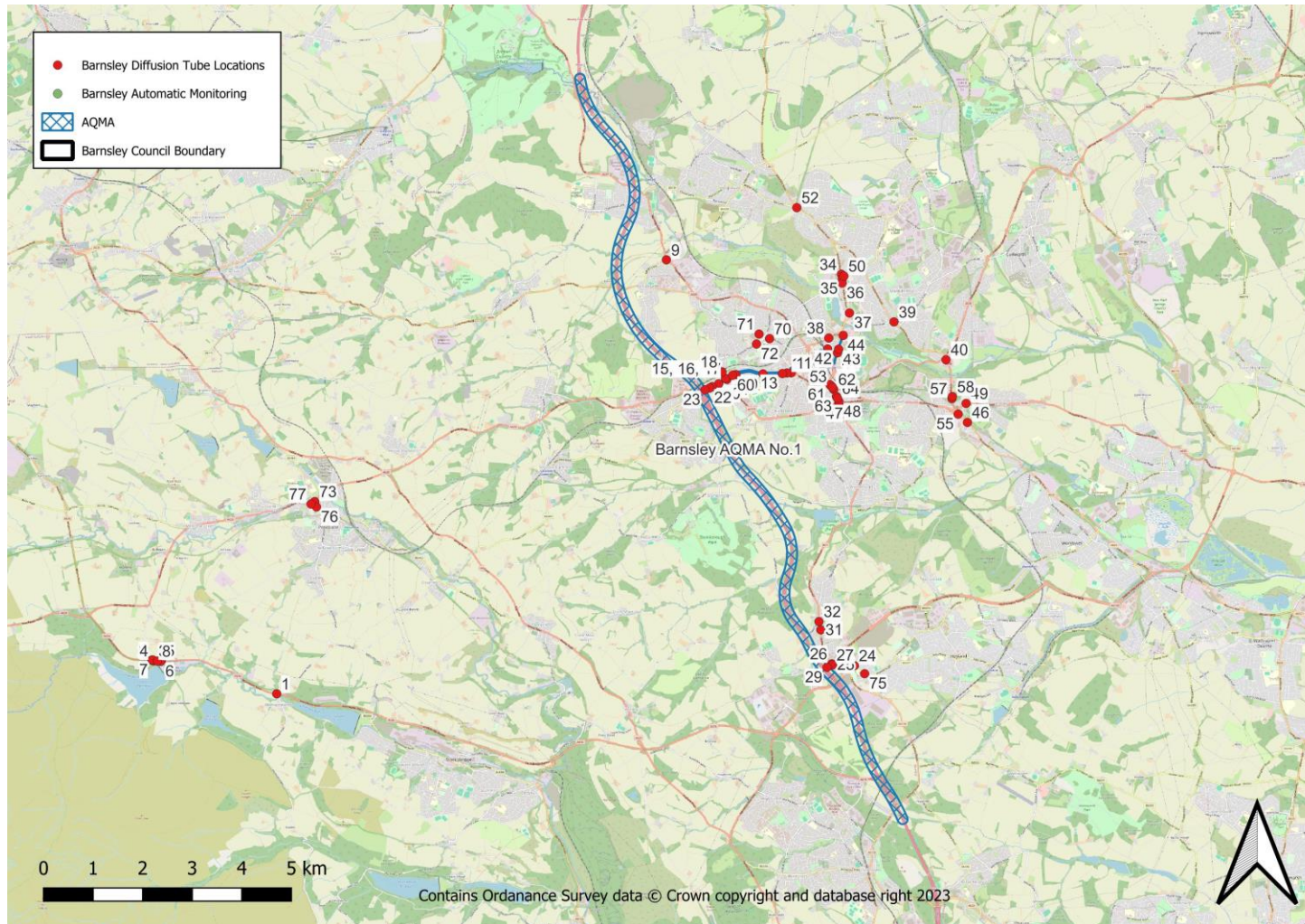
Figure D.1 1 - Map displaying diffusion tube 1
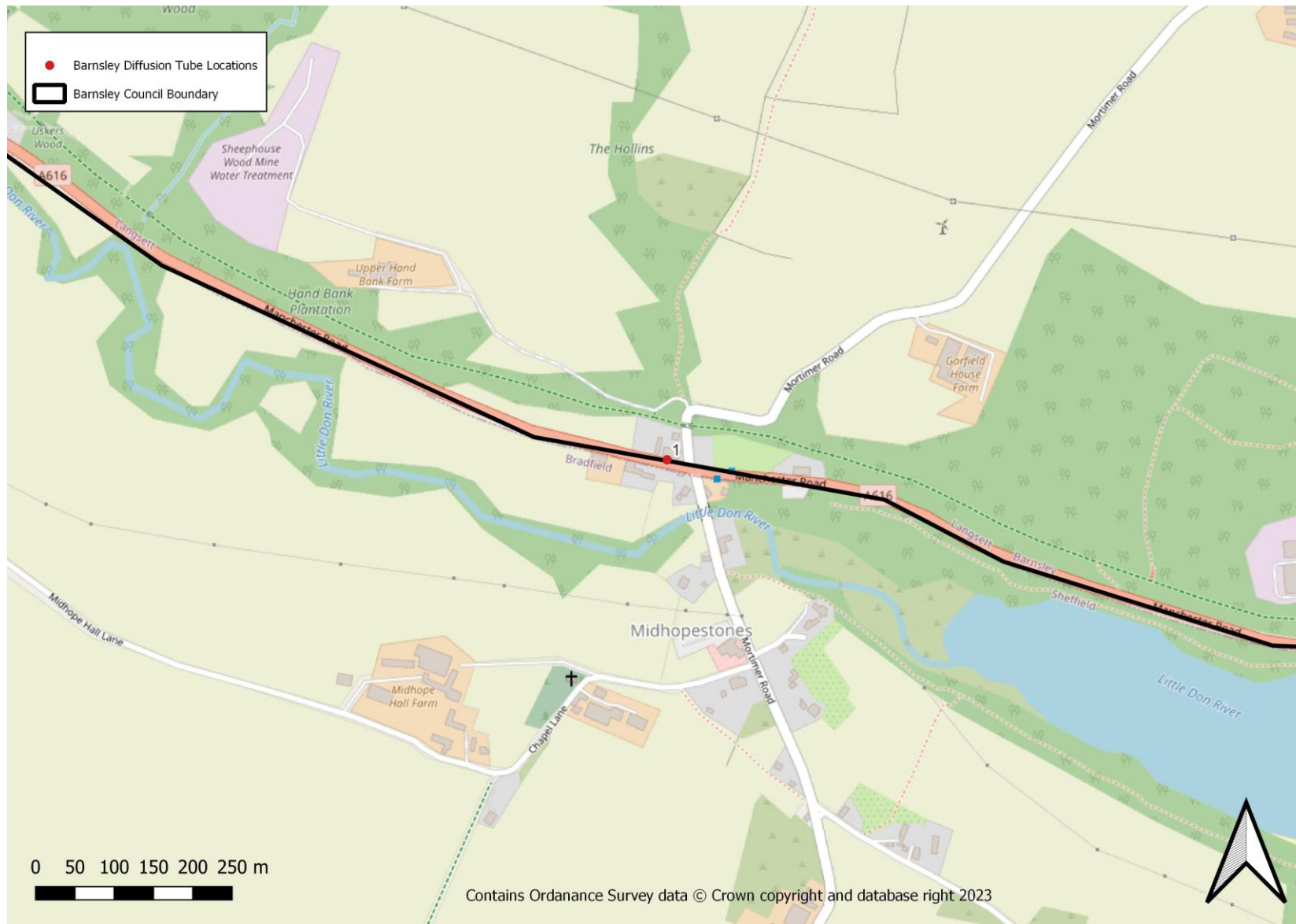
Figure D.1 2 - Map displaying diffusion tubes 2 to 8, and AQMA 6
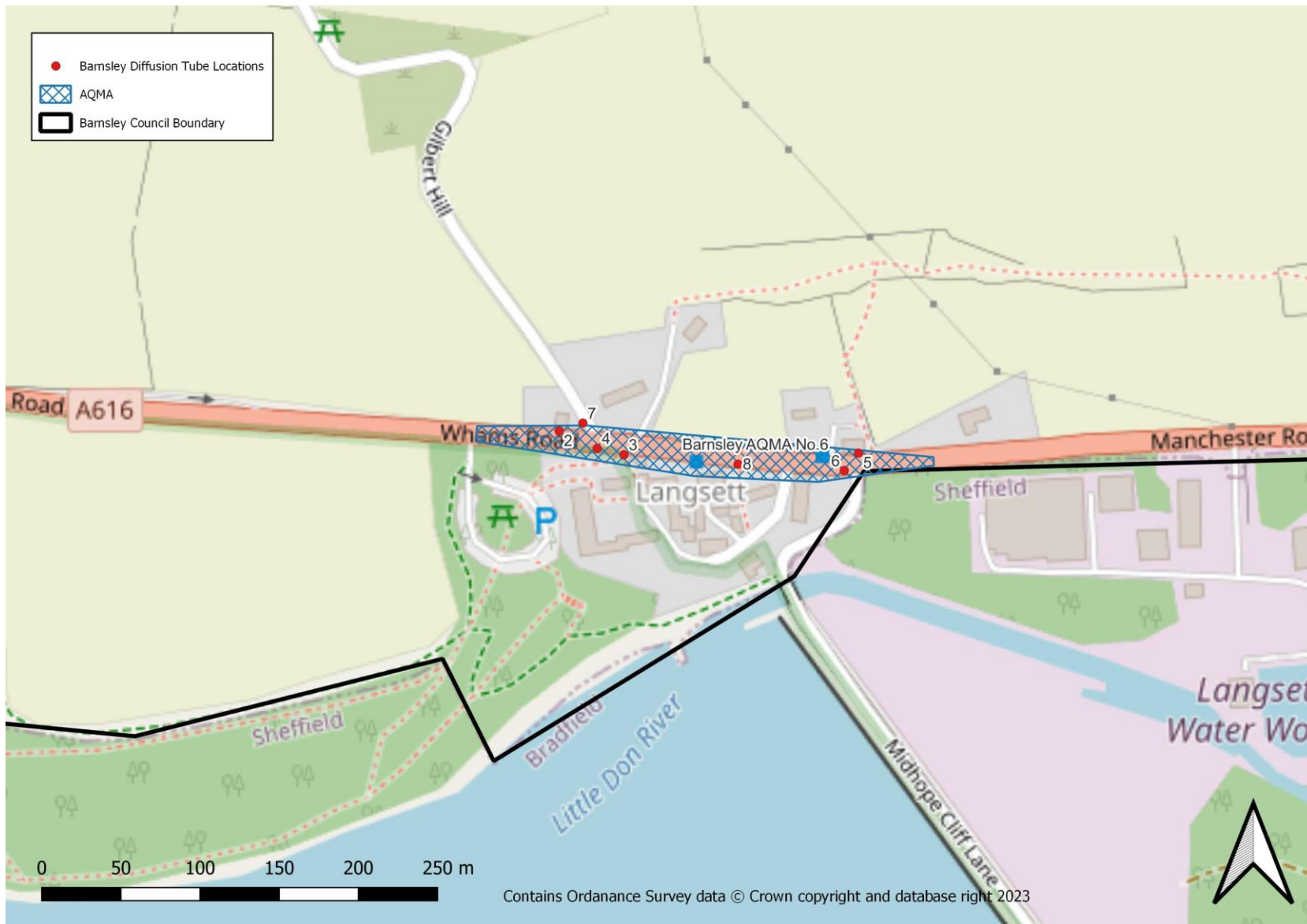
