



2019 Air Quality Annual Status Report (ASR)

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

June 2019

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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 associated mainly 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.

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. The Trend charts in Figure A.1 are coloured orange to highlight these locations, and possible explanations for this are included in section 3.2.

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

In the late June and early July of 2018 fires engulfed large areas of moorland between Chorley and Bolton. Short duration particulate monitoring was undertaken to provide an indication of the impact on Air Quality during this period. The results have been added to Appendix A for information. Little conclusion can be drawn from these because of the limited data and this will not impact on the long-term strategy for Chorley Council. At the time Public Health provided advice for vulnerable individuals and residents in relation to the impact of the smoke from the fires.

The main challenge for Chorley Council and its partners with regard to developing strategies that will promote air quality and public health are continually diminishing resources. However, Chorley Council's priority is to continue to develop an integrated Community Wellbeing Service in partnership with the Lancashire Care Foundation Trust. As a Council we are therefore committed to a long-term vision of prevention and early intervention, which will include focussing on the wider determinants of health, such as air quality, that can have long-term costs benefits to the health services. This concept is a priority for Chorley Council and will influence policy and decision making over the coming years.

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 for this service and promote a partnership approach to air quality with health colleagues and provide a mechanism for engagement with key stakeholders.

Chorley Council works closely with Public Health colleagues at Lancashire County Council and 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 and South Ribble, 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.
- 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.

Lancashire County Council update for Local Air Quality Management Annual Status Report 2019

Lancashire County Council has an important role to play in taking action to reduce the 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 activity is underway or in development:

1. Encourage 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.
- The Safe and Healthy Travel 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. Support 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.

3. Create 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. Stakeholder engagement and consultation will be carried out during 2019. Approaches to improving air quality could include:
 - Redesigning road networks to reduce congestion and separate vehicle emissions from places where people live, work and congregate;

- Increasing access to cycling and walking infrastructure, and cleaner public transport;
- Facilitating the move towards the use of low emission vehicles through upgrading public transport and public sector vehicle fleets and introducing new electric vehicle charge points;
- Targeting areas with high levels of air pollution, including considering the introduction of Clean Air Zones.

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 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. Embed 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. Providing support to districts to develop policies that seek to ensure that new development does 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 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 spatial planners, public services and the public to introduce

the most effective infrastructure at the most appropriate sites. In time, there may be opportunities for further projects around this work.

5. Raise awareness and increase 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 scheme 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 to deliver a clean air event, campaign and poster competition.
- The County Council's Lead Member for Health and Adult Services has established network for elected members from across Lancashire and Cumbria to come together to gain an understanding of the issues and the key messages to champion and advocate in their communities.

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 2018. 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 **Error! Reference source not found.** 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. An Air Quality Strategy is currently being developed and will be published on the Council's website www.chorley.gov.uk once completed. For reference, a map of Chorley Council's monitoring locations is 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 that the report is well structured, detailed, and provides the information specified in the Guidance, using the latest version of the template. The following comments are made to inform future reports.

1. The CH14 diffusion tube site continues to exceed the annual mean NO₂ concentration at 42.28µg/m³, but following distance correction this reduces to 33.2µg/m³ as shown in Table B.1.
2. The report states that this location remains a location of interest and will continue to be monitored. This is supported. ***The Council will continue to monitor this site.***
3. There are two other locations that are within 10% of the NO₂ annual mean objective: CH18 and CH18b which are on the same road, the A6. According to LAQM TG(16) para 7.77-7.79 the Council may wish to consider applying the distance correction calculation to these results. ***This has not been necessary this year as the results have not been within 10% of the Objective level, but where any other tubes has been then a distance correction calculation has been made.***
4. It is very encouraging that the Council takes such a proactive approach to air quality monitoring and reviews the monitoring locations regularly to ensure they are still relevant. This is supported. ***The annual review has taken place and a number of new sites have been identified for inclusion in the programme for 2020.***
5. It is noted that the Council is going to pursue sources of funding to enable particulate monitoring. This is supported and an update on this should be provided in the next ASR. ***This is still ongoing as part of the development of the Air Quality Strategy and will be updated as soon as possible.***
6. The Council may wish to update Table 2.1 to take account of the fact that some of the measures were completed 6 or 7 years ago and to reflect the actions that it is currently taking to improve air quality, such as producing an air quality strategy and continuing to promote sustainable development and travel. ***This has been taken into account for this report.***

7. The map showing the locations of the diffusion tubes is very useful but it would be helpful if the locations were labelled to link with Tables A.2 and B.1 so it is obvious which site is which. ***The map has been updated with location references for this report.***

8. The trend data provided in Figure A.1 is very clear and shows a long term slight downward trend in emissions which is encouraging. It may also be informative to present the same data as a bar graph for each diffusion tube location so that local trends are easier to identify. ***The trend data for each tube has been appended to this report.***

Chorley Council has taken forward a number of direct measures during the current reporting year of 2018 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 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 the following measures has been slower than expected due to: There has been a delay in developing the Air Quality Strategy due to reorganisation within the

responsible team and limited time associated with other competing pressures for our limited resources.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	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	Lancashire LA's	2015	2019	N/A	Reduce emissions from construction, encourage low emission vehicles usage and better transport planning	Guidance produced, consulted with Public Health. DC to implement	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	Chorley Council	2019	2020	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	Chorley Council	2015	2016	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	Network Rail	2010-15	2016-20	N/A	Reduction in emission by converting from diesel to electric trains	Ongoing until 2020	Manchester to Preston line completed in 2018. West Coast Main line conversions still ongoing	no additional incentive to use rail network

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's priority is to continue to develop an integrated Community Wellbeing Service in partnership with the Lancashire Care Foundation Trust. As a Council we are therefore committed to a long-term vision of prevention and early intervention, which will include focussing on the wider determinants of health, such as air quality, that can have long-term costs benefits to the health services. This concept is a priority 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 these 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.
- 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 the Public Health Outcomes Framework Indicator's, 2016 data is detailed below.

Public Health Profiles

Fraction of mortality attributable to particulate air pollution 2017
Proportion - %

Area	Recent Trend	Neighbour Rank	Count	Value	95% Lower CI	95% Upper CI
England	–	-	-	5.1	-	-
Lancashire	–	-	-	3.8	-	-
Burnley	–	-	-	4.1	-	-
Chorley	–	-	-	3.9	-	-
Fylde	–	-	-	3.3	-	-
Hyndburn	–	-	-	4.2	-	-
Lancaster	–	-	-	3.5	-	-
Pendle	–	-	-	4.1	-	-
Preston	–	-	-	4.1	-	-
Ribble Valley	–	-	-	3.5	-	-
Rossendale	–	-	-	3.7	-	-
South Ribble	–	-	-	4.0	-	-
West Lancashire	–	-	-	3.7	-	-
Wyre	–	-	-	3.3	-	-

Source: Background annual average $PM_{2.5}$ concentrations for the year of interest are modelled on a 1km x 1km grid using an air dispersion model, and calibrated using measured concentrations taken from background sites in Defra's Automatic Urban and Rural Network (<http://uk-air.defra.gov.uk/interactive-map/>.) Data on primary emissions from different sources and a combination of measurement data for secondary inorganic aerosol and models for sources not included in the emission inventory (including re-suspension of dusts) are used to estimate the anthropogenic (human-made) component of these concentrations. By approximating LA boundaries to the 1km by 1km grid, and using census population data, population weighted background $PM_{2.5}$ concentrations for each lower tier LA are calculated. This work is completed under contract to Defra, as a small extension of its obligations under the Ambient Air Quality Directive (2008/50/EC). Concentrations of anthropogenic, rather than total, $PM_{2.5}$ are used as the basis for this indicator, as burden estimates based on total $PM_{2.5}$ might give a misleading impression of the scale of the potential influence of policy interventions (COMEAP, 2012).

