






2020 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the
Environment Act 1995
Local Air Quality Management

June 2020

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Executive Summary: Air Quality in Our Area

Air Quality in Chorley 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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

The principle pollutants of concern within Chorley are those mainly associated with traffic, these being Nitrogen Dioxide, and Particulate Matter. The Council monitors Nitrogen Dioxide emissions via a network of passive diffusion tubes. Currently there are no Air Quality Management Areas declared within the borough as the Air Quality Objectives are being met.

The diffusion tube programme measures concentrations from traffic sources at the busiest roads and junctions where there is a potential for exposure to the public, either by proximity to residential properties or where the public might be expected to spend time. The monitoring programme is reviewed regularly to identify the likely worse cases as new developments or changes in traffic flow are identified that might impact on an area or introduce new receptors close to a significant source.

There is an overall downward trend in monitored Nitrogen Dioxide levels. All but three diffusion tubes show either falling or stable levels. The three with very slight upward trends will continue to be monitored.

An Air Quality Action Plan is not a statutory requirement, as there are no AQMA's declared in the Chorley area. However, the development of an Air Quality Strategy will help to identify the key areas for intervention, promote a partnership approach to air

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

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

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

quality with health colleagues and provide a mechanism for engagement with key stakeholders.

To that end, Chorley Council has identified Air Quality as a Corporate Priority and set aside a capital budget for the undertaking of additional air quality monitoring and the implementation of measures identified by the Air Quality Strategy.

Chorley Council works closely with Public Health colleagues at Lancashire County Council. The Director of Public Health has provided a statement for inclusion in this report.

Actions to Improve Air Quality

- A key action for Chorley Council and the neighbouring local authorities of Preston City Council and South Ribble Borough Council is the revision and updating of the Central Lancashire Local Plan.

Officers from all three authorities have been providing input in relation to air quality, with a particular focus on sustainable development, energy generation and conservation, alternative transport options and the infrastructure inclusions necessary to encourage behavioural change while still delivering economic growth.

This ambitious plan will then support the individual authorities to implement planning guidance that seeks to minimise any negative impact of development on air quality and strive to improve air quality.

- Chorley Council will continue to monitor Nitrogen Dioxide emissions from traffic sources and will implement changes to monitoring locations in light of development and changes in traffic flows and road layout as identified by a recent review process. The 2020 monitoring programme has been reviewed and includes 6 new sites.
- Chorley Council will develop and implement an Air Quality Strategy which will include a range of ideas designed to improve air quality and increase public engagement. This local Strategy will complement and reflect the Clean Air Strategy 2019 and the Road to Zero campaign launched by Central Government.

The most important element of the strategy will be publicity and communications, to educate, inform and motivate the public to effect behavioural change, as this is the key to long term improvements in air quality. These changes will of course need to be supported by the appropriate infrastructure, which is where planning policy and transport planning play a vital role.

The Council has committed a capital budget to implement a more detailed monitoring programme of a wider range of pollutants to help inform our future actions and provide empirical data to support planning policy and education initiatives.

Lancashire County Council Summary for Air Quality Annual Status Reports, 2020

In Lancashire, the strongest evidence we have concerning the population health impacts of air pollution comes from Public Health England's Public Health Outcomes Framework. This Framework estimates ['the fraction of adult mortality attributable to particulate air pollution \(PM_{2.5}\)'](#) each year. It shows that, while the overall mortality rate from particulate air pollution in Lancashire-12 (4.0%) is lower than the England average (5.2%), air pollution is still a significant public health issue for the county.

Working with district councils, Lancashire County Council has an important role to play in taking action to reduce these health impacts of air pollution. Responsible for transport planning, network management, highway maintenance, public health and procuring local vehicle fleets, there are a number of ways LCC can support local and county wide efforts to improve air quality. In summary, the following activities are underway or in development:

1. Encouraging the use of sustainable forms of travel

- Lancashire's cycling and walking strategy, [Actively Moving Forward](#), sets out an ambitious plan for increasing the number of people walking and cycling in the county by 2028. Through improving and increasing access to cycling and walking infrastructure, alongside training and promotional activities, it aims to significantly increase the amount of cycling and walking people do across the county.

- As part of Lancashire's cycling and walking strategy, work has now commenced on developing Local Cycling and Walking Infrastructure Plans (LCWIPs) for the five Lancashire Highway and Transport Masterplan areas. The Plans will include a network plan for cycling and walking infrastructure and a prioritised list of schemes for delivery over short, medium and long term timeframes. These plans will be used to support future infrastructure decisions and access new funding schemes as they become available.
- [Connecting East Lancashire](#) is a 'smarter travel choices' campaign designed to encourage healthier and greener ways of travelling in East Lancashire. A dedicated team of Business Travel Planners work with individuals and organisations across east Lancashire to support a shift towards more sustainable and active forms of travel.
- The Road Safety Team work with schools, workplaces and the community to encourage safe and sustainable modes of travel. Initiatives for schools are promoted through the [Safer Travel Moodle](#) and include: a series of cycling and walking safety training programmes; guidance and resources for teachers to encourage safe and active travel; and support for creating travel plans.

2. Supporting the transition to low emission vehicles

- The County Council is working with BP Chargemaster to deliver 150 electric vehicle charge points across the County. [The charging network](#) will be accessible to drivers from all over the country, and will support local and national efforts to increase the number of drivers purchasing electric vehicles.
- The County Council is supporting six district councils with a low emission taxi infrastructure scheme. Funded by the Office for Low Emission Vehicles, the scheme will provide taxi drivers with access to 24 new rapid electric vehicle charge points across the six districts. This, alongside a series of promotional activities and suggested regulatory changes, is designed to produce a transition towards more low emission taxi vehicles across Lancashire.

3. Creating cleaner, healthier road networks

- Work to develop the next Local Transport Plan (LTP4) for Lancashire, Blackpool and Blackburn with Darwen is now underway. The Public Health team has

submitted an evidence base to the process, highlighting transport related health challenges affecting the population of Lancashire and making recommendations about how local transport planning policy can make a contribution to addressing these. Air quality is one of the key themes of the evidence base and will be an identified priority in LTP4. The local [Highways and Transport Masterplans](#) will be refreshed to align with the priorities of LTP4, which will provide an opportunity to identify longer-term network solutions that address issues in AQMAs and have a positive impact on air quality generally.

- The Lancaster City Centre Movement Strategy is looking at how vehicular, public transport and pedestrian walking movements can be improved across the city. A key facet of the study is to examine what improvements can be implemented to prioritise public transport, reduce severance, improve air quality and effectively make the city centre a more welcoming environment for people. The intention is for a similar approach to be adopted as part of future Highways and Transport Masterplans.
- The County Council's vehicle fleet will be fitted with a driver behaviour tracking system to monitor and influence driver behaviour. The aim of the tracking system is to improve driver performance, reducing fuel costs, road accidents and vehicle emissions.

4. Embedding air quality into policy

- The County Council works with district planners to ensure air quality is a key consideration of Local Plans, alongside wider public health issues. It supports district councils in developing policies that seek to ensure new developments do not contribute to increasing levels of air pollutants and that requirements for appropriate mitigation are in place.
- The County Council, as part of its highways input into planning applications, actively encourages measures that aim to promote sustainable forms of travel. Working under the direction of the National Planning Policy Framework, the Council seeks measures that facilitate cycling and walking, increase the use of public transport and provide access to electric vehicle charge points. The County Council also seeks funding from developers, through section 106 contributions, to support existing bus services or to provide new bus services suitable to serve development sites once their built.

- The County Council is working with Lancaster and Birmingham Universities to develop evidence based guidance for the use of green infrastructure as an approach to mitigating the health impacts of road transport emissions. The guidance will enable organisations to introduce the most effective infrastructure at the most appropriate sites. In time, there may be opportunities for further projects around this work.

5. Raising awareness and increasing engagement

- The Lancashire Insight website provides information on the sources and health impacts of air pollution. Webpages include a [Summary of Emissions Data](#), [Monitoring of Air Quality and Health Impacts](#) and an [Air Quality and Health Dashboard](#).
- The County Council is the process of developing a clean air programme for schools. The toolkit will include: guidance and support for schools on developing a clean air strategy; lesson plans, activities and resources for teachers; provision of LCC's cycling and walking programmes; and resources for delivering a Clean Air Day event and creating a clean air banner.

Conclusions and Priorities

Air Quality remains a key priority for Chorley Council and its partners.

The current monitoring data shows a general downward trend in Nitrogen Dioxide for most sites, there are some sites that are static or displaying slight increases and these will be assessed closely.

The diffusion tube monitoring sites are continually reviewed and due to some new developments and changes in traffic flow and road layout there have been some alternative locations identified for inclusion from January 2020.

There are no exceedences of the Air Quality Objectives in Chorley, but that does not mean we are complacent.

