



Lewes District Council

2019 Air Quality Annual Status Report (ASR)

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



June 2019

Local Authority Officer	Melissa Bomford
Department	Quality Environment – Specialist Advisor
Address	Lewes District Council, Southover House, Southover Road, Lewes, East Sussex, BN7 1AB
Telephone	01273 085428
E-mail	Melissa.bomford@lewes-eastbourne.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in Lewes District 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 importance of improving air quality and what local actions we can take can be found on:

[https://laqm.defra.gov.uk/documents/air_quality_note_v7a-\(3\).pdf](https://laqm.defra.gov.uk/documents/air_quality_note_v7a-(3).pdf)

Background & episodes

Air pollution can come from many different sources – traffic, imported air pollution from the Continent, air emissions from shipping, and domestic wood burning. There are also natural sources of air pollution too, such as dust from soils, ash and sea-spray. Burning wood and coal in open fires and stoves makes up 38% of the UK's primary emissions of fine particulate matter (PM_{2.5}). Particulates are not a single pollutant; they are made up from a huge variety of chemical compounds and materials. Around 15% of UK PM comes from naturally occurring sources, up to a third from other European countries and around half from UK human-made sources. (Clean Air Strategy 2019, Defra⁴)

Unfortunately there is no 'quick fix' in regards to air quality. The air is a constantly changing and evolving environment. We may get days when air pollution is higher than others, due to a number of meteorological conditions and chemical reactions occurring in the air. We can receive 'imported' pollution from the Continent and also from sources such as domestic wood burning and shipping. Wind speed, wind direction and the topography of the land mass plays an important part in where 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

⁴ Defra. Clean Air Strategy 2019

pollution ends up. Particles or particulate matter are extremely small bits of liquid or solid suspended in the air. They can originate from engine emissions, brake and tyre wear, industry and natural sources such as sea salt/spray, dust, desert dust, soil and pollen. Very fine particulates (PM_{2.5}) can therefore remain in the air for weeks and travel great distances (e.g. from the continent).

Ground level ozone is normally formed when other pollutants including nitrous oxides react in sunlight to form ozone (sometimes leading to a haze/smog); ozone levels are highly dependent on the weather and warm sunny periods can cause a sharp increase in mean levels. Ozone concentrations in the summer months tend to be higher in the south-east because it is closer to European pollution sources. The Sussex Air Pollution Monitoring Network⁵ Annual Report 2019, records there were many days of moderate ozone recorded at all (those sites monitoring ozone in Sussex) network sites during the summer of 2018. First widespread incident occurred in April and the last in September. As quoted in the Air Quality Bulletin⁶ (May 2019) for both rural and urban background sites, 2018 had the greatest number of hours of moderate or higher ozone pollution since 2008 (from government statistics, not just for Sussex).

The end of February – early March saw the ‘Beast from the East’ arrive. February was extremely cold with snow and fog. A particulate episode was seen during this period where moderate and high particle pollution was measured across large parts of the UK and western Europe. Winds arriving from east Europe caused increased sulphate particles indicative of coal burning. Thereafter air arriving from North Western Europe demonstrated contributions from traffic, gas combustion, wood burning and farming⁵. Kings College found that analysis of an April (21st) episode suggested a contribution from long range imported air from continental Europe together with poor dispersion of local emissions⁵

PM_{2.5} (particulates) were only measured at one Sussex site during 2018 – Eastbourne Holly Place. Moderate pollution was recorded on 4 days in March, May and high levels on 21st April⁵.

⁵ Sussex Air Pollution Monitoring Network Annual Report (May 2019) King's College London

⁶ Air Quality Bulletin (May 2019). Environmental Management Publishing Ltd

Both Lewes and Newhaven have an Air Quality Management Area (AQMA). Nitrogen dioxide concentrations were measured above annual objective concentrations and Air Quality Management Areas (AQMA) were declared in June 2005 and July 2014, respectively. Air Quality Action Plans were put in place (Lewes, May 2009 and Newhaven, June 2016) to manage the reduction in air pollution and air quality monitoring stations established to assess the impact of the measures put forward by the action plans.

In 2018, nitrogen dioxide monitoring using diffusion tubes took place at 41 locations throughout the Lewes District Council area. One extra diffusion tube was added at Drove Road, Newhaven in June 2018. Concentrations above the $40 \mu\text{g}/\text{m}^3$ annual objective concentration were still observed in both AQMAs. However, once corrected for fall-off of NO_2 concentration away from the kerb⁷ the concentrations drop below the annual objective concentration, except for two sites LDC34 – 204 High Street-School Hill (See Table 7) and LDC1 Fisher Street East (this however has not been corrected as there is no receptor). Nitrogen dioxide concentration measurements should continue within the AQMAs to monitor progress of the respective action plans in reducing air pollution. The Lewes Town Centre AQMA also has a continuous automatic monitoring station situated within it measuring: nitrous oxides - NO , NO_2 , NO_x and particulate (PM_{10}) concentrations. NO_2 at the automatic monitoring station appears to show improvement over the last 5 years (See Appendix A, Table A.3) and NO_2 concentrations show general improvements over the five year period. There are some sites that remain more static e.g. LDC36-Fisher Street West for the last 4 years has remained around the $31/32 \mu\text{g}/\text{m}^3$ concentration, but has really improved compared to the 2014 reading of $40 \mu\text{g}/\text{m}^3$. Over the last 5 years (see Appendix A, Table A.3), NO_2 annual means for Fisher Street and Station Street (except LDC14 Station Street which has remained more static) have shown some reduction in concentrations. Annual mean PM_{10} for 2018 had to be annualised⁷ (see Table 8) because there was insufficient data capture (67%) – due to a period of abnormal readings, the equipment maintenance unit found a disconnection in the sampling array⁵. The annual mean PM_{10} was annualised at $18 \mu\text{g}/\text{m}^3$ which does show an improvement on last year (see Table A.5) but caution taken as the figures are annualised.

⁷ <https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>

Figure 1 & 2: Fisher Street and Station Street in the Lewes Town Centre AQMA.

Illustrates the historic narrow roads where vehicle pollutants can often get trapped



Figure 3 & 4: A259 Newhaven Ring Road AQMA. This area is frequently clogged with traffic particularly during rush hour and when the swing bridge is in operation.



For both Lewes Town Centre and A259 Newhaven Ring Road AQMA's please click the following link/s:

https://uk-air.defra.gov.uk/aqma/details?aqma_ref=404

https://uk-air.defra.gov.uk/aqma/details?aqma_ref=1576

For a countrywide list of local authority AQMA's please follow this link:

<http://uk-air.defra.gov.uk/aqma/list>

Actions to Improve Air Quality

Lewes District Council has taken forward a number of initiatives during the current reporting year of 2018 in pursuit of improving local air quality. East Sussex County Council (ESCC) managed to secure £1.4 million funding from the Department for Transport to deliver a programme of active travel across East Sussex. The Active Access for Growth Programme will run from 2017 to 2020, focusing on a number of growth areas, one of these being Newhaven (See Section 2.2). Other measures can be found in Section 2.2.1 and 2.2.2 and Table 2.2.

East Sussex County Council (ESCC) successfully applied to DEFRA's air quality grant fund on behalf of the Sussex Air Quality Partnership to deliver interventions with 25 schools and 25 businesses in Sussex to contribute to reducing exceedances of the annual mean objective for NO₂ in the designated AQMAs (or near to), caused mainly by local traffic. Sustrans and Living Streets were commissioned to deliver this project into schools, adding value to the ESCC Access Programme. A consultancy company, Phlorum was commissioned to deliver the business interventions.

A short description of the project

The purpose of this project is to contribute to a reduction in the emissions within the AQMAs in Sussex, and thereby speed up the date at which compliance will be achieved. The project will deliver the following outputs:

- 1) An intensive and targeted intervention with 25 schools in the AQMAs across Sussex to:
 - a. reduce idling during school drop-off and pick-up times;
 - b. increase walking and cycling rates to and from school;
 - c. measure the change in walking and cycling rates, and idling, and assess the effect on local air quality.
- 2) An intensive and targeted intervention with 25 businesses in the AQMAs across Sussex to:
 - a. reduce local emissions from fixed and mobile plant;
 - b. increase walking and cycling rates to and from work, and reduce business mileage;
 - c. deliver eco-driver training to staff working in the 25 businesses;
 - d. evaluate the change in local emissions from the above measures.

- 3) The dissemination of the project results and key lessons learned:
- a. amongst the 14 Sussex Local Authority partners through the project board;
 - b. to all schools in Sussex, as the Sussex Air partners include the Sussex Local Education Authorities for Sussex;
 - c. to a wider audience of key stakeholders, including Public Health colleagues, through a conference;
 - d. to the wider public through improvements to the existing Sussex Air website (<http://www.sussex-air.net/>).

Briefly, some of the results by the end of May 2019:

Sustrans - 26 schools took part, students usually coming to school by car reduced by 13% after the sessions, students usually cycling to school doubled from 3% to 6% and students cycling outside of school time rose by 6%. It was found, on average the levels of nitrogen dioxide were 26% higher outside the school gates than in the classroom. Living Streets: Recruited 21 schools and delivered 13 events with a further 8 schools confirmed for events in June 2019. Living Streets created a student-led anti-idling programme - events included talks in assemblies about anti-idling, some school pupils talked to drivers and have handed out hundreds of postcards with the anti-idling message. Schools are encouraged to continue the anti-idling message with Living Streets 'Walking on Clean Air – Your 'How To' Anti-idling Guide.' Link to Living Streets website: <https://www.livingstreets.org.uk/>

On the business side – there has been some engagement with small and medium sized businesses and engagement with Sussex Transport for eco driver training. Delivering and promoting a Sustainable Transport eVent with Gatwick Airport, Manor Royal and Crawley BC will be held in June 2019.

Conclusions and Priorities

In order to fulfil its goal in producing quantifiable outcomes to appropriate timescales, Lewes District Council will work closely and in collaboration with all its delivery partners, such as ESCC. Collaborative working is extremely beneficial in many ways e.g. in reviewing, updating and implementing measures regarding Air Quality Action Plan (AQAP)'s and other projects or initiatives.

The Lewes AQAP still requires further reviewing and updating (further modelling work has been carried out since the last ASR report and is included in this report). All AQAP's should be seen as live documents and reviewed as necessary. For example, the Newhaven AQAP has an action for 'use of traffic management to reduce emissions' – ESCC are commissioning work to develop designs in improving the

traffic flow around the Ring Road by co-ordination of existing signalised pedestrian crossings plus improvements to the layout of the area. It is envisaged for construction by March 2020.

Lewes District Council is still in the process of securing a new continuous air quality monitoring station in Newhaven (preferably in or nearby the current AQMA). It was hoped that this would have been completed by now, but there have been various issues encountered along the way, a suitable location being one of them. We envisage the monitoring station to be installed and running this year (2019).

Temporary anti-idling signs have been deployed in and around both Lewes and Newhaven AQMA's (mentioned as an action in the Lewes 2009 AQAP). Deployment was highlighted in the local press and on social media. We have placed a few more of these signs in areas where there may have been additional issues highlighted by members of the public. We are continuing this anti-idling initiative – in March 2019 we launched an anti-idling education campaign aimed at schools over both Lewes and Eastbourne councils. We will be continuing this anti-idling message into schools over the next few years.