Public Health have also 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.

Chorley Council

An Air Quality Action Plan is not a statutory requirement, as there are no AQMA's declared in the Chorley area. However, the production of an Air Quality Strategy will help to identify the key areas for intervention for this service and promote a partnership approach to air quality with health colleagues and provide a mechanism for engagement with key 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.

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 2018. Table A.2 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.

These sites are reviewed annually to determine if they are still relevant, although it is preferable to maintain a monitoring site for a number of years to provide sufficient data to determine any trends and changes at that location.

Trend data for each site is attached as Appendix **

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 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.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

There are no exceedences of the air quality objectives, either by the annual mean concentrations of 40µg/m³ or any tube result exceeding 60µg/m³, 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. The Trend charts in Appendix *** are coloured orange to highlight these locations.

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. Tube 14a is displaying a downward trend.

In 2018 the Annual Average Daily Traffic Flow rate fell from 14,000 vehicles per day in 2016 and 2017, to 10,000 vehicles per day. However, the NO₂ concentrations have remained relatively static. The annual mean concentration for this tube was within 10% of the air quality objective and therefore has been corrected for distance, in accordance with comments received on the previous ASR.

Currently there is no clear explanation for the continued mean concentrations compared to the reduction in traffic and therefore this site will continue to be monitored.

Site CH18b, which is on the A6, in an area of incline and the location of a speed camera, is also showing static trends. For the 2020 monitoring programme, an additional tube is being considered which will be slightly further along the road closer receptors and a junction, to map the emissions along this section of road. This may assist in determining any further actions required in this area.

Tubes CH23 and CH25 are close to the location of a relatively new 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.

Tube CH24 demonstrates a rising trend of NO₂, this tube is close to a large area of significant development (Buckshaw Village) and there continues to be new development very close to this monitoring site, with the opening of anew digital park

and other office and business developments close by and this may account to the current trend. There have also been some changes to the Hospital opposite. This site will continue to be monitored.

Tube CH27 is located close to a road junction, there is no obvious reason identified for the upward trend at this location.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

There are no automatic monitoring sites in Chorley.

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with Continuous Analyser? ^a	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/adjacent to the façade of a residential property).
- (2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
CH05	Kerbside	Diffusion Tube	100.00	100.00	32.99	34.59	35.43	33.85	34.15
CH06	Kerbside	Diffusion Tube	100.00	100.00	29.47	28.13	30.80	28.01	28.04
CH08	Roadside	Diffusion Tube	91.66	91.66	32.46	28.86	33.40	29.35	29.26
CH09	Roadside	Diffusion Tube	100.00	100.00	32.68	28.76	32.69	30.03	28.55
CH11	Kerbside	Diffusion Tube	91.66	91.66	30.03	28.61	31.67	28.23	26.62
CH14	Roadside	Diffusion Tube	100.00	100.00	39.93	40.15	43.19	42.28	38.87
CH14a	Roadside	Diffusion Tube	83.33	83.33	29.76	27.63	31.33	29.79	27.00
CH17	Kerbside	Diffusion Tube	91.66	91.66	33.83	31.93	33.00	31.62	29.04
CH17a	Roadside	Diffusion Tube	100.00	100.00	30.28	28.12	32.03	28.26	28.02
CH18	Roadside	Diffusion Tube	100.00	100.00	40.12	36.61	38.28	36.05	35.01
CH18a	Roadside	Diffusion Tube	100.00	100.00	33.09	31.31	32.01	31.44	29.72
CH18b	Roadside	Diffusion Tube	100.00	100.00	37.67	34.46	37.74	36.23	32.49
CH19	Roadside	Diffusion Tube	100.00	100.00	34.04	32.14	35.08	34.14	31.06
CH20	Roadside	Diffusion Tube	100.00	100.00	33.15	31.50	35.46	32.18	31.72

CH22	Kerbside	Diffusion Tube	100.00	100.00	25.82	23.04	28.28	25.09	24.37
CH23	Kerbside	Diffusion Tube	100.00	100.00	32.32	26.99	35.03	31.29	30.90
CH24	Roadside	Diffusion Tube	100.00	100.00	37.35	32.02	37.71	33.53	34.90
CH25	Roadside	Diffusion Tube	91.66	91.66	0.00	22.69	29.25	25.81	25.65
CH27	Kerbside	Diffusion Tube	100.00	100.00	0.00	24.43	30.62	25.84	28.51
CH28	Kerbside	Diffusion Tube	100.00	100.00	0.00	0.00	26.63	25.59	25.28

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

Notes:

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

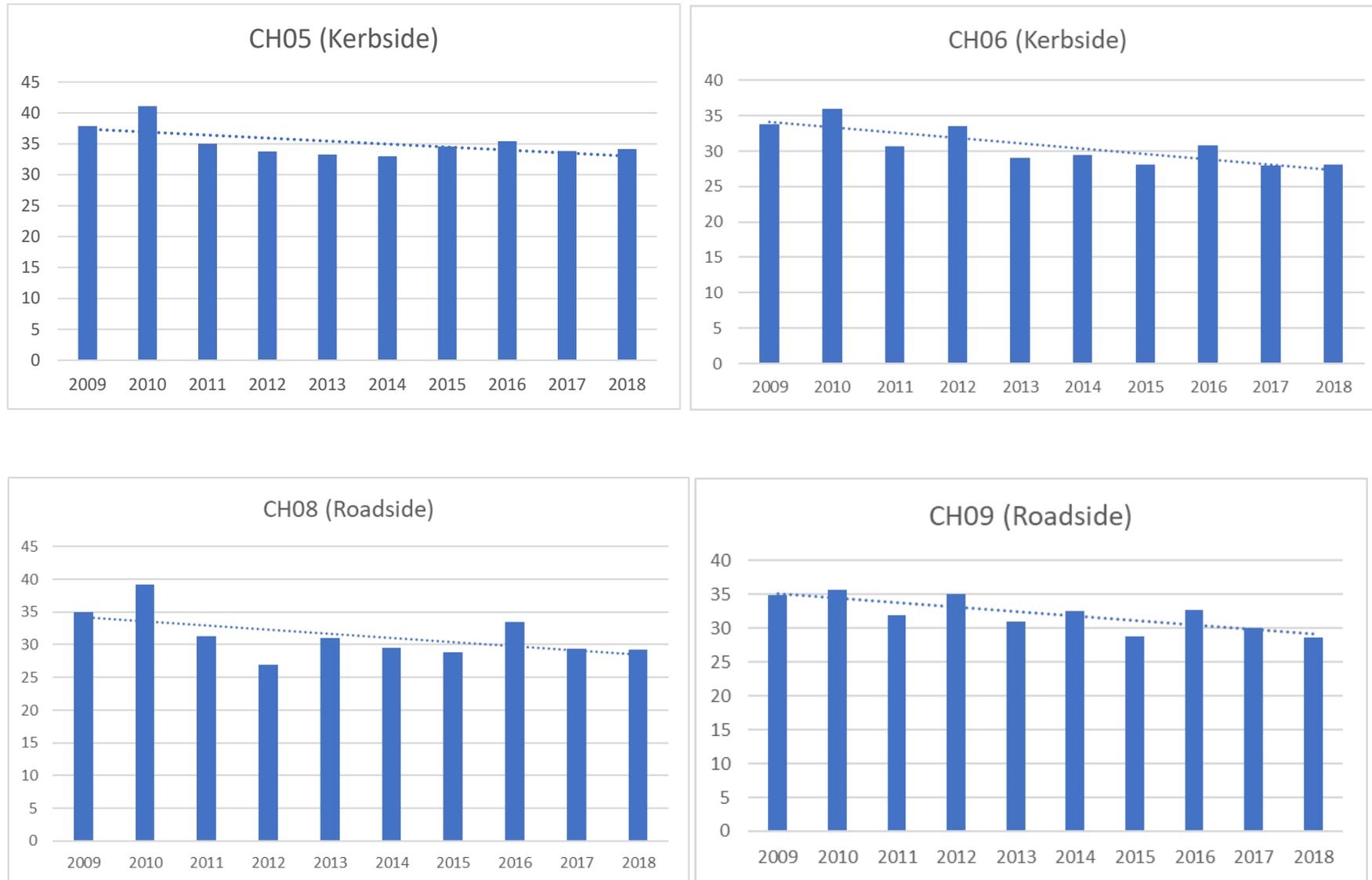
NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