The development and implementation of an Air Quality Strategy will be the main focus for the forthcoming year, and this will drive us to improving air quality standards further and look at new initiatives to engage with the public and other important stakeholders.

Our input into the Central Lancashire Local Plan development process is an important factor in shaping our communities for the future and ensuring sustainable development.

Local Engagement and How to get Involved

Air Quality is an issue that each individual can take responsibility for and make small changes to achieve improvements. There is a wealth of information on the internet on how you can contribute to improving air quality.

Lancashire has a large number of established and well maintained cycle routes that can be used for commuting as well as leisure purposes. More information can be found on: <http://www.visitlancashire.com/cycling-lancashire>

There is also a wealth of information on public transport:

<http://www.lancashire.gov.uk/roads-parking-and-travel/public-transport.aspx>

And alternative ways to travel:

<http://www.lancashire.gov.uk/roads-parking-and-travel/alternative-ways-to-travel.aspx>

And the national strategies and maps can be found using the following link:

<https://uk-air.defra.gov.uk/>

The Clean Air Strategy 2019 has a wealth of useful and accessible information on the types of pollutants, sources and proposals for more strategic action at a national level to improve air quality. This document can be found using the following link:

<https://www.gov.uk/government/publications/clean-air-strategy-2019>

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1 Local Air Quality Management

This report provides an overview of air quality in Chorley Council during 2019. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 pursuit of the objectives. 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 can be found in Table E.1 in Appendix E.

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 must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

Chorley Council currently does not have any AQMAs.

For reference, maps of Chorley Council's monitoring locations are available in Appendix D.

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

Defra's appraisal of last year's ASR concluded

1. The report provides a discussion on the measures the Council are implementing to improve air quality in the borough, despite this not being a requirement as there are no AQMAs present. The inclusion of this discussion demonstrates the Council's proactive stance to improving air quality and is a sign of good practice.
2. The Council provide an in-depth discussion on the NO₂ trends seen within their borough and try to provide explanations for changes in concentrations seen. This is an example of good practice and shows that they Council actively trying to understand air quality within their borough.
3. The map in Appendix D could be improved as currently the labels of the diffusion tube sites are overlapping and it is unclear to where the monitoring sites are located.

New maps have been included in Appendix D to provide greater detail on the location of the 2019 monitoring sites.

4. Overall the report is detailed, concise, satisfies the criteria of relevant standards and can be considered an example of good practice. The Council should continue their good work and submit an Annual Status Report in 2020.

Chorley Council has taken forward a number of direct measures during the current reporting year of 2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1.

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

- The development and implementation of an Air Quality Strategy will be the main focus for the forthcoming year, and this will drive us to improving air quality standards further and look at new initiatives to engage with the public and other important stakeholders.

- Our continued input into the Central Lancashire Local Plan development process is an important factor in shaping our communities for the future and ensuring sustainable development.

The principle challenges and barriers to implementation that Chorley Council anticipates facing are the diminishing expertise and resources available to develop strategies and implement the ambitious actions identified.

The most significant source of pollution in Chorley come from road vehicles and therefore we are reliant on our County Council Transport and Highways Agency partners to help delivery improvements in our area. The other significant challenge is the need for behavioural change and the ability to support this through communication but also appropriate infrastructure and alternative travel options.

Progress on some of the following measures has been slower than expected, therefore they have been rolled over from last year. There has been a delay in developing the Air Quality Strategy and associated planning policy and guidance updates due to reorganisation and long-term absence within the responsible team and limited time associated with other competing pressures for our reduced resources.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Air Quality Planning Policy	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2020	Lancashire LA's	None	N/A	Reduce emissions from construction, encourage low emission vehicles usage and better transport planning	Guidance produced consulted with Public Health. DC to implement as part of wider Central Lancashire Policy- local policy to be tailored to ensure compatibility with other plans and actions	2020	limited buy in from DC. Potential to use Central Lancashire local plan to create SPG
2	Introduction of Air Quality Strategy	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2020	Chorley Council	internal	N/A	Reduce Vehicle Emissions	linked into Central Lancashire Planning Policy refresh	ongoing	Main focus of Air Quality Strategy will be to promote and support behavioural change and sustainable development
3	Minimum Euro 5 vehicles as licensed taxis	Promoting Low Emission Transport	Taxi Licensing conditions	2016	Chorley Council	None	N/A	Reduced vehicle emissions	Implementation on-going	2021	resistance from taxi trade to upgrade to low emission vehicles
4	Electrification of the Rail Network	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2016-20	Network Rail	capital investment by Network Rail	N/A	Reduction in emission by converting from diesel to electric trains	programme almost completed in Chorley area	Manchester to Preston line completed in 2018. West Coast Main line conversions still ongoing	no additional incentive to use rail network
5	Make Air Quality and Climate Change key factors in Central Lancashire Planning Policy	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2020	Preston City Council, South Ribble Borough Council and Chorley Council	shared internal funding	N/A	sustainable development and improvements to travel infrastructure	policy document under consultation	2020	Developers' reluctance to implement planning policy guidance.

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

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

Chorley Council is committed to working in partnership with the Lancashire Care Foundation Trust and to a long-term vision of prevention and early intervention, which will include focussing on the wider determinants of health, such as air quality. The long-term costs benefit to our health services from more integrated working is a key driver for Chorley Council and will influence policy and decision making over the coming years.

There are already a number of other measures being undertaken to reduce air pollution across the borough, and these are described in more detail in other areas of this report, but include:

- Planning Policy which promotes sustainable development, including the increase provision of Electric Vehicle Recharging points for new developments.
- The development of a Lancashire-wide Air Quality Planning Guidance which will include the need for assessment of PM_{2.5} as part of a requirement for an air quality assessment in relation to planning applications and the review of the Council's Construction and Demolition Code of Good Practice.
- Encourage the use of alternative forms of transport through design of developments and closer relationships with transport planners.
- Raise awareness of the harmful effects of PM_{2.5}, using new monitoring data and a school education programme in partnership with Lancashire County Council.

Public Health have produced data (June 2017) which identifies the mortality burden of PM_{2.5} on the under 75's. The Lancashire average is 15.3/100,000 population, Chorley is 17.1/100,000 population, the second highest in Lancashire after Burnley (Blackpool and Blackburn with Darwen are not included as Unitary Authorities).

Chorley Council is committed to improving air quality and health outcomes for residents and to this end will endeavour to identify future measures that have a positive impact on air quality and health as part of the broader strategy of improved health and wellbeing and implement actions as appropriate.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Chorley Council does not undertake any automatic monitoring.

3.1.2 Non-Automatic Monitoring Sites

Chorley Council undertook non- automatic (passive) monitoring of NO₂ at 20 sites during 2019. Table A.1 in Appendix A shows the details of the 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 bias⁴, “annualisation” (where the data capture falls below 75%), and distance correction⁵. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³. Note that the concentration data presented in Table A.2 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 2019 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.

⁴ <https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html>

⁵ Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

There are no exceedences of the air quality objectives, either by the annual mean concentrations of $40\mu\text{g}/\text{m}^3$ or any tube result exceeding $60\mu\text{g}/\text{m}^3$, which indicates that an exceedance of the 1-hour mean objective is likely.

The trend data for the diffusion tube survey shows most of the locations displaying a downward trend of Nitrogen Dioxide at the roadside. This is in part due to changes in vehicle technology, although traffic trend data is also showing a slight downward trend for most locations.

However, there are a number of locations where the Nitrogen Dioxide levels are either static or increasing.

Tubes CH23 and CH25 are close to the location of a supermarket, the development of which significantly changed the lay-out of the roads in this area and the movement of vehicles. However, there have been no road traffic monitoring exercise undertaken by Lancashire County Council to provide any empirical data on the changes. These sites will continue to be monitored to identify whether the upward trend continues over a longer period of monitoring. There are anecdotal reports that the traffic signal rephasing may affect the traffic flows in this area.

Tube CH14 is of continuing interest, it is located close to M6 Junction 28, and although residential properties are set back from the main road, a further tube (CH14a) was located at the other side of the junction to provide additional information on the emissions from road vehicles in that area. Both Tubes 14 and 14a display a downward trend.

Tubes CH22, CH27 and CH28 show consistently low levels either remaining relatively static or declining. It is proposed that in 2020 these tubes will be removed and placed into alternative locations (being renamed) to provide broader information on NO_2 levels in other areas of the borough.

Tubes CH18, CH18a and CH18b, although providing information relating to the busy A6, do not provide the best location in relation to public exposure and these will be relocated in 2020 to attain a more accurate picture of exposure.

Appendix A: Monitoring Results

There are no automatic monitoring sites in Chorley.

