



2023 Air Quality Annual Status Report (ASR)

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

Date: November 2023

Information	Pendle Borough Council Details
Local Authority Officer	Michael Duck
Department	Housing, and Environmental Health
Address	Pendle Borough Council, Town Hall, Market Street, Nelson, BB9 7LG
Telephone	01282662009
E-mail	Michael.Duck@pendle.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in Pendle Borough Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas^{1,2}.

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

The annual status report (ASR) covers monitoring results for 2022 and action that the council is taking in a bid to improve air quality. In Pendle Borough Council (PBC) the main pollutant of concern is nitrogen dioxide (NO₂). National government has set health-based objectives for a range of pollutants and, where these are not met, the local authority must declare an air quality management area (AQMA) and commit to improving local air quality through action planning. There is one designated AQMA in the borough - Colne AQMA, which was declared because of exceedances of the annual mean NO₂ objective due to road traffic. Details of the AQMA can be found on the UK AIR website at https://uk-air.defra.gov.uk/aqma/details?aqma_ref=689.

In 2022, for the fifth year in a row, the NO₂ average objective was not exceeded at any monitoring site within the borough, including within the Colne AQMA. However, given the continual evidence identifying the harmful effects of both particulate matter (PM) and NO₂, along with the Council's commitment to work with partners on the public health agenda and the Council's duties under the Local Air Quality Management regime, combined with the significant development within the area, it is important that work continues to maintain

¹ Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

³ Defra. Air quality appraisal: damage cost guidance, January 2023

⁴ Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

and improve the air quality within the borough. Therefore, Pendle Borough Council will continue to identify measures to improve and maintain the air quality within the borough, including ensuring developments do not adversely affect or significantly contribute to pollutant levels. This will be helped by the adoption of an Air Quality Planning Guidance document.

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 Plan⁵ sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term PM_{2.5} targets. The National Air Quality Strategy, published in 2023⁶, will provide more information on local authorities' responsibilities to work towards these new targets and reduce PM_{2.5} in their areas. The Road to Zero⁷ details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

In recent years, Pendle Borough Council:

- Promoted “Cycle September”, which encouraged employees to cycle to work.
- Planted over 4,000 native trees to help combat climate change, support wildlife and improve Pendle’s green spaces as part of the Council’s Climate Action Plan.
- Created a funding pot of £25,000 for schools and community groups in Pendle to help tackle climate change. Successful applicants used the money to plant trees, build raised beds for planting vegetables and install water butts to help with watering.
- Consulted the public in July 2023 on options to improve traffic flow and pedestrian areas in Barnoldswick.

⁵ Defra. Environmental Improvement Plan 2023, January 2023

⁶ <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england>

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

- Announced a new traffic-free route in Nelson. The new route is called Pendle Water Bridleway, which encourages sustainable modes of transport.

Conclusions and Priorities

No exceedances of the NO₂ objectives were identified in Pendle Borough Council for 2022. Long-term monitoring data shows a noticeable reduction in NO₂ levels over time, particularly at roadside sites. Monitoring results in the Colne AQMA have been consistently below the air quality objective for NO₂, as such, there is intention to revoke the AQMA.

The Council will continue to work with partner organisations, in particular the County Public Health team and other local authorities on the implementation of the county wide guidance document for planning and the installation of electric vehicle charging points.

Local Engagement and How to get Involved

If you would like to get involved in the work being undertaken to tackle air pollution within Pendle; or you would like more information on how you can help reduce your personal emissions then please contact the Environmental Health Department at Pendle Borough Council on 01282 662009 or via e-mail at Michael.Duck@Pendle.gov.uk. Further information will be made available on the Council's website.

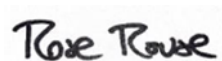
Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Pendle Borough Council with the support and agreement of the following officers and departments:



- Michael Duck - Commercial Team Leader
- Lisa Jefferson - Technical Officer

This ASR has been approved by:



- Rose Rouse - Chief Executive Pendle Borough Council

If you have any comments on this ASR please send them to Michael Duck at:

Pendle Borough Council, Town Hall, Market Street, Nelson, BB9 7LG

01282 662009

michael.duck@pendle.gov.uk

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Pendle Borough Council.....	i
Actions to Improve Air Quality	ii
Conclusions and Priorities	iii
Local Engagement and How to get Involved.....	iii
Local Responsibilities and Commitment	iii
1 Local Air Quality Management	1
2 Actions to Improve Air Quality	2
Air Quality Management Areas.....	2
Progress and Impact of Measures to address Air Quality in Pendle Borough Council.....	4
2.1.1 Defra appraisal of Pendle Borough Council's 2022 ASR	4
2.1.2 Progress of measures.....	5
PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations	12
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	13
Summary of Monitoring Undertaken	13
3.1.1 Automatic Monitoring Sites	13
3.1.2 Non-Automatic Monitoring Sites	13
Individual Pollutants	13
3.1.3 Nitrogen Dioxide (NO ₂)	13
3.1.4 Particulate Matter (PM ₁₀ PM _{2.5}).....	14
3.1.5 Sulphur Dioxide (SO ₂).....	15
Appendix A: Monitoring Results	16
Appendix B: Full Monthly Diffusion Tube Results for 2022	32
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	35
New or Changed Sources Identified Within Pendle Borough Council During 2022	35
Additional Air Quality Works Undertaken by Pendle Borough Council During 2022	35
QA/QC of Diffusion Tube Monitoring	35
Diffusion Tube Annualisation	35
Diffusion Tube Bias Adjustment Factors	35
NO ₂ Fall-off with Distance from the Road.....	36
Appendix D: Map(s) of Monitoring Locations and AQMAs	38
Appendix E: Summary of Air Quality Objectives in England	44
Glossary of Terms	45
References	46

1 Local Air Quality Management

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

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

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 Pendle Borough Council can be found in Table 2.1. The table presents a description of the Colne AQMA that is currently designated within Pendle Borough Council. *Appendix D: Map(s) of Monitoring Locations and AQMAs* provides maps of the Colne AQMA and the air quality monitoring locations in relation to the AQMA. The air quality objective pertinent to the current AQMA designation is the NO₂ annual mean objective.

Colne AQMA has been compliant with the NO₂ annual mean objective since 2017. As such, there is potential for AQMA revocation following a detailed assessment (see Section 3.2.1).

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
Colne AQMA	10 th March 2011	NO ₂ Annual Mean	Area incorporating Windsor St, and Skipton Rd, Colne, between the junctions of Windsor St, Byron St and Temple St / Oak St	NO	40.1 µg/m ³	31.9 µg/m ³ (PEN84)	5 years	Colne AQMA Air Quality Action Plan, Pendle Borough Council August 2015	https://www.pendle.gov.uk/download/meetings/id/17983/item_13_colne_air_quality_action_plan_appendix_1

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

Pendle Borough Council confirm that all current AQAPs have been submitted to Defra.

Progress and Impact of Measures to address Air Quality in Pendle Borough Council

2.1.1 Defra appraisal of Pendle Borough Council's 2022 ASR

Defra's appraisal of the 2022 ASR concluded that *"the report is well structured, detailed, and provides the information specified in the Guidance"*.

The appraiser's comments said:

- *"On the basis of the evidence provided by the local authority the conclusions reached in the report are **accepted** for all sources and pollutants, on the proviso that the grammatical and formatting errors in the report are corrected prior to publication on the council's website. ASRs are public facing documents that serve to keep local communities informed of the steps being taken by their local authority to improve air quality, and as such it is important that they are accessible and easy to read. Following the completion of this report, Pendle Borough Council should update the AQAP submit an Annual Status Report in 2023."*

The following comments were provided in the 2022 ASR appraisal to inform the writing of future reports. The following constructive comments have been addressed in the writing of the 2023 ASR:

- *"Relevant public health director sign off is an example of good practice, should continue in future ASRs."*
- *"The properties and proposed future actions to be undertaken by PBC is a well written section highlighting, priorities clearly for the next reporting year, the use of hydrated vegetable oil as fuel for the refuse collection service will aim to reduce the councils carbon emissions by 500,000 kg a year as well as reducing NO₂ and PM₁₀ emissions."*
- *"Table 2.2, missing columns in the Air Quality Action Plan, no information on progress to date or barriers to implementation."⁸*

⁸ Information on progress to date and barriers to implementation were indeed included in Table 2.2 in the 2022 ASR. However, due to a formatting error, the headings were misaligned such that it appeared that the columns were absent.

- *“Maps are not detailed with a missing scale on some maps and north arrow. There is no map which shows the overall area and the detailed area.”*

2.1.2 Progress of measures

Pendle 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. 44 measures are included within Table 2.2, presenting the type of measure and the progress Pendle have made during the reporting year of 2023. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

The Council has also declared a Climate Emergency, with many actions to reduce carbon emissions towards the goal of net-zero by 2030 also helping to improve air quality.

Pendle Borough Council expects the following measures to be implemented over the course of the next reporting year:

- Complete the air quality monitoring programme.
- Require Air Quality Assessments to be undertaken on all relevant planning applications.
- Require mitigation measures where appropriate on planning applications.
- Progress engagement and educational programmes both internally and externally.

Pendle Borough Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Lancashire County Council;
- The Highways Authority

The principal challenges and barriers to implementation that Pendle Borough Council anticipates facing are lack of sufficient staff and resources to implement actions, both internally and within partner organisations. However, it is acknowledged that work to tackle the Climate Emergency within the Council and reduce carbon emissions will also assist in improving air quality.

Progress on a number of measures has been slower than expected due to the lack of sufficient staff resources. Despite these challenges, progress will be made on those internal actions to reduce Council fleet emissions and promotion and educational activities to members of the public.