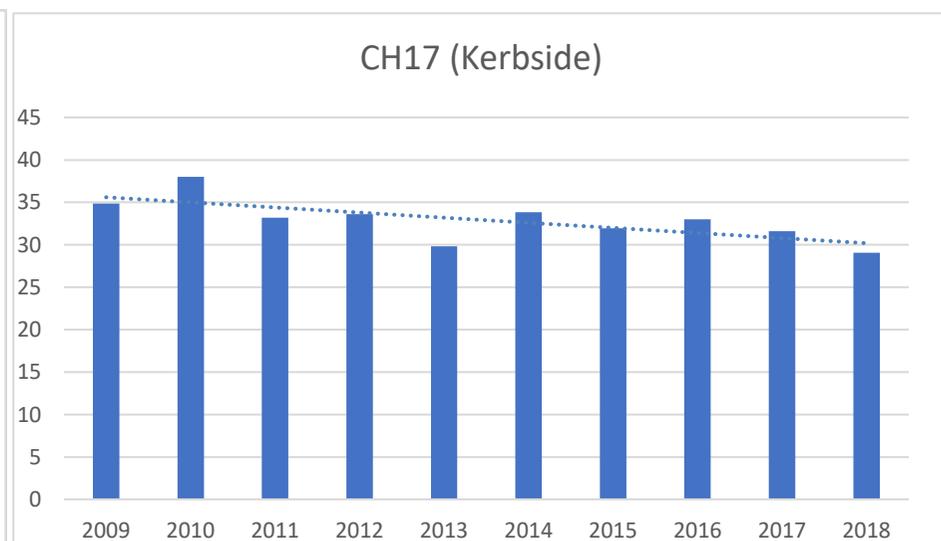
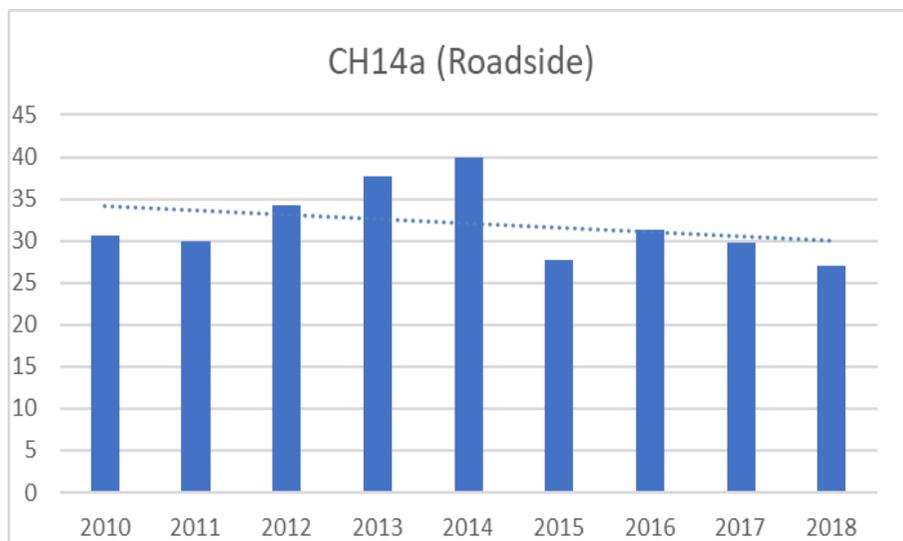
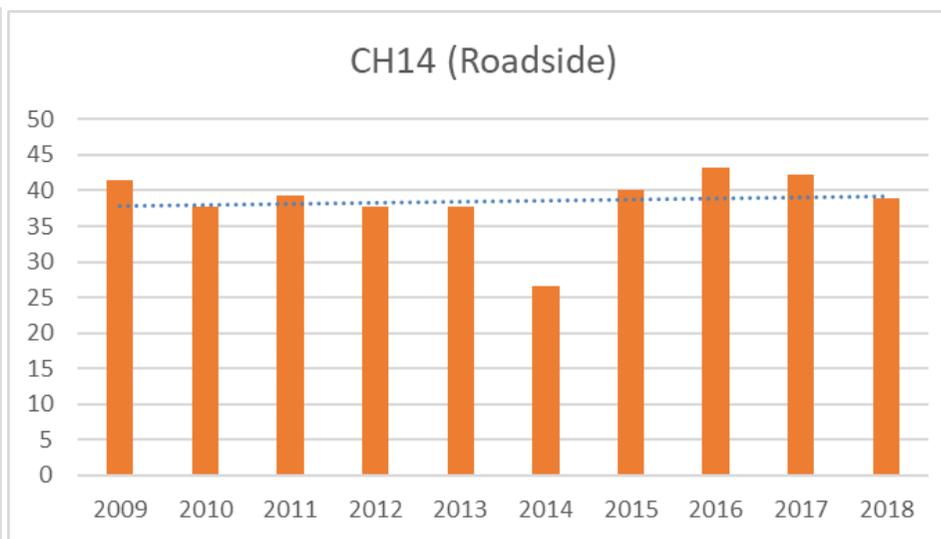
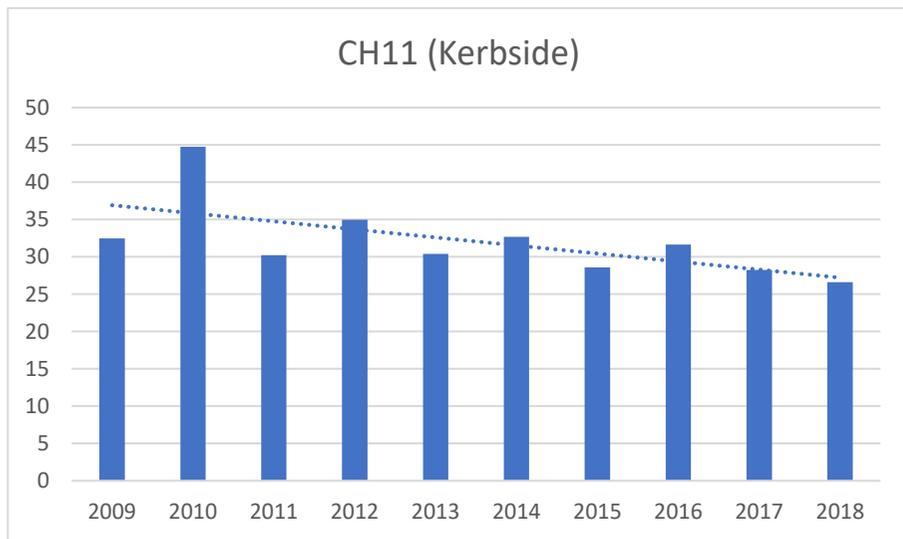
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

