2025 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 2025

Information	Chorley Council Details
Local Authority Officer	Jessica Heath
Department	Environmental Health
Address	Civic Offices Union Street Chorley Lancashire PR7 1AL
Telephone	01772 625625
E-mail	Jessica.heath@southribble.gov.uk
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Local Responsibilities and Commitment

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

Sally Green – Climate change Lead Officer – Chorley Council.

Katherine Greenwood – Team Leader Planning Policy – Chorley Council.

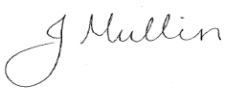
Jessica Heath – Environmental Health Technical Assistant – South Ribble Council.

This ASR has been approved by:

Chris Sinnott, Chief Executive, Chorley Council

Signature: 

Jennifer Mullin, Director of Communities, Chorley Council

Signature: 

This ASR has not been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Chorley Council at:

Address: Civic Offices

Union Street

Chorley

Lancashire

PR7 1AL

Telephone: 01257 515151

Email: contact@chorley.gov.uk

Executive Summary: Air Quality in Our Area

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents.

Air Quality has been improved in the Chorley Borough by implementing Air Quality and Climate Change Strategies and prioritising the reduction in the amount of petrol/diesel vehicles the Council operate. The result for 2024 was an increase in the Council's Electric Vehicle Fleet to 22% of the total fleet. In the coming years, Chorley Council is looking to implement an Electric Fleet Strategy which will commit the Council to a fully electric fleet and will also look to re-assess where petrol powered machines/equipment can be converted.

Work also undertaken in 2024 included:

- Making final contributions to the Central Lancashire Local Plan.
- Working to increase resident's engagement with Air Quality initiatives by creating more educational social media content and employing a new Climate Ambassador.
- Implementing a policy to ensure all new Council developments have cycling storage and changing facilities.
- Continuing with the monitoring of pollutants using the Air Quality Monitoring Programme.
- Working closely with the highways authority to inform the larger EVCP installation plans via the Lancashire County Council LEVI installation programme.

Air Quality in Chorley

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.

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Low-income communities are also

disproportionately impacted by poor air quality, exacerbating health and social inequalities.

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.

The pollutants of concern in the Chorley Borough are Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}, $PM_{2.5}$), these pollutants are commonly associated with vehicle traffic.

In 2024 there has been a general stabilisation of the NO_2 results measured by the non-automatic diffusion tubes, when comparing to the previous 4 years of data.

2024 was only the third year of observing data collected by the EarthSense Air Quality Sensors. Across the three Low-cost Zephyr Air Quality Sensor sites recording PM_{10} and $PM_{2.5}$ levels, there was a general stabilisation from the previous two years, except for a minor increase at two sites in comparison to 2023. However, these results are only indicative of air quality levels and the result cannot be used to draw conclusions.

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.

In 2024, Chorley Council's primary focus was to use the Air Quality and Climate Change strategies to continue to improve Air Quality in the borough. Subsequently, this maintained

the Council's commitment to reducing its impact on the climate in response to the UK-wide declared Climate emergency. To provide clarity about which actions are primarily Climate or Air Quality based, the separate Air Quality/Clean Air strategy is available using this link to the Chorley Council Air Quality webpage.

The Council continued to monitor pollutant concentrations in the borough by using the diffusion tubes and following the Air Quality Monitoring Programme. In addition, the Zephyr EarthSense Air Quality Sensors were utilised as an indicative measure of pollutant levels. Aside from this, the EarthSense data is vital to engage the public as they can freely access the data collected by the Air Quality Sensors. In 2024, there was an increased effort to engage the public and make them aware of Air Quality initiatives. For example, a new Climate Ambassador post was created at the Council with the intension of enhancing communication between the public and the Council. In addition, the Council released educational social media campaign videos supporting projects such as "Ready For Burn" created by Woodsure on behalf of Defra.

One of the key updates regarding the progress Chorley Council made to improve the borough's air quality in 2024 was the further actions taken to provide the facilities for sustainable transport. The Council did not only promote the use of sustainable travel within the Council but also contributed to the district-wide policies that will provide residents with methods for sustainable travel e.g. Local Cycling and Walking Infrastructure Plan and the commitment to EV infrastructure in the Central Lancashire Local Plan. Furthermore, the ongoing work to reduce the amount of the Council fleet that is petrol/diesel has been positive as the number of Electric vehicles in Chorley Council's fleet increased to 22%, in 2024.

Main Air Quality actions for 2025-

- Development of an Electric Vehicle Infrastructure Strategy to improve the public's access to electric vehicle charging.
- Continue monitoring air quality in the borough using the Diffusion tubes and looking at the Zephyr Air Quality sensors for indicative information.
- Making final contributions with South Ribble and Preston City Councils to complete the revised Central Lancashire Local Plan and adopt this plan in 2025.
- Review the Council's current Climate Change Strategy.
- The Council are currently developing a Fleet Strategy, which will commit the Council to a fully electric fleet and to review other petrol-powered assets.

Conclusions and Priorities

The 2024 monitoring programme results, combined with the review of the government data have demonstrated there were no likely exceedances above the National Objective levels for the pollutants of concern in the Chorley Borough during 2024.

The significant trends that were identified in the monitoring programme included a stabilisation or decrease in NO_2 results at the existing monitoring sites. Sites CH63 and CH53 in the North of the Chorley Borough and CH65 in the South of the Chorley Borough were the exception and saw a minor increase in NO_2 compared to 2023. There is no immediate plan to move the diffusion monitoring tubes as the A6 (location of the CH65 and CH53 diffusion tubes) continues to measure higher compared to the rest of the Chorley Borough.

The main actions for 2025 are to continue progression on existing aims e.g. improving public engagement on Air Quality, but also to focus on the implementation of new policies. In 2025 these are mainly based around increasing electric vehicle usage for the Council and the residents. Examples include the Council's contribution to the implementation of the Local Electric Vehicle Infrastructure (LEVI) scheme by Lancashire County Council, which aims to increase the number of EV charge points in the borough.
Over the next couple months, a priority will be to work with the Central Lancashire Planning team to see the delivery of the Central Lancashire Local Plan as this reaches completion. Finally, Chorley Council's Clear Air Strategy has been implemented and is now due to be reviewed to ensure it remains relevant for Chorley Council's priorities.

How to get Involved

Chorley Council welcome scrutiny and suggestions from residents about our Air Quality monitoring programme. To get involved in work to tackle air pollution within Chorley Borough; or for more information on how to reduce your personal emissions, please contact Chorley Council Environmental Health Department on 01257 515151 or e-mail contact@chorley.gov.uk.

Chorley Council are active on their social media and make posts to engage the public. One example is a series of social media campaign videos for education purposes supporting the DEFRA project, "Ready For Burn". The aim is that this increases the engagement with residents in the borough and introduces them to topics that will impact

them in the future. This is being supported by the recently employed Climate Change Ambassador, which is a dedicated role focused on public and school engagement on climate and environmental matters including air quality.

Air Quality and pollutant levels across the Borough are complaint with standards, therefore there is not a high public interest in the matter. However, the Council is aware of some isolated concerns about the use of wood burning stoves and the collective impact that may be having on localised particulate levels.

Chorley Council's Air Quality webpage highlights some of the main ways that the public can currently improve air quality in the Chorley Borough. One of these is to use public transport instead of petrol/diesel cars. The Chorley Borough is well connected internally by buses and can access other areas in the North West of England by train. For example, from the Chorley Borough the railway stations at Chorley, Buckshaw Village, Euxton, Adlington, Croston and Bamber Bridge, are all within close distance. The timetabling information for local trains is provided by National Rail (Link to National Rail website).

More information on public transport can be found on this Link to Lancashire County Council public transport website, as public transport is a responsibility that falls under Lancashire County Council.

Chorley Borough has cycle routes that can be used for commuting and leisure purposes. More information can be found on the Check Out Chorley website: Link to Check Out Chorley.

Further information is available on the Council's Air Quality website, using this link to the Chorley Council Air Quality webpage., and the Climate Change website, using this link to the Chorley Climate Change webpage.

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1 Local Air Quality Management

This report provides an overview of air quality in Chorley during 2024. 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 Chorley 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.

Chorley Council currently does not have any declared AQMAs. A local Air Quality Strategy is in place to prevent and reduce polluting activities. The Local Air Quality Strategy is available on the Chorley Council Website and can be accessed using this link to the Chorley Council Air Quality webpage.

2.2 Progress and Impact of Measures to address Air Quality in Chorley

Defra's appraisal of last year's ASR concluded that the report was well structured, detailed, and provided all the specified information. Chorley Council is grateful for the feedback and has noted the following comments which were provided to help inform future reports:

- It is not detailed in the text which diffusion tubes have been removed/added or as to the reason for the decision. This can only be determined by cross referencing last year's ASR.
- The Council have correctly applied QA/QC protocols for annualisation and have selected an appropriate bias adjustment factor using a national factor. Please note it would be useful to know if the zephyr data has been adjusted to a co-location methodology.
- It is positive to see Chorley Council commitment to developing a Local Plan with a positive impact on air quality.
- It is noted that the Council have installed three low-cost Zephyr monitors for NO, O_3, NO_2, PM_{10} and $PM_{2.5}$ monitoring within the Borough which is welcomed. The Council are reminded that these monitors are indicative and should not be used to provide any conclusions against the air quality objectives. Although this is highlighted in the report, it is recommended that the details and results of monitoring from these sensors are only included as separate appendices in future ASRs. The monitoring results shown in the appendix indicate there are currently no concerns with PM_{10} and $PM_{2.5}$ concentrations.
- The Council have provided detailed ways for the local populace to engage in air quality improvement, offering a variety of methods through which they can contribute and providing links for further information.
- The Council have demonstrated consistency between the ASR submission and the supplementary Excel ASR Table.

Chorley Council has taken forward a number of direct measures during the current reporting year of 2024 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 Chorley Council have made during the reporting year of 2024 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans Clean Air Strategy (Link to the Chorley Council Air Quality webpage) and Climate Change Strategy (Link to the Chorley Council Climate Change webpage). Key completed measures are:

- A post of Climate Change Ambassador has been created to deliver community based public health messages on climate change and air quality. (Measure 10)
- The Council has released a series of social media campaign videos for education purposes supporting ready for burn and emission sources. (Measure 4)
- The Council now has a policy in place to ensure all new Council developments have cycling storage and changing facilities. (Measure 7)
- A feasibility study has been completed for the Council's move to electric vehicles. Furthermore, the percentage of electric vans in the fleet has increased to 21.95%. (Measure 3)

Chorley Council expects the following measures to be completed over the course of the next reporting year:

- The Council are also developing an Electric Vehicle Infrastructure Strategy. This will clearly demonstrate the Council's commitments to the installation plan of public electric vehicle infrastructure throughout the borough. (Measure 6)
- The Council's Air Quality and Climate Change Strategy is currently under review to ensure that it is still appropriate to Chorley Council's priorities. (Measure 13)
- The Council are currently developing a Fleet Strategy; this commits the Council to the conversion of all fleet to electric and review of other petrol-powered assets. (Measure 3)
- Over the next 2-3 years the Council are working closely with the highways authority to inform the larger EVCP installation plans via the Lancashire County Council LEVI installation programme. As another way to increase the Electric vehicle infrastructure that residents can access. (Measure 6)

The Council's priorities for the coming year are to review the Air Quality and Climate Change Strategy, focus on the progression of the Electric Vehicle Infrastructure and

Council Fleet strategies and to implement The Central Lancashire Local Plan when completed.