The Sussex-air Quality Partnership led by Horsham District Council were successful in bidding for a DEFRA grant (for period 2019/2020). This project is an educational campaign on solid fuel burning, promoting cleaner fuels, low smoke appliances and the correct way of installing and maintaining them. We plan to gather information and data on the type of appliance and solid fuels that house-holders use in the region, to heat their home. We aim to promote cleaner burning choices. We would like to try and ascertain why householders use particular appliances and fuels and understand their decision making process when considering energy efficiency improvements. Advice and information to householders will be provided online via a dedicated website. In addition, leaflets will be posted or be available to download from the website. Each questionnaire respondent will be either directed or referred to energy improvement programmes. There will be an update of this initiative in next year's ASR.

We are always keen to work with our neighbouring authorities via Sussex-air, with our county council and increasingly with our public health colleagues. For example, the schools anti-idling campaign – part of the information we send out includes

'Health Matters by Public Health England'. The link:

<https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution>

We recognise the importance of joint working and the successful award of both last year's grant and this year's grant demonstrates the importance and success that combining forces can create. We also recognise that joint working provides the public with a greater understanding of how air quality and health are intrinsically linked.

**More exercise – less obesity – less vehicles on the road – improved air quality -
= increased general health**

Local Engagement and How to get Involved

Help improve your own environment:

Can you cut down on the use of your vehicle?

- Use public transport
- Cycle
- Walk
- Use alternative routes to get from A to B. Instead of walking or cycling along a major road, use alternative quieter and less polluted routes.

Not only can you help in improving our environment but it gives you the added benefit of exercise and helps improve general health and well-being.

Idling engines:

Vehicle idling causes air pollution and engines should not be left running unnecessarily. Breathing polluted air is not only extremely unpleasant but is also detrimental to our health. The air inside the vehicle can be worse than outside!

Why it's good to turn off vehicle engines - Cut Engine Cut pollution

- Exhaust emissions contain a range of air toxic pollutants such as carbon monoxide, benzene, formaldehyde, Polyaromatic hydrocarbons, nitrogen dioxide and particulate matter.
- Every minute your car idles you could fill 150 balloons with harmful chemicals.

- Turning off your car engine and restarting it after one minute causes less pollution and uses less fuel than keeping the engine running.
- Modern batteries need less engine running time to stay charged.
- It takes up to an hour for an engine to cool down which means your car heating fan will work with your engine turned off.
- Idling does not keep a catalytic converter warm. They retain heat for approximately 25 minutes after the engine is switched off.

Air quality is as important as exercise and diet for health. Reducing air pollutants can help reduce respiratory problems, heart disease, lung cancer and asthma attacks.

Changing your vehicle:

- If you are considering buying a new or second hand vehicle/s consider the options of newer cleaner models – e.g. hybrids, electric.
- Have a good look at the vehicles emission credentials before buying.
- Consider alternatives – could you join a Car Club?

There are various organisations and clubs which offer help and advice on getting active, for example: Sustrans: <http://www.sustrans.org.uk/what-you-can-do>, walking: <https://www.livingstreets.org.uk/walk-to-school>, Bikeability: <http://bikeability.org.uk/> - programmes – involving schools and workplaces (cycling and walking activities). Public Health England published a very informative document on air pollution and health. This can be found on this link:

<https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution>. Public Health England says: *‘Epidemiological studies have shown that long-term exposure to air pollution (over years or lifetimes) reduces life expectancy, mainly due to cardiovascular and respiratory diseases and lung cancer. Short-term exposure (over hours or days) to elevated levels of air pollution can also cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in respiratory and cardiovascular hospital admissions and mortality.’*⁸

Details, including local air quality monitoring data, annual air quality reports and the impact air quality may have on health can be found on the Sussex-air website. Sussex-air also runs the airAlert service providing warnings to people with respiratory

and cardiovascular conditions, health professionals and carers in Sussex. The service is FREE to register/subscribe to and anyone can join. Alerts are sent direct to the airAlert app, email, mobile phone via text message or home phone. Sussex-air also provides a free coldAlert service – providing extreme cold weather warnings and information and also a heatAlert service. The apps, airAlert, coldAlert and heatAlert are provided as a free service by the Sussex Air Quality Partnership and supported by the Public Health Bodies (East Sussex & West Sussex County Council). Further information can be found: www.sussex-air.net or telephone 01273 484337.

Business

Businesses in East Sussex can obtain assistance from energy advisors LoCASE (Low Carbon Across the South East). Your business may be eligible for a free energy audit and funding for energy efficiency solutions identified with a grant. More information can be found on: <http://locase.co.uk/partners-and-services/>

⁸ Health Matters – Public Health England (2018)

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Lewes District Council	i
Actions to Improve Air Quality	v
Conclusions and Priorities	vi
Local Engagement and How to get Involved	viii
1 Local Air Quality Management	1
2 Actions to Improve Air Quality	2
2.1 Air Quality Management Areas	4
2.2 Progress and Impact of Measures to address Air Quality in Lewes District Council	5
2.3 PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations	26
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	28
3.1 Summary of Monitoring Undertaken	28
3.1.1 Automatic Monitoring Sites	32
3.1.2 Non-Automatic Monitoring Sites	33
3.2 Individual Pollutants	33
3.2.1 Nitrogen Dioxide (NO ₂)	33
3.2.2 Particulate Matter (PM ₁₀)	39
Appendix A: Monitoring Results	42
Appendix B: Full Monthly Diffusion Tube Results for 2018	55
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	59
Appendix D: Map(s) of Monitoring Locations and AQMAs	64
Appendix E: Summary of Air Quality Objectives in England	67
Glossary of Terms	68
References	69

List of Tables

Table 2.1 - Declared Air Quality management Area	4
Table 2.2 - Progress on Measures to Improve Air Quality	5
Table 3 - Summary of ESCC Local Transport Capital programme 2018/19-Supporting Cycling/Walking/Public Transport for Lewes & Newhaven	10
Table 4 - Summary of ESCC Local Transport Capital programme 2019/20-Supporting Cycling/Walking/Public Transport for Lewes & Newhaven	11

Table 5 – Modelling Baseline NO ₂ Concentration Results.....	29
Table 6 – National Bias Factor Adjustment Spreadsheet.....	60
Table 7 – Sites where the annual mean for NO ₂ has been exceeded & corrected for distance to receptor.....	61
Table 8 – PM ₁₀ Annualised mean for Lewes Town Centre site.....	62
Table 9 – NO ₂ Annualised Diffusion Tube mean for Drove Road site.....	63

List of Figures and Photographs

Figure 1 and 2 – Photographs of Fisher Street and Station Street in Lewes AQMA	iv
Figure 3 and 4 – Photographs of part of the A259 Newhaven Ring Road AQMA	iv
Figure 5 and 6 – Location of Lewes and Newhaven AQMA	3
Figure 7 – Fraction of mortality attributed to particulate air pollution in Lewes District area.....	26
Figure 8 – Fisher Street NO _x Predicted Source Apportionment 2019.....	30
Figure 9 – Fisher Street NO _x Predicted Source Apportionment 2023.....	30
Figure 10 – School Hill LDC34 NO _x Predicted Source Apportionment 2019.....	31
Figure 11 – School Hill LDC34 NO _x Predicted Source Apportionment 2023.....	31
Figure 12 – Annual average NO ₂ concentration in µg/m ³ measured at Lewes automatic monitoring site in the Lewes district 2014-2018.....	33
Figure 13 – Annual average NO ₂ concentration (diffusion tubes) located within the A259 Newhaven Ring Road AQMA from 2014-2018.....	34
Figure 14 - Annual average NO ₂ concentration (diffusion tubes) located within the Lewes Town Centre AQMA from 2014-2018.....	35
Figure 15 - Annual average NO ₂ concentration (diffusion tubes) located within the Newhaven area but not in the AQMA and one tube in Telscombe from 2014-2018.....	36
Figure 16 - Annual average NO ₂ concentration (diffusion tubes) located within the Lewes area but not in the AQMA from 2014-2018.....	37
Figure 17 – Annual average NO ₂ concentration (diffusion tubes) located within the Lewes area but not in the AQMA from 2014-2018.....	38
Figure 18 – Annual average NO ₂ concentration (diffusion tubes) located within the Lewes District area as a whole and not in the AQMA's from 2014-2018.....	39
Figure 19 – Annual average PM ₁₀ concentration measured at LS5 Lewes Town West Street (Automatic Monitoring site) 2014-18.....	40
Figure 20 – Number of exceedances of the 50µg/m ³ daily average at LS5 Lewes Town West Street (Automatic Monitoring site) 2014-2018.....	40

1 Local Air Quality Management

This report provides an overview of air quality in Lewes District 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 Lewes District 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 Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMA's) 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.

A summary of AQMA's declared by Lewes District Council can be found in Table 2.1. Further information related to declared or revoked AQMA's, including maps of AQMA boundaries are available online at:

https://uk-air.defra.gov.uk/aqma/details?aqma_ref=404

https://uk-air.defra.gov.uk/aqma/details?aqma_ref=1576

For a countrywide list of local authority AQMA's please follow this link:

<http://uk-air.defra.gov.uk/aqma/list>

See Appendix D: Map(s) of Monitoring Locations and AQMA's, which provides for a map of air quality monitoring locations in relation to the AQMA(s).