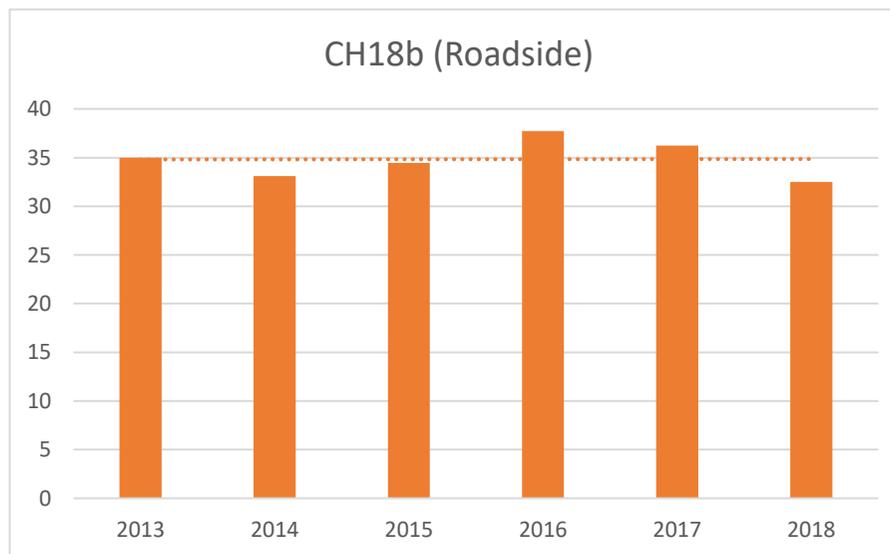
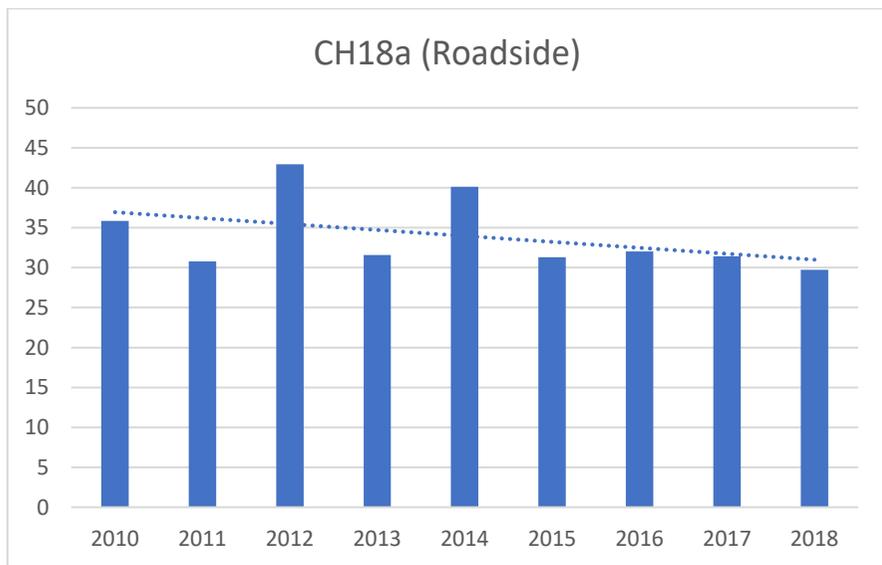
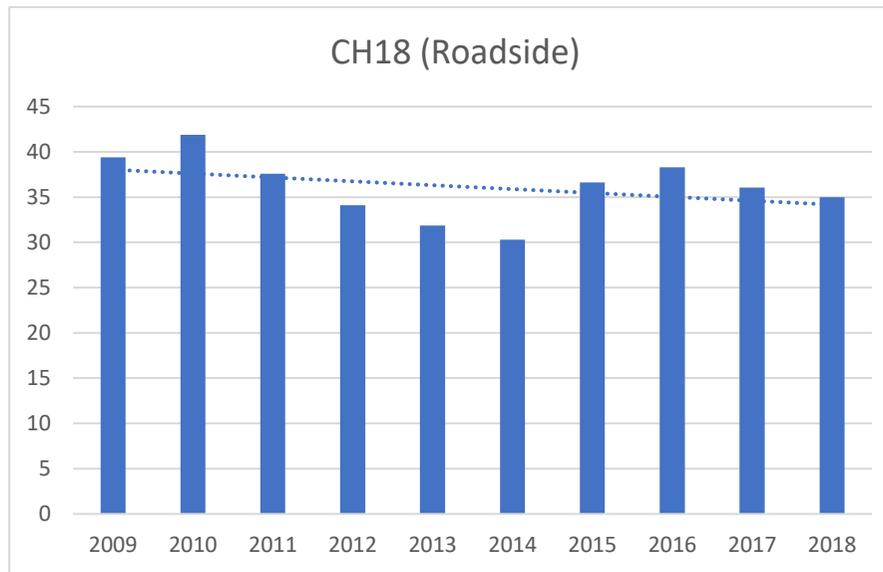
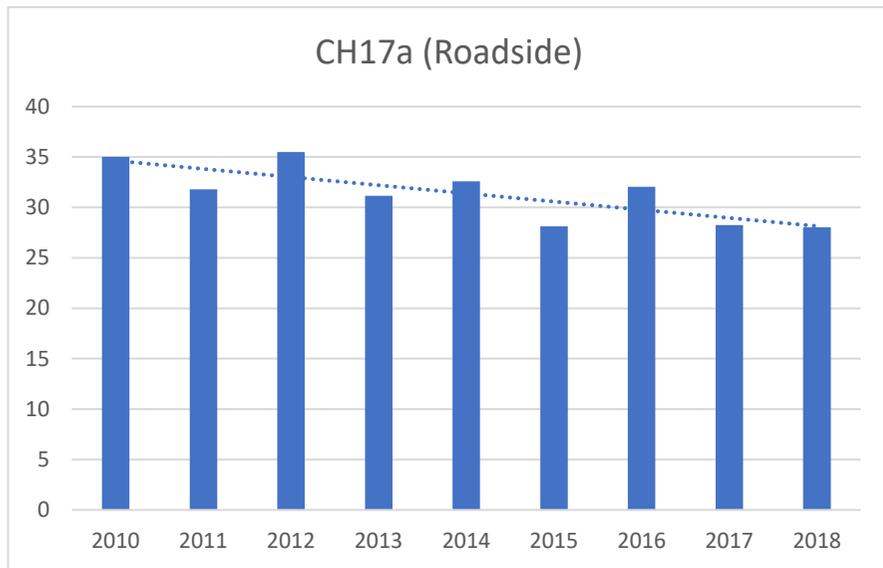
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