Pendle Borough Council anticipates that these measures will continue to maintain the Borough's compliance with air quality objectives, and improve air quality further.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	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	Strategic highway improvements, Re-prioritising Road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2013	2030	LCC	LCC	NO	Not Funded	£1 million - £10 million	Planning	Estimated significant reduction in pollutant levels within villages along the A56	Start of Construction	Feasibility study undertaken	Funding
2	Public transport improvements-interchanges stations and services	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2012	2030	PBC, LCC, Skipton east Lancashire Railway Action Partnership (SELRAP)	-	NO	Not Funded	£1 million - £10 million	Planning	Reduction in private vehicle trips thus reduction in pollutant levels	Commissioning of service	Feasibility study undertaken	Funding
3	UTC, Congestion management, traffic reduction	Traffic Management	UTC, Congestion management, traffic reduction	2015	2030	DfT	DfT	NO	Not Funded	£1 million - £10 million	Planning	Reduced emissions	Improvement in management of congestion and road traffic	None	DfT / Funding
4	Reduction of speed limits, 20mph zones	Traffic Management	Reduction of speed limits, 20mph zones	2015	2030	LCC	LCC	NO	Not Funded	£1 million - £10 million	Planning	1.1 µg/m ³	Measures identified and implemented	None	Funding
5	Freight Partnerships for city centre deliveries	Freight and Delivery Management	Freight Partnerships for city centre deliveries	2015	2030	PBC	-	NO	Not Funded	£500k - £1 million	Planning	~32% NO ₂ reduction (3.6 µg/m ³)	Implementation of FQP	None	Funding / Staffing
6	Reduction of speed limits, 20mph	Traffic Management	Reduction of speed limits, 20mph zones	2015	2030	PBC, LCC	-	NO	Not Funded	£50k - £100k	Planning	2.1 µg/m ³ reduction	Introduction of 20mph speed limit	None	Staffing / Funding / Public Acceptance
7	Reduction on vehicle travel, whilst increasing walking, public transport and cycling in accordance with County transport plan	Public Information	Promoting sustainable transport	2015	2032	PBC	-	NO	Not Funded	£50k - £100k	Planning	11% reduction in car trips; 15-33% increase in walking, cycling and use of public transport	Reduction in traffic flow	County transport plan	Staffing / Funding
8	Bus route improvements	Transport Planning and Infrastructure	Bus route improvements	2015	2030	PBC, LCC	-	NO	Not Funded	£1 million - £10 million	Planning	Reduction of current bus emissions which account for 4% of total NO ₂	Improved bus fleet	None	Funding / Staffing / Willingness of bus company
9	Public transport improvements-interchanges stations and services	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2015	2030	PBC	-	NO	Not Funded	£1 million - £10 million	Planning	Up to 29% of NO _x emissions	Planning granted for P&R	None	Funding / Land
10	Public transport improvements-interchanges stations and services	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2015	2030	PBC, LCC	S.106/LCC	NO	Not Funded	£500k - £1 million	Planning	Reduced emissions from buses	New & improved services	None	Funding

Measure No.	Measure	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
11	Awareness of public of idling vehicles and potential LA enforcement action for failing to do so.	Public Information	Other	2015	2025	PBC	PBC	NO	Not Funded	< £10k	Planning	Reduced emissions from idling vehicles	Reduction in idling	Officers to be authorised to enforce anti-idling legislation, but staff resources are limited.	Staff Resources
12	Freight Consolidation Centre	Freight and Delivery Management	Freight Consolidation Centre	2015	2032	PBC, LCC	-	NO	Not Funded	£1 million - £10 million	Planning	Up to 32% NO ₂ emissions from HGVs	Commissioning FCC	None	Funding
13	Testing Vehicle Emissions	Vehicle Fleet Efficiency	Testing Vehicle Emissions	2015	Ongoing	PBC	PBC	NO	Partially Funded	< £10k	Implementation	Reduced emissions from PBC fleet	Regular emissions testing	Council vehicles already undergo an enhanced service plan and regular MOT inspections to ensure	Funding to increase beyond legal minimum / lack of operational benefit
14	Vehicle Retrofitting programmes	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2015	2025	PBC	PBC	NO	Not Funded	£50k - £100k	Planning	Reduced emissions from PBC fleet	Fleet emission reduction	Review of council fleet and possibly retrofit options being considered. Trial of eco fuel scheme completed and fully implemented	Funding / Staff Resources / Technology
15	Collaboration with Sustrans to promote alternative travel	Promoting Travel Alternatives	Promoting sustainable transport	2015	Ongoing	PBC	PBC, Sustrans	NO	Not Funded	< £10k	Planning	Reduced emissions from car journeys	Reduced vehicle trips	None	Funding / Staff Time
16	Awareness and education of both domestic/commercial use wood burners and appropriate fuel	Public Information	Promotion and increasing awareness of NO _x to change behaviour	2015	Ongoing	PBC	PBC	NO	Not Funded	£10k - 50k	Planning	Improved education resulting in lower emissions from domestic and commercial wood burners and transport	Delivery of educational program	Basic information and links provided on website	Funding / Staff Time
17	Promoting active travel campaigns to schools	Promoting Travel Alternatives	Increase public awareness to change behaviour	2015	Ongoing	PBC	PBC	NO	Not Funded	< £10k	Planning	Reduced traffic emissions	Promotion of cycling to employees and use of cycle mileage claims	None	Staff Resources / Cycle Mileage Payment
18	Creating public awareness of levels of pollution within locality.	Public Information	Via the Internet	2015	Ongoing	PBC, Defra	PBC, Defra	NO	Partially Funded	£10k - 50k	Implementation	Improved knowledge	Real time data available to public	Links to Defra Air Pollution Forecast website, included on PBC website	-
19	Promoting active travel campaigns to schools	Promoting Travel Alternatives	Promotion and increasing awareness of NO _x to change behaviour	2015	Ongoing	PBC, LCC, Schools	LCC	NO	Partially Funded	£10k - 50k	Implementation	Reduced schools' trips, reduced traffic emissions and changing behaviour	Implementation of travel plans at each school in Borough	Encouragement of travel plans within schools underway, basic template provided	School take up of campaigns to walk to and from school as opposed to vehicle use
20	Air Quality Planning and Policy Guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2015	Ongoing	PBC	PBC	NO	Partially Funded	£10k - 50k	Implementation	Reduced emissions from developments / associated traffic	Comments made on each relevant application	Air Quality comments made on each relevant planning application submitted to PBC	Ongoing work
21	Air Quality Planning and Policy Guidance	Policy Guidance and Development Control	Other policy	2015	Ongoing	PBC	PBC	NO	Not Funded	< £10k	Implementation	Reduced emissions from developments / associated traffic	Participation in policy discussions and consultations	Ongoing	Buy-in from other stakeholders

Measure No.	Measure	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
22	Control of industrial emissions from emissions to air, land and water	Environmental Permits	Control of environmental emissions	2015	Ongoing	PBC	PBC	NO	Partially Funded	£10k - 50k	Implementation	Monitoring and control of emissions from permitted processes	Completion of permit inspection process	Ongoing, processes are being inspected as ER risk rating scheme. Officers actively seeking new processes during daily activities	Ongoing work
23	Responding to emissions complaints from businesses and the public	Other	Other	2015	Ongoing	PBC	PBC	NO	Partially Funded	£10k - 50k	Implementation	Prevent unnecessary emissions	Response to complaints received	Ongoing enforcement in line with council's enforcement policy	Ongoing work
24	Continuous monitoring of NO _x emissions across the Borough	Monitoring of NO _x emissions	Other	2015	Ongoing	PBC	PBC	NO	Funded	£10k - 50k	Implementation	Monitoring of emissions to inform other actions	Completion of monitoring program	Ongoing monitoring program	Ongoing work
25	Move petrol tools to battery	Landscape maintenance	Reducing emissions	2023	Ongoing	PBC	PBC	NO	Funded	£10k- 50k	Implementation	Reduction of emissions from petrol power tools such as hedge trimmer and chainsaw	Fleet emission reduction	Replacement of machinery with suitable battery alternatives as need for replacement arises with working cycle. so far we have 1 combi unit, 1 pruning saw and 1 hedge trimmer. On order next week are 2 chainsaw, 2 hedge trimmer, 2 pole saw, 2 kombi strimmers	Not all Professional grade battery tools are yet up to worktime/power via battery - market constantly evolving. ongoing work as required. bigger battery tools such as ride on mowers will be cost prohibitive
26	End user training - driver behaviour, idling, braking and speeding	Educating Employees	Reducing emissions	2023	Ongoing	PBC	PBC	No	Not funded	<£10k	Implementation	Changing behaviour to reduce emissions	Reduction of NO _x emissions	Advice/information available in staff driver handbook and driving safely training.	Ongoing but relies on implementation by staff
27	Where applicable, reduce the need for staff travel i.e. through home working, better use of IT and flexi working	Control of environmental emissions	Promoting sustainable alternatives	2020	Ongoing	PBC	PBC	No	Funded	£10k- 50k	Implemented	Opportunities for agile working, cutting down travel and NO _x emissions	Reduce emissions	Existing agile workers issued with laptop	Challenge removal of agile workers
28	Undertake annual staff travel survey to baseline and understand current commuting patterns and encourage lift sharing amongst PBC staff	Promoting Travel Alternatives	Public information	2020	2024	PBC / LCC / Go Velo	PBC/LCC	NO	Not Funded	<£10k	Planning	Reduction in private vehicle trips thus reduction in pollutant levels	Reduce emissions	Discussions with LCC	Staff resources / funding / expertise
29	Bike library pilot (PIF funding project underway)	Promoting Travel Alternatives	Reducing car use and thereby emissions/public guidance/change in vehicle usage	2023	2024	PBC/LCC/Go Velo	LCC Public Health	NO	Funded	<£10k	Implementation	Reduction in private vehicle trips thus reduction in pollutant levels	Bikes hired out	Go Velo setting up	Continuity once initial pilot scheme is over
30	Planning applications – consult with colleagues re active travel measures inc. cycling	Transport Planning and Infrastructure	Sustainable transport improvements	2023	2025	PBC/LCC	-	NO	Not Funded	<£10k	Implementation	11% reduction in car trips; 15-33% increase in walking, cycling and use of public transport	Planning apps shared	Discussions with Planning Department	Staff time

Measure No.	Measure	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
31	LUF funding mobility hubs	Transport infrastructure and promoting sustainable transport	Sustainable transport improvements	2023	2026	PBC/LCC	LUF	NO	Funded	£50k	Planning	Reduction in private vehicle trips thus reduction in pollutant levels	Start of Construction	Public consultations by LCC	LCC managed scheme
32	Secure bike parking as part of mobility hubs	Transport infrastructure and promoting sustainable transport	Sustainable transport improvements	2023	2026	PBC	LUF	NO	Funded	£10k	Planning	Reduction in private vehicle trips thus reduction in pollutant levels	Start of Construction	Public consultations by LCC	Staff time
33	EV charging car parks	Proving electrical charging points to encourage sustainable vehicles	Reduction of NO _x and supporting infrastructure for sustainable vehicle use	2023	2026	PBC	No funding sources	NO	Not Funded	>£100k	Planning	Increased provision of public parking charging points	Document produced for car parking strategy	Reviewing car parking strategy policy for Pendle	Staff resourcing
34	EV charging on street	Proving electrical charging points to encourage sustainable vehicles	Reduction of NO _x and supporting infrastructure for sustainable vehicle use	2023	2026	PBC, LCC	No funding sources	NO	Not Funded	>£100k	Planning	Increased provision of domestic car charging points	LCC local electrical vehicle infrastructure scheme	Discussions with LCC and trial scheme to be implemented	Staff resourcing
35	More staff and public EV charging points (inc bike charging points)	Transport infrastructure and promoting sustainable transport	Sustainable transport improvements	2023	2025	PBC/LCC	LUF	NO	Not Funded	>£10k	Planning	Reduction in private vehicle trips thus reduction in pollutant levels	Start of Construction	Discussions with LCC and other providers	Staff time/funding
36	Connectivity of transport hubs – integrated transport	Transport infrastructure and promoting sustainable transport	Sustainable transport improvements	2023	2025	PBC/LCC	LUF	NO	Funded/part of Mobility Hubs and Accessible Nelson scheme	>£10k	Planning	Reduction in private vehicle trips thus reduction in pollutant levels	Start of Construction	Discussions with LCC and other providers	LCC managed scheme
37	Promote electric vehicles through the staff salary sacrifice car scheme	Promoting sustainable transport	Reduction in NO _x emissions whilst utilising sustainable transport	2020	Ongoing	PBC	PBC, Liberata	NO	Staff funded as salary sacrifice with discounted costs	>£100k	Implementation	Reduced emissions from personal and business use of staff cars	Reduce emissions	Ongoing commitment to provide EV cars to staff	Viable costs and willingness of staff
38	Introduce and promote e-bike pool for PBC staff business use	Promoting sustainable transport	Introduction of two electric bikes for staff to hire.	2020	2023	PBC	Connecting East Lancashire/LCC	NO	Funded	<£10k	Implemented	Reduction in private vehicle trips thus reduction in pollutant levels	Bikes hired out	Bikes hired out	Staff time
39	Increase allowance on bike scheme to encourage staff to cycle more	Promoting sustainable transport	Increase allowance from £1,000 to £1,500	2018	2018	PBC	PBC	NO	Funded	<£100k	Implemented	Promotion of bike take up	Bikes purchased on cycle 2 work scheme incl. electric bikes	Bikes being purchased	completed
40	Incentivise public transport use for PBC events and activities	Promoting sustainable transport	Use of alternative transport	2021	Ongoing	PBC	PBC	NO	Not funded	<£100k	Planned	Reduce emissions from car journeys	Uptake in staff using alternative public travel	Planned	Seeking to formalise within policy and procedure to move forward. Appetite to action
41	Signpost and promote other existing cycling routes for safer cycling and walking	Promoting sustainable transport	New bridleway to create a traffic free route between Brierfield, Nelson and Lomeshaye.	2018	2023	PBC	ESIF LEP & LCC	NO	Funded	£1 million	Implemented	Reduction in private vehicle trips thus reduction in pollutant levels	Construction started	Construction completed	New bridleway completed but other routes can be promoted work with LCC on the LCWIPS