Figures 5 and 6 Lewes Town Centre AQMA and A259 Newhaven Ring Road AQMA

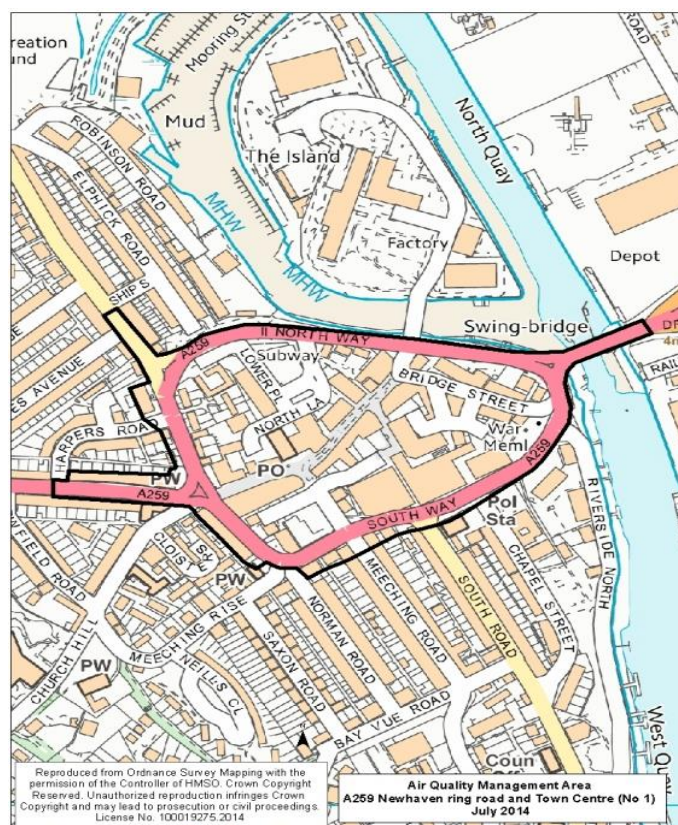
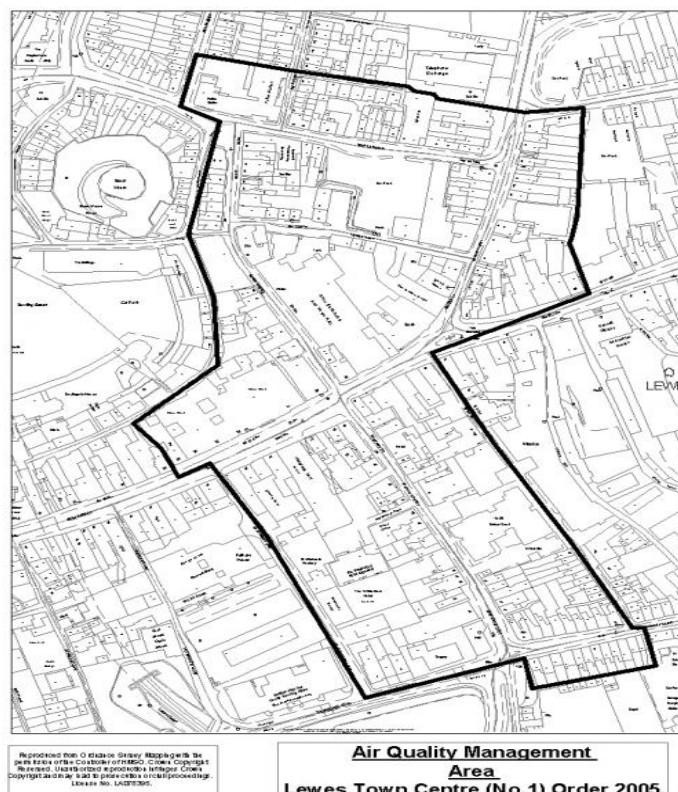


Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Lewes Town Centre	30.06.05	NO2 Annual Mean	Lewes	An area encompassing a section of Lewes Town Centre extending north to the old police station, south to St Andrews Place	NO	53	µg/m3	42* not distance corrected as no receptor	µg/m3	Lewes Town Centre	May-09	http://www.sussex-air.net/Reports/LewesAQAP2009.pdf
A259 Newhaven Ring Road	16.07.14	NO2 Annual Mean	Newhaven	Incorporates Newhaven Town Centre, Southway, Northway and sections of the A259 Brighton Road, Lewes Road and the swing bridge	NO	49	µg/m3	35	µg/m3	A259 Newhaven Ring Road	Jun-16	http://www.sussex-air.net/Reports/NewhavenAQAP2016.pdf

☒ Lewes District Council confirm the information on UK-Air regarding their AQMA(s) is up to date

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

Defra's appraisal of last year's ASR concluded that both AQMA's should be monitored further and considered for revocation in the next few years if monitoring consistently shows no exceedances of air quality objectives. It also instructed that any update of the Lewes AQAP should be included in this year's report (2019) – some further modelling has been completed during this time and is included in this report. The Lewes AQAP is going to have further review and input during 2019/20 and be updated in its entirety. Defra also pointed out that monitoring results suggest that the pollution exceedances in Lewes are small scale and localised.

Lewes District 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 2.2 and in section 2.2.1.

On the 11th April 2019, Lewes Town Council's Neighbourhood Plan for 2015-2033 was 'made' by the South Downs National Park Authority (<http://www.lewes4all.uk/>).

⁹*The plan sets out a vision for the town through to 2033 in a set of planning policies supported by a series of proposed projects.*

'5.17 The Lewes Neighbourhood Plan will seek to ensure there are appropriate opportunities for renewable energy generation and energy storage in new and existing developments. Demand for energy will also be reduced by using land efficiently and imaginatively so new developments are close to services and open spaces, reducing the need for car use and car parking, and cutting air and noise pollution.'

The Lewes District Local Plan, Part 1 Joint Core Strategy 2010-2030 (May 2016) includes Core Policy 9 – Air Quality: Link below

<https://www.lewes-eastbourne.gov.uk/planning-policy/lewes-local-plan-2003-saved-policies/>. Its key strategic objectives are: *'reducing the need for travel and to promote a sustainable system of transport and land use for people who live, work, study in*

⁹ Lewes Town Council Neighbourhood Plan (2019)

and visit the district’ and ‘to ensure the district reduces locally contributing causes of climate change and is pro-active regarding climate change initiatives’.

In brief: Local planning must have regard to AQMA areas and AQAP's. Planning must ensure applications for developments: provide mitigation measures where traffic may adversely affect an AQMA, ensure development will not have a negative impact on the surrounding area in terms of its health, promote opportunities for walking, cycling and public transport and congestion management to reduce traffic levels in areas of reduced air quality and secure best methods to reduce levels of dust and other pollutants arising from construction.

A collaborative approach has been taken in order to improve the environment as a whole – for example the East Sussex Strategic Partnership:

<http://www.essp.org.uk/What-we-do/Pride-of-Place/Environment>

The current priority themes in the Lewes District Sustainable Community Strategy are:

- A valued environment
- Decent and affordable housing for all
- Safer and stronger communities
- Access to good local facilities
- Healthier communities
- Vibrant and sustainable economy

More on the link below:

<http://www.essp.org.uk/East-Sussex-Strategic-Partnership-Media/East-Sussex-Strategic-Partnership-Document-Library/PoP%20documents/Lewes.pdf>

One of the key tasks under the Environment and Climate Change theme is to reduce traffic by increasing alternative sustainable travel choices and to improve air quality.

Lewes District Council works in partnership with East Sussex County Council to improve local air quality. One of the main mechanisms to achieve this is through the Local Transport Plan (LTP3, 2011-2021). An update on the Local Transport Plan is provided in the Second Implementation Plan (2016/2017 to 2020/2021) which can be

found at:

<https://www.eastsussex.gov.uk/roadsandtransport/localtransportplan/ltp3/downloadltp3>

It identifies the importance of various improvements to key walking and cycling corridors (e.g. improving signs for cycle Regional Route 90), focussing on improvements to public transport corridors, better use of technology e.g. Real Time Bus Information and charging points for electric vehicles. Further information can be found on: <https://www.eastsussex.gov.uk/roadsandtransport/localtransportplan>

While air quality is not an explicit objective for the LTP, there will be co-benefits in terms of the measures designed to tackle climate change and improve quality of life.

2.2.1 Lewes Town Centre AQMA

In Table 2.1 the monitoring location of initial exceedance (at declaration) was measured at in Fisher Street (Fisher Street East). Initially measured at $53\mu\text{g}/\text{m}^3$ (annual mean) in 2005/06 this has gradually decreased to a reading of $42\mu\text{g}/\text{m}^3$ (however this is still above the annual air quality objective of $40\mu\text{g}/\text{m}^3$). There is a bus stop on this street and traffic has to wait behind the bus if it stops here. This queuing traffic will add to NO_2 emissions at this end of the street. This tube is also very close to the crossroads in the High Street.

However, there has been steady reductions in NO_2 at Fisher Street West and 18 Fisher Street and this is probably due to the change of traffic priority at the that end of Fisher Street where traffic is more free-flowing. This is a narrow street with high buildings either side, thus enclosing pollutants; a very common problem for old historic towns.

The link to the current Lewes AQAP is:

<http://www.sussex-air.net/Reports/LewesAQAP2009.pdf>

Many of the actions originally placed into the Lewes AQAP 2009 have been completed: for example, there have been reductions in NO_2 concentrations (e.g. change of traffic priority in Fisher Street), car club is well established, 20mph zones in town centre and beyond, Offham Road pedestrian crossing installed, a pedestrian crossing installed on the A277 Brighton Road (near corner of Montacute Road), Ringmer to Lewes cycle route completed, improvements at Lewes Railway Station,

many buses coming through Lewes have cleaner engines and installation of anti-idling signs.

The Lewes AQAP is in the process of reviewing and will also have to take into account a major planned development for the town called the *North Street Quarter*. This has the potential to have a major impact on the AQMA and town as a whole.

In April 2019, detailed plans for the latest phase of the North Street Quarter development in Lewes were approved.

See link for details: <https://northstreetqtr.co.uk/news/>

Some modelling has been completed in preparation for updating the Lewes AQAP – See section 3.1: Summary of monitoring undertaken

Recent schemes such as the Offham Road and A277 Brighton Road pedestrian crossings will hopefully encourage people to walk (particularly children walking to school) as there are now safe places to cross two very busy roads. The 20mph speed limit has been implemented around Lewes including the residential areas, creating safer and hopefully smoother driving!

Lewes District Council expects the following measures to be completed over the course of the next reporting year: Update of the Lewes AQAP – help to benchmark ‘where we are now’ in relation to the last AQAP of 2009 and how we should move forward and establish feasible ways we can improve general air quality and tackle the pollution hotspots such as School Hill and Fisher Street.

2.2.2 A259 Newhaven Ring Road AQMA

In Table 2.1 the monitoring location of initial exceedance (at declaration) was measured at LDC-16 Southway, Newhaven with an annual NO₂ mean of 49µg/m³ in 2013. This year the annual mean for this location was nearly 40µg/m³ (39.88) but when corrected for distance to receptor the annual mean was 35µg/m³. This location has shown annual means above 40µg/m³ for the few years so this is a welcome reading. It is located on a busy road, near a bus stop and traffic lights and is at the top of a steep incline so these factors will affect NO₂ readings at this location.

Following the declaration of an Air Quality Management Area in July 2014 for the centre of Newhaven, an Air Quality Action Plan was prepared to address the high concentrations of nitrogen dioxide (NO₂) which people are exposed to alongside the

busy roads in the centre of Newhaven. Road transport is the main source of emissions relating to NO₂, and particularly diesel vehicles in stop- start traffic which make the biggest contribution resulting in higher emissions.

The AQAP has seven broad areas of action to help deliver better air quality, with specific measures then identified for each of these actions areas. The categories of action are as follows:

Action 1: Enable the use of sustainable travel choices through the delivery of transport infrastructure and initiatives

Action 2: Actively promote low emission vehicles and supporting infrastructure.

Action 3: Use the planning system to ensure that air quality is fully considered for new development.

Action 4: Use traffic management to reduce emissions within the AQMA.

Action 5: Work with Public Health colleagues to inform the public about health impacts of Air Pollution and how they can change behaviour to reduce emissions and reduce exposure.

Action 6: Continue to monitor and assess air quality in line with Government guidance on Local Air Quality Management (LAQM).

Action 7: Target point sources in Newhaven Town Centre

The above actions are evaluated in terms of their impact on:

- Air quality
- Cost & feasibility
- Timescale for implementation

The delivery of the Newhaven Action Plan is dependent on adequate levels of resourcing, both for capital costs and staffing. Currently, increases in traffic around the ring road are likely assuming planned development for Newhaven proceeds. Any

improvements made will therefore be challenged by an increase in vehicles due to new developments. The plan can be found on this link:

<http://www.sussex-air.net/Reports/NewhavenAQAP2016.pdf>

East Sussex County Council are looking into developing proposals to improve the A259 Newhaven Ring Road by way of improving traffic flow and linking existing signals with crossings and improving road layout.