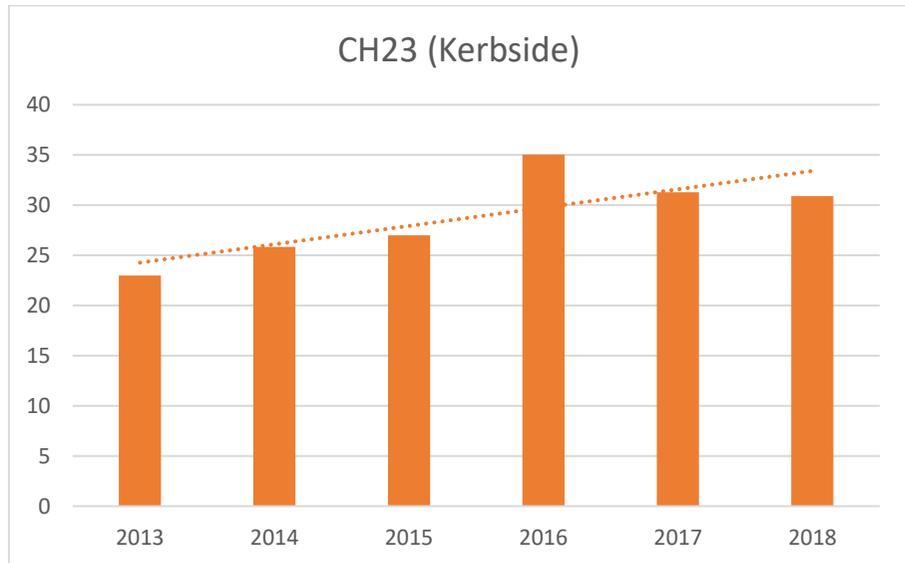
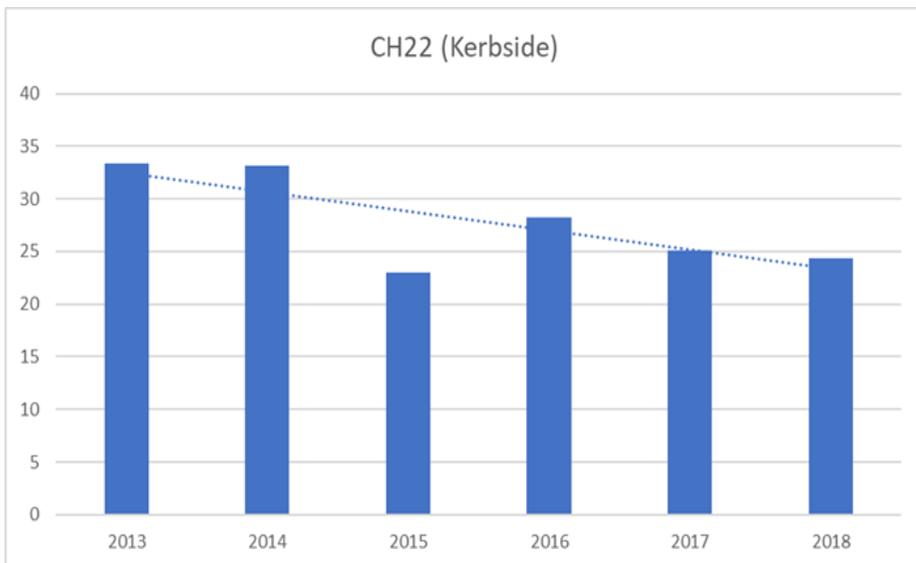
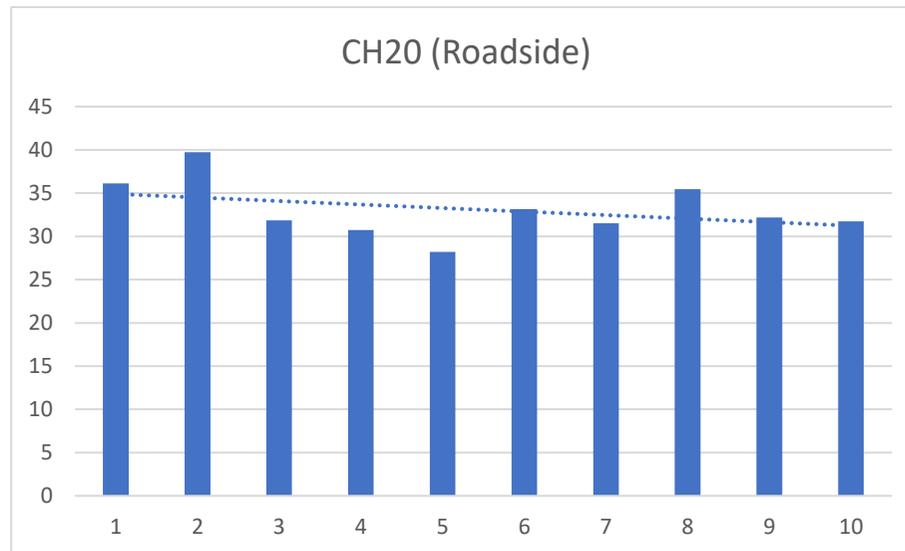
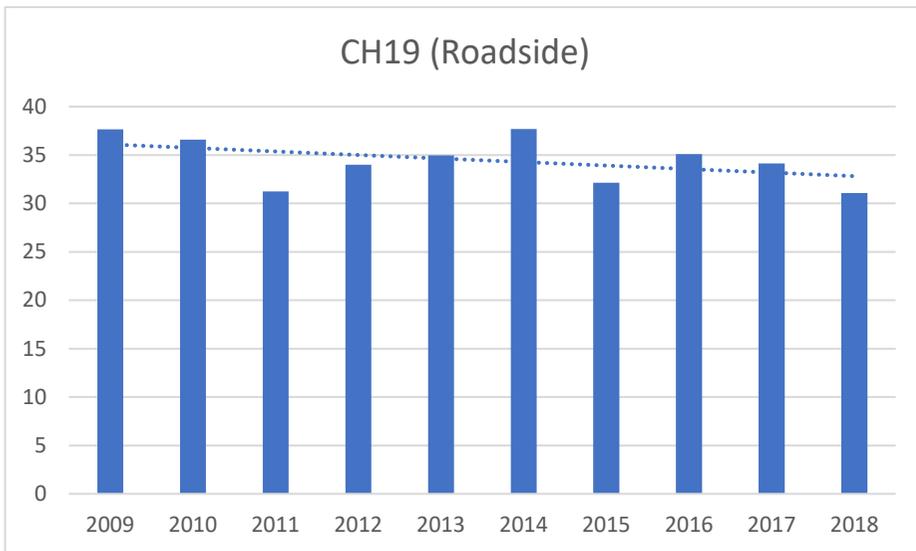
(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