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

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
CH05	Market Street, Adlington	Kerbside	360095	413094	NO2	NO	4m	0.5m	NO	2.5m
CH06	Moor Road, Chorley	Kerbside	357436	416130	NO2	NO	8.5m	0.5m	NO	2.5m
CH08	Balshaw Lane	Roadside	355891	418467	NO2	NO	11m	2m	NO	2.5m
CH09	A49 Wigan Road South Balshaw Lane	Roadside	355550	418243	NO2	NO	8m	3m	NO	2.5m
CH11	A49 Wigan Road South Euxton Lane	Kerbside	355454	419317	NO2	NO	1.5m	0.5m	NO	2.5m
CH14	A49 Wigan Road	Roadside	355663	422349	NO2	NO	10m	2m	NO	2.5m
CH14a	A49 Wigan Road / Lancaster La	Roadside	355674	422568	NO2	NO	22m	1.5m	NO	2.5m
CH17	A6 Whittle (Swansey Lane)	Kerbside	357952	422176	NO2	NO	6m	0.5m	NO	2.5m
CH17a	A6 Whittle (Opp St John's Church)	Roadside	357885	421524	NO2	NO	7m	1.5m	NO	2.5m

CH18	A6 Whittle (South Shaw Brow)	Roadside	358014	420699	NO2	NO	15m	3m	NO	2.5m
CH18a	A6 "Doorway to Value"	Roadside	358141	420072	NO2	NO	10m	3m	NO	2.5m
CH18b	A6 Whittle O/S 128	Roadside	358058	420612	NO2	NO	12m	2m	NO	2.5m
CH19	A6 at Chorley Hospital	Roadside	358335	419226	NO2	NO	10m	4m	NO	2.5m
CH20	A6 South Chorley Hospital The Spinney	Roadside	358325	418920	NO2	NO	13m	2m	NO	2.5m
CH22	Market St, Chorley (LP181)	Kerbside	358298	417589	NO2	NO	1.5m	0.5m	NO	2.5m
CH23	Market St, Chorley (LP172)	Kerbside	358357	417297	NO2	NO	1.5m	0.5m	NO	2.5m
CH24	Euxton Lane Opposite Hospital	Roadside	358023	419145	NO2	NO	10m	1.5m	NO	2.5m
CH25	Bolton Street Opposite Asda	Roadside	358518	417105	NO2	NO	2m	1.8m	NO	2.5m
CH27	Spendmore La/Preston Road Coppull	Kerbside	355568	413792	NO2	NO	5m	1m	NO	2.5m
CH28	Spendmore La Coppull opposite school	Kerbside	355698	413875	NO2	NO	4.5m	1m	NO	2.5m

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ^{(3) (4)}				
							2015	2016	2017	2018	2019
CH05	360095	413094	Kerbside	Diffusion Tube	100	100	34.59	35.43	33.85	38.87	32.22
CH06	357436	416130	Kerbside	Diffusion Tube	100	100	28.13	30.80	28.01	27.00	27.11
CH08	355891	418467	Roadside	Diffusion Tube	100	100	28.86	33.40	29.35	29.04	29.01
CH09	355550	418243	Roadside	Diffusion Tube	75	75	28.76	32.69	30.03	28.02	28.30
CH11	355454	419317	Kerbside	Diffusion Tube	83.33	83.33	28.61	31.67	28.23	35.01	24.17
CH14	355663	422349	Roadside	Diffusion Tube	100	100	40.15	43.19	42.28	29.72	37.12
CH14a	355674	422568	Roadside	Diffusion Tube	100	100	27.63	31.33	29.79	32.49	26.35
CH17	357952	422176	Kerbside	Diffusion Tube	91.66	91.66	31.93	33.00	31.62	31.06	29.63
CH17a	357885	421524	Roadside	Diffusion Tube	100	100	28.12	32.03	28.26	31.72	27.03
CH18	358014	420699	Roadside	Diffusion Tube	100	100	36.61	38.28	36.05	24.37	35.31
CH18a	358141	420072	Roadside	Diffusion Tube	100	100	31.31	32.01	31.44	30.90	28.72
CH18b	358058	420612	Roadside	Diffusion Tube	100	100	34.46	37.74	36.23	34.90	34.68
CH19	358335	419226	Roadside	Diffusion Tube	100	100	32.14	35.08	34.14	25.65	30.38
CH20	358325	418920	Roadside	Diffusion Tube	100	100	31.50	35.46	32.18	28.51	30.18

CH22	358298	417589	Kerbside	Diffusion Tube	100	100	23.04	28.28	25.09	25.28	24.35
CH23	358357	417297	Kerbside	Diffusion Tube	100	100	26.99	35.03	31.29	30.90	32.84
CH24	358023	419145	Roadside	Diffusion Tube	100	100	32.02	37.71	33.53	34.90	31.39
CH25	358518	417105	Roadside	Diffusion Tube	100	100	22.69	29.25	25.81	25.65	26.15
CH27	355568	413792	Kerbside	Diffusion Tube	100	100	24.43	30.62	25.84	28.51	24.79
CH28	355698	413875	Kerbside	Diffusion Tube	91.66	91.66	-	26.63	25.59	25.28	24.26

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

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 adjustment

Notes:

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

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

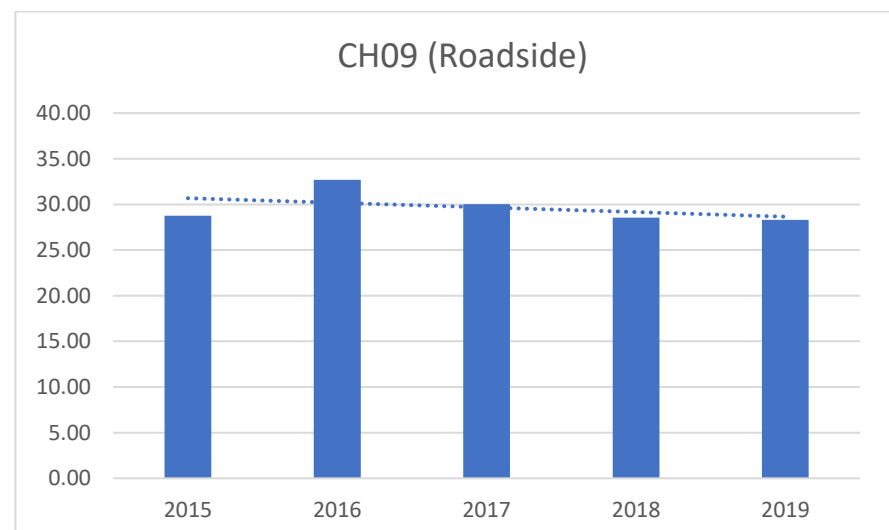
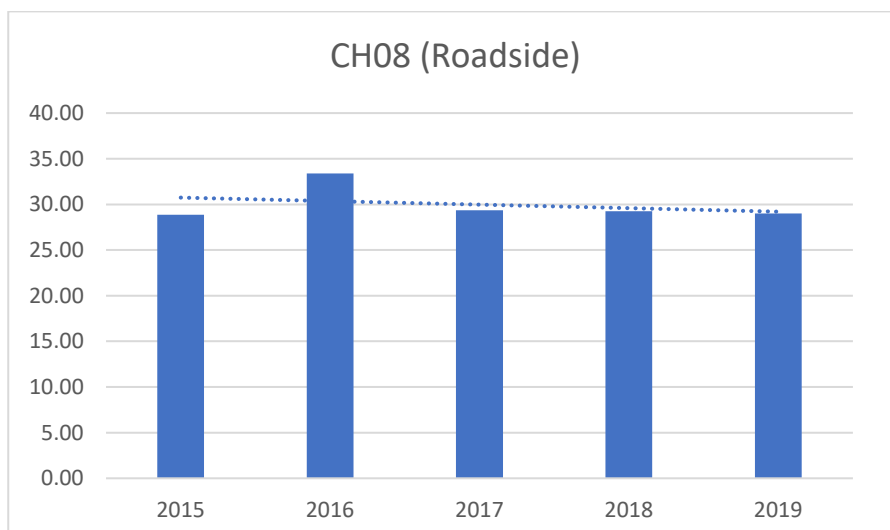
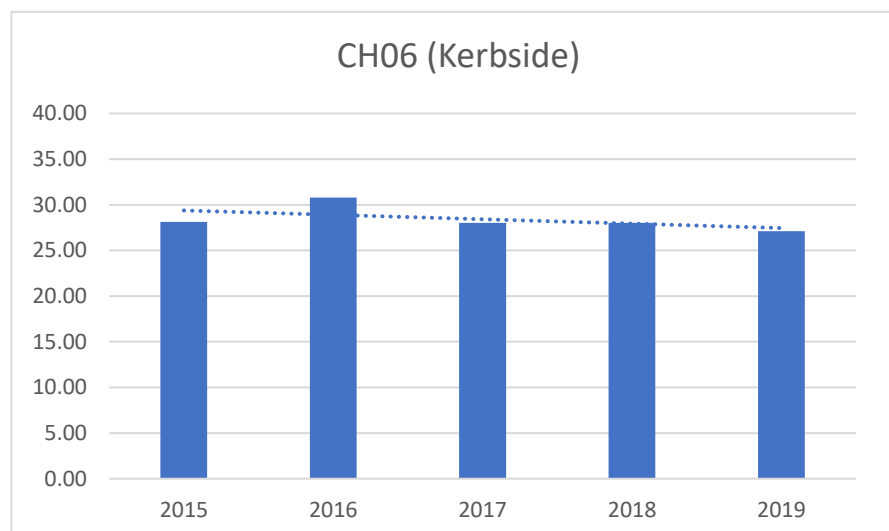
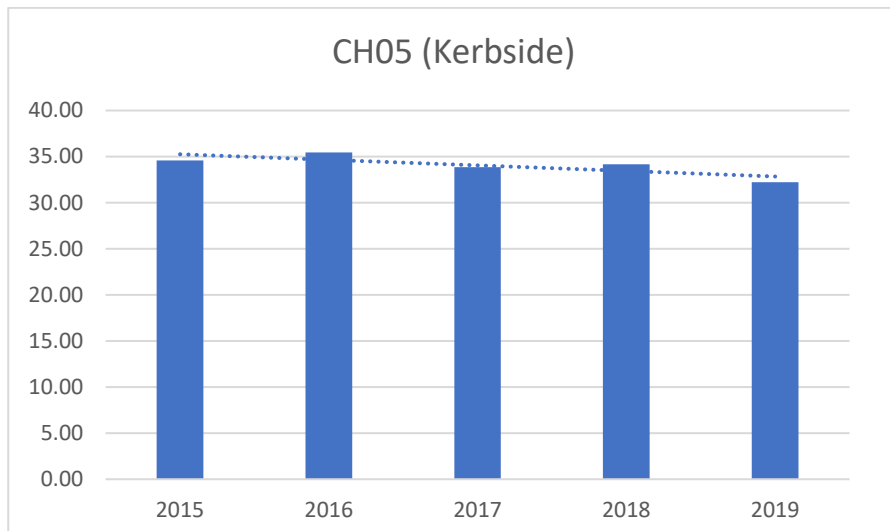
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