Figure D.1 3 - Map displaying diffusion tube 9
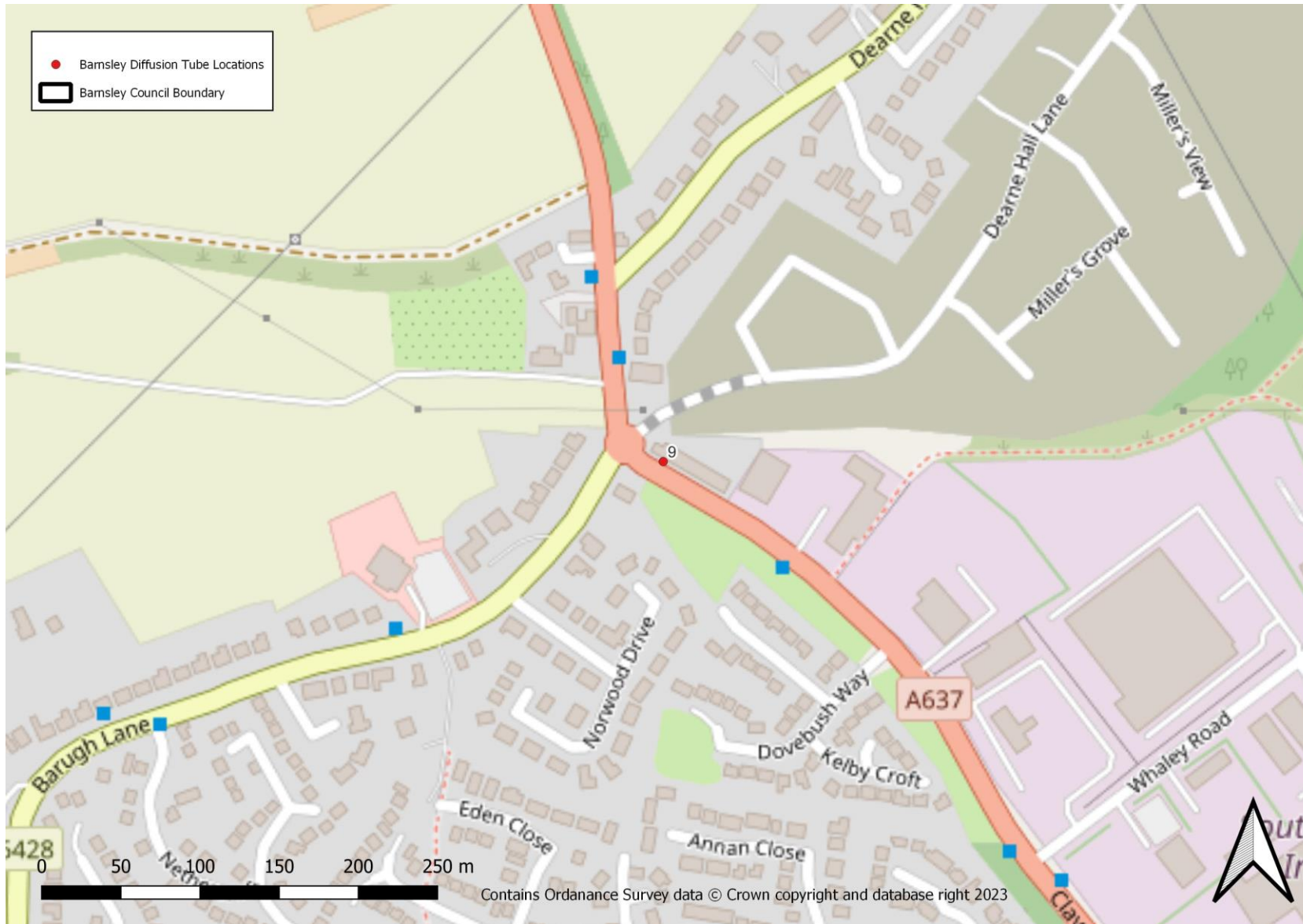
Figure D.1 4 - Map displaying diffusion tubes 11 to 23, 28, 45, 59 to 60, 74, automatic monitoring location AL3, AQMA1 and AQMA 2A