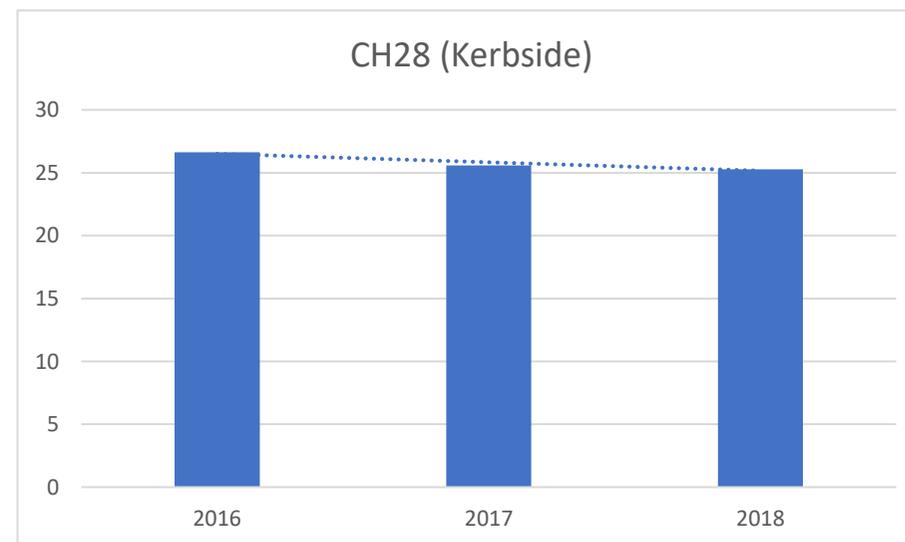
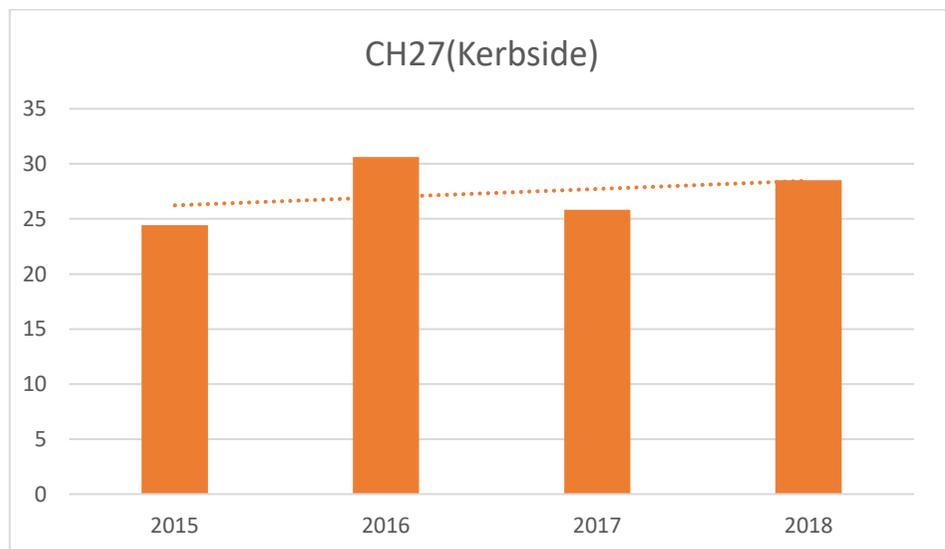
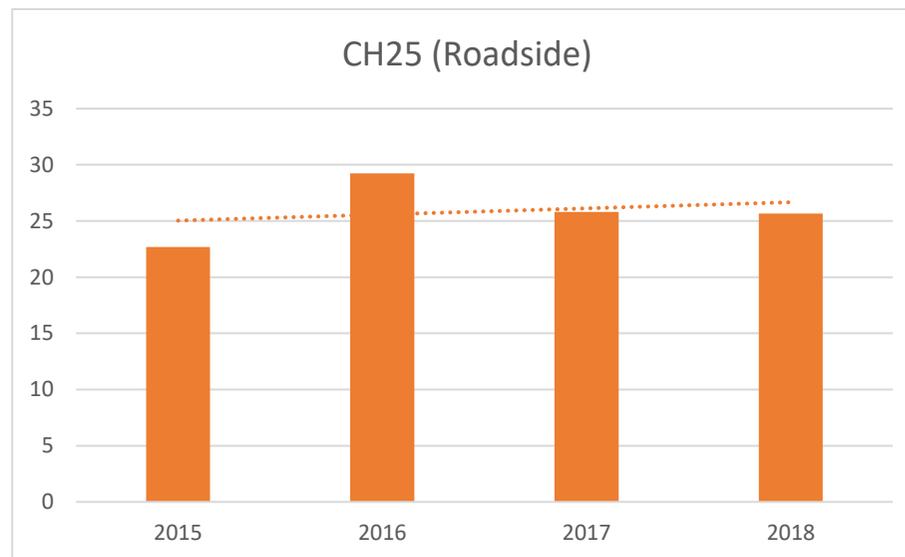
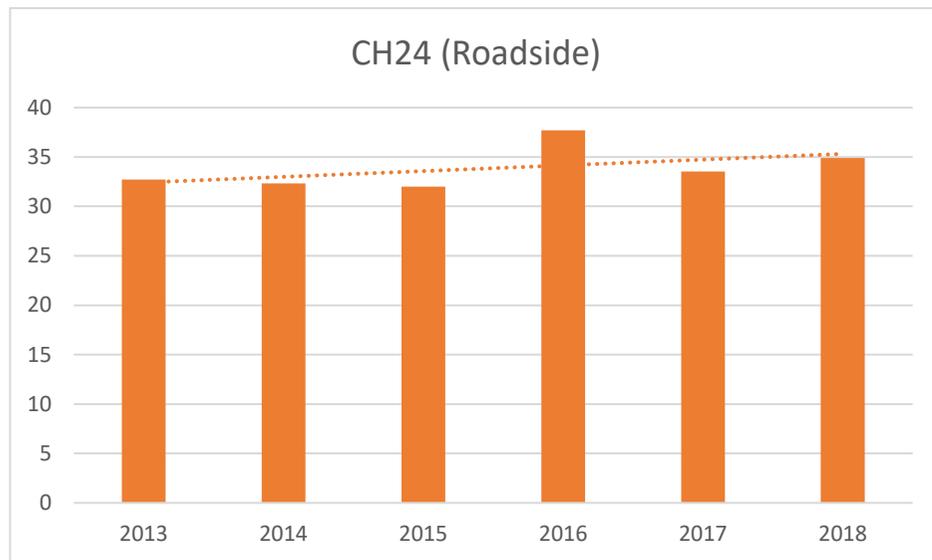
Figure A.1 – Trends in Annual Mean NO₂ Concentrations