ESCC's LTP links in well with the *Active Access for Growth Programme* (See Tables 3 and 4)

Table 3: Summary of ESCC Local Transport Capital Programme 2018/19 – Supporting Cycling/Walking/Public Transport for Lewes and Newhaven

Location	Measure	Scheme Phase
Newhaven		
A259 South Coast Corridor package - Newhaven Ring Road Junction Improvements	Traffic Management	Completed detailed design by March 2019
A259 South Coast Corridor package - Newhaven Cycling Improvements (Avis Way)	Cycle Route	Completed detailed design by March 2019
Lewes		
Lewes Traffic Management - New Malling 20mph Scheme	20mph Scheme (Traffic Calming Old Malling Way + signs)	Completed detailed design by March 2019
Lewes Walking and Cycling Network - Cycle route 90	Cycle route 90	Commenced preliminary design by March 2019
Lewes Bus Stop Accessibility Improvements - High Street and town centre	Accessible Bus Stops	Completed detailed design by March 2019

Table 4: Summary of ESCC Local Transport Capital Programme 2019/20 – Supporting Cycling/Walking/Public Transport for Lewes and Newhaven

Newhaven		
A259 South Coast Corridor package - A259 corridor study	Multi Modal	Completed initial feasibility work by March 2020
A259 South Coast Corridor package - Newhaven Ring Road Junction Improvements	Traffic Management	Construction by March 2020
A259 South Coast Corridor package - Newhaven Cycling Improvements (Avis Way)	Cycle Route	Completed detailed design by March 2020
Lewes		
Lewes Traffic Management - New Mallong 20mph Scheme	20mph Scheme (Traffic Calming Old Mallong Way + signs)	Completed construction by March 2020
Lewes Walking and Cycling Network - Cycle route 90	Cycle route 90	Completed detailed design by March 2020
Lewes Bus Stop Accessibility Improvements - High Street and town centre	Accessible Bus Stops	Following a review of preliminary design, alternative locations to be identified during 19/20

East Sussex County Council (ESCC) managed to bid successfully from the *Active Access for Growth Programme*, obtaining a £1.4 million grant from the Department for Transport to deliver a programme of active travel across East Sussex. The Growth programme will run from 2017-2020, focusing on particular growth areas, one of them being Newhaven.

The key objectives of this are:

- Improve access to jobs, skills, training and education
- Seek support for local economic growth
- Demonstrate an alignment to health, air quality and reduced carbon emissions and improve air quality
- Increase walking and cycling by 2%/year and increase the proportion of people completing 30 minutes of physical activity/day

The programme is split into 3 strands and covers a wide range of audiences and has many partners to deliver the programmes:

1. Business and Workforce Development
2. Education and Training
3. Healthy Communities

The Community Grant Scheme (AAfG Community Fund) aims to assist community groups, voluntary organisations and educational establishments to actively promote increasing the number of people traveling to work/education/training to walk and cycle and actively promote increased physical activity and AAfG officers have built important links with workplaces and colleges in relation to the first two strands above.

See link:

<https://www.eastsussex.gov.uk/roadsandtransport/localtransportplan/funding/active-access-for-growth/active-access-for-growth/>

Under point 1: *Sustrans Active Steps, Living Streets, Sustrans Active Travel and Pedal Power have all delivered activities aimed at enabling employees to travel more actively for every day journeys.*

Under point 2: *In surveyed Sustrans schools, cycling more than tripled after 1 year of engagement*

Point 3 works with public health colleagues tackling physical inactivity in the county. It aims to integrate a number of cycling and walking initiatives into existing community development plans to promote increased levels of exercise into people's daily lives.

During the 2018/19 period there have been various cycling and walking schemes in the design phase with design and construction planned for 2019/20 (also see Tables 3 & 4). For example:

Cycling

Under the Active Access for Growth – ESCC have launched Pedal Power which gives people the opportunity to try cycling by offering bikes for rent for between 1 and 6 months. There are a range of bikes to try – for more information please see this link:

<https://eastsussexpedalpower.com/>

There are further plans to introduce a new cycle route on Avis Road which will tie into the existing NCR2 cycle route on the A259.

Walking

Under the ESCC Active Access for Growth not only is cycling encouraged but also walking opportunities: using active travel maps, journey planning and giving people walking challenges and pledges. There are also opportunities to explore the South Downs by walking and or cycling.

There are other plans in development, e.g. looking towards 2019/20, ESCC are looking to propose a Local Cycling & Walking Infrastructure Plan later in 2019, where integrated travel behaviour programmes and road safety initiatives will be a key element of the plan.

Many of the above initiatives feed into the Newhaven A259 Ring Road AQAP 7 main actions, with other improvements such as improvements to bus shelters and facilities which should help encourage further use of buses.

More detail on these measures can be found in their respective Action Plans (see above for links)

The principal challenges to implementation of air quality improvements that Lewes District Council face - funding will be required for the replacement of automatic analysers at the Lewes automatic monitoring station. The planned installation of the Newhaven air quality monitoring station has been slow due to a variety of issues, one being a suitable site within the AQMA. We envisage this station will be installed and up and running during 2019. The AQAP review may give rise to further challenges. Progress on the Lewes AQAP has been slower than expected due to data collation from a third party and further modelling which was necessary.

⁴DEFRA's, Clean Air Strategy (Jan 2019) states:

'New legislation will create a stronger and more coherent framework for action to tackle air pollution. This will be underpinned by new England-wide powers to control major sources of air pollution, in line with the risk they pose to public health and the environment, plus new local powers to take action in areas with an air pollution problem. These will support the creation of Clean Air Zones to lower emissions from all sources of air pollution, backed up with clear enforcement mechanisms.'

If local authorities are going to be given 'new powers' to 'take action' the government need to consider how they will support and fund resources for this. Staff resourcing and funding is already an issue for many local authorities. Other challenges range from: changing people's behaviour on their travel choices, getting people to recognise the polluting and health effects of engine idling, linking of cycle routes to encourage and make cycling safer (particularly if trying to encourage more children to cycle – the safety aspect of this can make parents very anxious), the increased popularity of domestic wood burning stoves in homes and how quickly can/will company vehicle fleets change to cleaner vehicles?

There are lots of pressures placed upon local authorities – on one hand they must improve air quality but on the other they must find suitable locations for development. In Newhaven, for example, the need for economic regeneration places pressure on air quality and the environment. There is significant investment in the Port area (following approval for a deep water berth at the harbour mouth) – which should grow the ferry service for both freight and passenger travel between Newhaven and Dieppe. There are more business's moving into the area and residential plans in the pipeline. Investment will also entail increased business premises and new homes in the Newhaven area, which in turn will increase traffic loading to the Ring Road. Careful planning measures will be required.

Whilst the measures stated above in Section 2 and in Table 2.2 will help to contribute towards compliance, Lewes District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Lewes Town centre and Newhaven A259 Ring Road AQMA's.

Table 2.2 – 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	White Hill / Fisher Street / West street scheme (LTP) - Change of priority at Commercial Square to improve flow in Fisher Street; review traffic signals at Station Street; greater priority to pedestrians. Two phases: (a) Experimental change in junction priority (b) Formalise priority working including other works in the area	Traffic Management	UTC, Congestion management, traffic reduction	East Sussex County Council	Completed	Completed	NO2	4-6.5 ug/m3 or 9-12% red in NO2 (Fisher Street) Some air quality benefits will be achieved from the experimental scheme	Completed	Completed	Reductions in NO2
2	Beddingham Crossing (LTP) - Rebuilding the Southerham and Beddingham roundabouts on the A27 outside Lewes and a new railway bridge to avoid queuing at Beddingham rail crossing.	Traffic Management	UTC, Congestion management, traffic reduction	Highways Agency	Completed	Completed	Traffic Count	None	Completed	Completed	Reduced congestion & emissions on A27. Longer term better traffic flow so reduced traffic flow through Lewes.
3	Lewes Town Centre 20mph zone - Provision of 20mph area in addition to the existing 20mph Zone. Will include majority of the AQMA.	Traffic Management	Reduction of speed limits, 20mph zones	East Sussex County Council	Completed	Completed	Traffic Count/NO2/CO2	None	Completed	Completed	Wider Impacts: Safety, walking, cycling, congestion
4	Signalised access from Phoenix Causeway, signalised junction Eastgate Str/Little East	Traffic Management	Strategic highway improvements, Re-	East Sussex County Council &	Yes	Planning consent & finalising discharge	Traffic Count	None	In planning	planning	Improve traffic flows. Any reduction could be offset by increased traffic

Lewes District Council

	Str/Phoenix Causeway, East Str closed western end, made one way, priority change at West Str/Market Str, implied roundabout at Boots/High Str		prioritising road space away from cars, inc Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	South Downs National Park		conditions with outline consent and finalising Reserved Matters					generated from Phoenix development. Project is a development lead opportunity.
5	The Living Cliffe (LTP) - Creation of pedestrian zone in Cliffe High Street with restricted vehicular access. Introduction of 20mph zone to vehicles allowed to enter the zone (e.g. for deliveries)	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, inc Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	East Sussex County Council	Completed	Completed	Traffic Count	None	Completed	Completed	Existing through-traffic in Cliffe High Street will tend to go across Phoenix Causeway via School Hill and Market Street until Phoenix Roundabout scheme is implemented. Improved safety, walking & cycling facilities, reduced impact of car outside the AQMA
6	Offham Road Pedestrian Priority Scheme (LTP) Improvement to pedestrian facilities and vehicle speed management.	Traffic Management	Reduction of speed limits, 20mph zones	East Sussex County Council	Completed	Partially Completed	Traffic Counts	None	Mini roundabout at The Avenue and Offham Road construction completed in August 2010.	Completed	Improved safety, walking & cycling facilities, reduced impact of car outside the AQMA

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									Pedestrian crossing installed Offham Road early summer		
7	Ringmer –Lewes cycleway (LTP) - Introduction of off-road cycleway on the Lewes-Ringmer road link – heavily used by commuters from Ringmer to the Town Centre. Scheme split into two, (a) Phase 1 (Eastern section), (b) Phase 2 (Western section)	Transport Planning and Infrastructure	Cycle network	East Sussex County Council	Completed	Partially Completed	Traffic Counts	None	Completed	Completed	Encourage long term modal shift.
8	Lewes Railway Station Forecourt Scheme (LTP) Improved facilities for pedestrian, buses and taxis	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	East Sussex County Council	Completed	Partially Completed	Increased use of sustainable transport modes	None	Completed	Completed	Bridge repairs completed and pedestrian crossing completed. Should encourage modal shift
9	Lewes – Cycle Route 90	Transport Planning and Infrastructure	Cycle Network	East Sussex County Council	Yes	No	Increased use of sustainable transport modes	Not known	Pre-liminary design/design work commences 2019/20	March 2020	
10	Lewes Bus Stop Accessibility – High Street 7 Town Centre	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	East Sussex County Council	Yes	No	Increased use of sustainable transport modes	Not known	Design work commences 2019/20	Mar-20	
11	Better coordination of building and road works in the Lewes town area (LTP+) - Enhance existing LTP scheme to include building works and	Policy Guidance and Development Control	Other policy	East Sussex County Council	Completed	Completed	Number of agreements and s.61 agreements	None	Informal p-partnership working between ESCC and LDC and also through the	Ongoing	Improved flow resulting from better management of deliveries to sites. So emissions reduced in Lewes