Measure No.	Measure	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
42	Promote the canal tow path as a safe cycling and walking route	Promoting sustainable transport	Improve access onto the canal tow path. Funding received from LCC to produce a digital map to add to PBC website. Access to canal improvement within Accessible Nelson scheme	2018	2026	PBC	PBC, LCC, LUF	NO	Funded part of Accessible Nelson	£3.4 million	Construction	Reduction in private vehicle trips thus reduction in pollutant levels	Construction started	Public consultations	Staff time/working in partnership with LCC on Accessible Nelson - other canal routes to be promoted digitally on-line - staff time is barrier
43	Improve the workplace cycling infrastructure	Promoting sustainable transport	Installation of showers, lockers and secure cycle lockers at Nelson Town Hall. And new cycle shelter at Fleet Street	2020	2022	PBC	Connecting East Lancashire/LCC	NO	Funded	£20k	Implemented	Reduction in private vehicle trips thus reduction in pollutant levels	Construction started/installation started	Construction/implementation completed	Completed
44	Reducing or mitigating the risks posed by potential contributors to poor health	Promoting active travel	Promoting active travel as part of the health weight agenda	2023	Ongoing	PBC	PBC/LCC	No	Partially Funded	<£10k	Planned	Reduction in travel therefore less NO _x .	Number of active people	Planned	Ongoing as linking in with various health agendas.

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

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

Though Pendle Borough Council does not currently monitor PM_{2.5}, the following measures address PM_{2.5}:

- The Borough has several designated Smoke Control Areas, covering the densely populated areas, and these are enforced where necessary. The Council responds to any complaint about smoke from chimneys or rubbish burning and works proactively to advise on the harm done by smoke emissions. Where education fails, the Council will take enforcement action.
- Encouraged the provision of electric vehicle recharging points on all new developments
- Investigating options for the provision of electric vehicle recharging points on Council car parks – currently trying to source funding.
- Raise awareness of the harmful effects of PM_{2.5} using the Public Health Indicators which demonstrate that Pendle suffers from an adult mortality attributed to particulate matter (D01 health indicator) of 4.4% (2021)⁹.
- Lancashire County Council have set out an ambitious cycling and walking strategy, called “Actively Moving Forward”, which aims to increase the number of people actively travelling across the region by 2028. Through improving and increasing access to infrastructure, alongside training and promotional activities.
- As part of the Lancashire cycling and walking strategy, work is progressing on the development of Local Cycling and Walking Infrastructure Plans (LCWIPS).

⁹ <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/4/gid/1000043/pat/6/ati/501/are/E07000122/iid/93861/age/230/sex/4/cat/-1/ctp/-1/yr/1/cid/4/tbm/1>

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

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

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Pendle Borough Council does not undertake any automatic monitoring for any pollutant across the borough.

3.1.2 Non-Automatic Monitoring Sites

Pendle Borough Council undertook non-automatic (i.e. passive) monitoring of NO₂ at 50 sites during 2022. This includes 17 duplicate sites and one triplicate site. Table A.1 in Appendix A presents the details of the non-automatic sites.

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

Individual Pollutants

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

3.1.3 Nitrogen Dioxide (NO₂)

Error! Reference source not found. and Table A. in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40 µg/m³. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias

adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

In 2022, no exceedances of the annual mean objective were recorded at any monitoring sites either within or outside the Colne AQMA. As such, there is no need to declare additional AQMAs or extend existing AQMAs. The highest results in 2022 were 34.0 $\mu\text{g}/\text{m}^3$ at site PEN91 in Brierfield and 31.8 $\mu\text{g}/\text{m}^3$ at PEN84 in the Colne AQMA.

Following the easing of COVID-19 lockdowns and the consequent increase in road traffic flows, annual average concentrations of NO_2 in 2022 were higher than 2021 levels. In general, however, the levels were still lower than they had been prior to COVID-19 lockdowns. Monitored levels of NO_2 in the Colne AQMA have steadily declined over time and no exceedances have been recorded in the five years 2018-2022. As noted in last year's report, there is a case to revoke the AQMA.

3.1.4 Particulate Matter (PM₁₀ PM_{2.5})

Pendle Borough Council does not monitor PM₁₀ or PM_{2.5} levels. However, a check of the Defra background maps indicates no likely exceedances of the objective levels for either of these two pollutants.

In April 2023, Defra published a new Air Quality Strategy (AQS) for local authorities¹⁰, which includes two legally binding PM_{2.5} concentration targets which local authorities are responsible in working towards achieving:

- 10 $\mu\text{g}/\text{m}^3$ annual mean PM_{2.5} concentration nationwide by 2040, with an interim target of 12 $\mu\text{g}/\text{m}^3$ by January 2028
- 35% reduction in average population exposure by 2040, with an interim target of a 22% reduction by January 2028 compared to a 2018 baseline.

¹⁰ <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery#>

From latest available 1 km x 1 km background maps for PM_{2.5} for 2022 (using 2018 baseline)¹¹, Pendle Borough has an average background annual mean PM_{2.5} concentration of 6.07 µg/m³ which currently satisfies both PM_{2.5} objectives. This is an improvement on the average background annual mean PM_{2.5} concentration of 6.53 µg/m³ in 2018.

Considering each data point at 1 km resolution from 2022 background concentration projections, 100% of the council area is still below the 12 µg/m³ concentration objective for 2028 and the 10 µg/m³ concentration objective for 2040.

Pendle Borough Council will be proactive in further reducing PM_{2.5} emissions within the area and their control in order to maintain the projected compliance with the new PM_{2.5} objectives.

3.1.5 Sulphur Dioxide (SO₂)

Pendle Borough Council does not monitor SO₂ levels.

¹¹ <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

Appendix A: Monitoring Results

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
PEN28	Pendle Business Centre	Urban Background	386296	437592	NO ₂	No	10.0	10.0	No	2.5
PEN13	Brunswick Street, Nelson	Roadside	386109	437634	NO ₂	No	5.0	5.0	No	2.5
PEN14	Brunswick Street, Nelson	Roadside	386109	437634	NO ₂	No	5.0	5.0	No	2.5
PEN17	62 Burnley Road, Brierfield	Roadside	384610	436118	NO ₂	No	0.0	0.0	No	2.5
PEN72	82 Burnley Road, Brierfield	Roadside	384587	436098	NO ₂	No	0.0	0.0	No	2.5
PEN73	92 Burnley Road, Brierfield	Roadside	384576	436006	NO ₂	No	0.0	0.0	No	2.5
PEN99	18 Burnley Road, Brierfield (Bottom Hill Street)	Roadside	384683	436357	NO ₂	No	1.0	1.0	No	2.5
PEN91	3 Burnley Road, Brierfield	Roadside	384664	436365	NO ₂	No	1.0	1.0	No	2.5
PEN92	3 Burnley Road, Brierfield	Roadside	384664	436365	NO ₂	No	1.0	1.0	No	2.5
PEN93	62 Colne Road, Brierfield	Roadside	384682	436650	NO ₂	No	1.0	1.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
PEN94	62 Colne Road, Brierfield	Roadside	384682	436650	NO ₂	No	1.0	1.0	No	2.5
PEN11	25 Gisburn Road, Barrowford	Roadside	385734	438965	NO ₂	No	1.0	1.0	No	2.5
PEN12	25 Gisburn Road, Barrowford	Roadside	385734	438965	NO ₂	No	1.0	1.0	No	2.5
PEN74	14 Gisburn Road, Barrowford	Roadside	385728	438925	NO ₂	No	1.0	1.0	No	2.5
PEN75	17 Gisburn Road, Barrowford	Roadside	385732	438936	NO ₂	No	1.0	1.0	No	2.5
PEN95	145 Gisburn Road, Barrowford	Roadside	385975	439719	NO ₂	No	1.0	1.0	No	2.5
PEN96	145 Gisburn Road, Barrowford	Roadside	385975	439719	NO ₂	No	1.0	1.0	No	2.5
PEN97	2 Brookbank, Barrowford	Roadside	386101	439797	NO ₂	No	1.0	1.0	No	2.5
PEN98	2 Brookbank, Barrowford	Roadside	386101	439797	NO ₂	No	1.0	1.0	No	2.5
PEN90	37 Parker Street, Colne	Urban Background	388138	440143	NO ₂	No	10.0	10.0	No	2.5
PEN82	257 North Valley Road, Colne	Roadside	389061	440482	NO ₂	Yes - Colne	0.0	0.0	No	2.5
PEN83	257 North Valley Road, Colne	Roadside	389061	440482	NO ₂	Yes - Colne	0.0	0.0	No	2.5
PEN84	Junction North Valley/Langroyd Road, Colne	Roadside	389079	440492	NO ₂	Yes - Colne	0.0	0.0	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)
PEN85	Junction North Valley/Langroyd Road, Colne	Roadside	389079	440492	NO ₂	Yes - Colne	0.0	0.0	No	2.5
PEN76	9 Langroyd Road, Colne	Roadside	389081	440519	NO ₂	No	3.0	3.0	No	2.5
PEN77	9 Langroyd Road, Colne	Roadside	389081	440519	NO ₂	No	3.0	3.0	No	2.5
PEN78	10 Langroyd Road, Colne	Roadside	389.098	440508	NO ₂	No	3.0	3.0	No	2.5
PEN79	10 Langroyd Road, Colne	Roadside	389.098	440508	NO ₂	No	3.0	3.0	No	2.5
PEN36	22 Langroyd Road, Colne	Roadside	389102	440540	NO ₂	No	3.0	3.0	No	2.5
PEN86	Likkle Monkeys Nursery, Langroyd Road, Colne RHS	Roadside	389105	440484	NO ₂	Yes - Colne	3.0	3.0	No	2.5
PEN87	Likkle Monkeys Nursery, Langroyd Road, Colne RHS	Roadside	389105	440484	NO ₂	Yes - Colne	3.0	3.0	No	2.5
PEN65	60 Windsor Street, Colne	Roadside	389159	440488	NO ₂	Yes - Colne	3.0	3.0	No	2.5
PEN66	60 Windsor Street, Colne	Roadside	389159	440488	NO ₂	Yes - Colne	3.0	3.0	No	2.5
PEN67	44 Windsor Street, Colne	Roadside	389207	440484	NO ₂	Yes - Colne	3.0	3.0	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)
PEN68	44 Windsor Street, Colne	Roadside	389207	440484	NO ₂	Yes - Colne	3.0	3.0	No	2.5
PEN69	32 Windsor Street, Colne	Roadside	389250	440482	NO ₂	Yes - Colne	3.0	3.0	No	2.5
PEN70	32 Windsor Street, Colne	Roadside	389250	440482	NO ₂	Yes - Colne	3.0	3.0	No	2.5
PEN63	100 Skipton Road, Colne	Roadside	389425	440490	NO ₂	Yes - Colne	3.0	3.0	No	2.5
PEN64	100 Skipton Road, Colne	Roadside	389425	440490	NO ₂	Yes - Colne	3.0	3.0	No	2.5
PEN36	22 Langroyd Road, Colne	Roadside	389102	440540	NO ₂	Yes - Colne	3.0	3.0	No	2.5
PEN4, PEN54	92 Skipton Road, Colne	Roadside	389410	440463	NO ₂	Yes - Colne	3.0	3.0	No	2.5
PEN5	Town Hall, Albert Road, Colne	Urban Centre	388820	440045	NO ₂	No	2.0	2.0	No	2.5
PEN6	Town Hall, Albert Road, Colne	Urban Centre	388820	440045	NO ₂	No	2.0	2.0	No	2.5
PEN71	Rowlands, 7 Albert Road, Colne	Urban Centre	388755	440026	NO ₂	No	2.0	2.0	No	2.5
PEN47	Jaipur, 19 Albert Road, Colne	Urban Centre	388711	439999	NO ₂	No	2.0	2.0	No	2.5
PEN46	52 Albert Road, Colne	Urban Centre	388655	440002	NO ₂	No	3.0	3.0	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)
PEN7	Junc Lord St/Albert Road, Colne	Roadside	388389	439924	NO ₂	No	1.0	1.0	No	2.5
PEN8	Junc Lord St/Albert Road, Colne	Roadside	388389	439924	NO ₂	No	1.0	1.0	No	2.5
PEN50	59 Burnley Road, Colne	Roadside	387922	439500	NO ₂	No	1.0	1.0	No	2.5