Chorley Council worked to implement these measures in partnership with the following stakeholders during 2024:

- Neighbouring local authorities
- The Highways Authority
- Lancashire County Council

The principal barrier to implementation that Chorley Council anticipates facing is a lack of resources with staffing and internal funding. For example, measures looking at Cycle Couriers and using Hydrogenated Vegetable Oil (HVO) Fuel for the Council Fleet could not pass the trial stage due to limited resources. (Measure 7 and 8)

A further challenge for Chorley Council is to maintain/increase public engagement around Air Quality issues. This is important for the Council to maintain because it can impact the results of measures such as public electric vehicle infrastructure usage (Measure 6).

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	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	Local Development Plan	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2023	2025	Preston City Council, South Ribble Borough Council and Chorley Council	Existing Budgets	Partially Funded	£50k - £100k	Implementation	Reduced emissions	Inclusion within the Central Lancashire Local Plan	The Central Lancashire Local Plan is currently under development for adoption during 2025.	Relevant development management policies that will have a positive impact on local air quality include: Policy EN14: Environmental Quality – seeks to reduce pollution caused by developments and ensure that developments do not cause the deterioration of air quality. Policy CC1: Climate Change – requires developments to maximise opportunities to contribute to the delivery of net zero greenhouse gas emissions. Policy ST2: Sustainable and Active Travel – requires developments to create opportunities for active travel which will help to improve air quality.
2	Review of existing Air	Policy Guidance	Air Quality	2020	2025	Chorley Council	Existing Budgets	Not Funded	< £10k	Planning	Reduced Emissions	Review air quality and		Linking to Measure 1, this demonstrates the

	Quality and Climate Change Strategy	and Development Control	Planning and Policy Guidance									climate change strategy		influence of the implementation of air quality and climate strategy on future developments.
3	Plan to progress the Council's conversion to Electric Vehicles	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2020	2025	Chorley Council	Existing Budgets	Partially Funded	£500k - £1 million	Implementation	Reduced vehicle emissions	The implementation of the scheme	The Council has produced a feasibility study to continue progression the Council's conversion to electric vehicles. The percentage of electric vans in the fleet has increased to 21.95%. In addition, older technology has been replaced with new easier to use public charge points.	The Council are currently developing a Fleet Strategy, this strategy commits the Council to the conversion of all our fleet vans to be electric and for the continued review of technological progression of waste and current petrol-powered assets such as leaf blowers and mowers.
4	Develop an engagement strategy to support the AQ agenda across the borough	Public Information	Other	2022	2025	Chorley Council	Existing Budgets	Not Funded	< £10k	Implementation	Reduced Emissions	Implementation	The Council has released a series of social media campaign videos supporting projects such as "Ready For Burn" and educational videos on Emission Sources.	Resistance from residents and businesses.
5	Promote flexible and homeworking to reduce commuting and avoidable travel	Promoting Travel Alternatives	Encourage / Facilitate homeworking	2021	2022	Chorley Council	Existing Budgets	Not Funded	< £10k	Completed	Reduced staff travel	Implementation	Hybrid working policy is embedded in practice and is reducing the number of travel to / from work by	Public accessibility to Council services and staff reduces the possibility of total home working across Chorley Council.

													Council employees.	
6	Improved access to Electric vehicles Charging options	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2021	2025	Chorley Council	Existing Budgets + External Grants	Partially Funded	£10k - 50k	Implementation	Reduced Emissions	Reliable EV charging network across Borough	The new local plan has adopted a public electric vehicle charging policy, promoting the installation of electric vehicle charge points on all new developments. The Council are working closely with the highways authority to inform the larger EVCP installation plans via the Lancashire County Council LEVI installation programme. This installation programme is ongoing for the next 2-3 years.	Availability of space for EV charging points. Cost of electricity supply and cost of EV vehicles. This hopefully will be helped by an Electric Vehicle Infrastructure Strategy being created by the Council. This will inform the Council's priorities, commitments and installation plan of public electric vehicle infrastructure throughout the borough.
7	Cycle parking, repair and changing facilities	Promoting Travel Alternatives	Promotion of cycling	2022	2025	Chorley Council	Existing Budgets + External Grants	Partially Funded	< £10k	Planning	Reduced Emissions	Implementation	The Council now has a policy in place to ensure all new Council developments have cycling storage and changing facilities.	Resistance from residents.
8	Complete and evaluate the trial use of hydrogenated vegetable	Freight and Delivery Management	Other	2022	2024	Chorley Council	Existing Budgets	Partially Funded	< £10k	Completed	Reduced Emissions	Completed review	Abandoned strategy. Instead, the Council is continuing to update its fleet to electric vehicles	The alternative combustion fuel sources for powering Council vehicles were abandoned due to cost effectiveness.

	oil (HVO) fuel throughout Council fleet												at the time of vehicle contract renewal. The Council's electric vehicle fleet currently stands at 22% of the total fleet.	
9	Bonfires and dark smoke offences	Public Information	Other	2022	2025	Chorley Council	Existing Budgets	Not Funded	< £10k	Planning	Reduced Emissions	Implementation	Council Environmental Health Officers are competent to deal with regulatory smoke control matters and follow standardised procedures when taking formal enforcement action.	Resistance from residents and businesses to comply.
10	Health based campaigns	Public Information	Other	2022	2025	Chorley Council	Existing Budgets	Not Funded	< £10k	Planning	Reduced Emissions	Implementation	A post of Climate Change Ambassador has been created to deliver community based public health messages on climate change and air quality.	The presence of the Climate Change Ambassador aims to increase engagement with residents to reduce any resistance to these actions.
11	Potential for cycle couriers	Freight and Delivery Management	Freight Partnerships for city centre deliveries	2023	2025	Chorley Council	Existing Budgets	Not Funded	< £10k	Aborted	Reduced Emissions	Ecargo bike(s) in use	Aborted due to cost of scheme and lack of available resourcing.	Lack of resources to trial the idea.
12	Lancashire Local Cycling and Walking	Promoting Travel Alternatives	Other	2022	2025	Lancashire LA's	Existing Budgets	Not Funded	< £10k	Planning	Reduced Emissions	Implementation of plan by Lancashire	The LCWIP has been published, this has planned improvements for cycling and	Resistance from residents and businesses.

	Infrastructure Plan											County Council	walking within the borough.	
13	Review Air Quality and Climate change Strategies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2023	2025	Chorley Council	Existing Budgets	Partially Funded	< £10k	Planning	Reduced Emissions	Implementation	The Council's Climate Change Strategy is currently under review.	

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[1], 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.

Chorley Council is taking the following measures to address $PM_{2.5}$:

Chorley Council is taking the following measures which will either address $PM_{2.5}$ directly or as a co-benefit of other measures. Where applicable, reference to specific measures in Section 2.2 above is shown in **bold**:

- Review of the Clean Air and Climate Change Strategies which contain actions that have co-benefits for reducing $PM_{2.5}$ (e.g. decarbonisation of heating and development of local EV strategy). **(1, 2, 3, 6, 13)**

- Chorley Council promotes national campaigns such as “Clean Air Day/Night”, “Ready to Burn”, DEFRA’s “Burn Better” and “Burnright”. **(9, 10)**

- Chorley Council have undertaken public engagement via the Council’s Climate Change Ambassador to support the air quality agenda across the Borough to raise awareness with residents on how to make better choices to reduce $PM_{2.5}$ production (e.g. reducing solid fuel burning, choosing active travel options etc.). This includes health-based campaigns. **(4, 5, 6, 7, 10)**

- Working in conjunction with neighbouring local authorities we have introduced a Public Spaces Protection Order to prevent West Pennine Moorland fires. **(4, 9)**

- Chorley Council have established PM monitoring using EarthSense Zephyr continuous automatic Air Quality at three locations across the borough. Though this

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

system is not approved for inclusion in the ASR or certified using the Environment Agency's Indicative instrument certification scheme, the data collected is providing qualitative data on the scale of the issue, particulate pollution trends and a benchmark against which to measure progress. In 2025/26 the Council will consider whether to retain these monitors, and whether they remain in their current locations, or relocate to new locations. **(4, 13)**

- An appraisal report was produced in 2023, using data collected during 2022, and concluded that particulate matter levels meet our obligations under UK local air quality management guidance and do not exceed Air Quality Objective limits. Furthermore, there are no exceedances of World Health Organisation Interim Target 4 for PM. The report is included as an addendum. **(4, 10, 13)**

- At the three monitoring locations we recorded PM_{10} annual mean concentrations of 10–12 $\mu g.m^{-3}$ and $PM_{2.5}$ concentrations of 6-8 $\mu g.m^{-3}$. The highest 24-hour mean concentrations across the three sites recorded were 43 $\mu g.m^{-3}$ for PM_{10} and 25 $\mu g.m^{-3}$ for $PM_{2.5}$.

- DEFRA background maps for 2024 suggest $PM_{2.5}$ concentrations of 5 - 8.5 $\mu g.m^{-3}$ across the Borough, of which ~54% is from secondary sources, ~20% residual and salt sources, ~11% from domestic heating, ~6% from industry, ~7% from transport sources and ~2% point sources.

- To support this work a public portal has been launched allowing residents to view live air quality data from the EarthSense monitors (link to the online portal).

- Of the transport sources, the motorway network is currently a large source of PM pollution. The exposure from the M6, M61 and M62 will likely reduce in-line with national targets and standards for vehicles. **(3, 6, 7)**

- During 2025 the location and operation of the EarthSense sensors will be validated against PAS 4023:2032 (Selection, deployment, and quality control of low-cost air quality sensor systems in outdoor ambient air – Code of practice, BSI). **(13)**

- Promoting flexible and homeworking to reduce commuting and avoidable travel. **(5)**

- Proactively inputting into Lancashire Local Cycling and Walking Infrastructure Plan to increase attractiveness and safety of walking, cycling, and wheeling. **(7,12)**

- Chorley Council acknowledge that there are some concerns regarding increased $PM_{2.5}$ emissions from the tyre and brake dust of Electric Vehicles and alternative fuels, though there are beneficial reductions in NO_x and CO_2. This is under constant review and responsive to national guidance. **(3, 6)**

Chorley has three smoke control areas, details of which can be found using this link to the Smoke and Smoke Control Webpage of the Chorley Council website. It was found that in 2024 there were 54 smoke related complaints in the Chorley Borough, with the most frequent source being bonfires. Only one of these cases resulted in an abatement notice being served on the source address. Chorley Council's Environmental Health Team continues to provide advice letters to the source address of the smoke, even if no warning letter or enforcement action is necessary.

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

This section sets out the monitoring undertaken within 2024 by Chorley Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2020 and 2024 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Chorley Council does not have any automatic (continuous) monitoring. However, at 3 sites during 2024 Air Quality was monitored using Low-Cost Zephyr Air Quality Sensors. Table A. in Appendix F shows the details of these monitoring sites.

The data collected from these sensors are not certified for compliance reporting against The Ambient Air Quality Directives using the Environment Agency's Indicative Instrument Certification scheme. Therefore, the data from these Air Quality Sensors are not able to be presented as a form of compliance reporting in the ASR.

The data from the EarthSense Air Quality Sensors are presented in Appendix F to give an indicative view of the pollutant levels across the Borough and are provided for transparency.

The Link to the online EarthSense portal page presents monitoring results for Chorley Council. Unfortunately, the monitoring results are not 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

Chorley Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 39 sites during 2024. **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).