Lewes District Council

	haulage route management								planning process and s61 agreements.		AQMA.
12	Target long-distance freight management & heavy traffic through town (LTP+) a) Intensification of existing LTP programmes b) Review signage on weight restrictions at access road links	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	East Sussex County Council	Yes	No	Traffic Counts	None	ESCC started investigation into freight movement and impacts on town	Unknown	Linkage to M10. Reduction in HGV since Beddingham improvements completed (M2)
13	Reduce emissions from idling vehicles a) Install "cut engine cut pollution" signs (i.e. schools, taxi & bus terminals) b) Raise awareness through eco-driving campaign c) investigate enforcing legislation (issue fines)	Traffic Management	Anti-idling enforcement	LDC	ongoing	Yes	NO2/Participation/Enforcements	Ongoing	ongoing - Temporary signs installed around AQMA's	Ongoing	Public engagement work targeting schools been carried out during 2018-19 Sustrans/Living Streets. If more funding can be secured will look to do further. Anti-idling campaign aimed at schools commenced Mar 2019. Anti-idling signs installed around AQMA areas in Newhaven & Lewes Town Centre. Emissions reductions may have to be calculated rather than measured.
14	Lewes Parking Management (LTP+) - Intensification of existing/planned LTP programmes a) extension of parking controlled area b) re-allocation of parking/loading spaces c) higher charges for long	Traffic Management	Other	East Sussex County Council	No	Yes	reduced traffic and congestion at peak time, reduced re-circulation, reduced	None	Parking review and consultation undertaken 2013. c) New charges at longer stay car parks d) Residents permits now	Unknown	None

Lewes District Council

	<p>stay parking d) higher charges for residents second parking permits e) discounted permits for low-emission vehicles f) introduce car spaces for low-emission vehicles, car-clubs and car share g) maintain/increase provision of two-wheelers parking</p>						emissions; and modal shift and sustainable travel behaviour		<p>limited with new build *f) 4 off street car park spaces provided for community car club. 2 EV charging bays now installed at Lewes railway station</p> <p>Investigating the provision of a low emission car park within the AQMA to include preferential parking.</p>		
15	<p>Partnership work with bus & train operators (LTP+) a) Reduce emissions: calculate emissions from existing bus fleet, route/fleet management (i.e. only cleaner vehicles through AQMA), eco-driving training b) Increase bus and train patronage: through supporting marketing campaign, extend use of subsidised/discounted fares, improve bus connection to key area, bus stop facilities, bus information c) Provision of additional undercover cycle parking at Lewes station</p>	Vehicle Fleet Efficiency	Driver training and ECO driving aids	LDC	No	Yes	accessibility, awareness	None	<p>a) Brighton and Hove bus drivers are now eco trained, preparing scheme to target other operators. New generation of LE buses starting to penetrate smaller fleets. b) LSTF monies invested in real time bus information on key routes through Lewes. In addition a travel choices marketing campaign will be delivered promoting bus and train</p>	Unknown	Long term modal shift from car to bus.

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									patronage. c) New 150 space secure cycle hub has been installed at Lewes train station with card entry system. LDC now working as part of the Sussex community rail partnership current projects include route guide.		
16	Lewes Town Travel Plans (LTP+) - a) Review existing County & District Travel Plans b) Accelerate implementation of workplace travel plans c) Accelerating implementation/review of local school travel plans (including colleges) d) Link to other actions (i.e. school monitoring projects, cycling and car-sharing promotion) e) Target shorter journeys – investigate personal travel planning marketing	Promoting Travel Alternatives	Other	LDC	Completed	Yes	lead by example, change in travel behaviour, education, awareness	None	a) LDC travel plan currently being reprioritised with a number of actions agreed by CMT including reduction in kgCo2/KM allowance on contract cars to 120.	None	Encouragement of modal shift and appropriate use of cars at workplace.
17	Car-sharing Database (LTP+) - Support LTP car-sharing	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	East Sussex County Council	Completed	Yes	Travel Behaviour	None	Ongoing focus.	Unknown	Modal shift
18	Car clubs - a) Support existing club in Lewes town (i.e. marketing) b) Accelerate introduction of	Alternatives to private vehicle	Car Clubs	LDC	No	Yes	Usage of Carclub	None	2 vehicles launched July 2010. Four Cars in Lewes as of	None	Modal shift and appropriate use of lower emission vehicles within and

Lewes District Council

	new clubs c) Provide parking locations for car parks (Require car-clubs for large new developments – M21)	use							February 2015.		around the AQMA.
19	Walking and cycling (LTP+) - a) implementation of LTP actions within Lewes town (i.e. improvement to existing cycle routes, identify new ones, improve signage and facilities) b) Promoting walking and cycling as a healthy and more preferable option to car for local journeys	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	East Sussex County Council	No	Yes	Delivery of LTP Actions	None	a). ESCC emerging Local Cycling & Walking Infrastructure Plan – identified improvements to existing cycling and walking infrastructure and new infrastructure. Public consultation summer/autumn 2019 – delivery subject to funding. b)Active Travel Challenge for work – County wide – 2018 & 2019 through ESCC Active Access for Growth Programme .	None	Modal shift and long term habit forming intervention.
20	Better control of impact of new developments - a) Facilitate funding from S106 agreement b) Conditions to require reduced parking allocation and inclusion of electric vehicle changing points, completion of Sustainability Checklist; travel plans for large	Alternatives to private vehicle use	Car Clubs	LDC	No	Yes	Number of s.61 agreements	None	a) Sustainable accessibility s106 agreements secured on numerous applications including increased car club provision. b) Conditions	None	Modal shift and integration of new developments into the urban landscape to enable pedestrian access throughout the town.

Lewes District Council

	developments and inclusion of pedestrian & sustainable transport facilities such as car-club dedicated car spaces and bus lanes								and sustainability checklist completed on all large planning applications including provision of car club by developer for town centre development. Car club policy note drafted to secure funding from developers for additional car club cars.		
21	Greater planning controls within or near the AQMA for new developments or applications a) Stricter conditions limiting permitted uses and changes of use for new applications b) Request detailed air quality assessment for developments affecting AQMA. c) Encourage the uptake of Low emission strategies by developers d) Investigate production of supplementary guidance notes on air quality for new developments	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	LDC	Yes	Yes	Planning Conditions and Guidance Production	None	a) LDC officers consulted on all planning applications, good awareness of AQMA including training session. b) AQ assessments requested for developments affecting AQMA	None	Sussex-air Guidance enables quantification of air quality impacts (health) and emissions mitigation options for new developments
22	Intensify promotion of national schemes on domestic heating and energy efficiency - Increase promotion of scheme aimed to improve insulation, replace/service	Promoting Low Emission Plant	Other	LDC	Completed	Yes	CO2/NO2 Reduction	None	93.80 tonnes of CO2 annual saving from cavity wall and loft insulation based on 178 installs in Lewes	Unknown	Reduction in point source emission within and around the AQMA from non-transport domestic sources.

Lewes District Council

	boilers, encourage energy efficiency in the Town Centre.								Town from Insulation Campaign and My Home 2012.		
23	Educational campaign on solid fuel burning across Sussex area	Promoting Low Emissions	Other	Sussex-air partnership	N/A	Ongoing	Particulate reduction	None	Defra funding (through Sussex-air bid) for Clean Burn Sussex campaign for 2019-2020 - education campaign	Ongoing	The DEFRA project is an educational campaign on solid fuel burning, promoting cleaner fuels, low smoke appliances and the correct way of installing and maintaining them
24	Continue investing in new technologies and pilot projects through the LDC Waste & Recycling a) Electric vehicles for recycling fleet b) NOx reducing additive for HGV diesels c) Eco-driving training d) Route management (GPRS) e) Monitoring of fuel use & efficiency	Vehicle Fleet Efficiency	Other	LDC	No	Yes	Fuel Usage/Maintenance Records	None	a)Fleet being maintained ESCC has undertaken a scoping study on the use of smart technology for use in transport b)NOx additive still used c)Eco driver training for operatives d)All vehicles GPRS controlled e)All fuel use monitored	Ongoing	Reduction of LDC fleet emissions in the AQMA. LDC is in the top 10 of EV users amongst councils in the UK: http://www.intelligentcarleasing.com/blog/new-study-compares-every-uk-council-electric-vehicles/
25	Raising awareness & engagement of non-statutory stakeholders a) Organise one-off events, talks, workshops and targeted campaigns on public transport marketing and eco-driving, involving the local community b) web-sites improvements to provide better information & allow	Promoting Travel Alternatives	Other	LDC	Completed	Completed	Participation in events	None	Measures in M20 and a) Active Travel Challenge for work – County wide – 2018 & 2019 through ESCC Active Access for Growth Programme	Ongoing	Informative: potentially significant cumulative impact by modal shift.

Lewes District Council

	feedback/participation from members of the public c) Pilot LDC internal pop-up messaging providing air quality/sustainable transport information										
26	Strengthen partnership work with ESCC (LTP), LDC Sustainability(Climate Change), Planning & Communities (LDF & LSP), Sussex Air (emissions inventory, air-alert) a) Intensify links to existing strategies b) Accelerate implementation of those schemes which may improve local air quality. c) Joint participation to events, campaigns, grants applications, data collation surveys d) Plan monitoring programme (i.e. traffic) to assess action plan effectiveness	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	LDC	No	Yes	climate change, transport, social inclusion, communication, effective partnership work	None	a)Working on links to LDF b)LES being promoted through RGI scheme c)Ongoing working with ESCC transport through emerging Local Cycling & Walking Infrastructure Plan and cycling and walking travel behaviour change programmes Dev control and environment team and local groups. d)Lewes town monitoring currently assessing M1 effectiveness	Ongoing	Informative: potentially significant cumulative impact due to modal shift and adoption of ULEV.
27	Address traffic flow & congestion on Newhaven Ring Road	Traffic Management	UTC, Congestion management, traffic reduction	ESCC	ongoing study	ongoing	Traffic flow/NO2	None	Junction improvements proposed – design and construct 2019/20	Ongoing	Wider Impacts: Safety, walking, cycling, congestion
28	Improve cycling facilities	Promoting Travel Alternatives	Promotion of cycling	ESCC	completed	completed	Cycling facilities	None	Provision of new cycle stands at key locations in Newhaven town	Completed	Wider Impacts: Safety, walking, cycling, congestion

Lewes District Council

									Centre		
29	Upgrades and signs for cycling	Promoting Travel Alternatives	Promotion of cycling	ESCC	design phase	ongoing	Traffic counts	None	Upgrades to routes and signage in and through Lewes	Ongoing. Likely to be integrated as part of any measures identified and delivered through ESCC emerging Cycling & Walking Investment Plan	Encourage long term modal shift.
30	A259 South Coast Corridor Package – A259 Corridor Package	Multi Modal Transport Study	Other	ESCC	Feasibility	Commence 2019/20	Currently unknown	Currently unknown	Commence 2019/20	Not yet started	

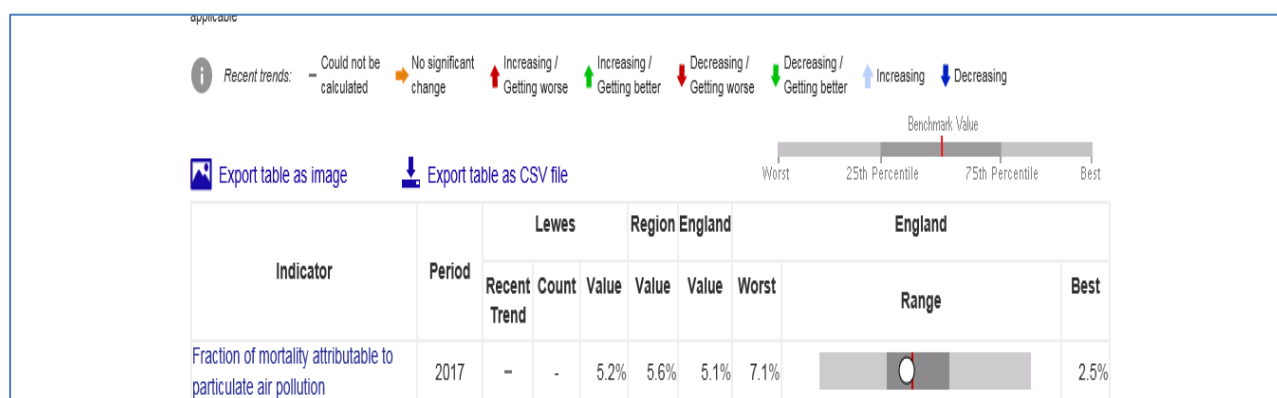
2.3 PM_{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations

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.