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
PEN28	386296	437592	Urban Background	84.6	84.6	15.0	17.4	13.0	14.7	16.0
PEN13	386109	437634	Roadside	100	100.0	27.7	31.7	24.1	25.8	31.8
PEN14	386109	437634	Roadside	100	100.0	27.7	31.7	23.3	26.4	27.0
PEN17	384610	436118	Roadside	100	100.0	38.8	34.7	26.9	27.8	31.2
PEN72	384587	436098	Roadside	100	100.0	29.0	30.6	23.9	27.2	28.1
PEN73	384576	436006	Roadside	100	100.0	31.2	32.0	25.6	28.8	29.0
PEN99	384683	436357	Roadside	92.3	92.3	34.5	37.7	25.6	28.9	28.8
PEN91	384664	436365	Roadside	100	100.0	31.4	37.5	27.5	30.9	34.0
PEN92	384664	436365	Roadside	100	100.0	31.4	37.5	29.2	31.5	32.6
PEN93	384682	436650	Roadside	100	100.0	30.6	35.1	25.6	28.7	29.6
PEN94	384682	436650	Roadside	100	100.0	30.6	35.1	25.9	29.0	30.0
PEN11	385734	438965	Roadside	100	100.0	27.4	29.6	21.9	24.7	25.4
PEN12	385734	438965	Roadside	90.4	90.4	27.4	29.6	21.4	24.5	24.2

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 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
PEN74	385728	438925	Roadside	100	100.0	27.9	29.4	22.2	24.9	25.2
PEN75	385732	438936	Roadside	82.7	82.7	28.9	31.5	24.6	26.7	27.7
PEN95	385975	439719	Roadside	92.3	92.3	28.1	28.9	20.9	23.6	23.8
PEN96	385975	439719	Roadside	100	100.0	28.1	28.9	20.4	24.0	24.2
PEN97	386101	439797	Roadside	100	100.0	26.0	26.8	20.0	21.6	21.6
PEN98	386101	439797	Roadside	100	100.0	26.0	26.8	21.2	20.8	22.1
PEN90	388138	440143	Urban Background	92.3	92.3	23.6	26.7	12.3	21.3	24.0
PEN82	389061	440482	Roadside	92.3	92.3	28.2	31.0	24.8	23.7	25.4
PEN83	389061	440482	Roadside	92.3	92.3	28.2	31.0	25.0	25.3	26.1
PEN84	389079	440492	Roadside	100	100.0	36.3	37.6	28.8	30.0	31.9
PEN85	389079	440492	Roadside	100	100.0	36.3	27.6	30.0	30.6	30.6
PEN76	389081	440519	Roadside	92.3	92.3	26.3	28.0	20.0	22.7	23.8
PEN77	389081	440519	Roadside	92.3	92.3	26.3	28.0	18.1	22.9	22.8
PEN78	389.098	440508	Roadside	92.3	92.3	31.6	31.7	24.3	26.9	26.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
PEN79	389.098	440508	Roadside	100	100.0	31.6	31.7	25.4	27.2	24.9
PEN36	389102	440540	Roadside	100	100.0	29.3	30.2	20.9	24.4	25.5
PEN86	389105	440484	Roadside	100	100.0	37.4	37.9	27.7	30.8	29.9
PEN87	389105	440484	Roadside	100	100.0	37.4	37.9	27.1	29.4	30.9
PEN65	389159	440488	Roadside	82.7	82.7	30.5	29.9	18.3	23.0	26.0
PEN66	389159	440488	Roadside	92.3	92.3	30.5	29.9	21.0	29.5	25.6
PEN67	389207	440484	Roadside	100	100.0	32.0	32.8	23.9	28.0	26.0
PEN68	389207	440484	Roadside	100	100.0	32.0	32.8	25.5	27.1	26.2
PEN69	389250	440482	Roadside	100	100.0	29.3	29.8	21.9	25.6	24.1
PEN70	389250	440482	Roadside	100	100.0	29.3	29.8	22.2	25.2	22.1
PEN63	389425	440490	Roadside	100	100.0	28.1	27.1	18.4	19.0	21.5
PEN64	389425	440490	Roadside	100	100.0	28.1	27.1	20.2	20.0	21.7
PEN36	389102	440540	Roadside	100	100.0	33.7	26.8	21.2	23.2	25.5
PEN4, PEN54	389410	440463	Roadside	100	100.0	33.7	26.8	22.1	24.4	23.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
PEN5	388820	440045	Urban Centre	92.3	92.3	29.5	31.1	25.2	26.1	26.1
PEN6	388820	440045	Urban Centre	92.3	92.3	29.5	31.1	23.3	24.7	26.4
PEN71	388755	440026	Urban Centre	100	100.0	32.0	31.2	23.7	25.1	26.5
PEN47	388711	439999	Urban Centre	90.4	90.4	30.7	31.4	22.4	27.5	26.7
PEN46	388655	440002	Urban Centre	84.6	84.6	26.2	29.9	21.6	25.3	24.6
PEN7	388389	439924	Roadside	76.9	76.9	30.8	29.3	20.6	23.7	22.5
PEN8	388389	439924	Roadside	92.3	92.3	30.8	29.3	19.9	23.9	22.9
PEN50	387922	439500	Roadside	92.3	92.3	30.4	30.4	22.7	26.6	26.2

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

☒ Diffusion tube data has been bias adjusted.

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

Notes:

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

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

NO₂ annual means exceeding 60 $\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

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

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

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations

Figure A.1.1 - Trends in annual mean NO₂ concentrations – Colne AQMA

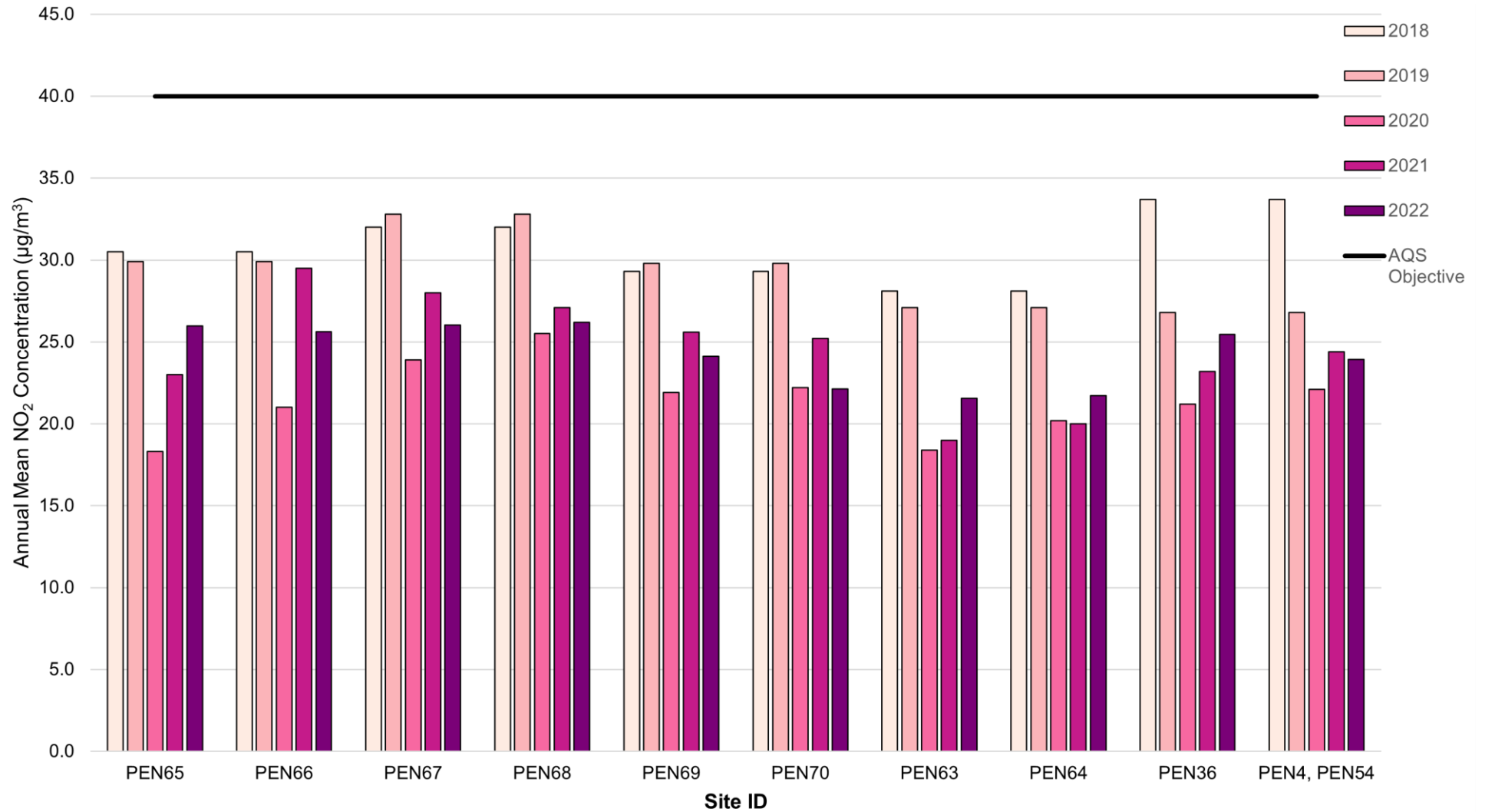


Figure A.1.2 - Trends in annual mean NO₂ concentrations – Colne, Albert Road (outside of AQMA)