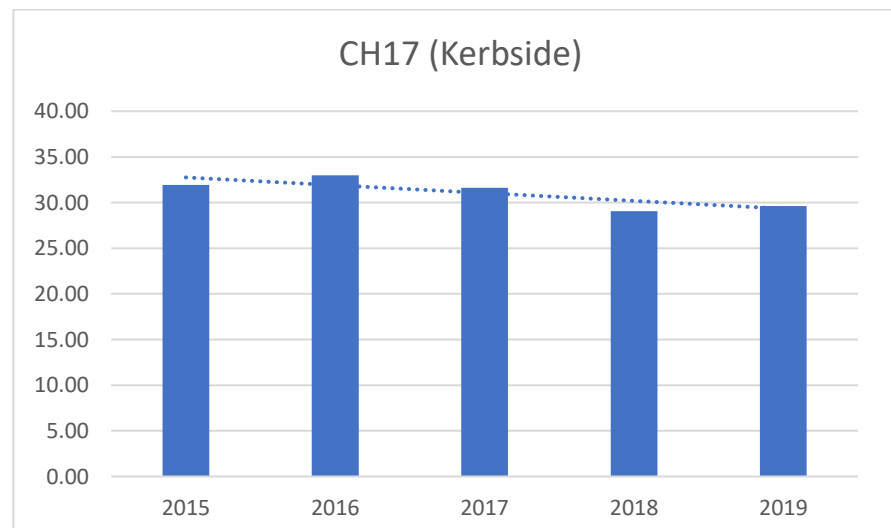
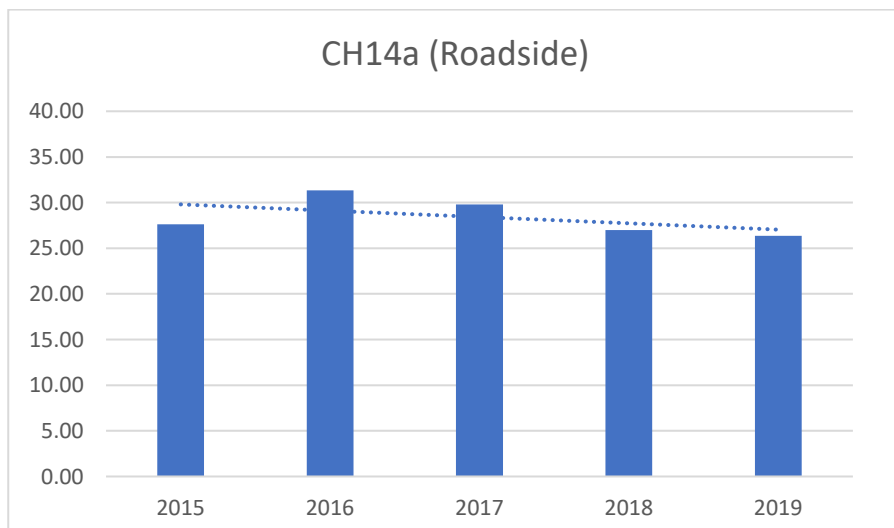
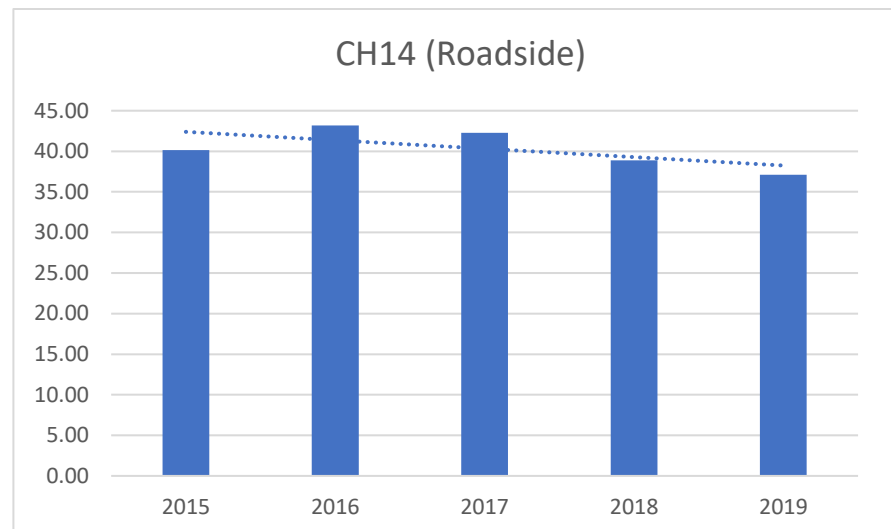
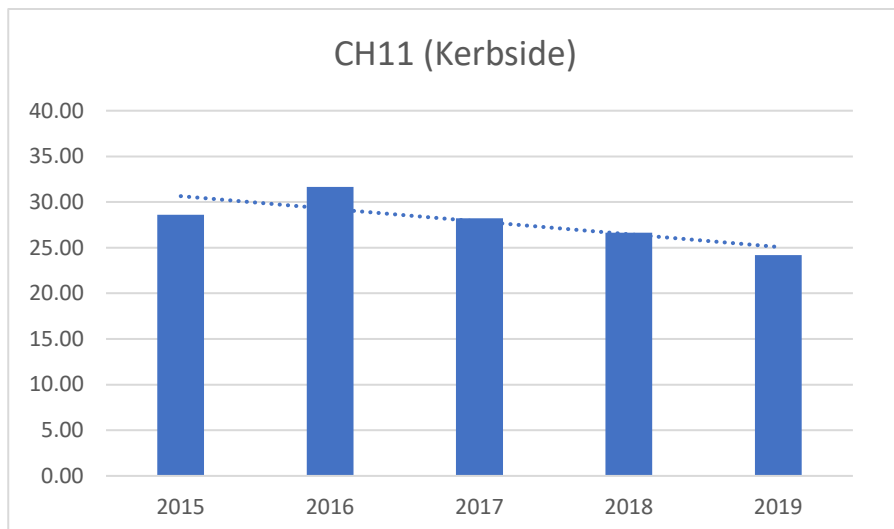
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