The data from the Low-cost Zephyr Air Quality Sensors by EarthSense are presented below in order to give an indicative view of the pollutant levels across the Borough and are provided for the purposes of transparency. These readings do not replace the diffusion tube network.

For diffusion tubes, the full 2024 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.

Chorley Council does not collect data to compare to ratified continuous monitored NO_2 hourly mean concentrations and therefore Table A.5 in Appendix A was not used.

The Chorley Council diffusion tube data demonstrated no exceedances of the air quality objectives for either the annual mean concentrations of 40µg/m^3 or any tube result exceeding 60µg/m^3. In the past five years of data collection there has been no annual mean concentrations that have exceeded 40µg/m^3. This means that any exceedance of the 1-hour mean objective is unlikely, despite not measuring specifically for it.

3.2.2 Particulate Matter (PM_{10})

Table F.3 Appendix F: 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.

Table F.4 in Appendix F 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.

Chorley Council monitors PM_{10} and $PM_{2.5}$ levels as part of the Zephyr Air Quality Sensor trial. The data from the EarthSense automatic sensors are presented below to provide only an indicative view of pollutant levels across the Borough. They have been used within this report for the purposes of transparency. These readings will support the on-going work regarding PM pollution at Chorley Council.

The Defra Background maps also indicated no exceedances of the objective level for PM_{10}.

Utilising the indicative monitoring data from the Low-cost Zephyr Air Quality Sensors in the last three years have shown PM_{10} annual mean concentrations of less than 15µg/m^3 at the three monitoring locations. Furthermore, in 2023 and 2024, the data observed did not exceed the Air Quality Objective of 50µg/m^3.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table F.5 in Appendix F presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

Chorley Council monitors PM_{10} and $PM_{2.5}$ levels as part of the Zephyr Air Quality Sensor trial. The data from the EarthSense Air Quality sensors are presented below to provide only an indicative view of pollutant levels across the Borough. They have been used within this report for transparency. These readings will support the on-going work regarding PM pollution at Chorley Council.

The Defra Background maps also indicated no exceedances of the objective level for $PM_{2.5}$.

The indicative monitoring data from the Low-cost Zephyr Air Quality Sensors from the past three years, demonstrates $PM_{2.5}$ annual mean concentrations of less than 10µg/m^3 at the three monitoring locations.

3.2.4 Sulphur Dioxide (SO_2)

Chorley Council does not monitor SO_2 levels, a check of the Defra background maps indicates that there are no likely exceedances of the objective levels for this pollutant.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Chorley Council do not have Automatic Air Quality Monitoring methods however, we have indicative data. See Table F.1 in Appendix F for details of the Low-cost Zephyr Air Quality Sensor Sites.

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)
CH35	St Thomas Road – Green lamppost outside Sumner House	Roadside	358145	417645	NO2	No	3.0	3.2	No	2.5
CH25	Bolton Street - (LP 158)	Roadside	358518	417072	NO2	No	0.5	1.8	No	2.5
CH36	Bolton Road near No.s 8-12 Lamppost with	Roadside	358714	416839	NO2	No	0.4	2.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	Eccleston Park sign on									
CH37	Bolton Road No. 68 downspout	Roadside	358830	416726	NO2	No	0.0	2.2	No	2.5
CH38	Bolton Road – 132 The Cottage downspout	Roadside	359060	416468	NO2	No	0.0	2.9	No	2.5
CH39	Duxbury Manor Gardens, Down pipe of 2a	Roadside	358933	415862	NO2	No	0.0	13.0	No	2.5
CH65	A6 Bolton Rd – 'Melville' house, downspout LHS	Roadside	359538	415419	NO2	No	0.0	12.0	No	2.0
CH05	Market St, Adlington - (LP16) PR7 4EZ – outside Compass	Kerbside	360095	413089	NO2	No	2.5	0.5	Yes	2.5
CH40	Devonshire Road – Down pipe of No. 15	Roadside	358092	416925	NO2	No	0.0	2.3	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)
CH06	Moor Road, Chorley (LP 50) Corner of Cross Swords near traffic lights	Kerbside	357436	416130	NO2	No	8.5	0.5	No	2.5
CH42	Spendmore Lane – Coppull down pipe of 102	Kerbside	356547	414525	NO2	No	0.0	5.5	No	2.5
CH44	Spendmore lane – Coppull Down Pipe of 260	Roadside	356039	414054	NO2	No	0.0	1.5	No	2.5
CH45	Preston Road Coppull Lamppost outside 122	Roadside	355534	413755	NO2	No	3.5	5.0	No	2.5
CH46	A49 Wigan Road South Balshaw Lane (LP12) lamppost outside 235	Roadside	355540	418309	NO2	No	7.5	2.0	No	2.5
CH08	Balshaw Lane (LP 82)	Roadside	355891	418467	NO2	No	11.0	2.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	Outside No 27, park at shops									
CH11	A49 Wigan Road South Euxton Lane (LP 457) Outside 152 Just after white houses	Kerbside	355454	419317	NO2	No	1.5	0.5	No	2.5
CH47	Buckshaw Avenue – Outside 5 Ordnance Road	Roadside	356464	420218	NO2	No	4.5	2.0	No	2.5
CH63	Main street – Lamppost outside No. 2	Kerbside	356345	420733	NO2	No	1.5	1.5	No	2.5
CH50	M6 - Moss Lane, down pipe of Mobeck House	Roadside	355400	422696	NO2	No	0.0	17.5	No	2.5
CH51	A49 Wigan Road - Lancaster Lane Junction.	Roadside	355697	422432	NO2	No	3.8	2.0	Yes	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)
	Newsagent on the corner lamppost									
CH52	A6 Preston Road – Downpipe of 2 Ambledene near M65	Roadside	357335	424499	NO2	No	0.0	5.5	No	2.5
CH53	A6 Preston Road - house before the Lidl round about Corner Lamppost Westwood sign outside 586	Roadside	357902	423586	NO2	No	5.0	1.0	No	2.5
CH32	M61 - Lamppost outside 19 Ashdown Dr (off Osborne Dr)	Roadside	358313	422937	NO2	No	5.5	0.9	No	2.5
CH31	A6 Preston Road Clayton Corner of Radburn Dr	Roadside	357879	423303	NO2	No	1.2	2.9	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)
	outside 510 Preston Road									
CH17	A6 Whittle, Swansey Lane (LP 420) 1st after zebra crossing	Kerbside	357936	422176	NO2	No	0.5	4.0	No	2.5
CH17A	A6 Preston Road, Whittle (LP 398) Opposite St Johns Church	Roadside	357885	421524	NO2	No	7.0	1.5	No	2.5
CH33	A6 Preston Road Whittle Jubilee roundabout outside No. 82, corner of Royton Dr	Kerbside	358110	420361	NO2	No	2.4	1.4	No	2.5
CH34	M61- Lamppost outside 2 Fallow Close	Kerbside	358568	420246	NO2	No	3.3	0.5	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)
	(development off Moss Lane)									
CH54	Preston Road – down pipe of No. 12 next to the Sea View	Roadside	358193	419909	NO2	No	0.0	8.4	No	2.5
CH55	Blackburn Road 158 – Junction of Guildford Avenue	Roadside	359415	419740	NO2	No	0.0	11.5	No	2.5
CH19	A6 at Chorley Hospital (LP 291) Park at Hazel Grove and walk round –	Roadside	358335	419226	NO2	No	10.0	4.0	No	2.5
CH24	Euxton Lane Opposite Hospital (LP 07) Outside no. 20	Roadside	358023	419151	NO2	No	1.0	1.5	No	2.5
CH20	A6 South Chorley Hosp	Roadside	358325	418987	NO2	No	13.0	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)
	(LP 291) The Spinney									
CH58	A6 PRESTON ROAD – across from the Shell Garage lamppost outside Rydal park development	Roadside	358399	418579	NO2	No	30.0	1.0	No	2.5
CH59	A6 PRESTON ROAD – After the Shell Garage Lamppost outside No. 2	Roadside	358448	418540	NO2	No	0.0	3.0	Yes	2.5
CH60	Water Street – 45 lampposts outside help	Kerbside	358541	417816	NO2	No	2.0	0.5	No	2.5
CH61	Water Street – near No. 45 lamppost outside St Catherine's	Roadside	358526	417847	NO2	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)
CH62	Water Street – Downspout outside No. 229	Roadside	358566	418400	NO2	No	6.0	1.0	No	2.5
CH64	Brown Street, jn with Wright Street – Lamppost next to school	Kerbside	359064	417752	NO2	No	10.0	0.5	No	2.5

Notes:

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

(2) N/A if not applicable.

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

Chorley Council do not have Automatic Air Quality Monitoring methods however, we have indicative data See Table F.2 in Appendix F for details of the Low-cost Zephyr Air Quality Sensor Annual Mean NO_2 Monitoring Results.

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CH35	358145	417645	Roadside		100.0	-	21.6	18.1	18.9	18.4
CH25	358518	417072	Roadside		100.0	26.2	20.8	18	18.4	17.1
CH36	358714	416839	Roadside		100.0	-	32.3	28.3	26.3	24.3
CH37	358830	416726	Roadside		100.0	-	28.1	23.4	22.9	21.6
CH38	359060	416468	Roadside		100.0	-	19.5	17	15.7	15.0
CH39	358933	415862	Roadside		92.5	-	11.3	10.1	10	9.3
CH65	359538	415419	Roadside		90.6	-	-	-	17.7	18.0
CH05	360095	413089	Kerbside		100.0	23.4	24.8	22.8	21.9	21.8
CH40	358092	416925	Roadside		100.0	-	13.8	12.1	11.9	11.5

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 2024 (%) (2)	2020	2021	2022	2023	2024
CH06	357436	416130	Kerbside		92.5	22	21.9	19.4	19.9	18.2
CH42	356547	414525	Kerbside		100.0	-	17.3	14.5	15	14.1
CH44	356039	414054	Roadside		100.0	-	24.5	19.4	22.1	19.6
CH45	355534	413755	Roadside		100.0	-	23.8	19.5	19.8	19.0
CH46	355540	418309	Roadside		100.0	-	27.6	22.6	21.9	21.5
CH08	355891	418467	Roadside		100.0	21.6	23.4	20.5	20.6	18.7
CH11	355454	419317	Kerbside		83.0	19.5	21.5	18.9	20.5	16.4
CH47	356464	420218	Roadside		83.0	-	17.8	16.7	15.7	14.1
CH63	356345	420733	Kerbside		100.0	-	-	-	11.1	11.7
CH50	355400	422696	Roadside		100.0	-	21.9	19.5	18.5	18.3
CH51	355697	422432	Roadside		100.0	-	27.1	22.2	22.3	20.8
CH52	357335	424499	Roadside		100.0	-	17.7	16	15.7	14.9
CH53	357902	423586	Roadside		100.0	-	29.7	24	24	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 2024 (%) (2)	2020	2021	2022	2023	2024
CH32	358313	422937	Roadside		100.0	17.2	18.7	17.1	16.7	16.0
CH31	357879	423303	Roadside		100.0	16.9	18.7	17.8	16.5	15.6
CH17	357936	422176	Kerbside		100.0	-	23.9	19.9	19.5	19.3
CH17A	357885	421524	Roadside		100.0	20.3	20.5	19.5	17.9	17.9
CH33	358110	420361	Kerbside		90.6	19.6	21	19	17.5	15.4
CH34	358568	420246	Kerbside		100.0	18.6	20.1	17.9	17.2	16.0
CH54	358193	419909	Roadside		83.0	-	18.4	18	15.2	13.8
CH55	359415	419740	Roadside		100.0	-	15.8	14.7	13.8	13.3
CH19	358335	419226	Roadside		100.0	21.1	22.2	20.2	19.6	19.3
CH24	358023	419151	Roadside		100.0	23.7	26.7	24.4	24.1	22.0
CH20	358325	418987	Roadside		83.0	22.7	24.4	21.5	20.7	20.0
CH58	358399	418579	Roadside		90.6	-	33.3	26	26.1	25.8
CH59	358448	418540	Roadside		100.0	-	24.6	22.6	21.3	21.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CH60	358541	417816	Kerbside		100.0	-	31.9	34.1	33.1	32.4
CH61	358526	417847	Roadside		100.0	-	32.1	30.2	29.2	27.6
CH62	358566	418400	Roadside		100.0	-	30.2	25.5	23.1	20.9
CH64	359064	417752	Kerbside		100.0	-	-	-	11.2	10.4

☒ **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 µg/m^3.