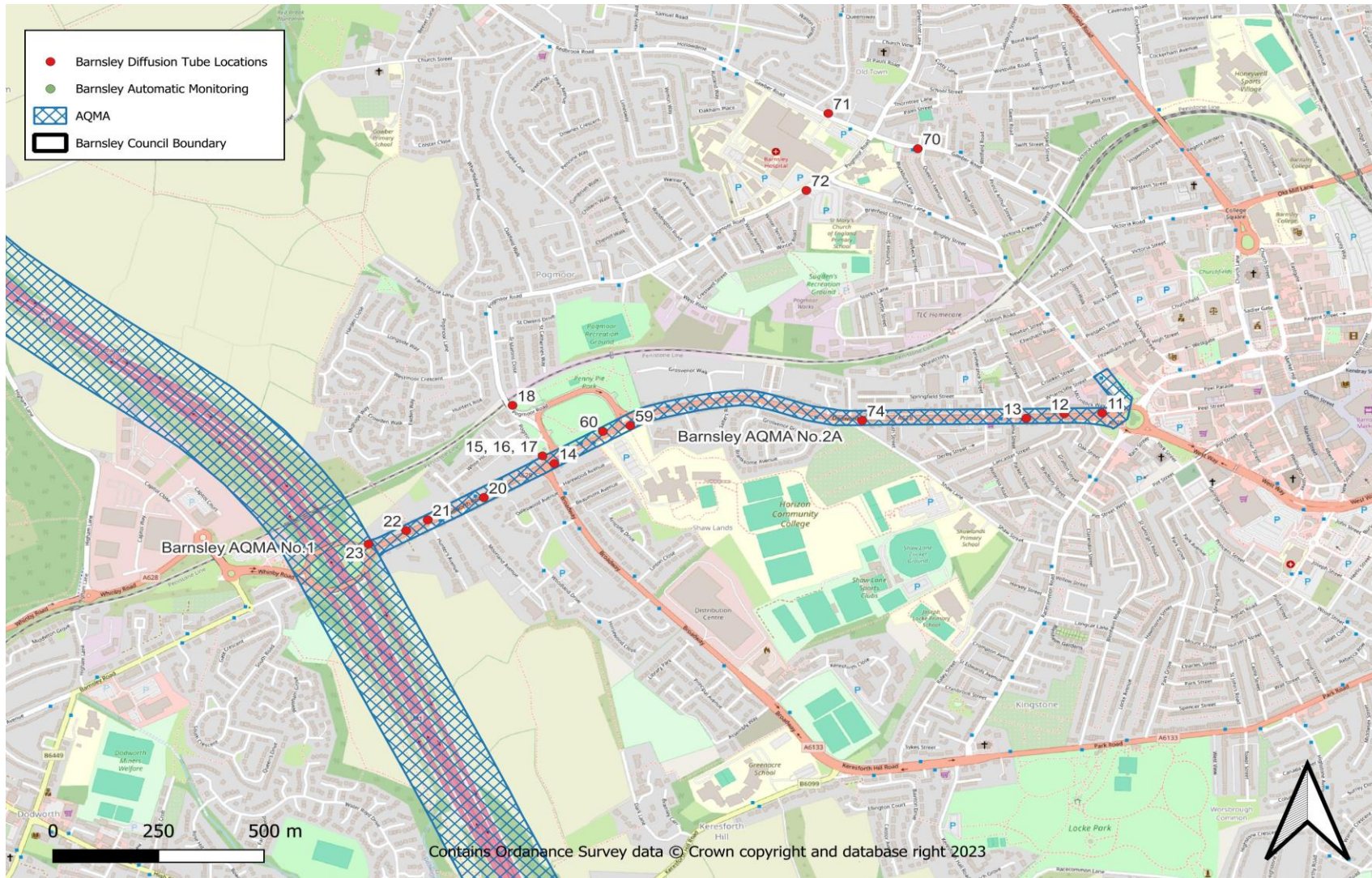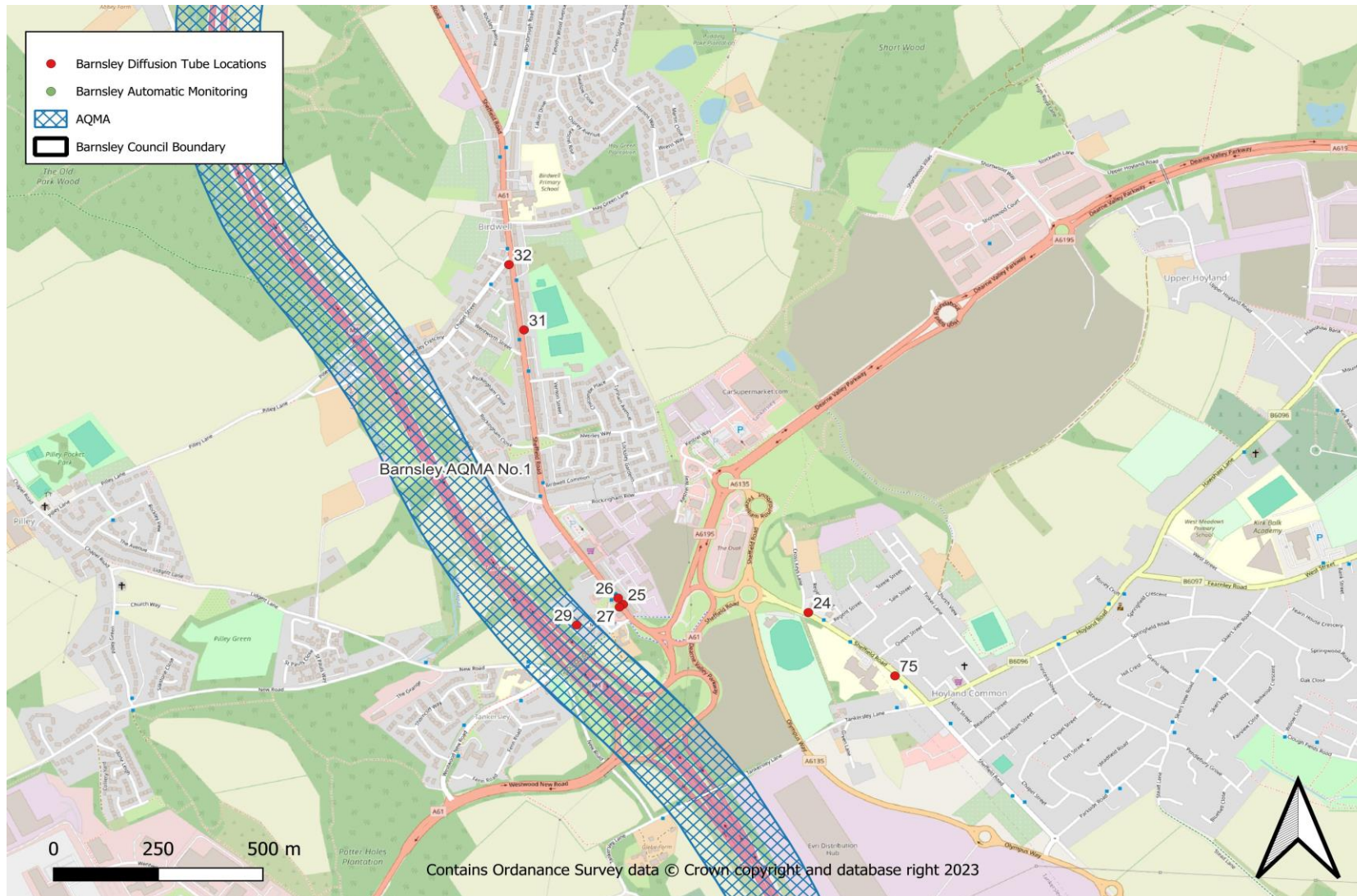
Figure D.1 5 - Map displaying diffusion tubes 24 to 27, 29, 31, 32, 75 and AQMA 1

Figure D.1 6 - Map displaying diffusion tubes 73, 76 and 77
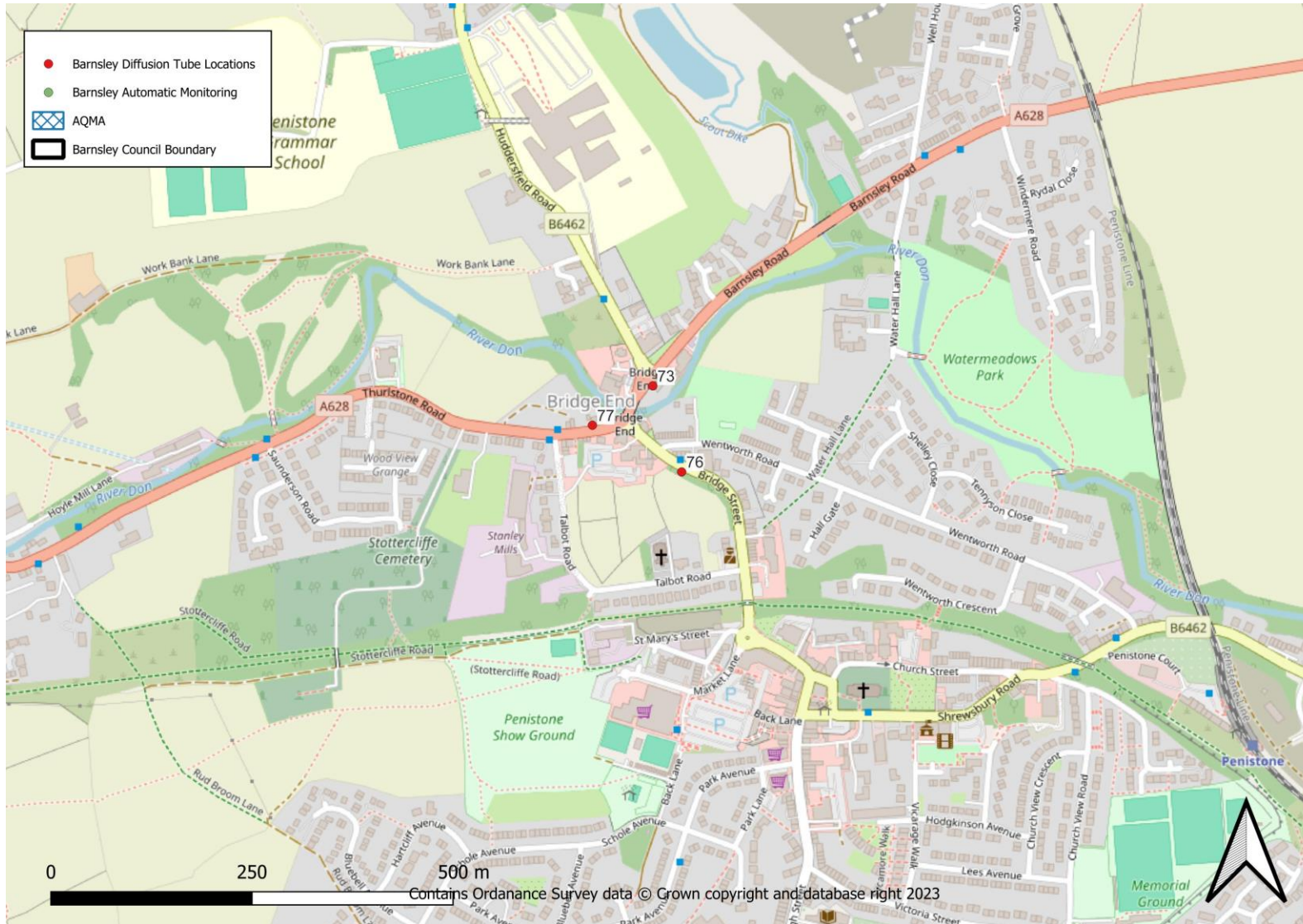