Work carried out by Public Health England as part of the Public Health Outcomes Framework (PHOF) shows that the mortality associated with particulate air pollution within Lewes District is 5.2% (2017 data), a very slight increase on the previous year (2016 data) which was 5.1 %. Figure 7 shows that the mortality calculated for Lewes District in 2017 is less than that calculated for south east England (5.6 %) and very slightly above the England value at 5.1%.as a whole. This information is available from the following web link:

<https://fingertips.phe.org.uk/search/particulate%20air%20pollution#page/1/gid/1/pat/6/par/E12000008/ati/101/are/E07000063/iid/30101/age/230/sex/4>

Figure 7: Fraction of mortality attributed to particulate air pollution in Lewes District in comparison to the South East region and England



Lewes District Council is developing its approach to addressing PM_{2.5} in partnership with public health local authority officers (e.g. the planned Clean Burn Sussex project for year 2019-20 mentioned in section Conclusions and Priorities). The automatic analysers in the Lewes District Council area do not measure PM_{2.5}. In DEFRA's recently published ⁴Clean Air Strategy 2019 the government want to cut PM_{2.5} levels to those recommended by the World Health Organisation:

'We will progressively cut public exposure to particulate matter pollution as suggested by the World Health Organisation. We will halve the population living in areas with concentrations of fine particulate matter above WHO guideline levels ($10 \mu\text{g}/\text{m}^3$) by 2025.'

Although Lewes District Council do not directly measure $\text{PM}_{2.5}$, by taking other various measures such as the schools anti-idling campaign and other actions/plans mentioned in Section 2 and by reviewing, remodelling and implementing possible new initiatives under the Lewes Air Quality Action Plan – these can only benefit the reduction in pollutants generally, including $\text{PM}_{2.5}$.

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

3.1 Summary of Monitoring Undertaken

As mentioned in last year's ASR, the Lewes AQAP requires reviewing and updating. Work started on this with some initial modelling (source apportionment and contour mapping) which was carried out by Brighton and Hove City Council Air Quality Consultancy. That modelling was included in last year's report.

Further modelling has been carried out by another consultancy and this further updates initial modelling with revised and updated traffic data, updated Local Plan developments plus new emission data and background concentrations updated by Defra in May 2019. Although the assessment of air quality within the Lewes AQMA will focus on NO₂ impacts additional reduction measures for particulates PM₁₀ and PM_{2.5} will also be assessed and reported in a final AQAP report. The modelling is based on predicted traffic growth across Lewes as provided by ESCC's contractor. Baseline modelling provides results as a 'do nothing' scenario (so with no intervention or action plans to reduce emissions locally). Results give baseline annual average NO₂ concentrations for the years 2019-2024¹⁰

With a 'do nothing' approach the predicted NO₂ modelling shows that by 2022 levels should fall within the air quality standard of 40µg/m³ (annual mean) – see Table 5.

¹⁰ Report 1 Baseline Modelling, Phlorum (May 2019)

Table 5: Modelled baseline NO₂ Concentration results

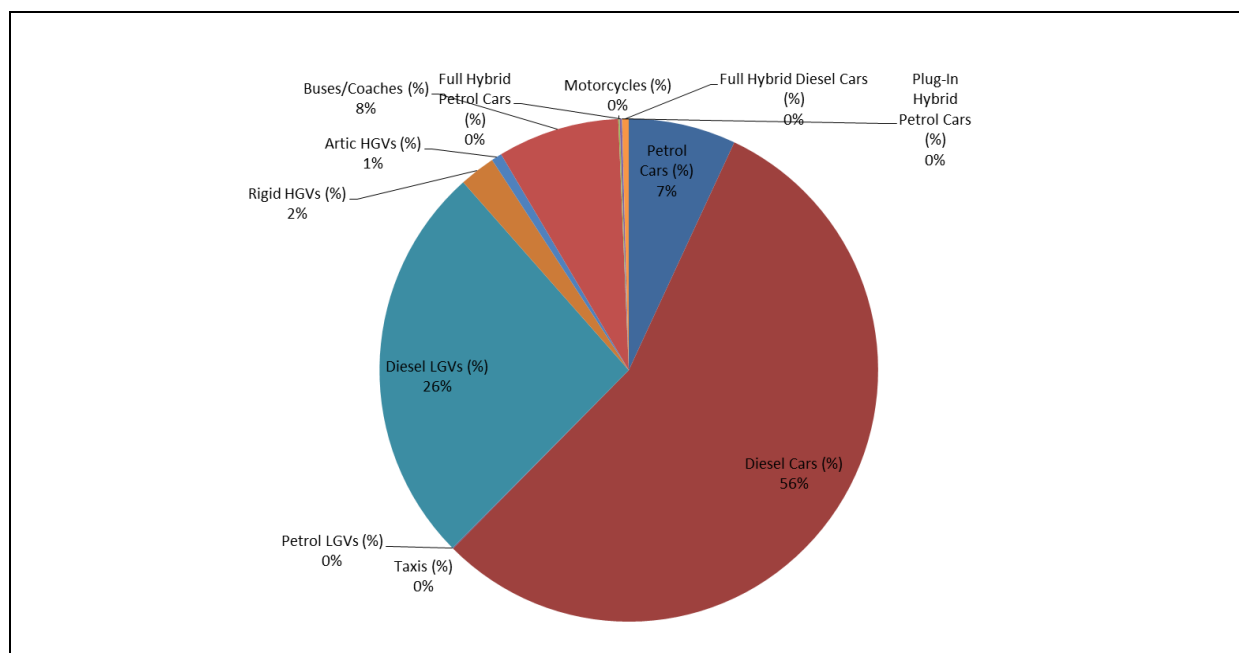
Diffusion Tube	Predicted concentration NO ₂ – annual average (µg/m ³)					
Site	2019	2020	2021	2022	2023	2024
LS5	22.5	21.6	21.1	20.8	20.0	19.5
LDC_25	22.6	22.6	21.8	21.2	20.4	19.7
LDC_26	21.4	20.9	20.3	19.0	19.2	18.7
LDC_27	22.5	21.6	21.1	20.8	20.0	19.5
LDC_18	27.1	26.1	25.2	24.8	23.6	22.8
LDC_36	32.8	31.4	30.1	29.1	27.6	26.4
LDC_1	44.5	42.4	40.3	38.1	36.4	34.5
LDC_29	40.6	37.5	36.0	35.5	33.4	32.0
LDC_31	17.5	17.1	16.8	16.6	16.3	16.0
LDC_6	25.8	24.8	23.9	22.9	22.4	21.6
LDC_30	28.4	26.9	26.0	25.2	24.4	23.6
LDC_45	33.6	30.9	29.0	27.4	26.0	24.7
LDC_34	42.7	38.8	36.1	33.9	31.8	29.8
LDC_35	19.4	19.4	18.8	18.1	17.9	17.5
LDC_23	28.7	28.0	26.8	25.7	24.8	23.8
LDC_14	40.6	38.6	36.7	34.3	33.3	31.6
LDC_46	27.6	26.8	25.7	24.3	23.8	22.9

Note: Receptors in **bold** (> AQS), receptors underlined (within 10% of AQS)

*The baseline modelling results show the majority of AQMA receptor locations are below the NO₂ AQS (40 µg.m-3) from 2019 to 2024. Two locations LDC_1 and LDC_34 exceed the AQS in 2019 and 2020, with LDC_1 exceeding the AQS in 2021 also. It should be noted that although the majority of locations are below the AQS by 2022, LDC_1 remains within 10% of the AQS until 2024.*¹⁰

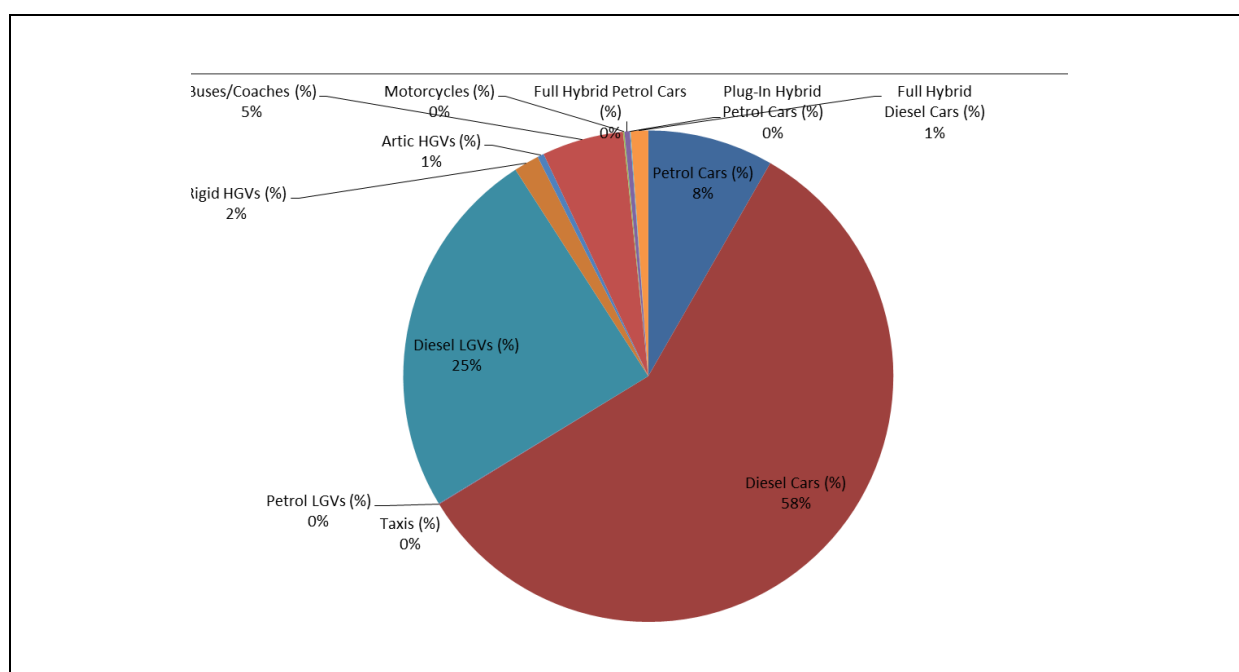
The following charts demonstrate the ratios (2019-2023) of emission sources of NO_x

Figure 8: Fisher Street NO_x Source Apportionment – 2019



The Fisher Street predicted source apportionment ratios in 2019 (Figure 8) and 2023 (Figure 9). They demonstrate NO_x emissions are dominated by diesel cars and LGV's at 56% and 26% in 2019 and 58% and 25% respectively in 2023. Petrol cars account for 7-8% only. Buses and coaches account for 8-5% of emissions from 2019-2023, probably due to the fact that access is restricted due to the narrow nature of this road. This also applies to HGV's.