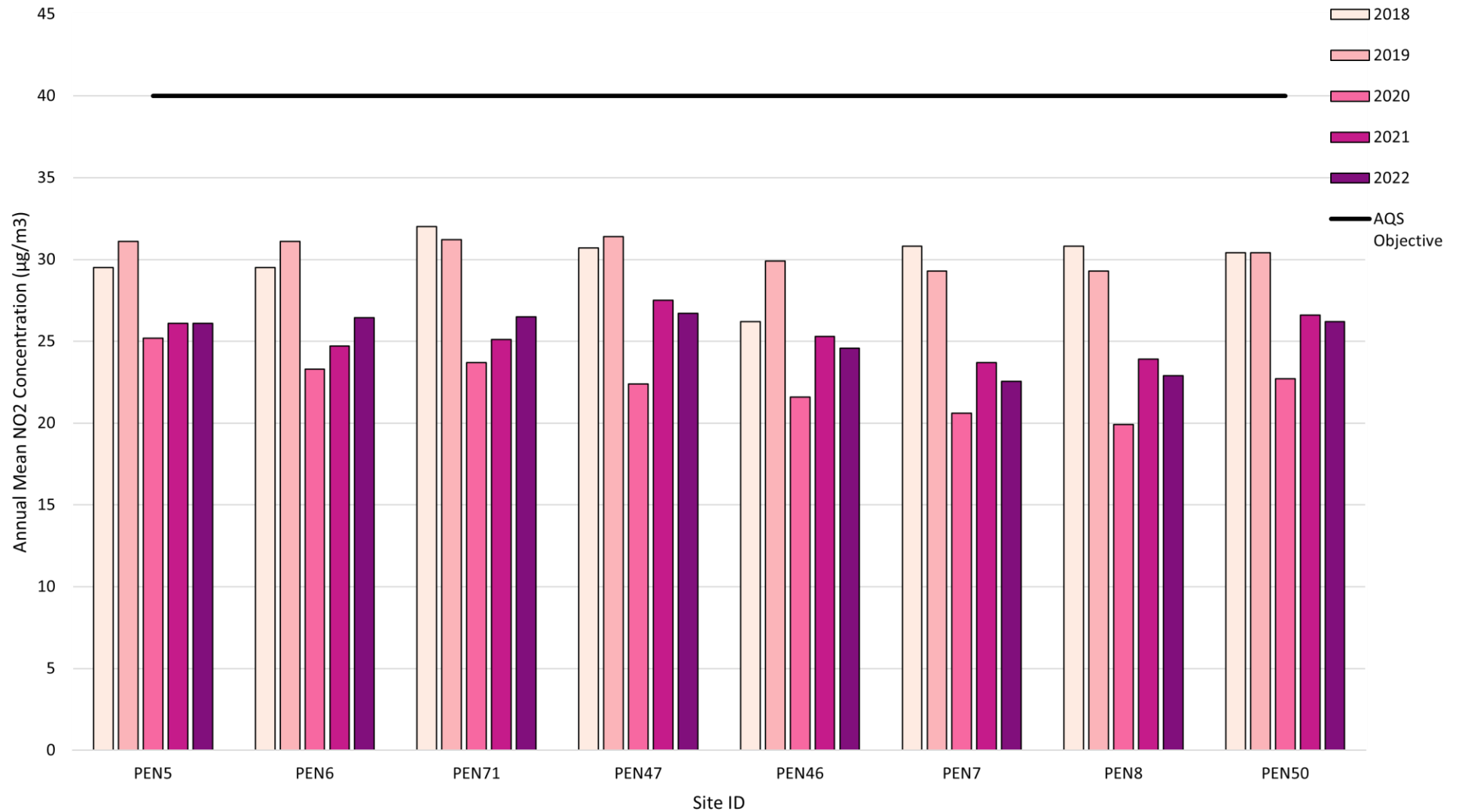


Figure A.1.3 - Trends in annual mean NO₂ concentrations – Colne, A6068 (outside of AQMA)