Figure D.1 7 - Map displaying diffusion tubes 34 to 36 and 50

Figure D.1 8 - Map displaying diffusion tubes 37 to 38, 41 to 44, and AQMA 4
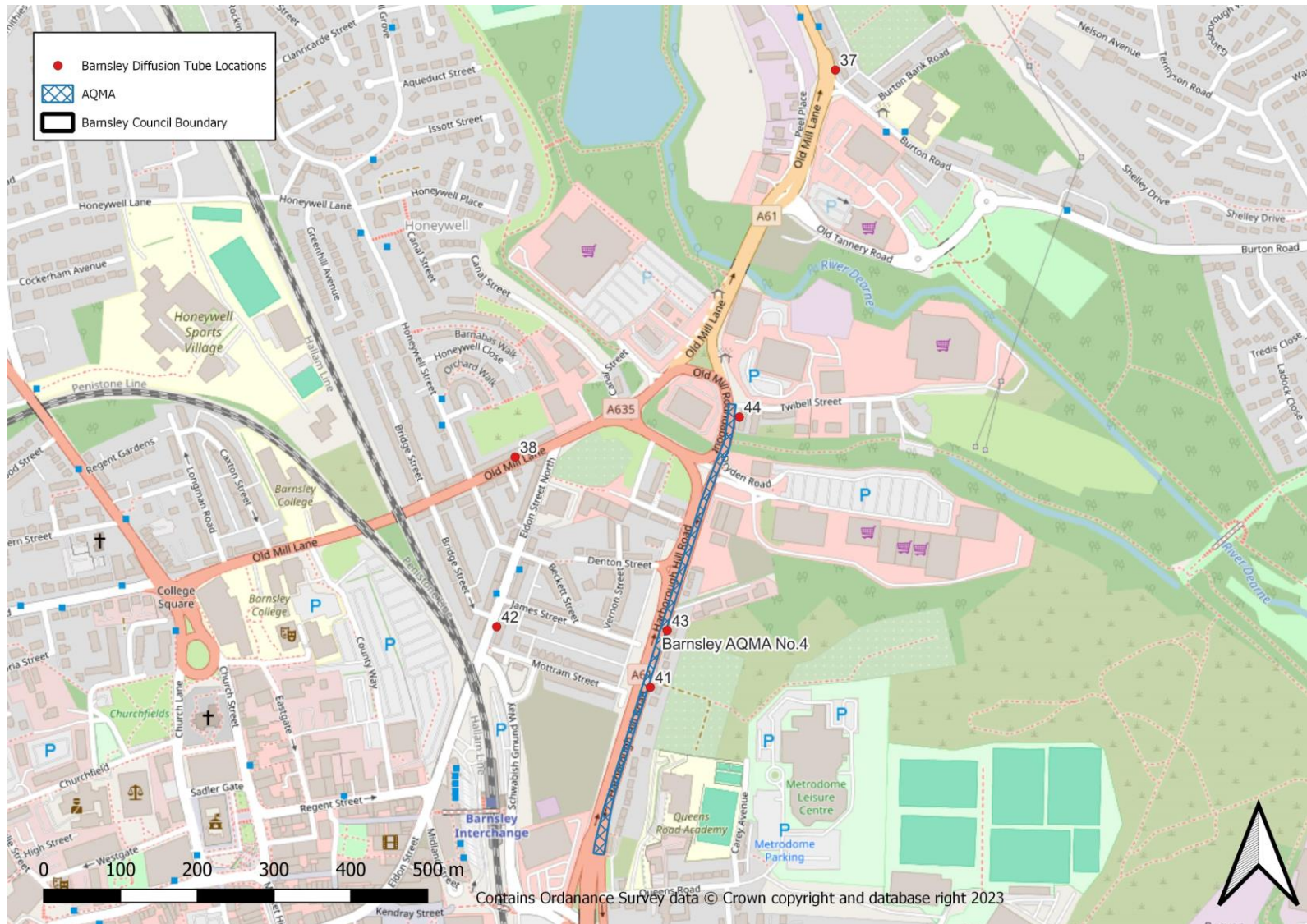
Figure D.1 9 - Map displaying diffusion tube 39