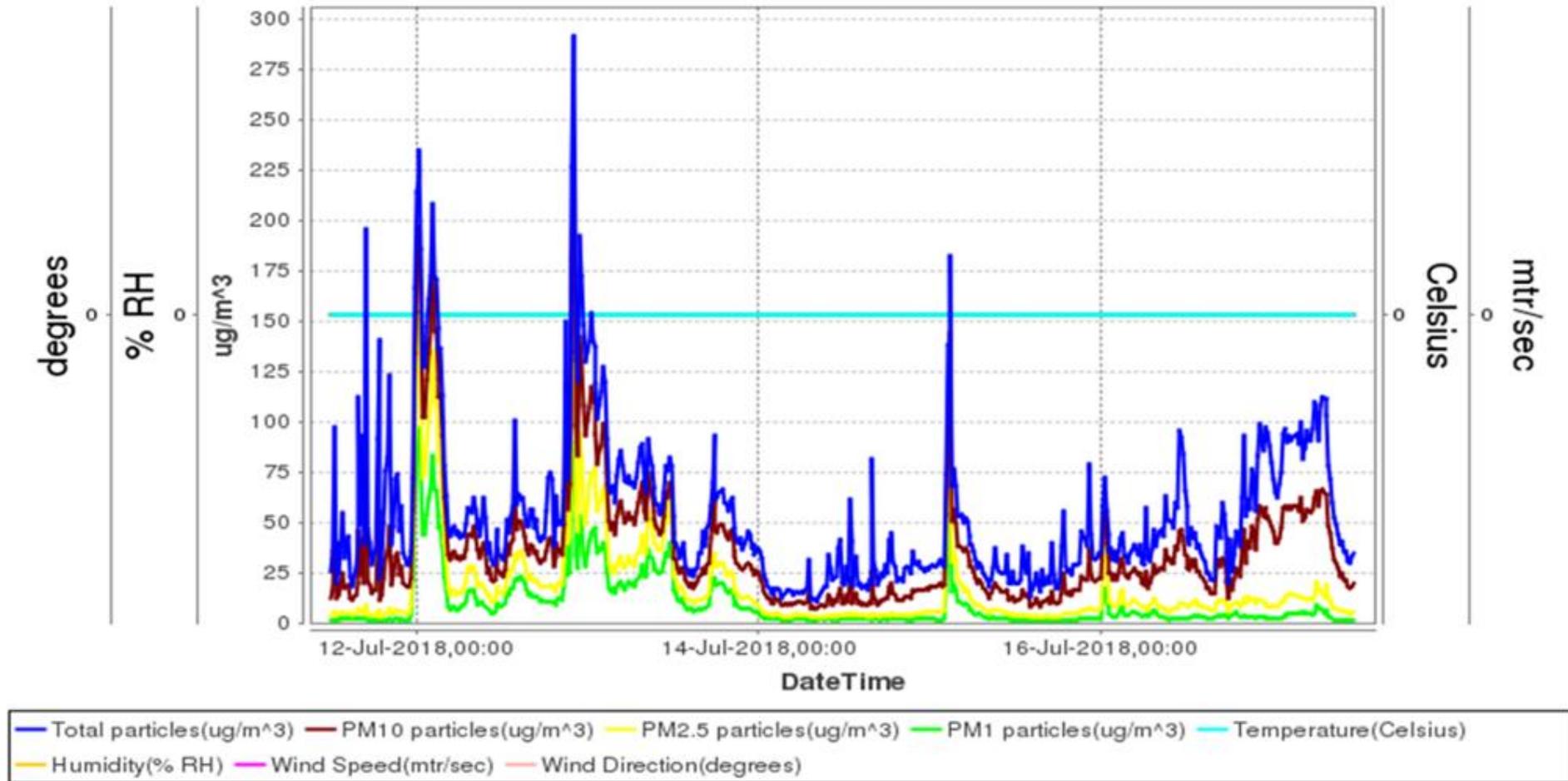


Monitoring locations and results relating to the Moorland fires in 2018

Anderton Centre



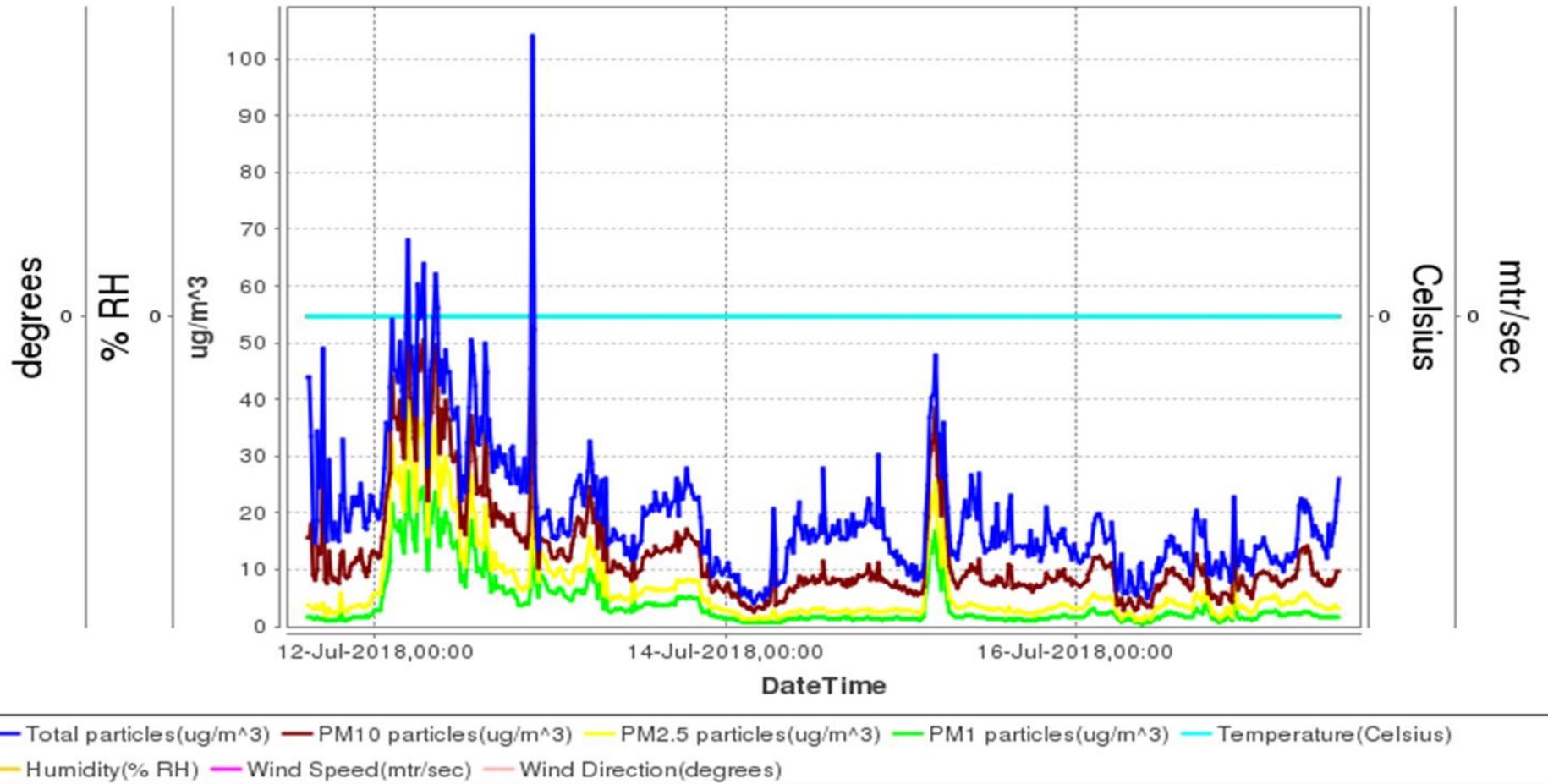
Graph



Jepsons Farm



Graph



Monitoring undertaken by Bureau Veritas deploying an OSIRIS sensor on behalf Bolton Council.