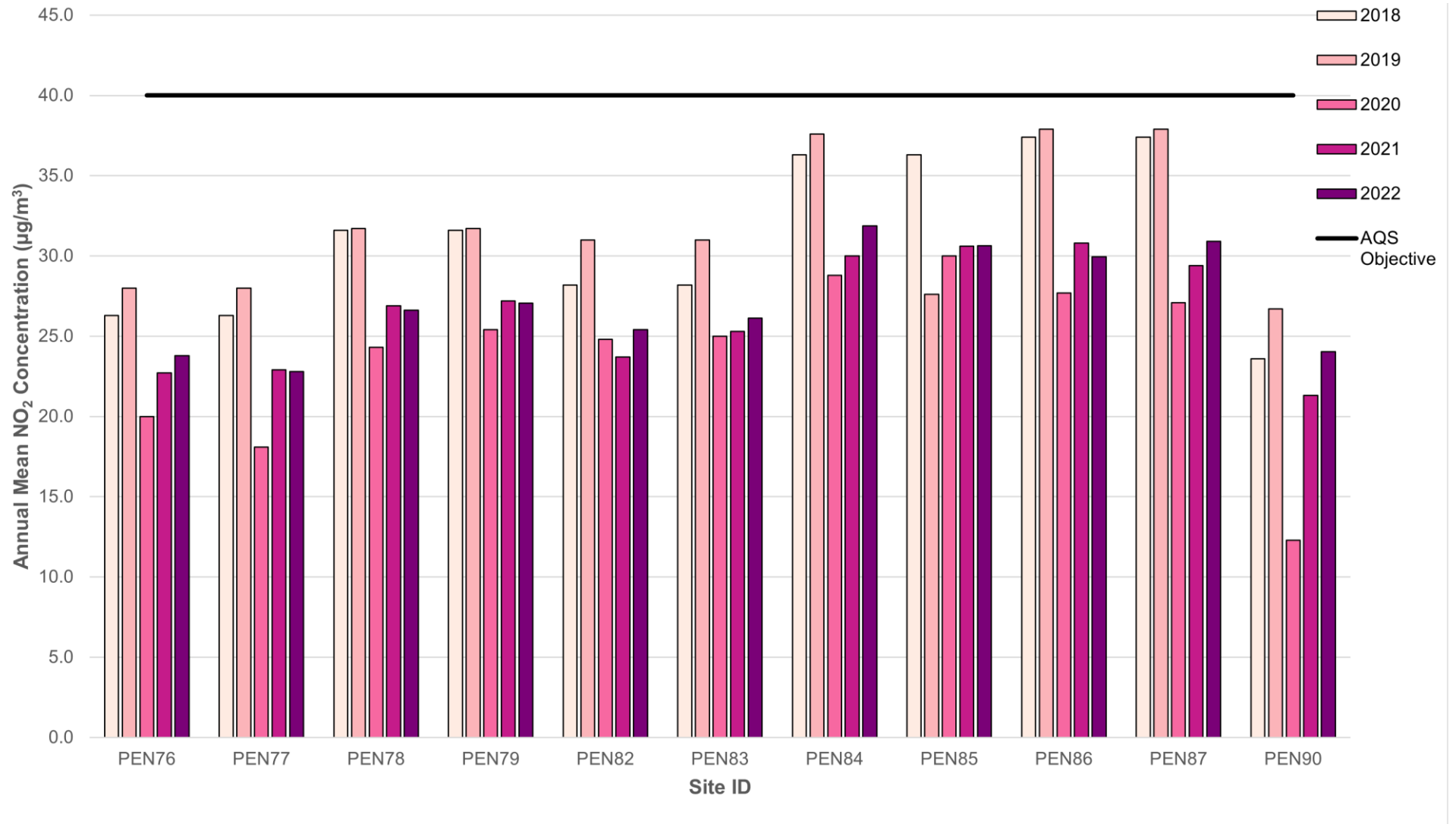


Figure A.1.4 - Trends in annual mean NO₂ concentrations – Barrowford

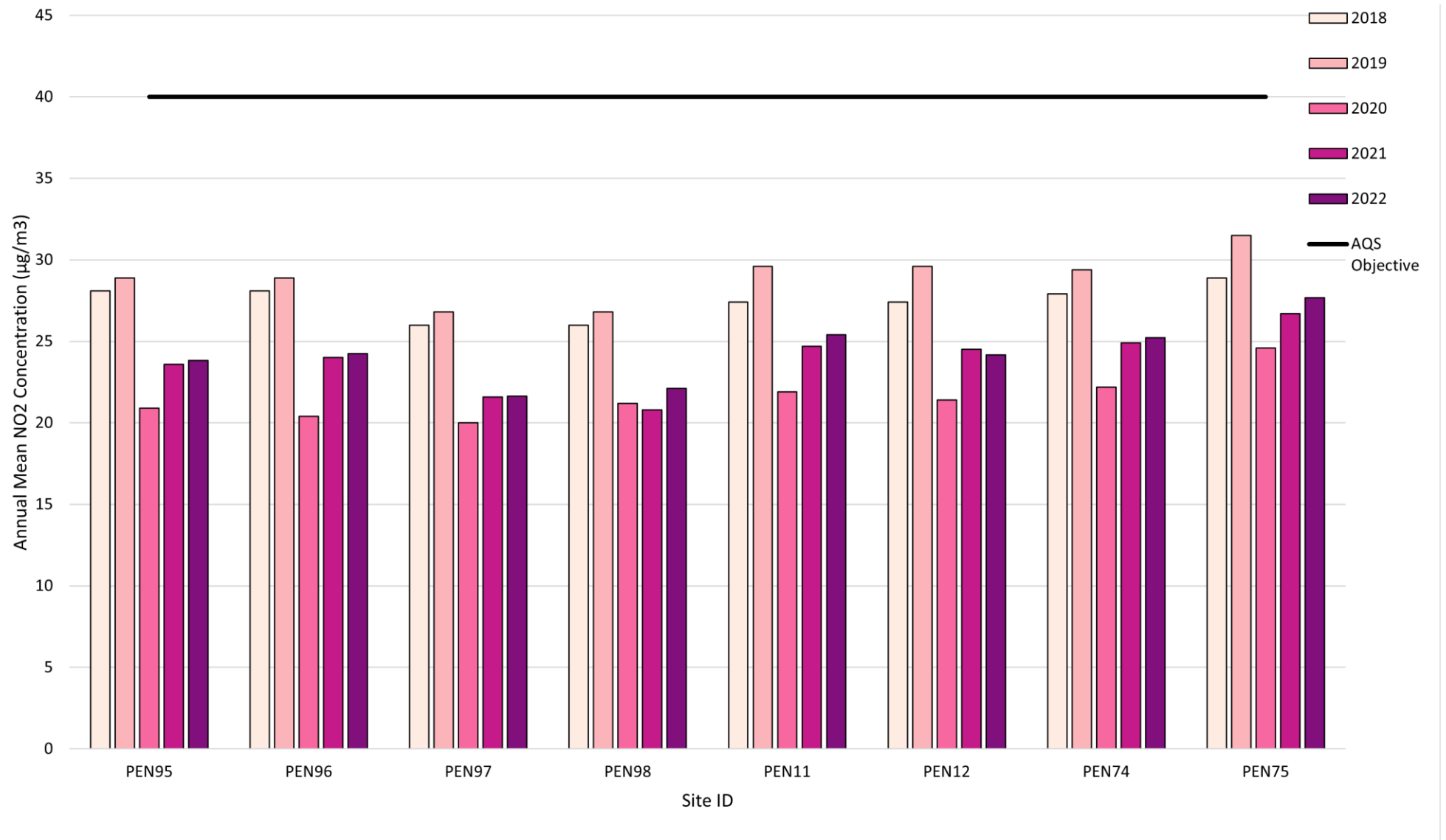


Figure A.1.5 - Trends in annual mean NO₂ concentrations – Brierfield

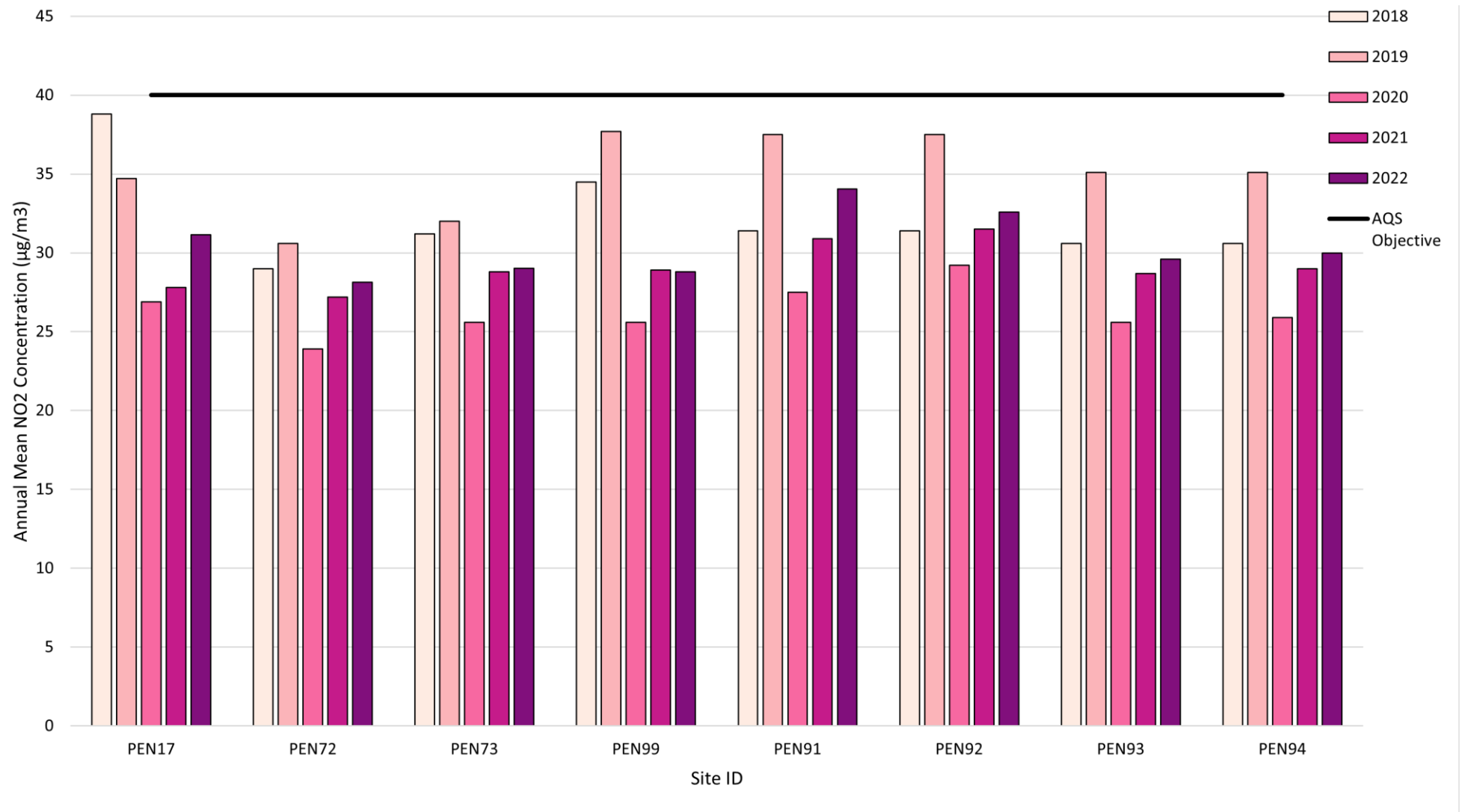
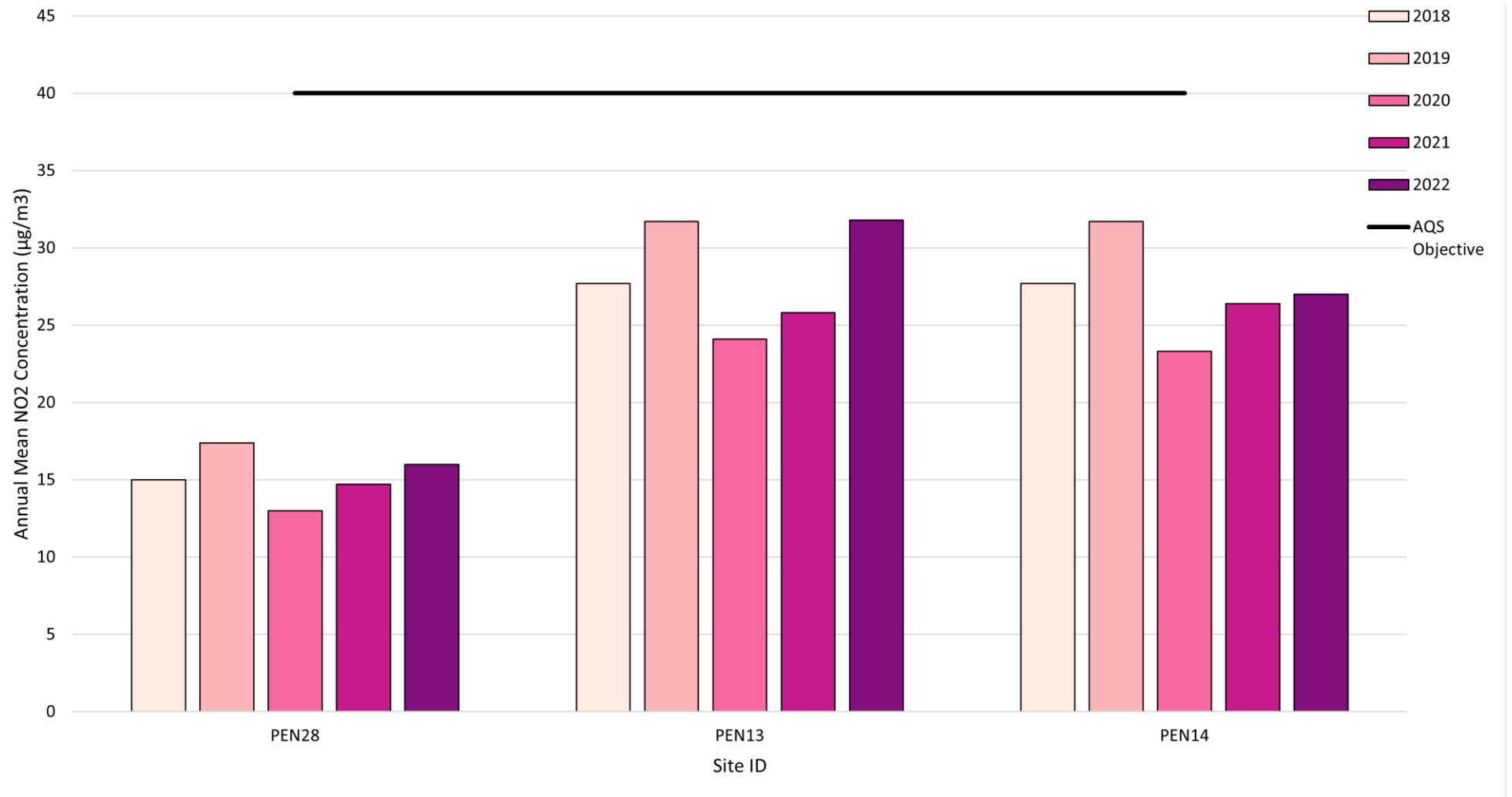