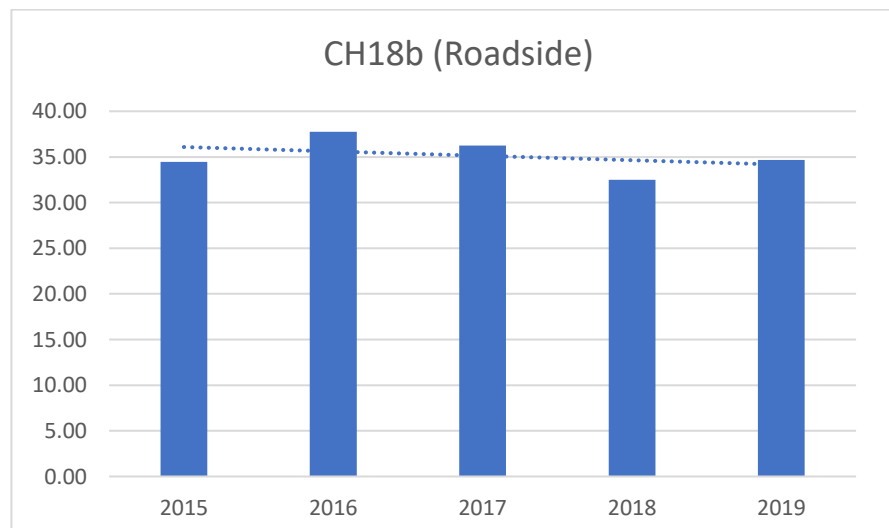
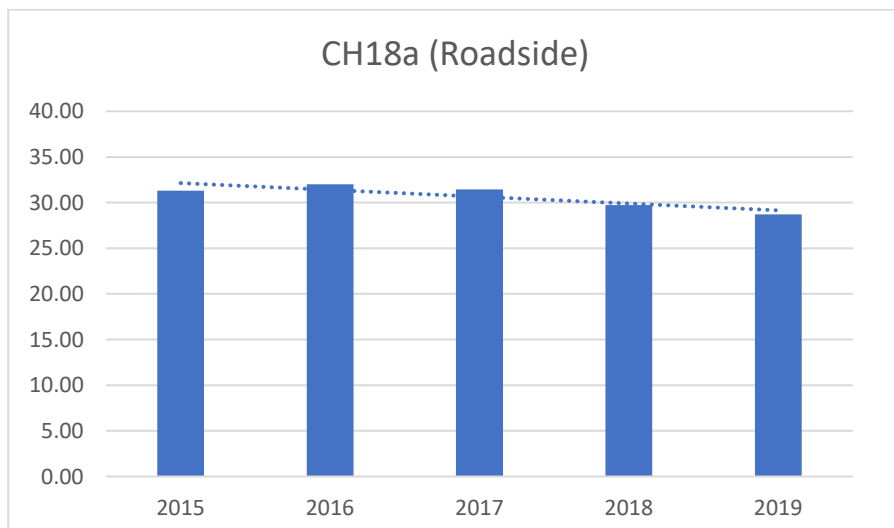
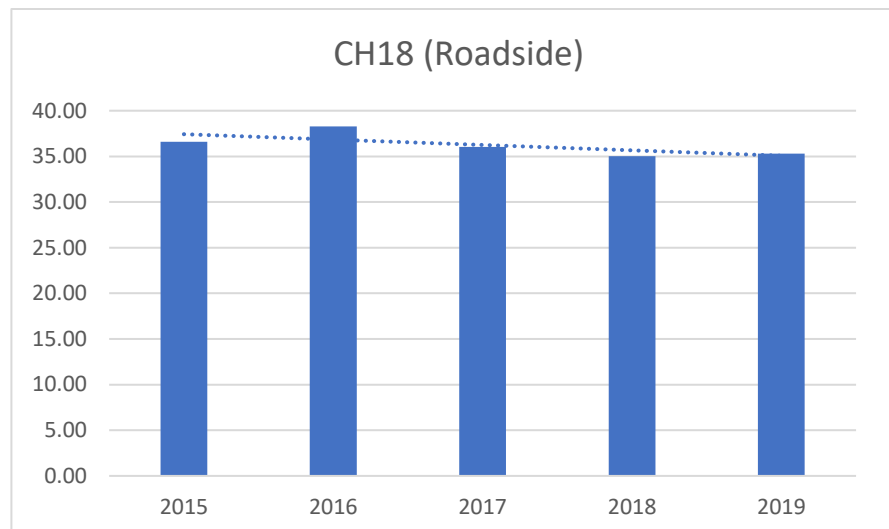
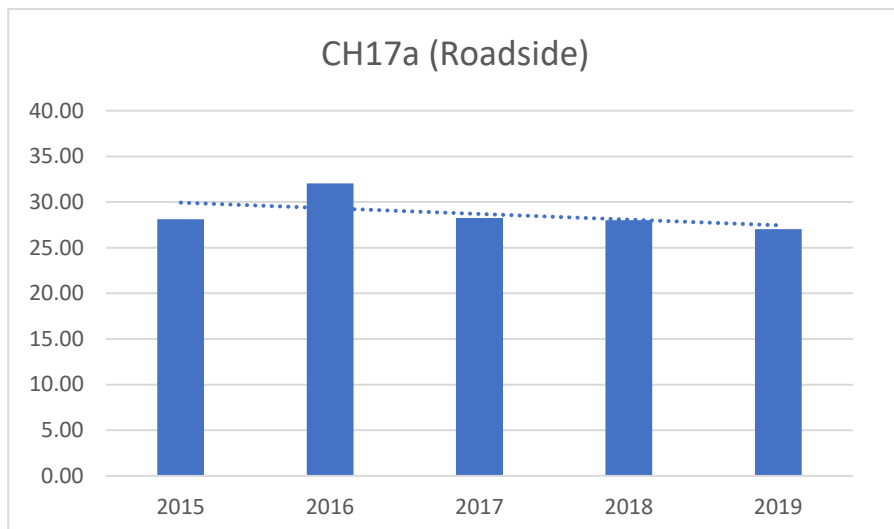
(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

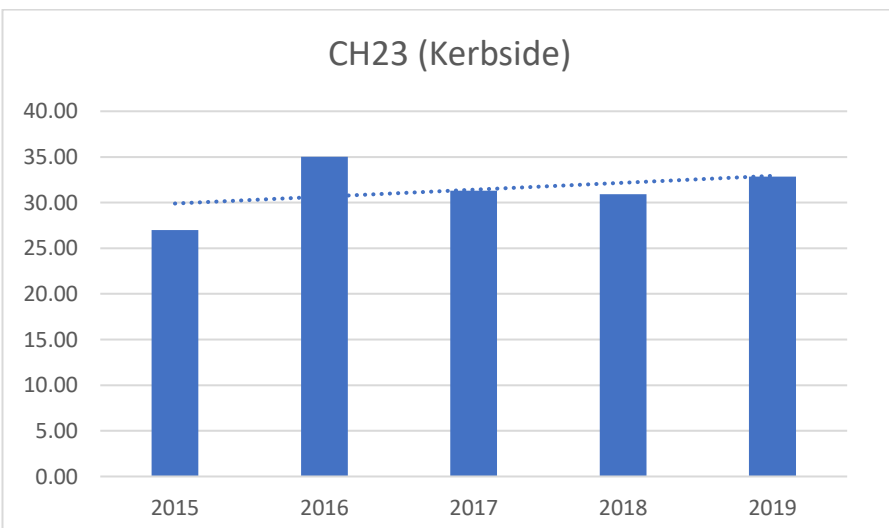
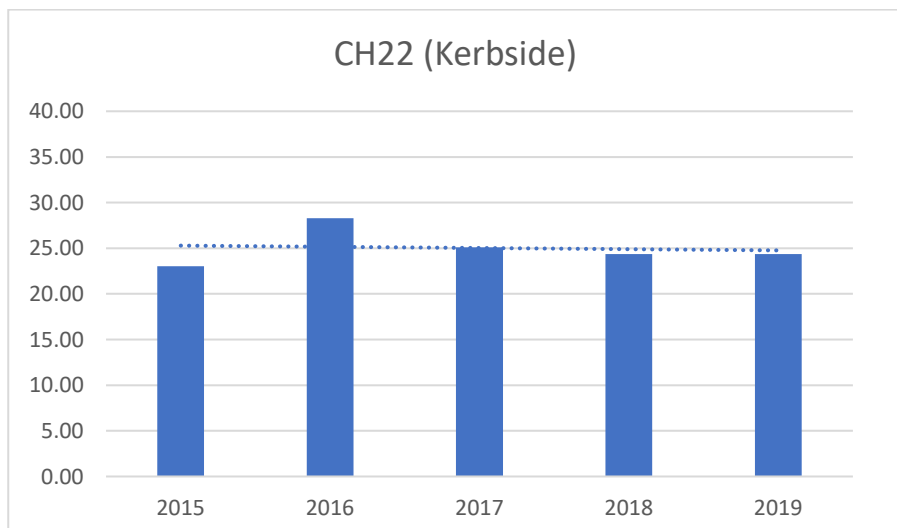
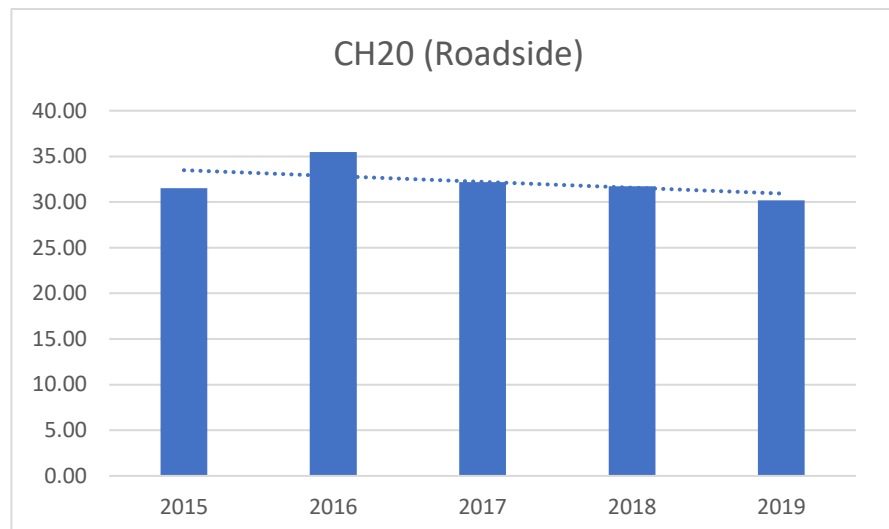
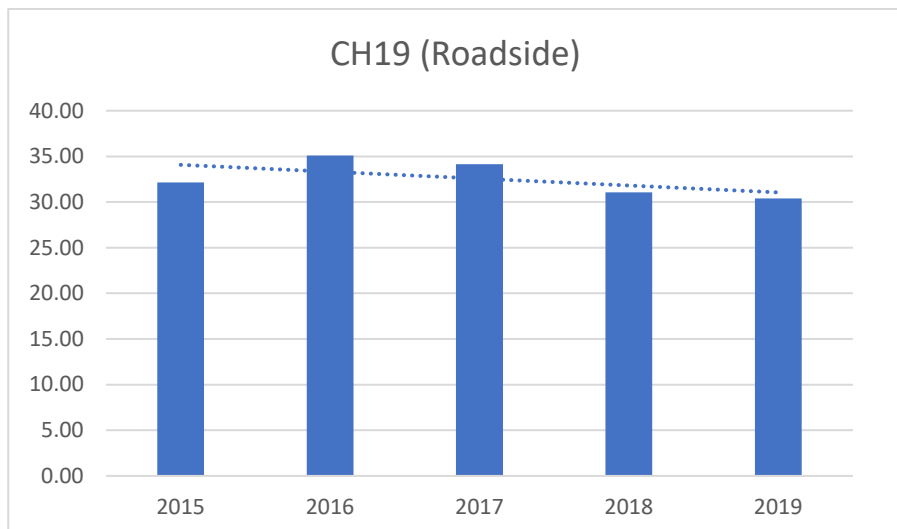
(4) Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