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

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

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.1a –Trends in Annual Mean NO_2 Concentrations Across Chorley North Sampling Sites

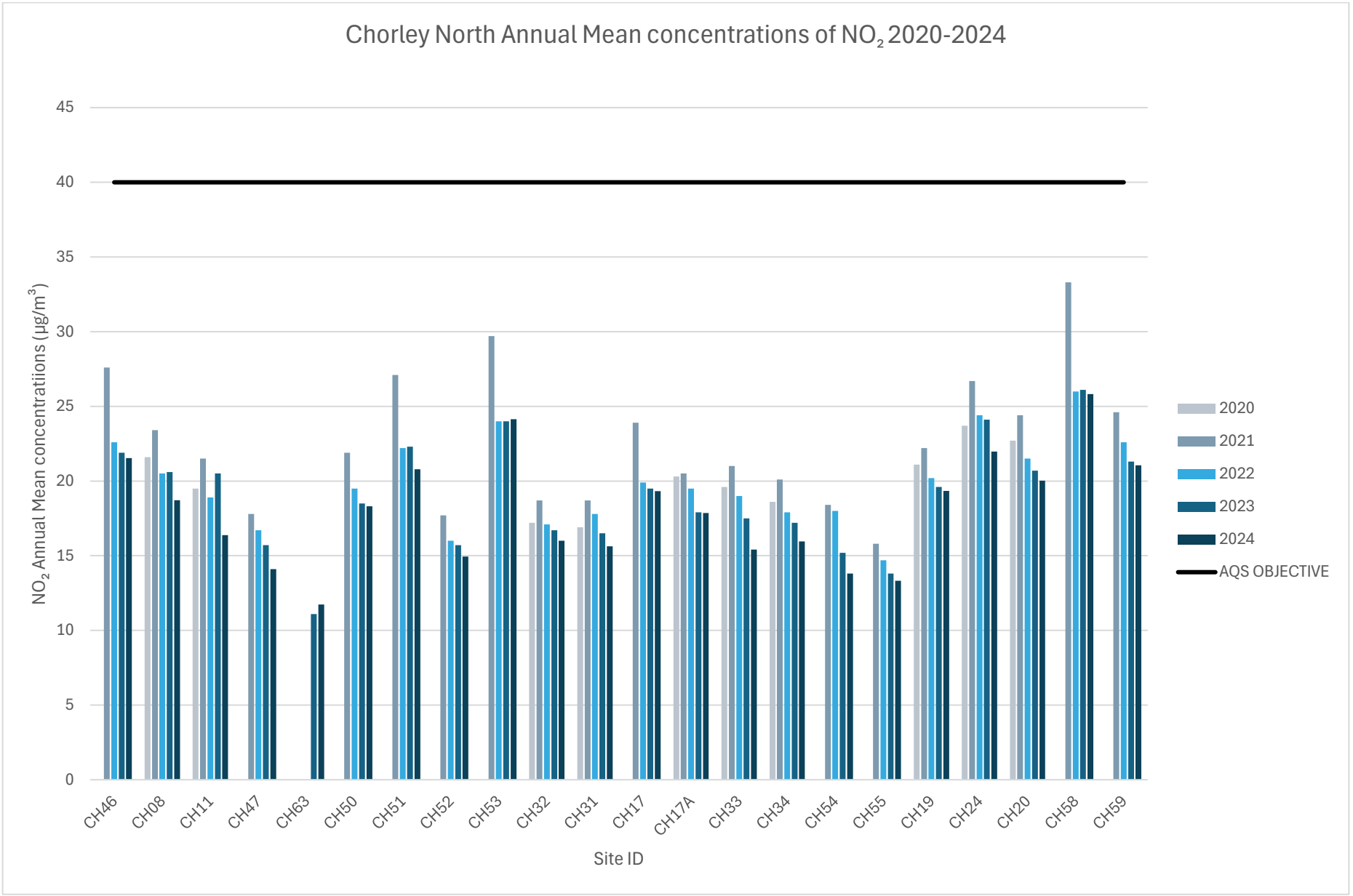


Figure A.1b – Trends in Annual Mean NO_2 Concentrations Across Chorley South Sampling Sites

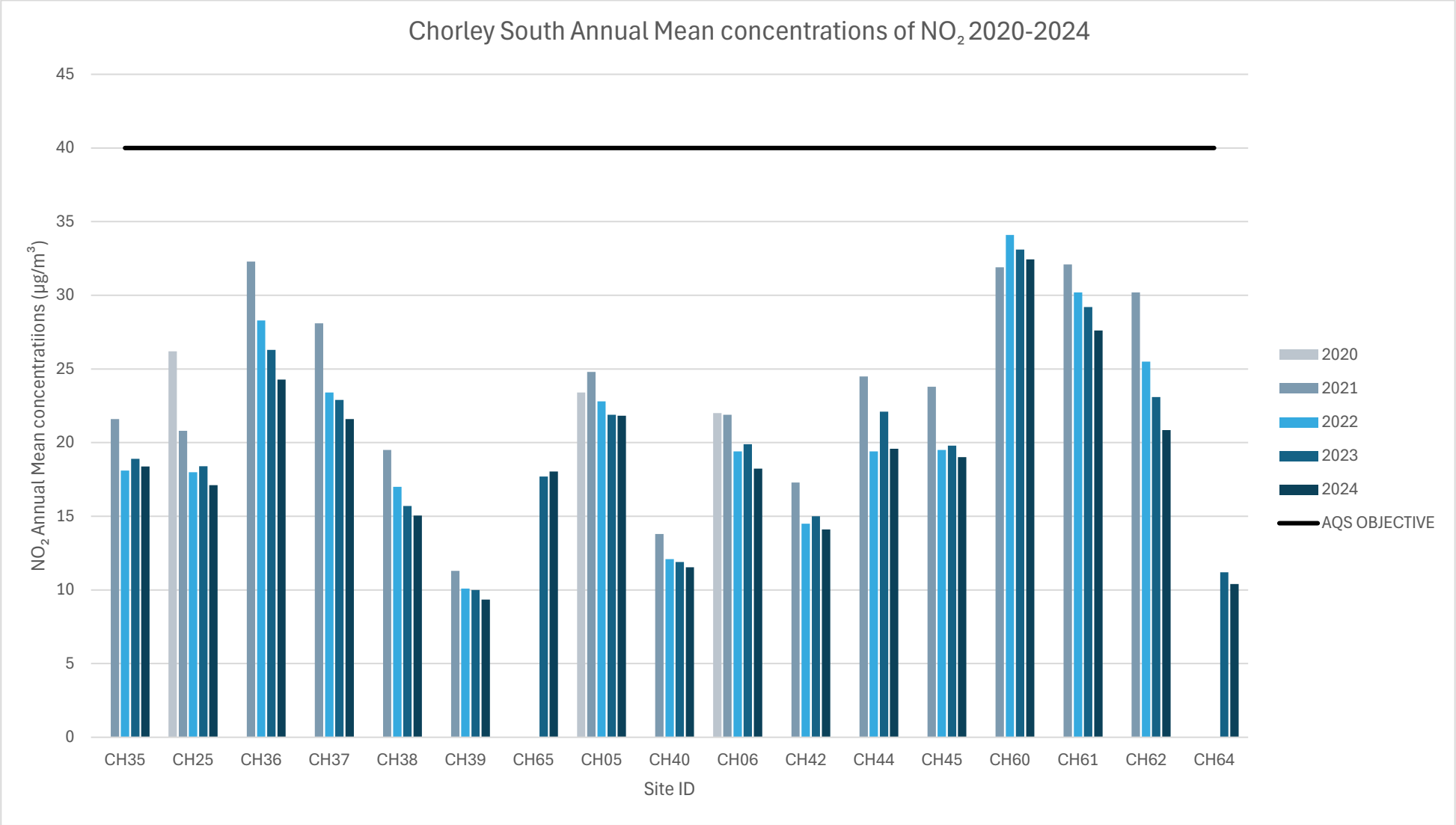


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Chorley Council does not collect this data.

Figure A.2 – Trends in Number of NO_2 1-Hour Means > 200µg/m^3

Chorley Council does not collect this data.

Table A.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Chorley Council do not have Automatic Air Quality Monitoring methods however, we have indicative data. See Table F.3 in Appendix F for details of the Low-cost Zephyr Air Quality Sensor Annual Mean PM_{10} Monitoring Results.

Figure A.3 – Trends in Annual Mean PM_{10} Concentrations

Chorley Council do not have Automatic Air Quality Monitoring methods however; we have indicative data. See Figure F.1 in Appendix F for details of the Low-cost Zephyr Air Quality Sensor 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

Chorley Council do not have Automatic Air Quality Monitoring methods however, we have indicative data. See Table F.4 in Appendix F for details of the Low-cost Zephyr Air Quality Sensor 24-Hour Mean PM_{10} Monitoring Results.

Figure A.4 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m^3

Chorley Council do not have Automatic Air Quality Monitoring methods however, we have indicative data. See Figure F.2 in Appendix F for details of the Low-cost Zephyr Air Quality Sensor trends in Number of 24-Hour Mean PM_{10} Results > 50ug/m^3.

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

Chorley Council do not have Automatic Air Quality Monitoring methods however, we have indicative data See Table F.5 in Appendix F for details of the Low-cost Zephyr Air Quality Sensor Annual Mean $PM_{2.5}$ Monitoring results.

Figure A.5 – Trends in Annual Mean $PM_{2.5}$ Concentrations

Chorley Council do not have Automatic Air Quality Monitoring methods however, we have indicative data. See Figure F.3 in Appendix F for details of the Low-cost Zephyr Air Quality Sensor Trends in Annual Mean $PM_{2.5}$ Concentrations.

Table A.9 – SO_2 2024 Monitoring Results, Number of Relevant Instances

Chorley Council does not collect this data.