Figure A.1.6 - Trends in annual mean NO₂ concentrations – Nelson



Appendix B: Full Monthly Diffusion Tube Results for 2022

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

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(0.85)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PEN28	386296	437592	26.5	17.1	19.5	13.9	13.2		13.6		17.2	17.8	22.6	26.6	18.8	16.0	-	
PEN13	386109	437634	33.0	33.5	36.0	28.4	28.5	25.4	30.3	96.4	30.9	33.1	36.3	37.4	37.4	31.8	-	
PEN14	386109	437634	32.2	27.4	32.9	27.8	32.0	25.7	32.2	30.0	30.4	33.6	36.0	40.9	31.8	27.0	-	
PEN17	384610	436118	42.3	31.9	38.5	31.5	32.4	28.6	32.1	38.5	36.7	37.7	41.5	48.0	36.7	31.2	-	
PEN72	384587	436098	34.9	29.4	35.8	28.5	26.9	23.9	27.0	31.3	33.8	38.1	40.5	47.3	33.1	28.1	-	
PEN73	384576	436006	33.2	27.0	40.4	34.3	27.8	24.1	26.9	34.5	33.7	35.7	44.1	48.1	34.1	29.0	-	
PEN99	384683	436357	35.0	27.8		32.9	32.0	27.9	32.0	36.8	34.9	31.4	38.8	42.9	33.9	28.8	-	
PEN91	384664	436365	45.8	40.8	38.5	34.9	42.5	36.3	43.7	42.0	40.3	36.6	37.5	42.0	40.1	34.0	-	
PEN92	384664	436365	43.0	37.9	40.0	36.0	43.7	35.7	40.3	23.0	40.0	36.8	41.2	42.3	38.3	32.6	-	
PEN93	384682	436650	42.0	31.6	35.9	28.7	32.7	29.8	33.2	33.6	36.4	35.0	38.1	40.6	34.8	29.6	-	
PEN94	384682	436650	43.3	33.4	36.1	29.6	33.0	28.3	32.8	33.4	36.5	34.4	39.4	43.0	35.3	30.0	-	
PEN11	385734	438965	33.8	25.8	32.0	25.8	25.5	25.1	24.6	27.3	29.0	30.5	35.2	43.9	29.9	25.4	-	
PEN12	385734	438965	35.0	26.9	32.6	23.3	23.2	24.1	27.1	26.5	29.5	30.7	33.9		28.4	24.2	-	
PEN74	385728	438925	36.8	23.6	35.1	26.6	22.5	22.4	22.9	27.8	30.2	32.4	36.8	39.2	29.7	25.2	-	
PEN75	385732	438936	31.1	28.2	34.6	26.6			28.5	28.7	32.9	35.8	36.8	42.5	32.6	27.7	-	
PEN95	385975	439719	32.1	24.3	29.2	26.7	22.0	21.0	23.4	28.5		30.0	33.4	37.8	28.0	23.8	-	
PEN96	385975	439719	33.2	25.7	30.9	25.6	24.3	20.9	22.4	29.2	29.0	29.4	33.0	38.7	28.5	24.2	-	
PEN97	386101	439797	27.8	20.0	25.8	24.8	23.3	20.3	23.0	24.4	24.2	27.4	31.1	33.6	25.5	21.6	-	

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 <(0.85)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PEN98	386101	439797	29.1	22.6	25.5	25.2	22.9	20.9	22.9	25.6	24.4	28.1	31.1	34.0	26.0	22.1	-	
PEN90	388138	440143	34.1		29.2	23.8	25.5	22.1	27.4	24.0	24.7	32.9	31.4	36.1	28.3	24.0	-	
PEN82	389061	440482	33.0		33.7	30.0	23.0	21.9	23.8	28.5	28.0	31.9	36.2	38.9	29.9	25.4	-	
PEN83	389061	440482	40.6		34.3	28.4	24.9	21.9	24.4	28.5	27.0	32.4	34.7	41.1	30.7	26.1	-	
PEN84	389079	440492	42.6	37.8	38.0	33.7	36.5	28.5	36.8	35.8	35.2	37.2	42.2	45.7	37.5	31.9	-	
PEN85	389079	440492	35.5	37.8	34.7	31.9	34.5	29.9	37.4	33.8	35.4	37.6	37.1	46.7	36.0	30.6	-	
PEN76	389081	440519	36.3		32.1	25.8	24.2	20.5	24.6	25.1	28.4	24.2	30.7	35.6	28.0	23.8	-	
PEN77	389081	440519	30.8		32.1	23.2	22.3	20.2	23.4	25.4	28.0	28.1	25.4	36.3	26.8	22.8	-	
PEN78	389098	440508	34.0	25.1		35.4	27.3	23.6	28.1	32.4	31.0	32.5	34.7	40.6	31.3	26.6	-	
PEN79	389098	440508	27.5		36.1	32.8	27.8	25.0	27.6	32.0	29.8	35.7	33.7	42.2	31.8	27.1	-	
PEN36	389102	440540	40.2	21.3	38.7	33.7	23.4	20.3	23.1	31.3	27.6	28.7	35.5	35.7	30.0	25.5	-	
PEN86	389105	440484	42.3	28.7	41.3	31.0	29.3	27.5	31.9	37.8	34.6	37.4	37.8	43.1	35.2	29.9	-	
PEN87	389105	440484	39.3	28.6	41.9	36.7	30.7	27.2	34.3	35.8	37.5	34.2	42.6	47.5	36.4	30.9	-	
PEN65	389159	440488	37.7	27.0		30.2	26.3	17.3	27.2	33.3	32.3		35.3	38.9	30.6	26.0	-	
PEN66	389159	440488	42.7	29.7	34.9	31.0	27.0	23.4	28.3	31.9	32.7	9.1		41.0	30.1	25.6	-	
PEN67	389207	440484	33.7	28.4	34.3	27.6	26.0	24.8	28.5	33.6	32.5	28.6	33.8	35.4	30.6	26.0	-	
PEN68	389207	440484	33.8	26.6	33.6	30.5	25.5	23.7	28.2	31.5	32.6	29.8	35.5	38.4	30.8	26.2	-	
PEN69	389250	440482	29.6	26.4	32.3	27.4	24.0	20.8	25.9	29.6	28.5	27.8	31.3	36.9	28.4	24.1	-	
PEN70	389250	440482	20.0	22.2	29.7	23.9	23.2	21.1	25.2	28.3	27.8	25.7	30.0	35.3	26.0	22.1	-	
PEN63	389425	440490	32.1	22.8	29.8	28.0	19.8	19.2	9.1	29.4	20.1	29.2	52.5	12.1	25.3	21.5	-	
PEN64	389425	440490	31.8	9.1	32.5	29.7	16.7	19.7	13.8	27.8	17.3	30.1	42.1	36.0	25.5	21.7	-	

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 <(0.85)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PEN36	389102	440540	40.2	21.3	38.7	33.7	23.4	20.3	23.1	31.3	27.6	28.7	35.5	35.7	30.0	25.5	-	
PEN4	389410	440463	31.3	24.9	33.7	28.8	22.8		23.7	28.2	28.1	27.2	31.3	36.5	-	-	-	Duplicate Site with PEN4 and PEN54 - Annual data provided for PEN54 only
PEN54	389410	440463	34.5	23.3	30.0	28.9	24.1	20.1	23.5	27.7	29.0	28.4	32.4	37.7	28.2	23.9	-	Duplicate Site with PEN4 and PEN54 - Annual data provided for PEN54 only
PEN5	388820	440045	36.7		34.1	32.5	28.1	25.2	25.5	30.6	29.5	25.4	33.7	36.3	30.7	26.1	-	
PEN6	388820	440045	35.7		32.1	33.5	26.7	25.7	30.0	31.8	32.4	25.4	34.1	35.1	31.1	26.4	-	
PEN71	388755	440026	39.8	26.0	30.7	29.9	29.3	26.7	30.6	29.6	29.8	32.8	31.9	37.1	31.2	26.5	-	
PEN47	388711	439999	32.7	30.2	34.3	31.7		21.3	30.7	29.7	30.3	32.0	34.6	37.8	31.4	26.7	-	
PEN46	388655	440002	35.3	25.6	29.7	26.8	26.6		28.8	27.7		24.8	31.5	32.1	28.9	24.6	-	
PEN7	388389	439924			26.4	23.9	22.7		25.7	21.4	23.6	29.2	29.9	35.9	26.5	22.5	-	
PEN8	388389	439924		28.4	28.0	24.7	23.9	21.9	24.5	23.6	24.9	29.5	31.6	35.2	26.9	22.9	-	
PEN50	387922	439500		29.1	29.4	28.5	28.6	26.2	29.8	27.7	28.7	35.9	35.7	39.5	30.8	26.2	-	

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

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

Local bias adjustment factor used.

National bias adjustment factor used.

Where applicable, data has been distance corrected for relevant exposure in the final column.

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

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Pendle Borough Council During 2022

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

Additional Air Quality Works Undertaken by Pendle Borough Council During 2022

Pendle Borough Council has not completed any additional works within the reporting year of 2022. No additional non-automatic NO₂ monitoring sites were added in 2022.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes used by Pendle Borough Council were supplied and analysed by Gradko Environmental Ltd, using a 20% TEA / Water solution. Gradko participate in the AIR NO₂ Proficiency Testing Scheme and their performance is publicly available on the Defra website.

In rounds AR037, 39, 40, 43, 45, 46, 49 and 50 (May 2020 to June 2022) Gradko achieved a satisfactory result of 75% or above. This dropped to 25% in round AR042 (Jan-Feb 2021) but an investigation was carried out and a repeat set of samples tested (Mar-21) to confirm results. It was concluded that there was no risk associated with results reported to customers. Gradko's precision score for 2022 was Good = 33 Bad = 0.

Diffusion Tube Annualisation

For 2022, no monitoring stations recorded a data capture below 75%. Therefore, diffusion tube annualisation was not required.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube

monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Pendle Borough Council have applied a national bias adjustment factor of 0.85 to the 2022 monitoring data. A summary of bias adjustment factors used by Pendle Borough Council over the past five years is presented in Table C.1. A screenshot of the national bias adjustment factor used is shown in Figure C-1.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	09/23	0.85
2021	National	09/22	0.84
2020	National	09/22	0.81
2019	National	03/20	0.91
2018	National	03/19	0.92

Figure C-1 - National Diffusion Tube Bias Adjustment Factor spreadsheet¹²

National Diffusion Tube Bias Adjustment Factor Spreadsheet Spreadsheet Version Number: 09/23

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies

Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of March 2024
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory. Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

Step 2: Select a Preparation Method from the Drop-Down List

Step 3: Select a Year from the Drop-Down List

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor shown in blue at the foot of the final column.

If you have your own co-location study then see footnote. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2022		Overall Factor ³ (33 studies)				Use		0.85

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

¹² <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/national-bias/>

has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

The Diffusion Tube Data Processing Tool confirmed that no diffusion tube monitoring locations within Pendle Borough Council required distance correction during 2022.