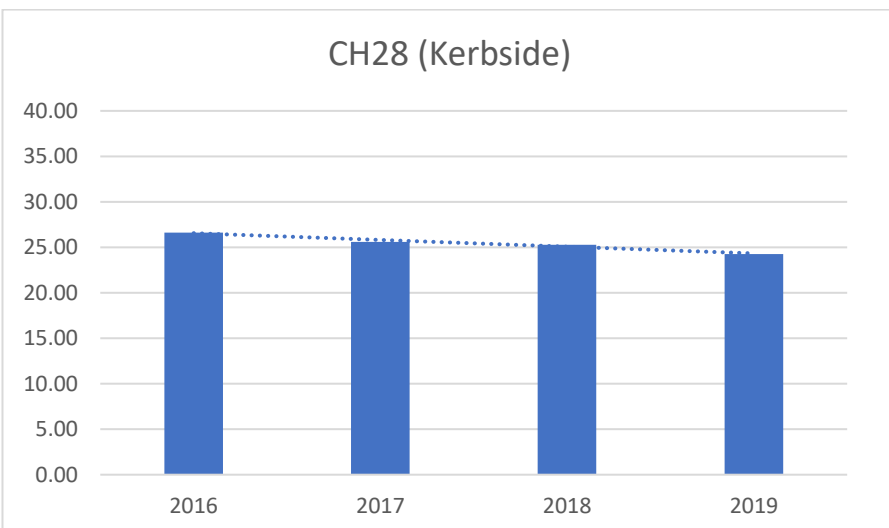
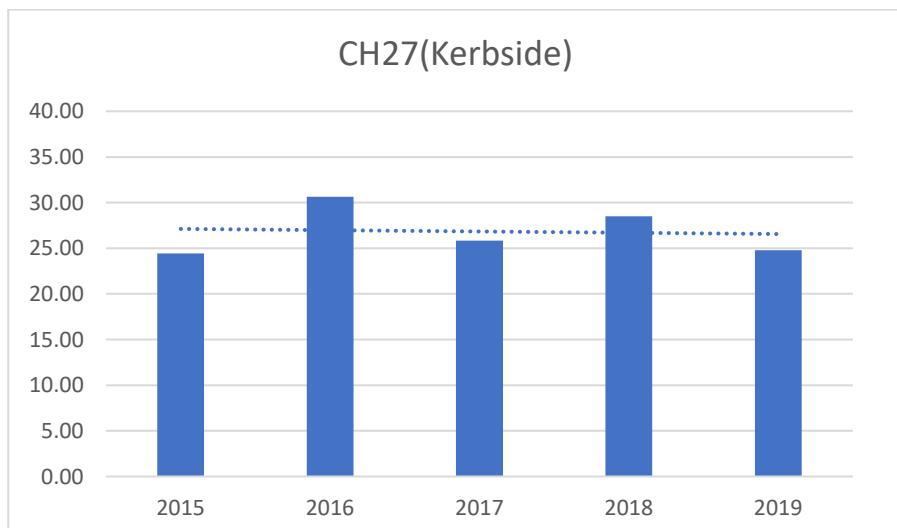
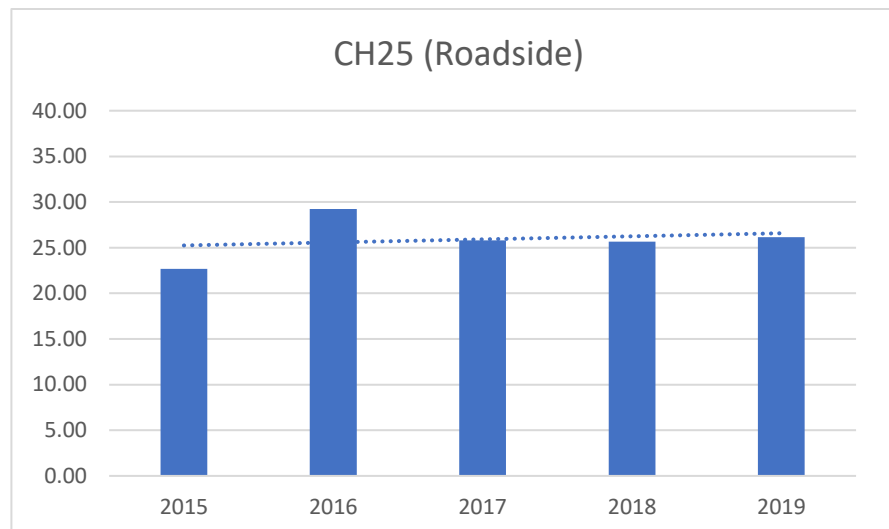
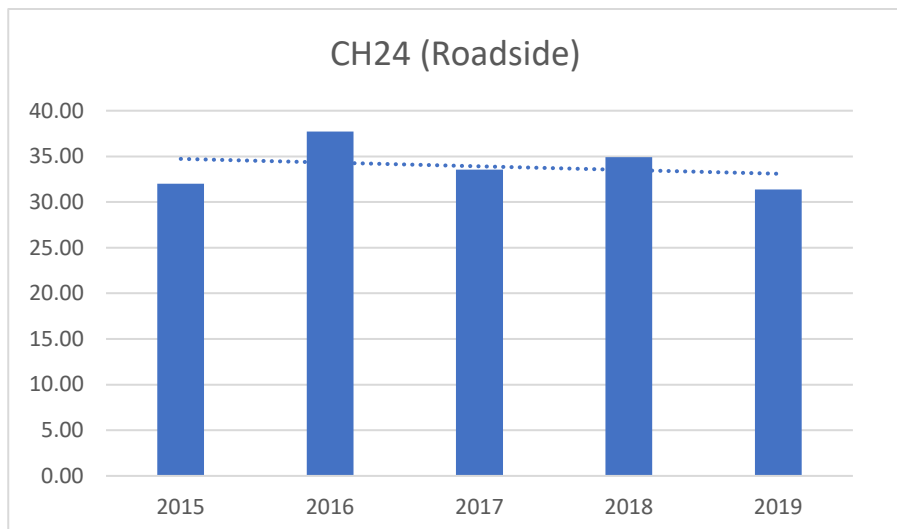
Figure A.1 – Trends in Annual Mean NO₂ Concentrations











Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 - NO₂ Monthly Diffusion Tube Results - 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO ₂ Mean Concentrations (µg/m ³)														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
			Raw Data	Bias Adjusted (0.93) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾												
CH05 (Kerbside)	360095	413094	44.24	50.16	35.63	35.58	27.19	28.57	28.77	26.68	32.66	31.87	42.12	32.23	34.64	32.22	
CH06 (Kerbside)	357436	416130	40.42	38.24	28.48	28.31	22.92	24.41	23.68	20.77	26.33	30.48	38.80	27.00	29.15	27.11	
CH08 (Roadside)	355891	418467	47.76	40.30	26.73	32.20	22.62	27.63	23.60	21.10	28.81	31.34	39.44	32.74	31.19	29.01	
CH09 (Roadside)	355550	418243	44.09	n/d	32.93	n/d	n/d	26.64	26.84	21.08	23.90	28.33	38.88	29.54	30.25	28.3 (1)	
CH11 (Kerbside)	355454	419317	n/d	n/d	26.71	25.58	19.33	22.38	21.30	21.74	24.37	29.39	37.24	31.87	25.99	24.17	
CH14 (Roadside)	355663	422349	53.93	46.11	43.72	30.63	37.56	36.83	40.19	32.59	40.45	37.67	40.69	38.56	39.91	37.12	
CH14a (Roadside)	355674	422568	19.96	47.08	31.23	23.34	20.74	23.91	23.53	22.93	24.83	28.23	39.14	35.02	28.33	26.35	
CH17 (Kerbside)	357952	422176	49.54	41.66	27.65	30.65	21.77	n/d	23.18	23.90	26.82	32.48	43.78	28.99	31.86	29.63	
CH17a (Roadside)	357885	421524	41.46	37.89	25.46	31.20	22.59	25.19	23.16	20.01	24.83	31.10	32.92	32.97	29.07	27.03	
CH18 (Roadside)	358014	420699	53.14	47.38	40.46	28.35	29.79	32.60	32.76	27.37	36.67	38.27	41.09	47.67	37.96	35.31	
CH18a (Roadside)	358141	420072	46.42	45.38	27.80	28.61	24.44	27.64	23.73	21.71	28.81	29.00	39.30	27.78	30.89	28.72	

CH18b (Roadside)	358058	420612	53.54	69.82	39.70	26.41	28.11	25.46	29.27	27.42	34.17	32.46	38.66	42.43	37.29	34.68	
CH19 (Roadside)	358335	419226	46.61	40.15	34.46	38.53	23.12	27.29	27.37	22.22	28.99	32.64	39.65	31.01	32.67	30.38	
CH20 (Roadside)	358325	418920	49.72	37.72	36.91	26.32	23.38	24.12	27.83	24.69	32.15	32.10	39.38	35.10	32.45	30.18	
CH22 (Kerbside)	358298	417589	42.25	35.40	20.23	22.94	19.66	16.85	19.05	19.08	24.14	27.39	35.39	31.76	26.18	24.35	
CH23 (Kerbside)	358357	417297	48.34	47.07	26.31	36.72	27.68	29.81	26.52	24.43	32.33	33.13	51.64	39.74	35.31	32.84	
CH24 (Roadside)	358023	419145	45.23	45.98	29.40	28.57	27.90	28.06	31.64	28.03	35.74	27.60	43.01	33.87	33.75	31.39	
CH25 (Roadside)	358518	417105	41.16	35.57	20.76	28.65	20.10	23.83	21.12	20.46	23.08	30.90	42.25	29.59	28.12	26.15	
CH27(Kerb side)	355568	413792	34.02	36.88	22.75	32.96	19.80	27.61	22.70	22.96	27.21	30.17	18.29	24.46	26.65	24.79	
CH28 (Kerbside)	355698	413875	34.44	35.14	23.52	19.33	20.38	n/d	20.60	18.85	25.09	28.59	33.56	27.45	26.09	24.26	

- Local bias adjustment factor used
- National bias adjustment factor used
- Annualisation has been conducted where data capture is <75%
- Where applicable, data has been distance corrected for relevant exposure in the final column

Notes:

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

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

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC National Bias Adjustment Factor for 2019

National Diffusion Tube Bias Adjustment Factor Spreadsheet Version Number 3/20

Gradko	20% TEA in water	2019		Overall Factor ³ (27 studies)	Use	0.93
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Precision information:

Overall Gradko 20% TEA in Water demonstrates good precision. The summary report can be found using this link:

https://laqm.defra.gov.uk/assets/Tube_Precision_version_03_20_Final_FULL_FINAL.pdf