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2018

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.93) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
CH05 (Kerbside)	43.92	33.03	46	32.36	27.79	29.46	32.97	34.02	36.23	36.48	43.06	45.31	36.7	34.1	
CH06 (Kerbside)	31.71	31.36	32.44	27.31	28.02	26.5	24.2	27.6	29.27	30.34	34.74	38.33	30.2	28.0	
CH08 (Roadside)	38.56	33.88	38.16	24.6	N/D	24.3	24.6	25.36	28.88	29.3	36.93	41.46	31.5	29.3	
CH09 (Roadside)	35.06	39.9	34.65	31.64	22.75	26.31	28.05	27.28	20.75	34.72	31.37	35.88	30.7	28.5	
CH11 (Kerbside)	33.4	34.62	34.8	27.05	21.74	21.47	24.27	27.52	28.99	26.37	34.67	N/D	28.6	26.6	
CH14 (Roadside)	43.01	38.18	41.21	37.68	35.86	35.7	42.23	43.36	48.97	44.14	41.54	49.65	41.8	38.9	29.8
CH14a (Roadside)	37.07	34.91	34.89	26.62	19.39	18.19	25.2	26.67	32.18	35.18	N/D	N/D	29.0	27.0	
CH17 (Kerbside)	34.26	31.77	N/D	28.28	27.82	29.34	26.51	27.94	28.75	31.18	37.37	40.32	31.2	29.0	
CH17a (Roadside)	35.87	34.25	33.86	27.27	24.28	26.19	25.98	24.2	27.41	29.5	34.8	37.88	30.1	28.0	
CH18 (Roadside)	45.8	33.32	40.03	32.35	34.92	32.17	31.06	37.1	40	34.9	43.95	46.08	37.6	35.0	

CH18a (Roadside)	32.27	30.89	42.63	29.94	23.01	25.94	26.51	29.36	27.17	30.15	42.28	43.32	32.0	29.7	
CH18b (Roadside)	42.2	34.32	37.59	31.68	24.72	25.6	30.93	33.56	32.93	36.91	41.27	47.57	34.9	32.5	
CH19 (Roadside)	42.64	32.85	38	14.57	29.02	34.52	29.61	30.8	32.36	36.13	39.45	40.79	33.4	31.1	
CH20 (Roadside)	41.59	35.24	35.5	32.83	20.74	27.38	33.44	35.38	35.38	38.66	37.54	35.55	34.1	31.7	
CH22 (Kerbside)	30.58	25.27	31.46	24.8	18.88	18.05	19.3	22.93	20.2	27.87	35.42	39.65	26.2	24.4	
CH23 (Kerbside)	31.79	45.47	41.36	31.77	25.79	25.74	22.23	27	31.94	30.97	41.84	42.87	33.2	30.9	
CH24 (Roadside)	42.18	35.88	41.84	36.4	27.58	33.76	31.24	32.73	40.95	32.44	46.85	48.47	37.5	34.9	
CH25 (Roadside)	N/D	28.82	33.18	25.06	22.71	23.16	19.99	23.45	21.92	27.17	36.34	41.6	27.6	25.7	
CH27(Kerbside)	30.55	33.25	34.04	28.09	26.8	28.35	25.76	26.02	28.64	31.28	37.93	37.14	30.7	28.5	
CH28 (Kerbside)	30.56	25.92	33.16	25.15	22.76	22.74	23.86	23.32	27.33	27.19	32.6	31.62	27.2	25.3	

National bias adjustment factor used

Annualisation has been conducted where data capture is <75%

Where applicable, data has been distance corrected for relevant exposure (*Tube CH14 as within 10% of air quality objective*)

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 Diffusion Tube Bias Adjustment Factor Spreadsheet Version Number 3/19

Gradko	20% TEA in water	2018	Overall Factor ³ (30 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/tubeprecision2018version0619finalreduced.pdf>

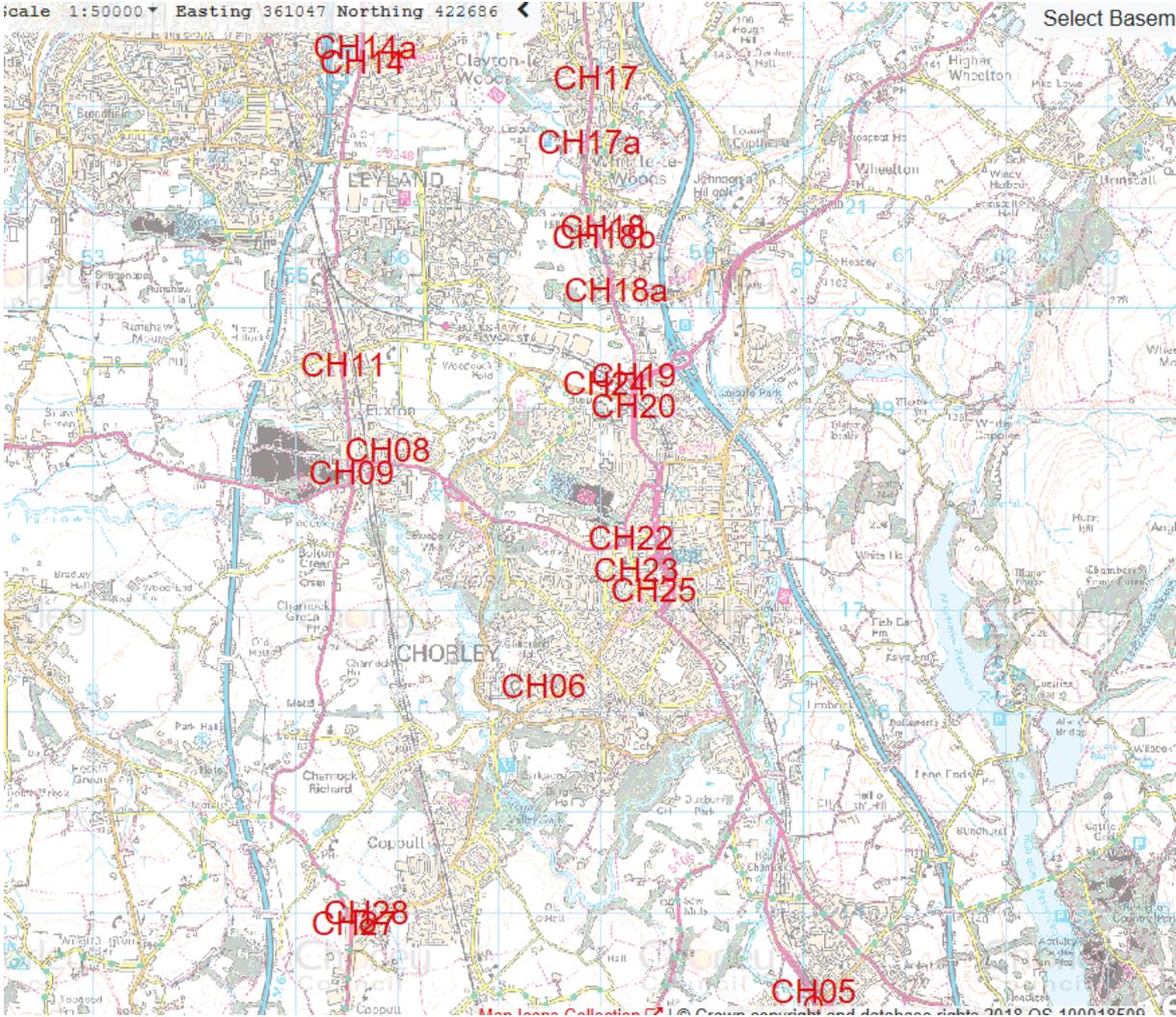
Distance Correction for Tube CH14



Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	12	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	17.152525	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	38.87	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	29.8	µg/m ³

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



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	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

⁴ 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

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2. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
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4. Public Health Outcomes framework,
<https://fingertips.phe.org.uk/search/particulate%20matter#page/3/gid/1/pat/102/par/E10000017/ati/101/are/E07000117/iid/30101/age/230/sex/4>
5. <https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>
6. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/460401/air-quality-econanalysis-nitrogen-interim-guidance.pdf
7. <https://uk-air.defra.gov.uk/>
8. 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>
9. 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>
10. Central Lancashire Local Delivery Plan- Health and Wellbeing:
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<http://healthierlives.phe.org.uk/topic/mortality/comparisons#are//par/E92000001/ati/101/pat/101>