Appendix B: Full Monthly Diffusion Tube Results for 2024

Table B.1 – NO_2 2024 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
CH35	358145	417645	29.7	24.9	22.1	17.2	18.6	12.8	15.6	15.6	20.3	23.4	36.2	26.2	21.9	18.4	-	
CH25	358518	417072	27.7	23.3	21.4	16.5	19.9	11.9	13.9	13.2	19.9	23.6	30.8	22.5	20.4	17.1	-	
CH36	358714	416839	37.0	32.2	29.4	28.7	29.7	29.9	26.3	25.6	26.3	30.8	18.7	32.2	28.9	24.3	-	
CH37	358830	416726	28.8	30.2	25.5	24.2	24.2	25.0	24.7	19.6	21.4	26.9	28.9	29.1	25.7	21.6	-	
CH38	359060	416468	26.9	20.0	18.7	16.3	16.9	11.0	13.1	13.2	14.1	21.2	24.2	19.3	17.9	15.0	-	
CH39	358933	415862	-	15.3	11.6	8.6	9.0	6.1	7.9	7.6	9.5	13.2	19.1	14.4	11.1	9.3	-	
CH65	359538	415419	28.0	25.1	20.6	19.9	18.5	17.1	18.6	19.0	20.0	-	26.1	23.3	21.5	18.0	-	
CH05	360095	413089	30.3	30.9	25.9	-	23.4	21.9	22.8	23.8	21.0	27.4	30.7	27.7	26.0	21.8	-	
CH40	358092	416925	21.7	17.4	13.6	10.0	10.6	7.1	8.7	8.9	11.7	15.6	23.2	16.3	13.7	11.5	-	
CH06	357436	416130	-	26.8	22.8	19.1	20.4	16.5	18.0	17.6	21.7	22.3	29.5	24.2	21.7	18.2	-	
CH42	356547	414525	23.5	19.5	16.2	-	14.7	10.4	12.3	11.7	14.8	18.9	24.9	17.9	16.8	14.1	-	
CH44	356039	414054	31.2	26.0	21.1	21.0	22.7	17.5	21.0	18.0	25.4	22.1	28.0	25.8	23.3	19.6	-	
CH45	355534	413755	28.1	26.8	22.2	18.2	20.5	18.6	21.0	18.9	21.9	25.3	27.5	22.7	22.6	19.0	-	
CH46	355540	418309	31.4	26.0	21.7	23.1	24.8	24.4	24.2	23.2	26.1	27.9	30.4	24.4	25.6	21.5	-	
CH08	355891	418467	25.8	25.5	22.8	19.3	20.8	15.0	18.2	15.3	19.9	26.5	33.7	24.6	22.3	18.7	-	
CH11	355454	419317	30.0	25.5	20.8	18.0	14.8	14.3	14.8	15.9	18.1	22.8	-	-	19.5	16.4	-	
CH47	356464	420218	25.2	20.9	18.2	15.2	14.1	12.1	13.6	12.9	15.1	20.6	-	-	16.8	14.1	-	
CH63	356345	420733	21.1	16.7	12.7	10.8	11.1	8.9	10.2	9.6	12.2	16.0	23.4	14.8	14.0	11.7	-	
CH50	355400	422696	25.7	32.7	19.3	20.9	18.1	19.2	17.0	18.2	17.7	21.4	28.0	23.3	21.8	18.3	-	
CH51	355697	422432	31.5	28.7	24.1	23.1	23.9	18.2	22.2	21.8	21.8	26.4	30.3	25.0	24.8	20.8	-	
CH52	357335	424499	25.5	19.1	17.1	15.8	16.9	14.3	14.2	12.3	14.8	18.6	25.5	19.3	17.8	14.9	-	
CH53	357902	423586	33.2	32.8	24.9	-	26.8	28.0	26.6	25.1	26.0	28.4	35.9	28.5	28.8	24.2	-	

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 <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
CH32	358313	422937	25.6	20.8	21.2	15.6	20.8	9.8	15.0	12.9	19.2	21.1	26.9	19.7	19.1	16.0	-	
CH31	357879	423303	27.8	22.9	17.5	15.3	16.7	12.5	15.7	14.7	15.8	20.6	23.3	20.4	18.6	15.6	-	
CH17	357936	422176	34.6	24.1	23.0	19.9	19.4	14.7	17.6	15.7	22.5	24.4	35.3	24.9	23.0	19.3	-	
CH17A	357885	421524	31.2	24.1	22.6	-	19.2	13.5	16.4	14.7	18.3	22.9	28.0	23.0	21.3	17.9	-	
CH33	358110	420361	28.2	23.4	19.4	13.2	16.4	13.0	13.7	14.6	15.3	-	24.6	20.0	18.3	15.4	-	
CH34	358568	420246	25.7	23.4	20.3	16.2	18.1	10.4	13.5	14.8	18.3	21.3	26.7	19.2	19.0	16.0	-	
CH54	358193	419909	24.0	20.5	18.3	14.7	15.1	11.0	13.3	13.0	15.8	-	-	18.6	16.4	13.8	-	
CH55	359415	419740	22.3	18.9	14.9	14.4	14.4	12.4	11.5	12.8	15.2	16.8	19.0	17.8	15.9	13.3	-	
CH19	358335	419226	32.2	24.5	19.9	22.9	20.6	17.3	17.6	17.4	23.9	23.7	29.6	26.7	23.0	19.3	-	
CH24	358023	419151	33.6	29.2	29.0	23.2	25.0	20.5	21.5	22.7	22.7	25.1	35.0	26.4	26.2	22.0	-	
CH20	358325	418987	31.8	27.4	21.1	21.3	20.8	-	18.6	18.7	20.0	24.9	33.7	-	23.8	20.0	-	
CH58	358399	418579	40.3	30.8	31.0	28.7	29.4	21.7	24.9	24.3	30.3	-	45.0	31.8	30.7	25.8	-	
CH59	358448	418540	32.0	27.0	24.8	22.8	24.0	17.6	19.0	19.2	23.4	28.4	35.5	27.1	25.1	21.1	-	
CH60	358541	417816	41.6	43.8	35.4	35.9	37.6	38.6	35.2	45.0	33.8	36.3	43.2	36.9	38.6	32.4	-	
CH61	358526	417847	40.1	38.8	35.0	30.7	30.5	25.7	27.4	21.1	28.3	37.9	42.7	36.2	32.9	27.6	-	
CH62	358566	418400	32.5	27.9	25.4	24.1	25.6	21.3	21.4	10.2	25.8	27.1	29.2	27.4	24.8	20.9	-	
CH64	359064	417752	20.6	18.1	13.7	10.3	10.2	8.3	10.0	0.1	10.6	15.3	14.3	17.0	12.4	10.4	-	

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

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

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

☒ **Chorley Council confirm that all 2024 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Chorley Council During 2024

Chorley Council has not identified any new sources relating to air quality within the reporting year of 2024.

Additional Air Quality Works Undertaken by Chorley Council During 2024

Chorley Council has not completed any additional works within the reporting year of 2024.

QA/QC of Diffusion Tube Monitoring

In 2024 Chorley Council used Gradko Environmental Ltd as the supplier for diffusion tubes and in continuation from previous years, the method of preparation was 20% TEA in water.

The precision and accuracy of Gradko's analysis of the diffusion tubes is confirmed to be at a good level, based on their performance in the AIR NO_2 Proficiency Testing (PT) Scheme and precision survey by DEFRA (Table C.1a).

Gradko continued their participation in the AIR NO_2 Proficiency Testing Scheme. This scheme involves sending UK Laboratories diffusion tubes spiked with known masses of nitrite to demonstrate the precision and accuracy of their analysis on a quarterly basis.

Table C.1a shows that Gradko have produced a 100% satisfactory response from samples across rounds from May 2022 to June 2024. Gradko can also be compared to the other UK Laboratories that take part in the AIR Nitrogen Dioxide PT rounds and are involved with LAQM.

To have precise diffusion tube analysis, it means that the UK laboratories to have been able to reproduce measurements. For example, ideally this would mean producing duplicate measurements with the same value. Table C.1b demonstrates the precision of Nitrogen Dioxide results analysed by Gradko compared to the other UK Laboratories. Gradko presented only "good" levels of precision from 2022-2024. This is vital because poor precision cannot be adjusted.

In addition, at Chorley Council the air quality monitoring was completed in adherence with the 2024 Diffusion Tube Monitoring Calendar

Table C.1a- Laboratory summary performance for AIR Nitrogen Dioxide PT rounds, 2022-2024

AIR PT Round	AR050	AR052	AR053	AR055	AR056	AR058	AR059	AR062	AR063
Round conducted in the period	**May – Jun 2022**	**Jul – Aug 2022**	**Sep – Oct 2022**	**Jan – Feb 2023**	**May – Jun 2023**	**Jul – Aug 2023**	**Sep – Oct 2023**	**Jan - Feb 2024**	**Apr - Jun 2024**
Aberdeen Scientific Services	100%	100%	100%	0%	100%	100%	75%	100%	100%
Edinburgh Scientific Services	50%	100%	100%	100%	75%	100%	50%	100%	100%
SOCOTEC	100% [1]	100% [1]	100% [1]	100% [1]	100% [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]
Glasgow Scientific Services	100%	100%	100%	100%	100%	100%	100%	75%	100%
Gradko International	**100% [1]**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Lambeth Scientific Services	75%	100%	50%	0%	75%	50%	0%	50%	50%
Milton Keynes Council	100%	75%	100%	50%	75%	100%	100%	100%	NR [2]
Somerset Scientific Services	100%	75%	100%	100%	75%	100%	100%	100%	100%
South Yorkshire Air Quality Samplers	NR [2]	NR [2]	NR [2]	NR [2]	NR [2]	NR [2]	NR [2]	NR [2]	NR [2]
Staffordshire County Council	100%	0%	100%	100%	100%	100%	100%	100%	100%

Tayside Scientific Services (formerly Dundee CC)	NR [2]	100%	100%	NR [2]	100%	NR [2]	NR [2]	NR [2]	NR [2]

[1] Participant subscribed to two sets of test results (2 x 4 test samples) in each AIR PT round.

[2] NR, No results reported.

Table C.1b- Summary of Precision Results for Nitrogen Dioxide Diffusion Tube Collocation Studies by Laboratory, 2022-2024

Diffusion Tube Preparation Method	2022 Good	2022 Bad	2023 Good	2023 Bad	2024 Good	2024 Bad
Gradko, 50% TEA in Acetone	16	0	16	0	11	0
Gradko, 20% TEA in Water	33	0	25	0	26	0
ESG Didcot / SOCOTEC, 50% TEA in Acetone	29	0	33	2	30	3
ESG Didcot / SOCOTEC, 20% TEA in Water	11	0	8	0	1	0
Staffordshire Scientific Services	13	0	12	0	16	0
Glasgow Scientific Services	3	3	1	0	1	0
Edinburgh Scientific Services	1	0	4	2	1	1
Milton Keynes Council	1	0	1	0	1	0
Tayside Scientific Services	1	0	1	0	1	0
Lambeth Scientific Services	6	4	10	1	2	0
Aberdeen Scientific Services	7	0	7	0	6	0

ESG Glasgow, 50% TEA in Acetone	1	0	1	0	1	0
ESG Glasgow, 20% TEA in Water	1	0	1	0	1	0
Somerset County Council	14	0	12	0	4	0

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Chorley Council recorded data capture of 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.

Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Annualisation was not required for any of the non-automatic data.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 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.

Chorley Council have applied a national bias adjustment factor of 0.84 to the 2024 monitoring data. A summary of bias adjustment factors used by Chorley Council Table C.

A screenshot of the National Diffusion Tube Bias Adjustment Factor spreadsheet (April 2025 version) for Gradko 20% TEA in Water diffusion tubes is included below as a reference.

National Diffusion Tube Bias Adjustment Factor Spreadsheet

Spreadsheet Version Number: 04/25

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 June 2025

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

If a laboratory is not shown, we have no data for this laboratory.