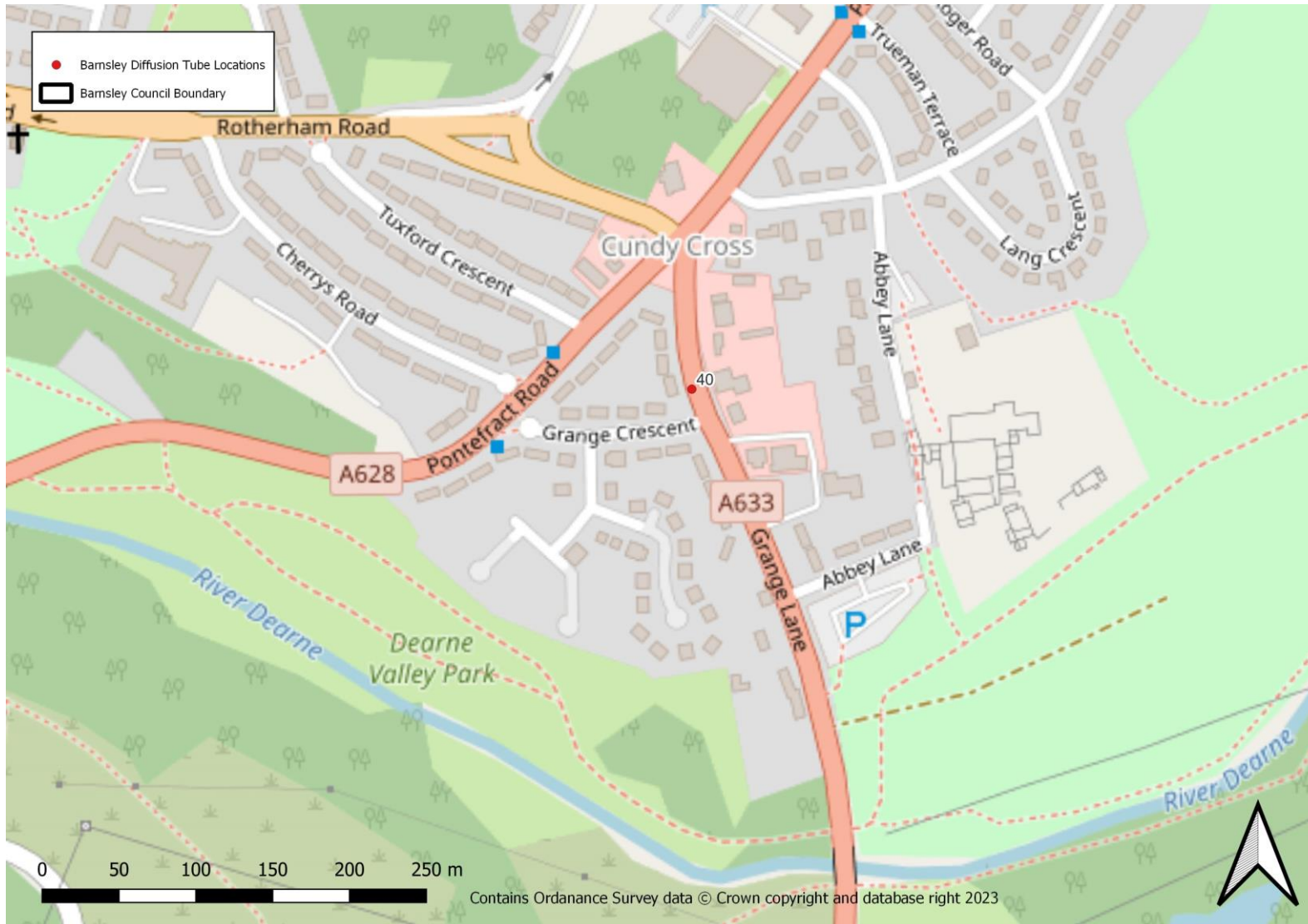**Figure D.1 10 - Map displaying diffusion tube 40**

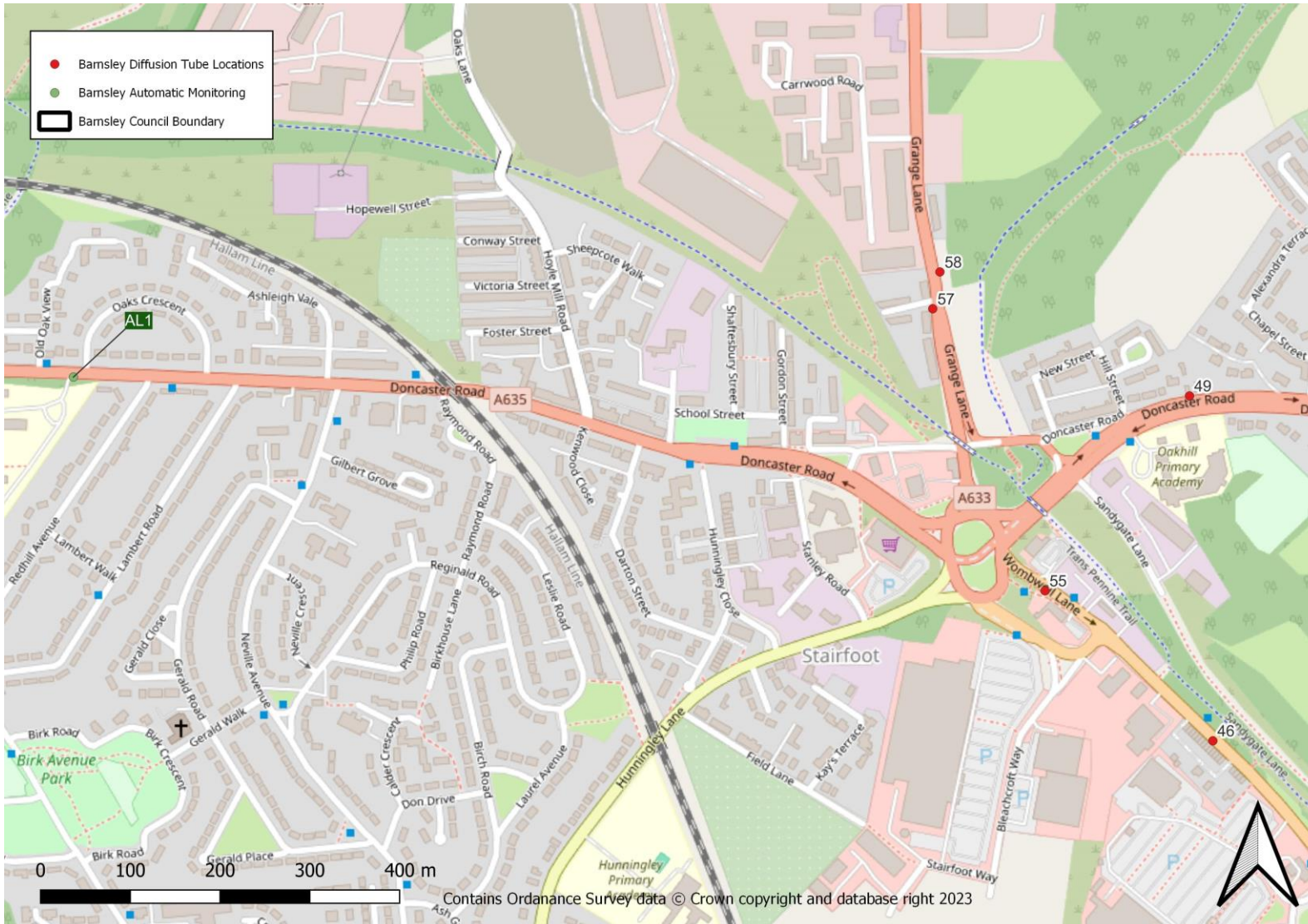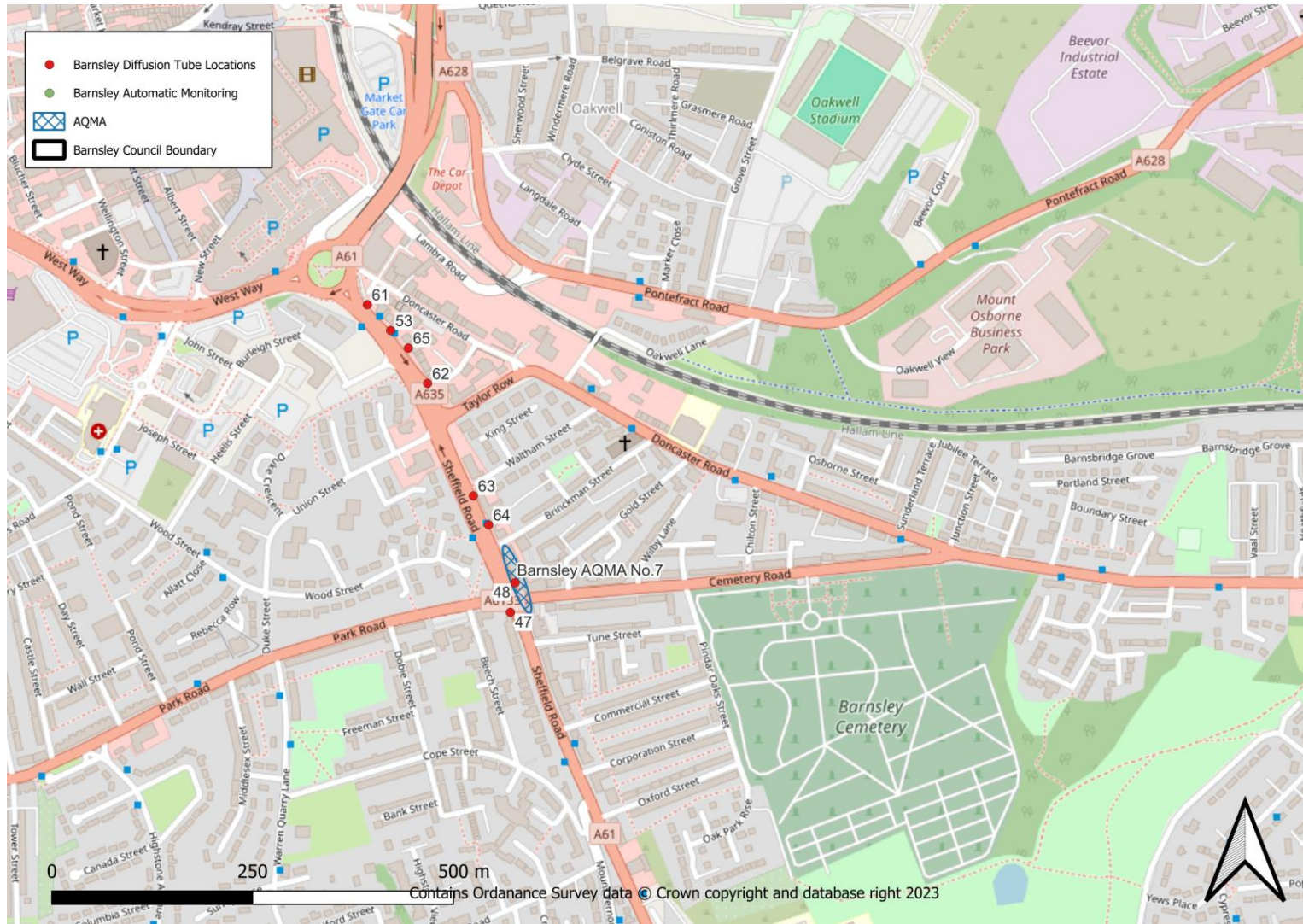**Figure D.1 11 - Map displaying diffusion tubes 46, 49, 55, 57 and 58**

Figure D.1 12 - Map displaying diffusion tubes 47, 48, 53, 61 to 64, 65 and AQMA 7

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[12]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[12] The units are in microgrammes of pollutant per cubic metre of air (µg/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'
AQI	Air Quality Index
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
BMBC	Barnsley Metropolitan Borough Council
CAZ	Clean Air Zone
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
NHS	National Health Service
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
SCA	Smoke Control Area
SO_2	Sulphur Dioxide

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