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

Figure D.1 – Map of Non-Automatic Monitoring Sites, Pendle Borough Council

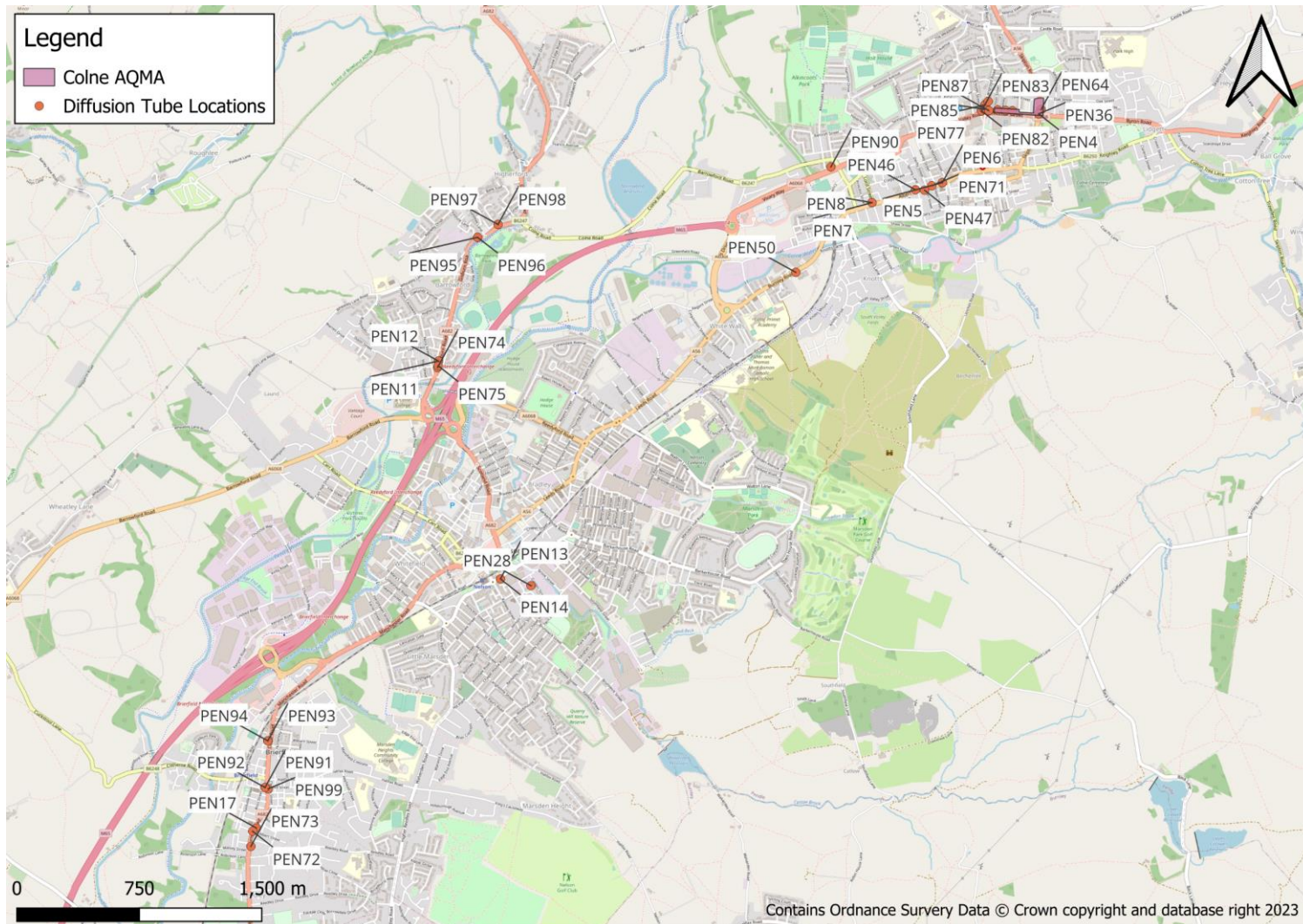


Figure D.2 – Map of Non-Automatic Monitoring Sites, Colne AQMA



Figure D.3 – Map of Non-Automatic Monitoring Sites, Colne

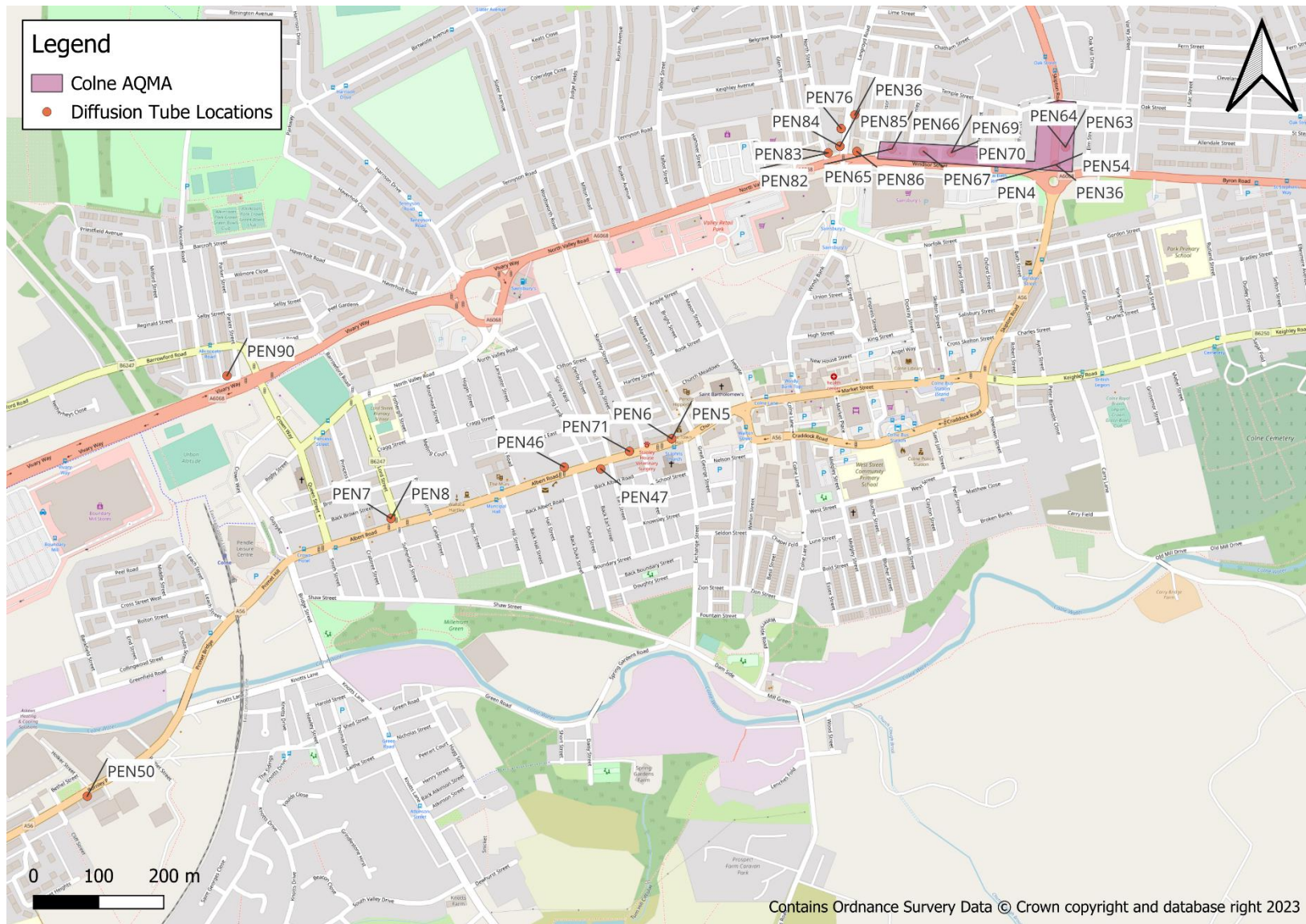


Figure D.4 – Map of Non-Automatic Monitoring Site, Nelson

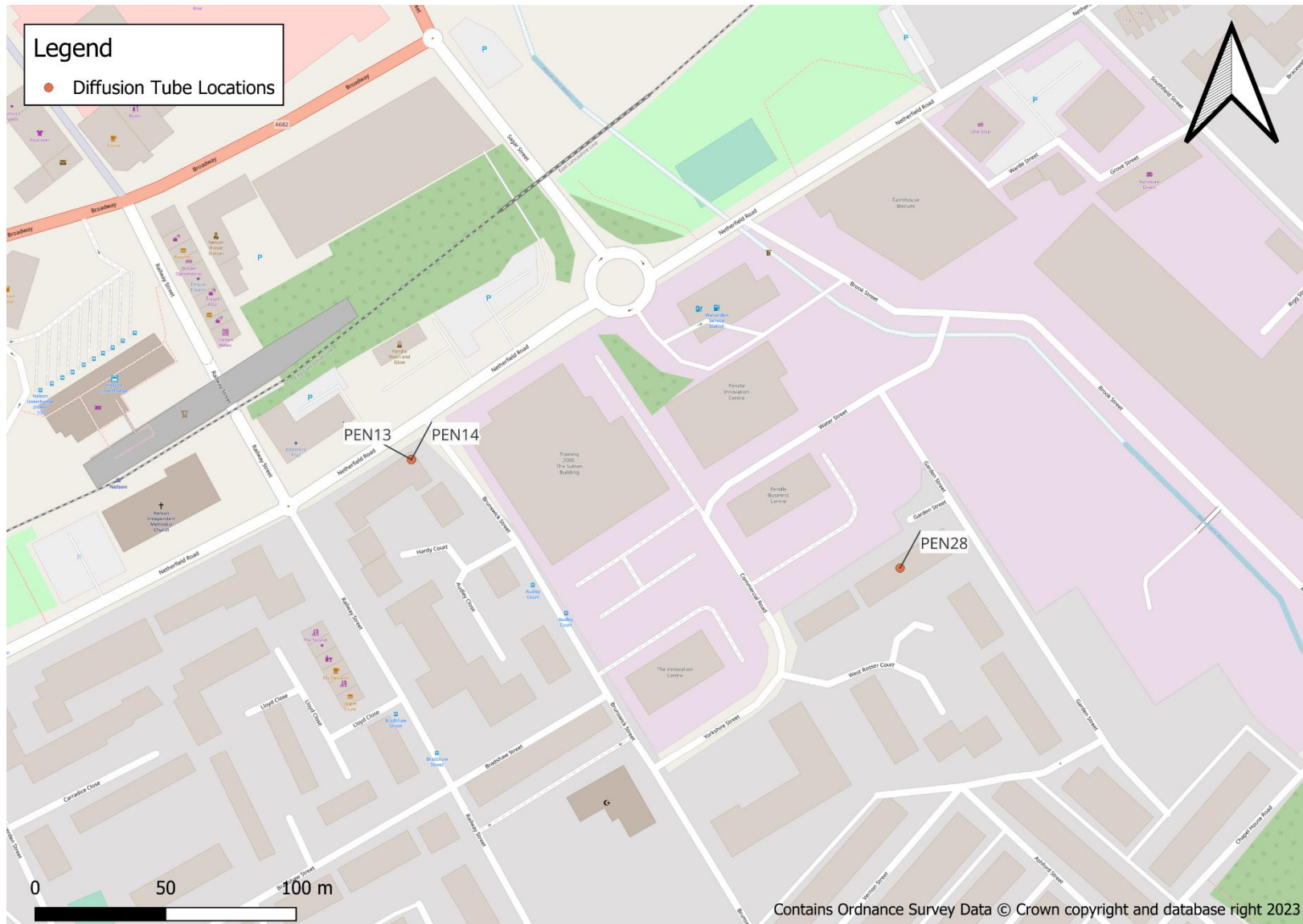


Figure D.5 – Map of Non-Automatic Monitoring Site, Barrowford



Figure D.6 – Map of Non-Automatic Monitoring Site, Brierfield



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England¹³

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

¹³ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AQO	Air Quality Objective
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
LCC	Lancashire County Council
LCWIPS	Local Cycling and Walking Infrastructure Plans
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PBC	Pendle Borough Council
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022.
Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022.
Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.