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

If a preparation method is not shown, we have no data for this method at this laboratory.

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

If a year is not shown, we have no data[2]

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[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m3)	Automatic Monitor Mean Conc. (Cm) (µg/m3)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2024	UV	Belfast City Council	10	24	20	19.9%	G	0.83
Gradko	20% TEA in water	2024	R	Belfast City Council	12	43	34	28.8%	G	0.78
Gradko	20% TEA in water	2024	R	Belfast City Council	12	24	21	13.9%	G	0.88
Gradko	20% TEA in water	2024	R	Belfast City Council	12	34	27	25.5%	G	0.80
Gradko	20% TEA in water	2024	R	Blackburn With Darwen Bc	12	22	17	32.9%	G	0.75
Gradko	20% TEA in water	2024	R	Bath & North East Somerset	12	25	20	22.6%	G	0.82
Gradko	20% TEA in water	2024	R	Cambridge City Council	12	19	15	28.5%	G	0.78
Gradko	20% TEA in water	2024	UB	Plymouth City Council	12	16	14	13.8%	G	0.88
Gradko	20% TEA in water	2024	R	Plymouth City Council	12	31	23	33.4%	S	0.75
Gradko	20% TEA in water	2024	R	Monmouthshire County Council	12	29	24	19.4%	G	0.84
Gradko	20% TEA in water	2024	KS	Marylebone Road Intercomparison	11	41	36	16.1%	G	0.86
Gradko	20% TEA in water	2024	R	Lisburn & Castlereagh City Council	12	24	19	27.8%	G	0.78
Gradko	20% TEA in water	2024	R	Ards And North Down Borough Council	11	28	20	44.5%	G	0.69
Gradko	20% TEA in water	2024	R	Eastleigh Borough Council	12	29	24	20.3%	G	0.83
Gradko	20% TEA in water	2024	UB	Eastleigh Borough Council	12	19	17	12.4%	G	0.89
Gradko	20% TEA in water	2024	R	Eastleigh Borough Council	12	19	17	12.0%	G	0.89
Gradko	20% TEA in water	2024	R	Gateshead Council	12	20	18	13.9%	G	0.88
Gradko	20% TEA in water	2024	R	Gateshead Council	11	20	17	19.7%	G	0.84
Gradko	20% TEA in water	2024	R	Gateshead Council	12	24	20	21.7%	G	0.82
Gradko	20% TEA in water	2024	R	Gateshead Council	12	27	23	19.0%	G	0.84
Gradko	20% TEA in water	2024	R	Gateshead Council	12	28	30	-6.0%	G	1.06
Gradko	20% TEA in water	2024	R	Brighton & Hove City Council	11	34	27	26.3%	G	0.79
Gradko	20% TEA in water	2024	R	Liverpool City Council	12	34	25	35.7%	G	0.74
Gradko	20% TEA in water	2024	KS	Liverpool City Council	10	52	47	10.2%	G	0.91
Gradko	20% TEA in water	2024	R	Nottingham City Council	10	29	26	12.2%	G	0.89
Gradko	20% TEA in water	2024	R	Wychavon District Council	10	29	26	14.7%	G	0.87
Gradko	20% TEA in water	2024	R	Worcestershire	12	12	12	-3.4%	G	1.04
Gradko	20% TEA in water	2024		Overall Factor[3] (27 studies)				Use		0.84

Table C.3 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2024	National	04/25	0.84
2023	National	03/24	0.81
2022	National	03/23	0.83
2021	National	04/22	0.84
2020	National	06/21	0.81

Table C.4 – Local Bias Adjustment Calculation

No local bias adjustment was performed on the 2024 diffusion tube results.

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 Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within Chorley Council required distance correction during 2024.

QA/QC of Automatic Monitoring

Chorley Council does not collect Automatically Monitored data and despite the Low-cost Zephyr Air Quality Sensors not being certified for compliance reporting they are described here because of the indicative results they provide (see Appendix F). The data from these Air Quality Sensors are not able to be presented as a form of compliance reporting in the ASR.

In 2021, three Zephyr Air Quality Sensors were purchased from EarthSense Systems Limited (Leicester, UK). Calibration was carried out over seven days at the EarthSense manufacturing facility before they were installed in the borough.

Officers in Environmental Health are the main Council staff that periodically observe the running of the air quality sensors and check them remotely to ensure they are still operating. If any of the sensors stop working, then they can be sent back to EarthSense who will perform the relevant repairs.

Each of the Zephyr Air Quality Sensors has a calibration certificate which shows the performance of the air sensor for measuring pollutants, before it is sent out to the customer. Furthermore, the calibration certificate explains the checking process done by EarthSense to see which units require remote re-calibrations. These do not overwrite existing data but are applied to all newly acquired data. Finally, EarthSense can perform periodic re-calibrations to correct for any systematic biases, which come from comparing a Zephyrs' data with a regional average of EU-standard reference stations.

The Earthsense data website shows both the historic and live monitoring data and can be accessed by following this link to the South Ribble Earth Sense Portal.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The type of PM_{10}/$PM_{2.5}$ monitors utilised within Chorley Council do not require the application of a correction factor.

Automatic Monitoring Annualisation

Annualisation for the Low-Cost Zephyr Air Quality Sensors was required for two locations which had less than a 75% capture rate, due to missing data when it was retrieved from the EarthSense website.

The sites requiring annualisation were: CH59 and CH05

The Automatic Urban and Rural Network urban background sites at Wigan (UKA00482, Easting/Northing: 357816, 406024) and Preston (UKA00408, Easting/Northing: 355250, 430131) were used to provide an annualisation correction factor which was applied to the sites. Details of the annualisation calculations are provided in Table C.5.

The remaining Zephyr monitoring site within Chorley Council recorded data capture of greater than 75% and therefore annualization was not required.

Also please note, the Zephyr data has not been adjusted to a co-location methodology.

Table C.4 – Automatic NO_2 Annualisation Summary (concentrations presented in µg/m^3)

Background Site	Annual Data Capture (%)	Annual Mean (A_m)	CH59		CH05	
			Period Mean (P_m)	Ratio (A_m / P_m)	Period Mean (P_m)	Ratio (A_m / P_m)
Wigan Central	90.0	12.7	12.7	0.998	12.7	1.000
Preston	98.6	15.6	15.6	0.998	15.6	1.000
Average (R_a)			0.998		1.000	
Raw Data Annual Mean (M)			14.1		16.3	
Annualised Annual Mean (M x R_a)			14.1		16.3	

Table C.5 – Automatic PM_{10} Annualisation Summary (concentrations presented in µg/m^3)

Background Site	Annual Data Capture	Annual Mean (A_m)	CH59		CH05	
			Period Mean (P_m)	Ratio (A_m/P_m)	Period Mean (P_m)	Ratio (A_m/P_m)
Wigan Centre	98.1	12.0	12.0	0.998	12.0	1.000
Preston	99.9	11.3	11.4	0.998	11.3	1.000
Average (R_a)			0.998		1.000	
Raw Data Annual Mean (M)			10.3		11.9	
Annualised Annual Mean (M x R_a)			10.2		11.9	

Table C.6 – Automatic $PM_{2.5}$ Annualisation Summary (concentrations presented in µg/m^3)

Background Site	Annual Data Capture	Annual Mean (A_m)	CH59		CH05	
			Period Mean (P_m)	Ratio (A_m/P_m)	Period Mean (P_m)	Ratio (A_m/P_m)
	98.1	7.5	7.5	0.997	7.5	0.998

Background Site	Annual Data Capture	Annual Mean (A_m)	CH59		CH05	
			Period Mean (P_m)	Ratio (A_m/P_m)	Period Mean (P_m)	Ratio (A_m/P_m)
Wigan Centre						
Preston	99.9	6.9	6.9	0.998	6.9	0.998
Average (R_a)			**0.998**		**0.998**	
Raw Data Annual Mean (M)			**6.5**		**7.7**	
Annualised Annual Mean (M x R_a)			**6.5**		**7.7**	

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 Chorley Council required distance correction during 2024.