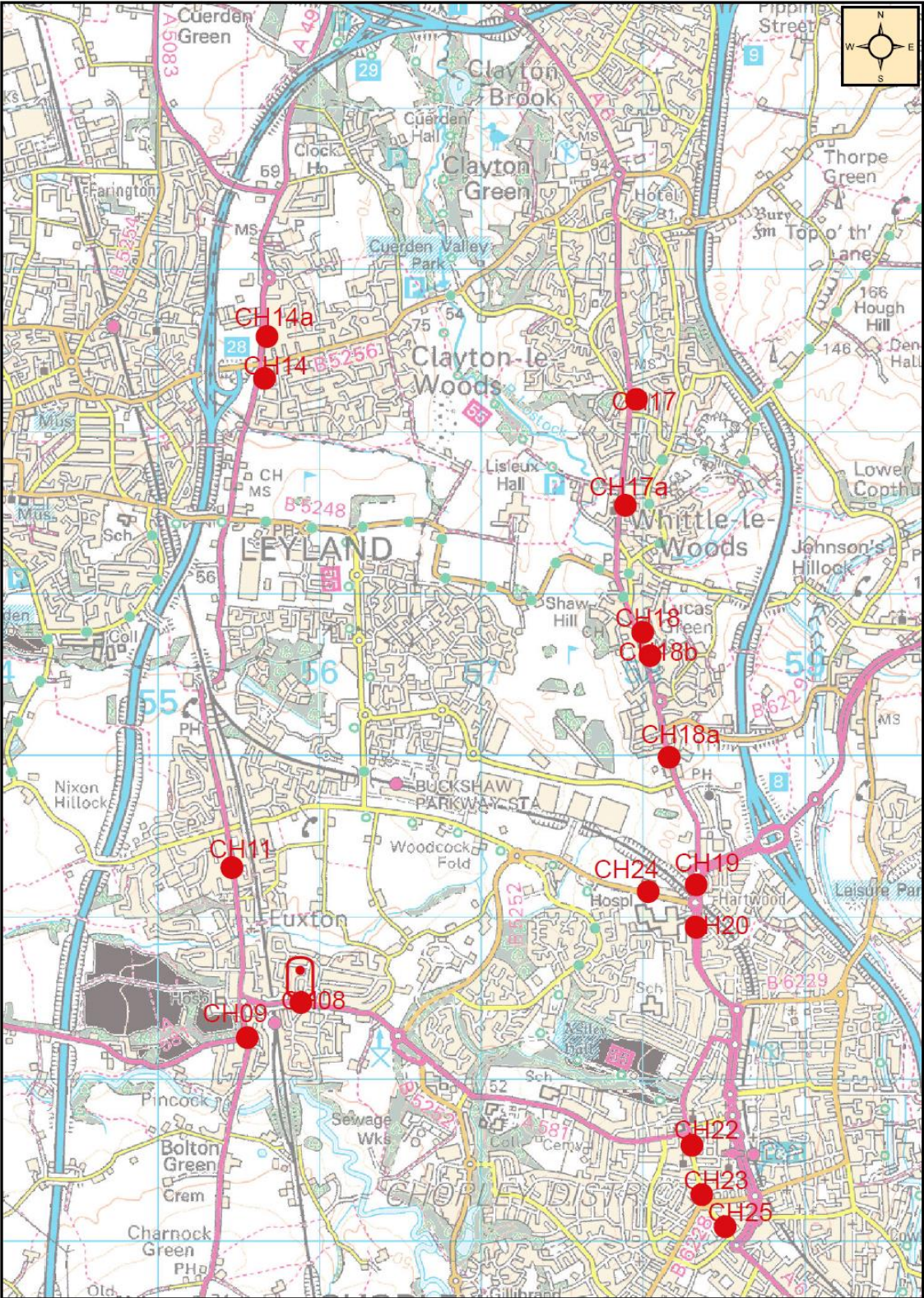
Annualisation for CH09

Tube/ Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 19	Bias	Bias Corrected	Data Capture %	% for pm	est annual mean
CH09 (Roadside)	44.09	n/d	32.93	n/d	n/d	26.64	26.84	21.08	23.90	28.33	38.88	29.54	30.25	0.93	28.13	75		28.30
																	100.62	
CH08 (Roadside)	47.76	40.30	26.73	32.20	22.62	27.63	23.60	21.10	28.81	31.34	39.44	32.74	31.19	0.93	29.01	100		
	47.76		26.73			27.63	23.60	21.10	28.81	31.34	39.44	32.74	31.02	0.93	28.85		100.55	
CH14a (Roadside)	19.96	47.08	31.23	23.34	20.74	23.91	23.53	22.93	24.83	28.23	39.14	35.02	28.33	0.93	26.35	100		
	19.96		31.23			23.91	23.53	22.93	24.83	28.23	39.14	35.02	27.64	0.93	25.71		102.49	
CH14 (Roadside)	53.93	46.11	43.72	30.63	37.56	36.83	40.19	32.59	40.45	37.67	40.69	38.56	39.91	0.93	37.12	100		
	53.93		43.72			36.83	40.19	32.59	40.45	37.67	40.69	38.56	40.51	0.93	37.68		98.51	
CH17a (Roadside)	41.46	37.89	25.46	31.20	22.59	25.19	23.16	20.01	24.83	31.10	32.92	32.97	29.07	0.93	27.03	100		
	41.46		25.46			25.19	23.16	20.01	24.83	31.10	32.92	32.97	28.57	0.93	26.57		101.73	
CH18 (Roadside)	53.14	47.38	40.46	28.35	29.79	32.60	32.76	27.37	36.67	38.27	41.09	47.67	37.96	0.93	35.31	100		
	53.14		40.46			32.60	32.76	27.37	36.67	38.27	41.09	47.67	38.89	0.93	36.17		97.62	
CH18b (Roadside)	53.54	69.82	39.70	26.41	28.11	25.46	29.27	27.42	34.17	32.46	38.66	42.43	37.29	0.93	34.68	100		
	53.54		39.70			25.46	29.27	27.42	34.17	32.46	38.66	42.43	35.90	0.93	33.39		103.86	
CH18a (Roadside)	46.42	45.38	27.80	28.61	24.44	27.64	23.73	21.71	28.81	29.00	39.30	27.78	30.89	0.93	28.72	100		
	46.42		27.80			27.64	23.73	21.71	28.81	29.00	39.30	27.78	30.24	0.93	28.13		102.09	
CH19 (Roadside)	46.61	40.15	34.46	38.53	23.12	27.29	27.37	22.22	28.99	32.64	39.65	31.01	32.67	0.93	30.38	100		
	46.61		34.46			27.29	27.37	22.22	28.99	32.64	39.65	31.01	32.25	0.93	29.99		101.3	
CH24 (Roadside)	45.23	45.98	29.40	28.57	27.90	28.06	31.64	28.03	35.74	27.60	43.01	33.87	33.75	0.93	31.39	100		
	45.23		29.40			28.06	31.64	28.03	35.74	27.60	43.01	33.87	33.62	0.93	31.27		100.38	
CH20 (Roadside)	49.72	37.72	36.91	26.32	23.38	24.12	27.83	24.69	32.15	32.10	39.38	35.10	32.45	0.93	30.18	100		
	49.72		36.91			24.12	27.83	24.69	32.15	32.10	39.38	35.10	33.56	0.93	31.21		96.69	
CH25 (Roadside)	41.16	35.57	20.76	28.65	20.10	23.83	21.12	20.46	23.08	30.90	42.25	29.59	28.12	0.93	26.15	100		
	41.16		20.76			23.83	21.12	20.46	23.08	30.90	42.25	29.59	28.13	0.93	26.16		99.96	
Wigan Centre Urban Background	32.73	28.75	14.26	18.47	12.29	11.77	9.32	11.70	14.87	21.23	28.47	29.45	19.44		19.44			
	32.73		14.26			11.77	9.32	11.70	14.87	21.23	28.47	29.45	19.31		19.31		100.67	
Blackpool Marton Urban Background	25.88	21.93	10.21	11.00	8.32	7.10	6.45	7.10	9.37	12.32	17.93	17.00	12.88		12.88			
	25.88		10.21			7.10	6.45	7.10	9.37	12.32	17.93	17.00	12.60		12.60		102.22	

Appendix D: Map(s) of Monitoring Locations

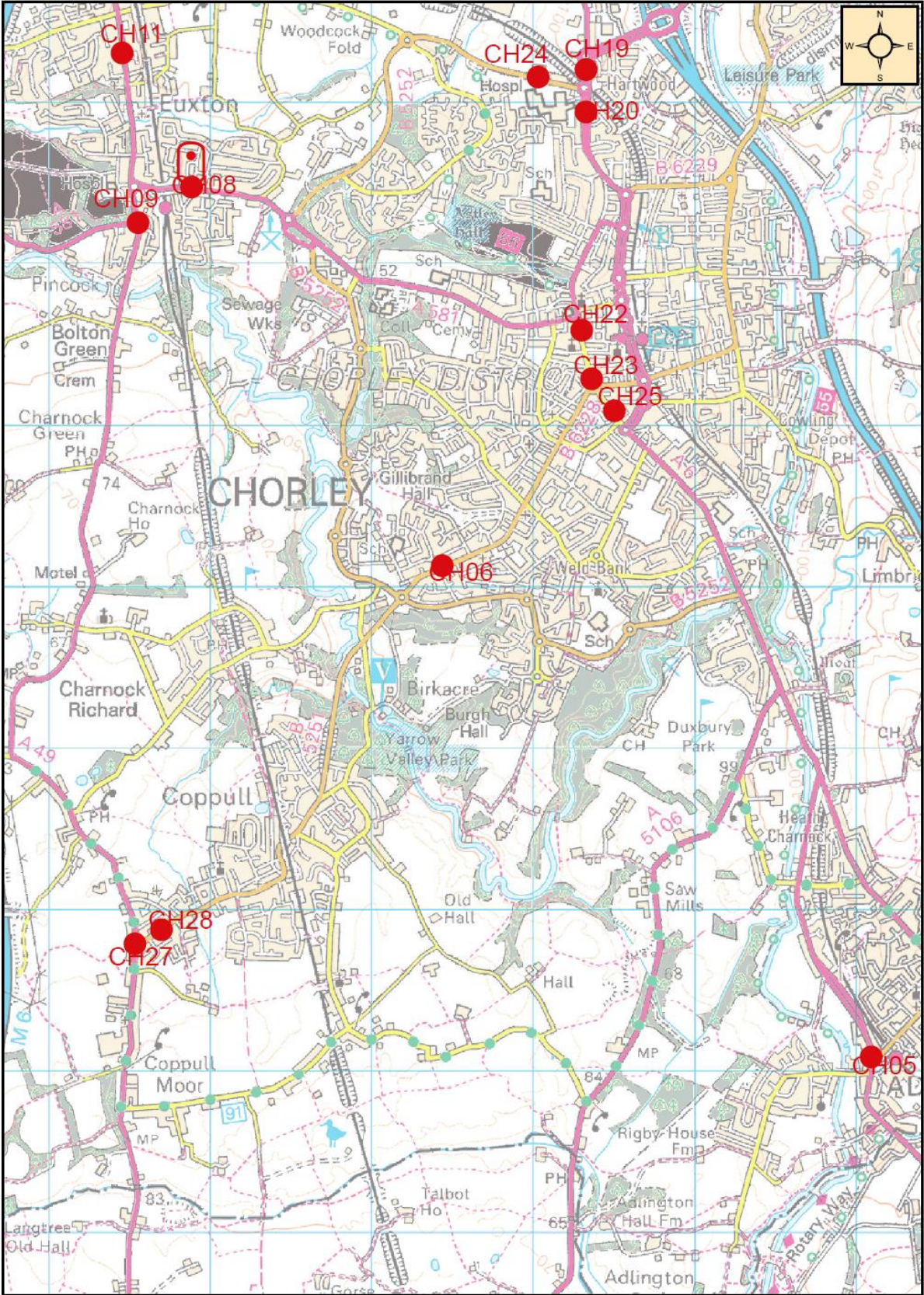


Monitoring locations Map 1 North



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1:30,000



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1:30,000

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁶	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁶ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) 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

1. Environmental equity, air quality, socioeconomic status and respiratory health, 2010
2. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
3. Defra. Abatement cost guidance for valuing changes in air quality, May 2013
4. <https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html>
5. Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)
6. <https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>
7. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/460401/air-quality-econanalysis-nitrogen-interim-guidance.pdf
8. <https://uk-air.defra.gov.uk/>
9. Integrated Community Wellbeing- basic case document:
<https://democracy.chorley.gov.uk/ecSDDisplayClassic.aspx?NAME=SD1875&id=1875&rpId=0&sch=doc&cat=13424&path=326%2c13424>
10. Lancashire County Council Local Transport Plan 2011-2021:
<http://www.lancashire.gov.uk/council/strategies-policies-plans/roads-parking-and-travel/local-transport-plan.aspx>
11. Central Lancashire Local Delivery Plan- Health and Wellbeing:
<https://www.greaterprestonccg.nhs.uk/download.cfm?doc=docm93jjm4n3176.pdf..>
12. PHE Healthy Lives for 2013-15 under 75 premature mortality rate:
<http://healthierlives.phe.org.uk/topic/mortality/comparisons#are//par/E92000001/ati/101/pat/101>