Figure 9: Fisher Street NO_x Source Apportionment - 2023



The following Figures 10 and 11 illustrate predicted NOx source apportionment for School Hill 2019 and 2023.

Figure 10: School Hill (LDC34) NOx Source Apportionment 2019

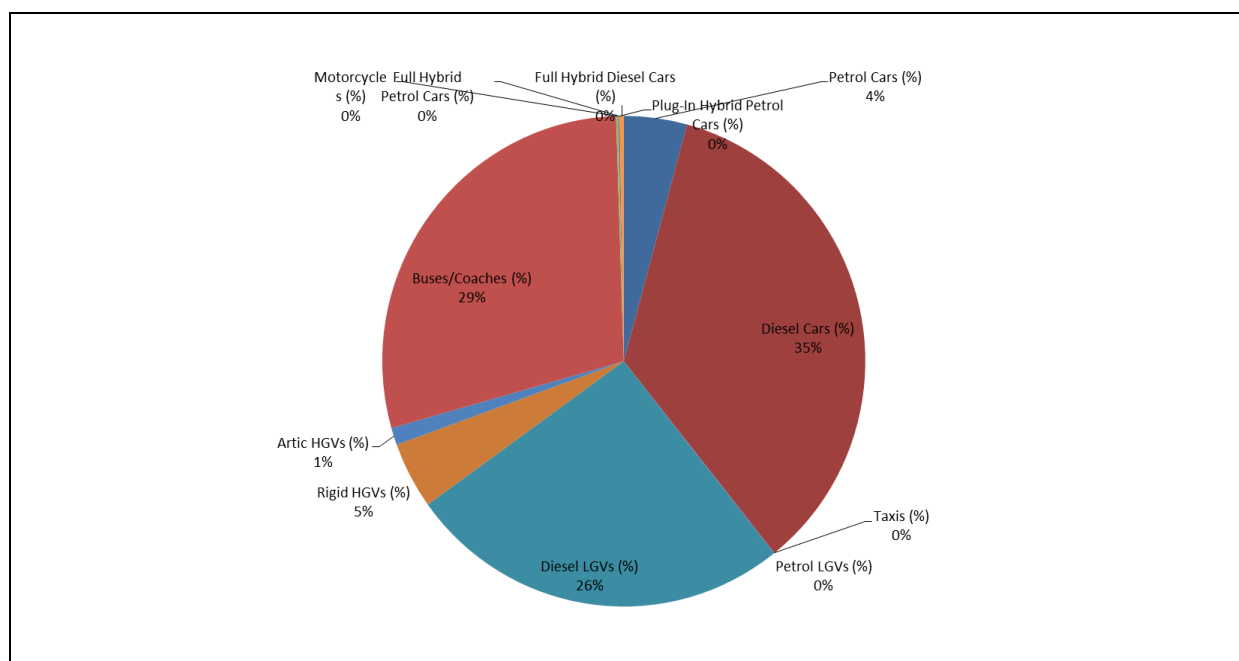
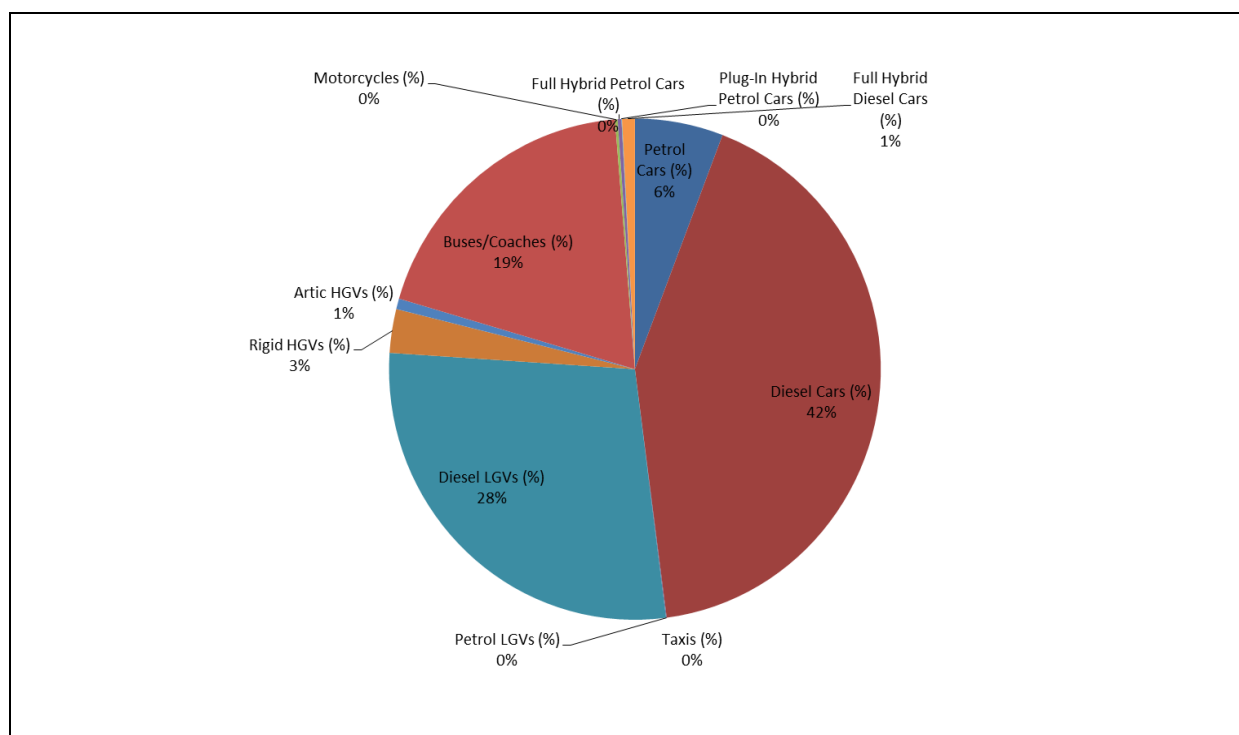


Figure 11: School Hill (LDC34) NOx Source Apportionment 2023



School Hill source apportionment ratios in 2019 and 2023 demonstrate NO_x emissions are more effected by diesel cars and LGV's, with buses and coaches accounting for 29-19% of NO_x emissions from 2019-2023. HGV's are lower at 6-4% for 2019 and 2023 respectively. There is greater use of public transport along this road and light goods vans (diesels), not helped by a steep incline and a proportion of buses looping up School Hill.

The next steps will be to assess potential reduction scenarios and the likely impact on concentrations of pollutants within the AQMA. There are some suggested scenarios (e.g. identify which buses are running pre-Euro VI vehicles – access grants for replacement or retro-fitting) which the steering group will need to consider and depending on what types of actions we believe appropriate and practical a more detailed assessment can be undertaken with the quantification of scenario measures put into the model. There will be further details in next year's report.

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

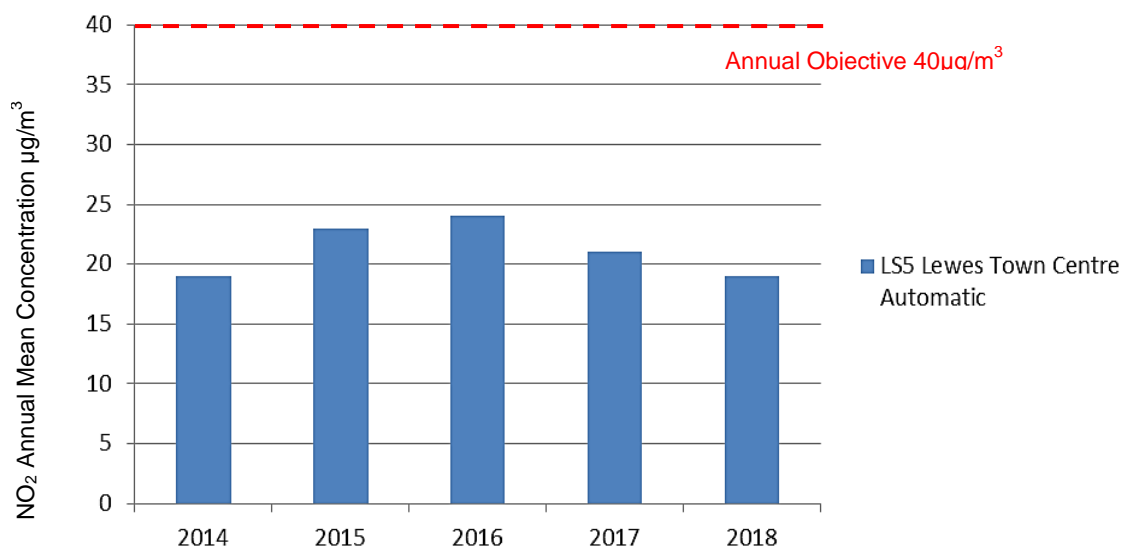
Lewes District Council undertook automatic (continuous) monitoring at one site during 2018. We are hoping to replace the automatic monitoring station in Newhaven in 2019. Table A.1 in Appendix A shows the detail of the LS5 Lewes Town Centre site.

NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. National monitoring results are available at <http://www.sussex-air.net/> Sulphur dioxide is not monitored as there have been no significant changes to potential sources for many years.

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

Figure 12 shows the annual average NO₂ concentrations measured at the automatic monitoring site from 2014-2018. Annual mean concentration levels demonstrate consistent levels below the 40µg/m³ annual mean objective for NO₂.