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

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

Chorley North Monitoring Sites 2024

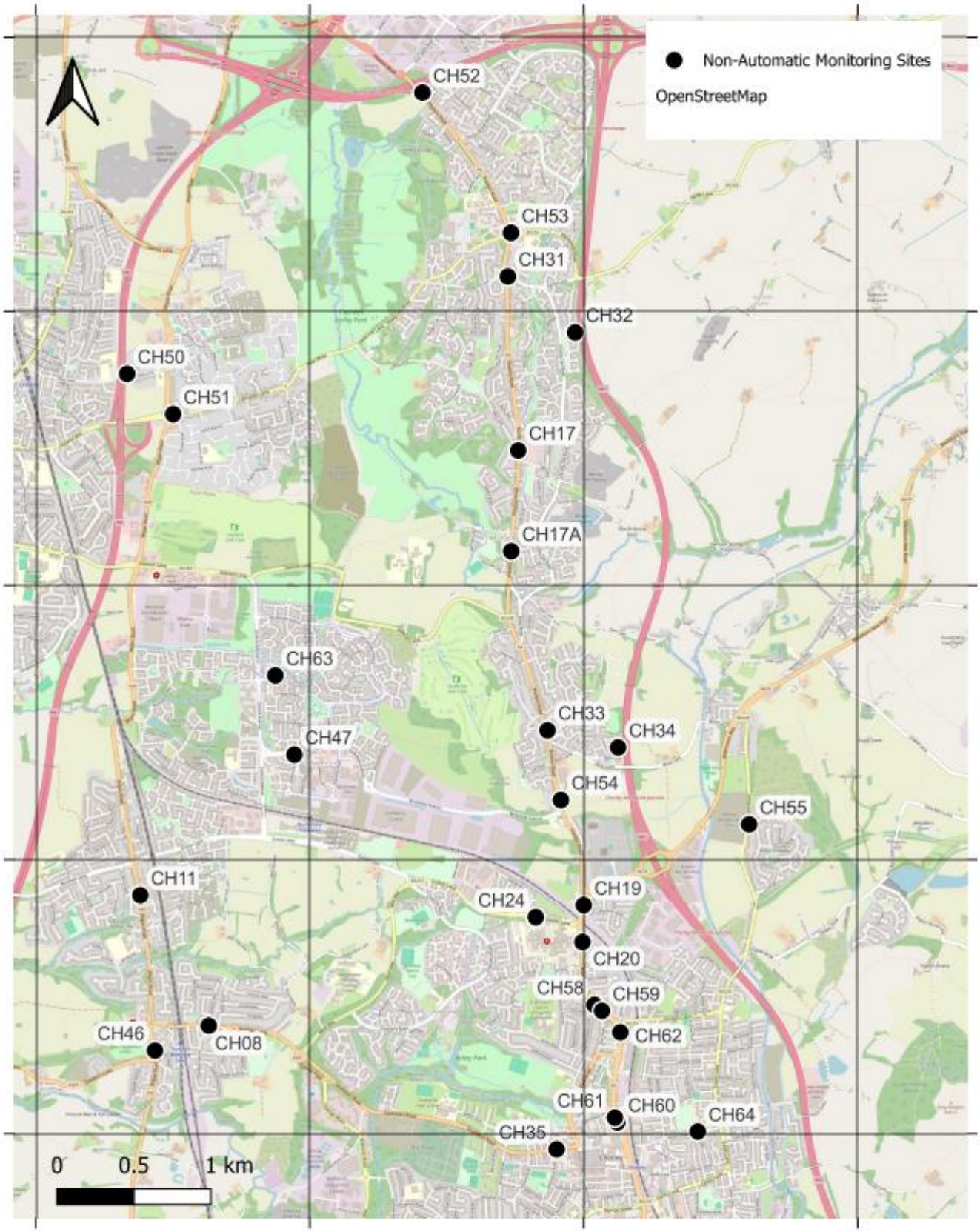


Figure D. 2 –Map of Non-Automatic Monitoring Sites Chorley South

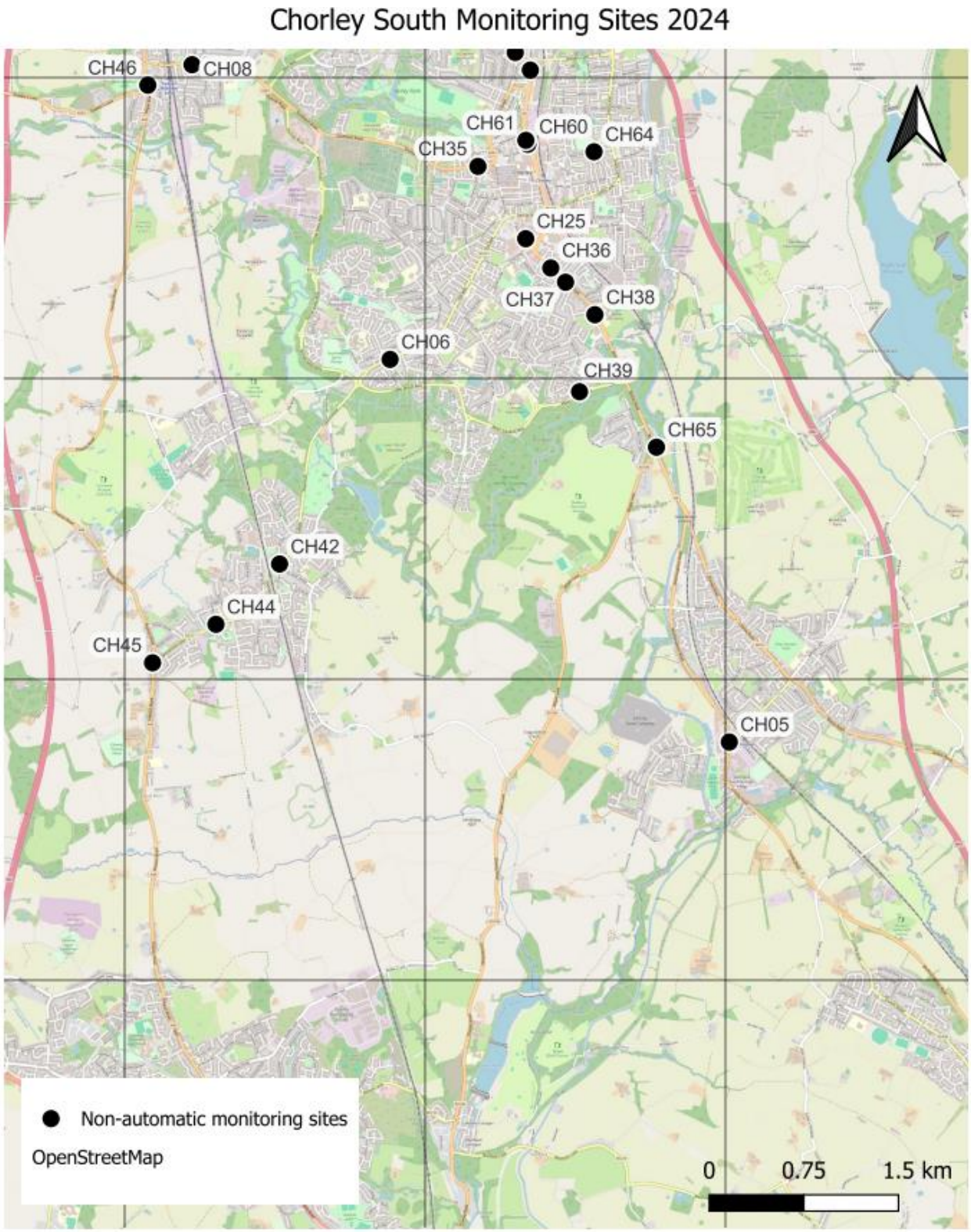
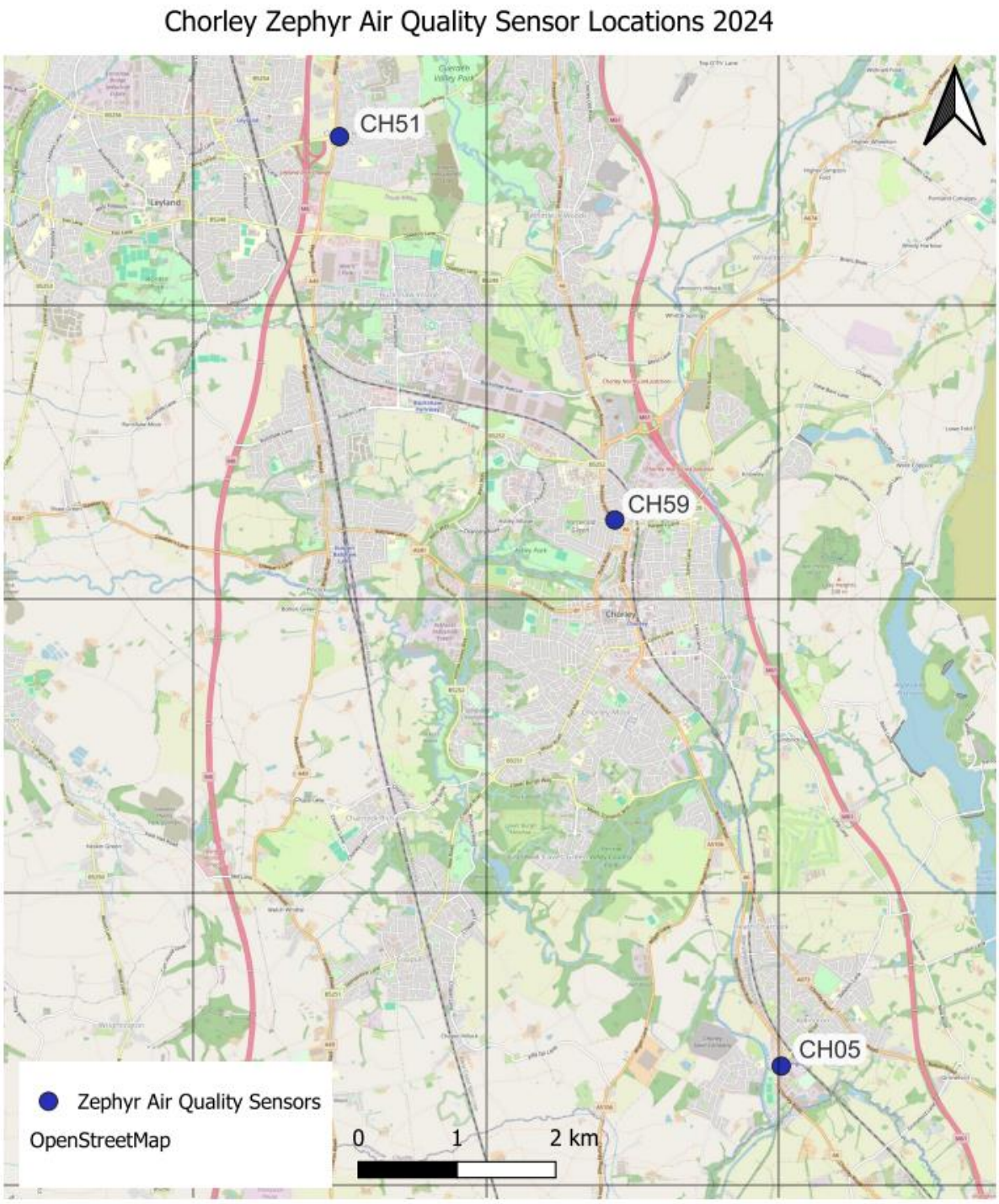


Figure D. 3 –Map of Zephyr Air Quality Sensors in the Chorley Borough 2024



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[2]

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

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

Appendix F: Low-cost Zephyr Air Quality Sensor Data

The data collected from these sensors are not certified for compliance reporting against The Ambient Air Quality Directives using the Environment Agency's Indicative Instrument Certification scheme. Therefore, the data from these Air Quality Sensors are not able to be presented as a form of compliance reporting in the ASR.

Table F.1 – Details of Zephyr Air Quality Sensor Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Which AQMA? (1)	Monitoring Technique	Distance to Relevant Exposure (m) (2)	Distance to kerb of nearest road (m) (1)	Inlet Height (m)
CH59	Chorley	Roadside	358448	418540	NO, NO_2, O_3, PM_{10}, $PM_{2.5}$, PM_1	NO		Optical particle counter	0.5	3	2.5
CH05	Adlington	Roadside	360086	413012	NO, NO_2, O_3, PM_{10}, $PM_{2.5}$, PM_1	NO		Optical particle counter	0.5	1.5	2.5
CH51	Clayton - le - Woods	Roadside	355697	422432	NO, NO_2, O_3, PM_{10}, $PM_{2.5}$, PM_1	NO		Optical particle counter	3.5	2	2.5

Notes:

(1) N/A if not applicable

(2) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

Table F.2 – Annual Mean NO_2 Monitoring Results: Zephyr Air Quality Sensor (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 2024 (%) (2)	2020	2021	2022	2023	2024
CH59	358448	418540	Roadside	100.0	67.1	-	-	-	16	14.1
CH05	360095	413089	Roadside	-	0.0	-	-	-	17	16.3
CH51	355697	422432	Roadside	98.5	98.2	-	-	-	17.8	18.7

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

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

☒ **Where exceedances of the NO_2 annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2024.**

Notes:

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

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

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

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 F.3 – Annual Mean PM_{10} Monitoring Results from Zephyr Air Quality Sensors (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 2024 (%) (2)	2020	2021	2022	2023	2024
CH59	358448	418540	Roadside	100.0	67.1	-	-	10.00	9.30	10.2
CH05	360086	413012	Roadside	98.7	66.2	-	-	14.00	12.10	11.9
CH51	355697	422432	Roadside	98.5	98.2	-	-	11.00	9.80	10.3

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

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 F.1 – Trends in Annual Mean PM_{10} Concentrations from Zephyr Air Quality Sensors

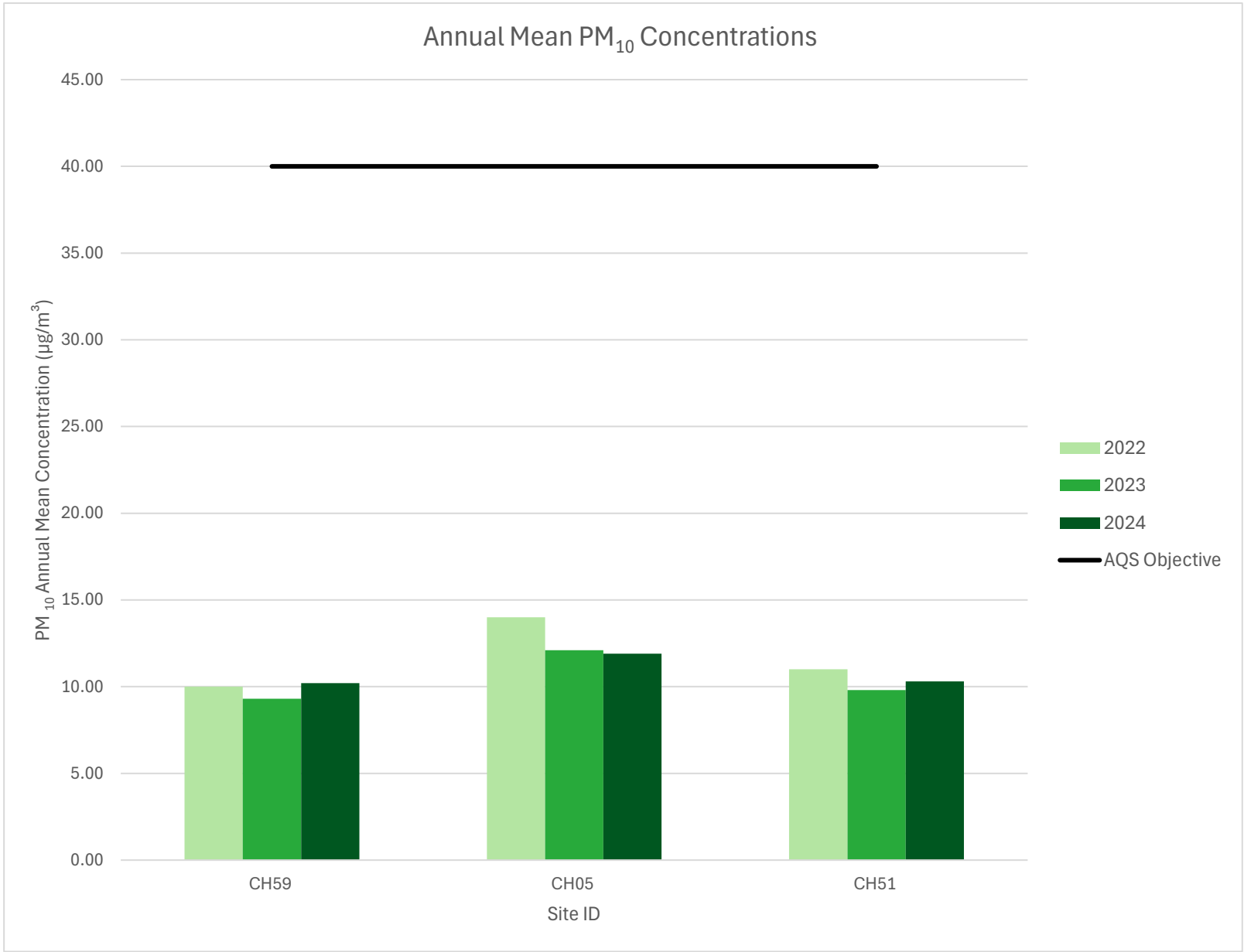


Table F.4 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3 from Zephyr Air Quality Sensors

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CH59	358448	418540	Roadside	100.0	67.1	-	-	0	0	0 (22)
CH05	360086	413012	Roadside	98.7	66.2	-	-	1	0	0 (24)
CH51	355697	422432	Roadside	98.5	98.2	-	-	0	0	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 F.2 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m³ from Zephyr Air Quality Sensors

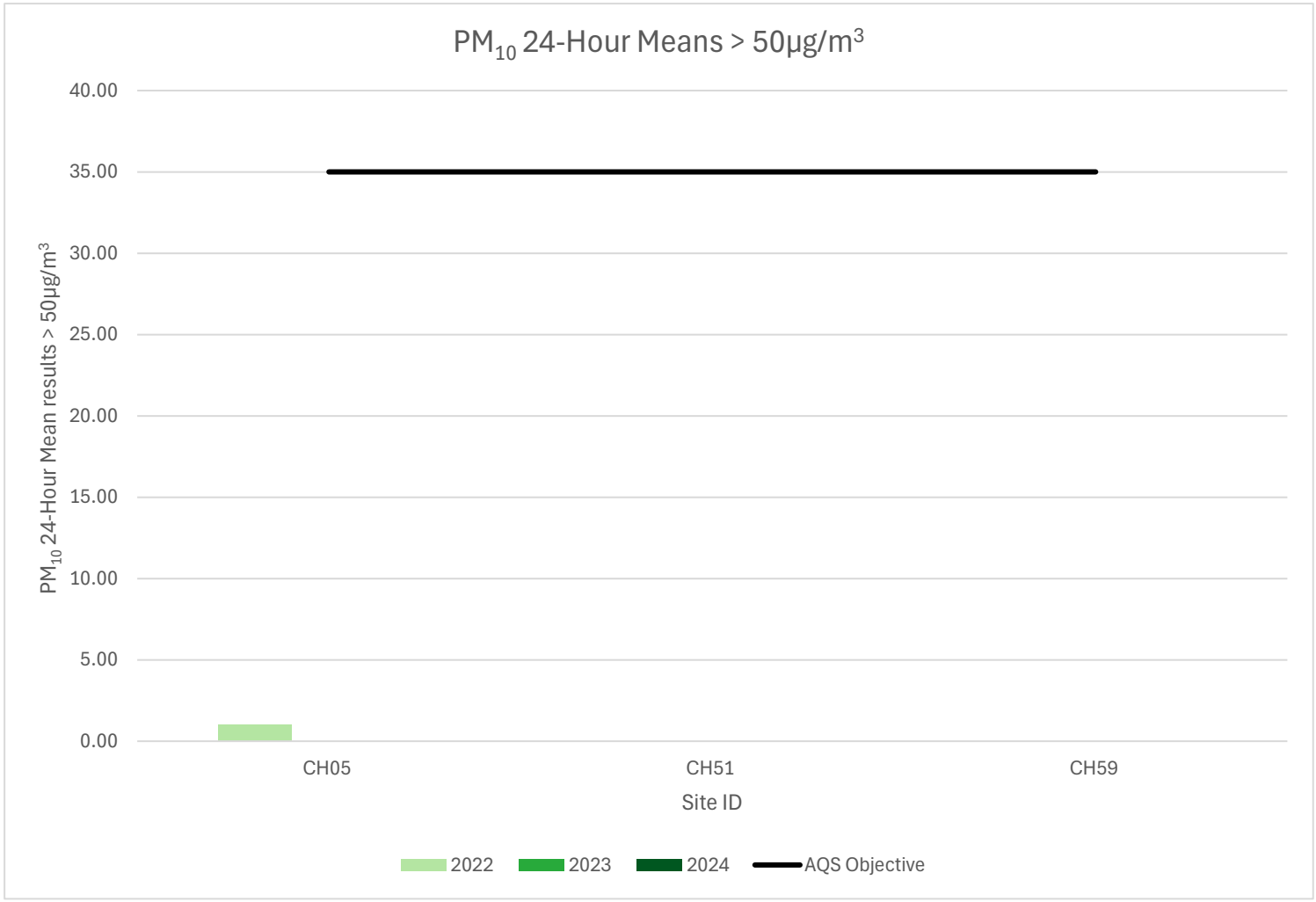


Table F.5 – Annual Mean $PM_{2.5}$ Monitoring Results from Zephyr Air Quality Sensors (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
CH59	358448	418540	Roadside	100.0	67.1	-	-	7	6	6.5
CH05	360086	413012	Roadside	98.7	66.2	-	-	9	7.7	7.7
CH51	355697	422432	Roadside	98.5	98.2	-	-	7	5.8	6.3

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

Notes:

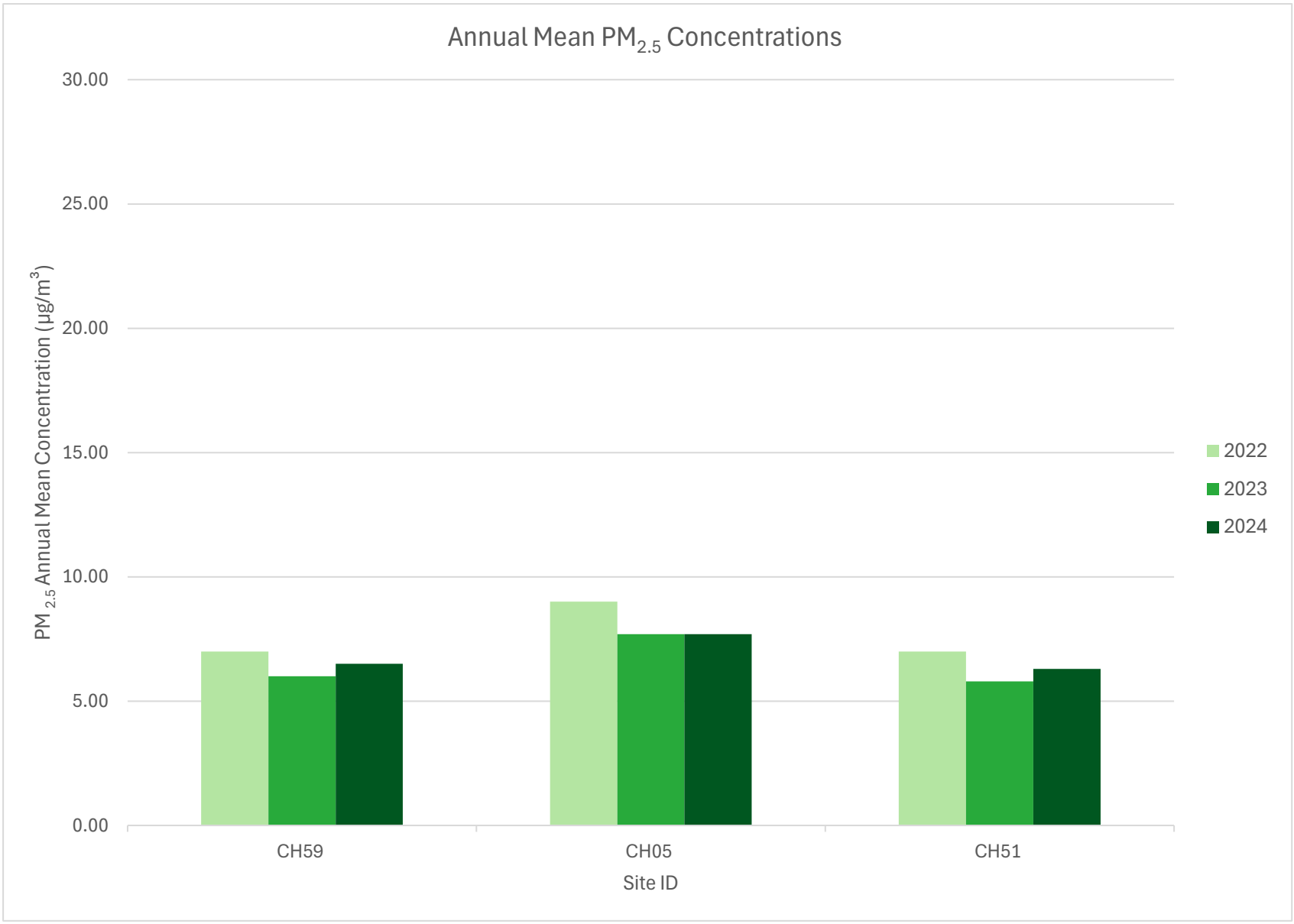
The annual mean concentrations are presented as µg/m^3.

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 F.3 – Trends in Annual Mean $PM_{2.5}$ Concentrations from Zephyr Air Quality Sensors



Glossary of Terms

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

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