Figure 12: Annual average NO₂ concentration in µg/m³ measured at Lewes automatic monitoring site in the Lewes district 2014-2018



3.1.2 Non-Automatic Monitoring Sites

Lewes District Council undertook non- automatic (passive) monitoring of NO₂ at 41 (Drove Road site commenced in June 2018) sites during 2018. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the diffusion tube monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO₂)

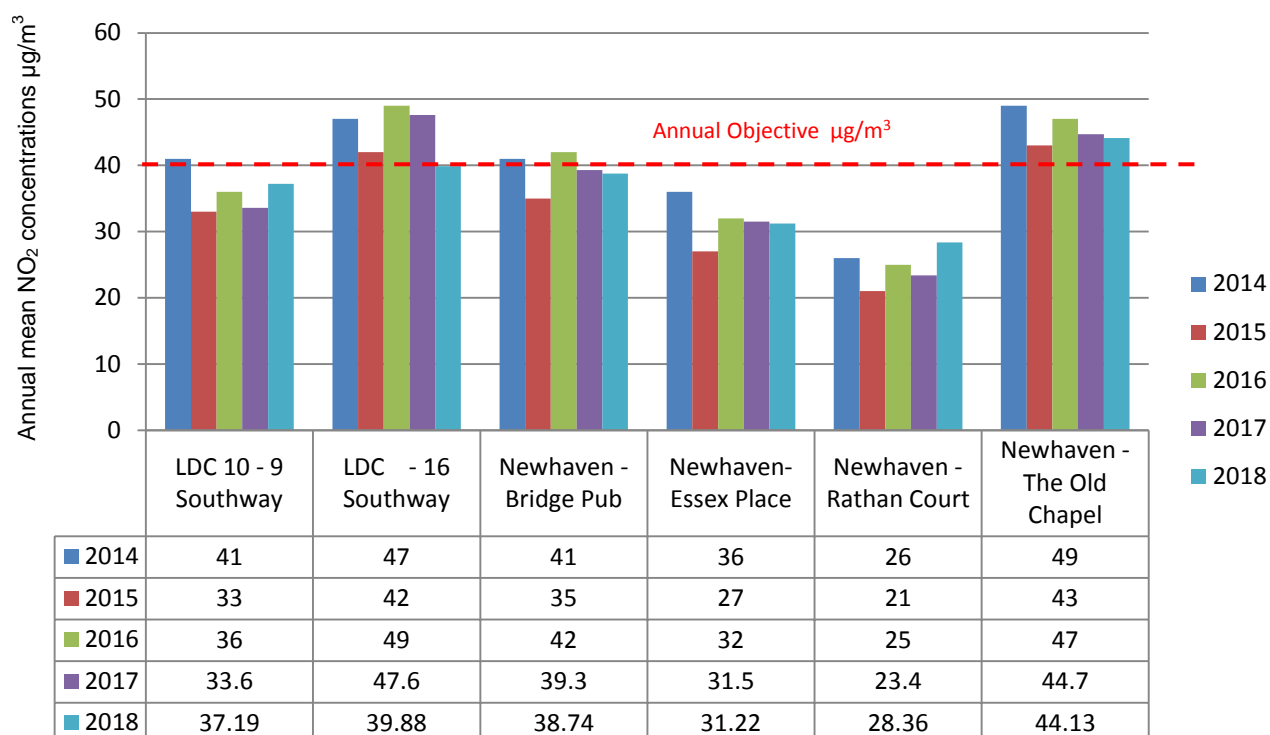
Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B. There was one site added during 2018 – Drove Road, Newhaven and

this commenced in June. As this tube had only 6 months of data it was annualised using continuous monitoring data from 2 other sites – see Table 9

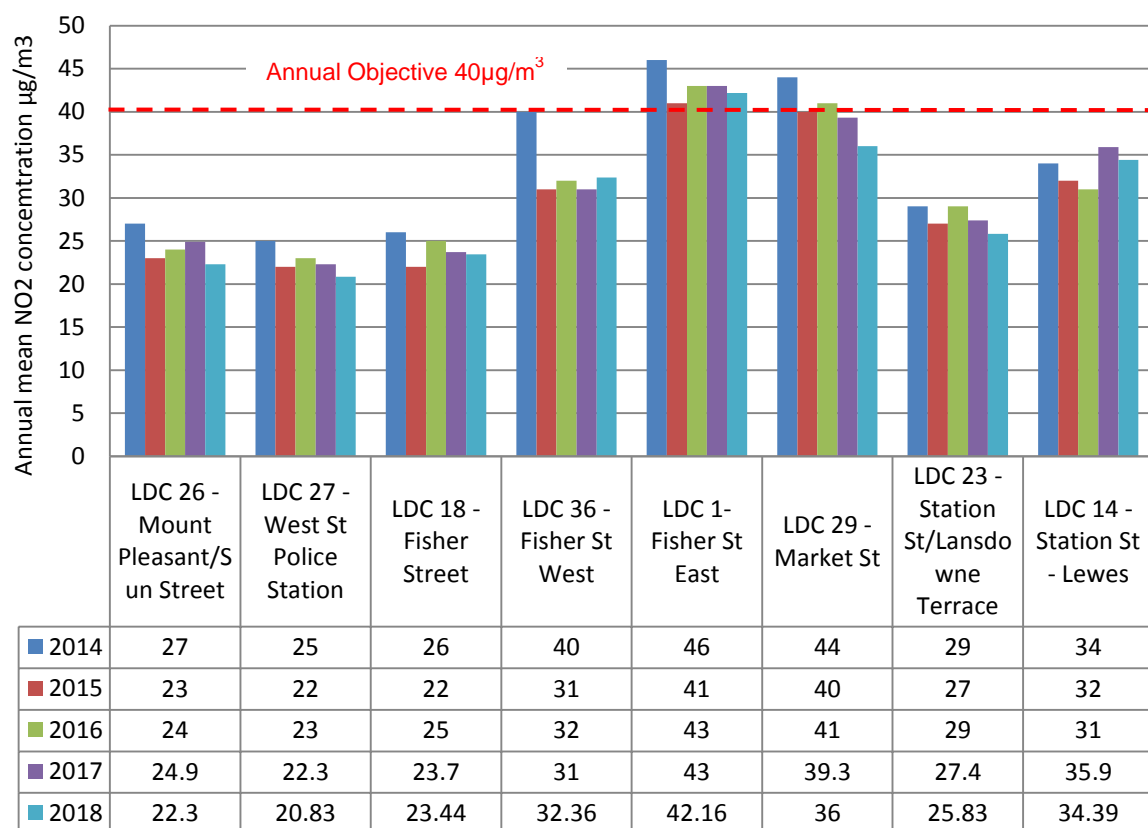
Figures 13-18 show trends in nitrogen dioxide measured by diffusion tube from 2014 to 2018. Each figure illustrates the concentration for groups of sites with data readings.

Figure 13: Annual average NO₂ concentration (diffusion tubes) located within the A259 Newhaven Ring Road AQMA from 2014-2018:



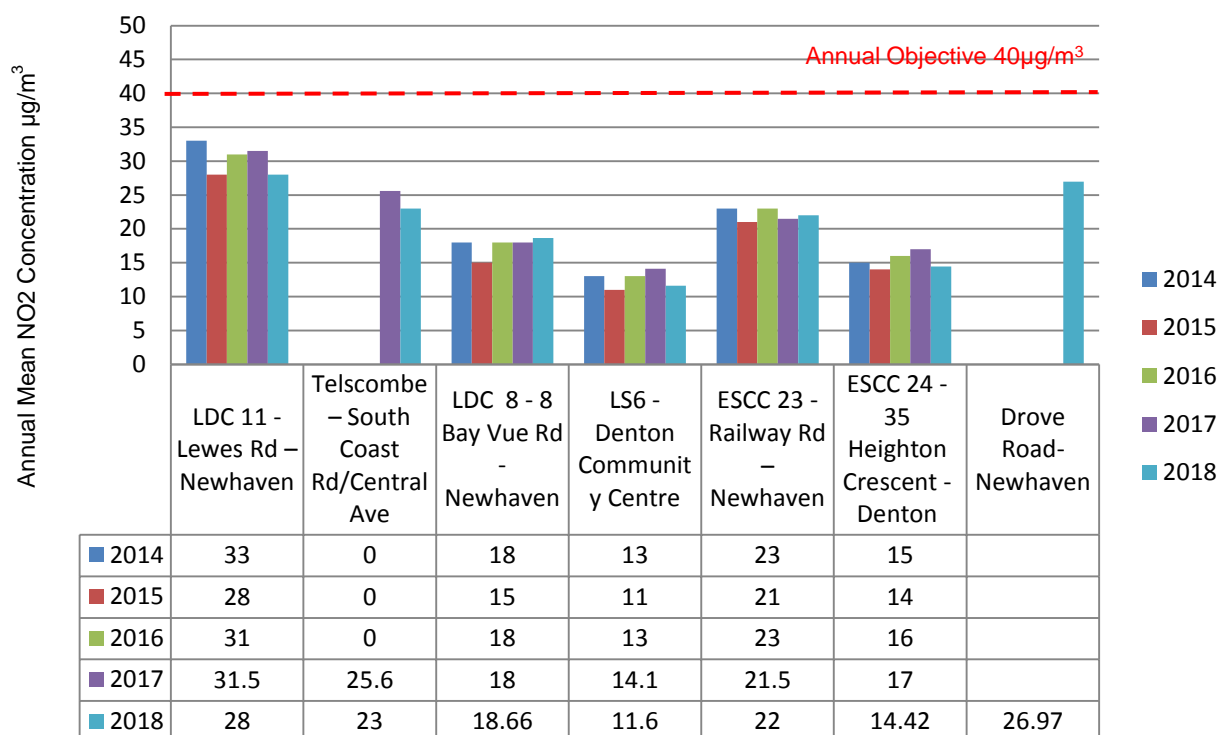
The above figure shows the diffusion tubes within the Newhaven AQMA – it is clear that two sites, LDC- 16 Southway and The Old Chapel have illustrated exceedances over the last few years (except LDC-16 Southway for the first time in 2018, recorded a level just under 40µg/m³ (39.88)). The Old Chapel is located on a hill, near a junction and will receive ‘launch’ exhaust from vehicles that have stopped and then started on the hill at the nearby pedestrian crossing. 16 Southway is at the apex of the hill, where vehicles queue and there is a nearby bus stop. However, once these were corrected for distance to receptor (see Table 7), both tubes met annual objective of below 40µg/m³. NO₂ concentrations appear to have slightly fallen on some tubes but increased on others (e.g. LDC10 and Rathen Court).

Figure 14: Annual average NO₂ concentration (diffusion tubes) located within the Lewes Town Centre AQMA from 2014-2018



The above figure shows the diffusion tubes which are located within the Lewes AQMA. LDC 1 – Fisher Str East has consistently shown above annual objective concentrations over the last 5 years, albeit those concentrations are demonstrating slight reductions. LDC 18 and LDC 36 Fisher Street have shown more static/slight reductions towards the middle and other end of this street where a change of priority in traffic was implemented as part of recommendations made in the Lewes AQAP 2009. Most sites have shown static/some reductions in concentrations compared to 2017. All sites except LDC14 have shown good reductions in levels since 2014.

Figure 15: Annual average NO₂ concentration (diffusion tubes) located within the Newhaven area but not in the AQMA and one tube in Telscombe from 2014-2018.



From Figure 15 it is clear to see that these sites demonstrate considerably lower concentrations than those tubes found within in the Newhaven AQMA, except for the LDC 11 Lewes Rd location which shows more elevated readings. It should be noted that this tube location sits on the edge of the Newhaven AQMA, therefore more raised readings are more expected. However all tubes demonstrate that annual mean NO₂ concentrations have not exceeded the annual objective for the last 5 years. Telscombe–SouthCoast Rd/Central Ave was a new tube installed in January 2017, and Drove Road installed June 2018, but both concentration levels sit comfortably within the annual mean objective for NO₂.

Figure 16: Annual average NO₂ concentration (diffusion tubes) located within the Lewes area but not in the AQMA from 2014-2018

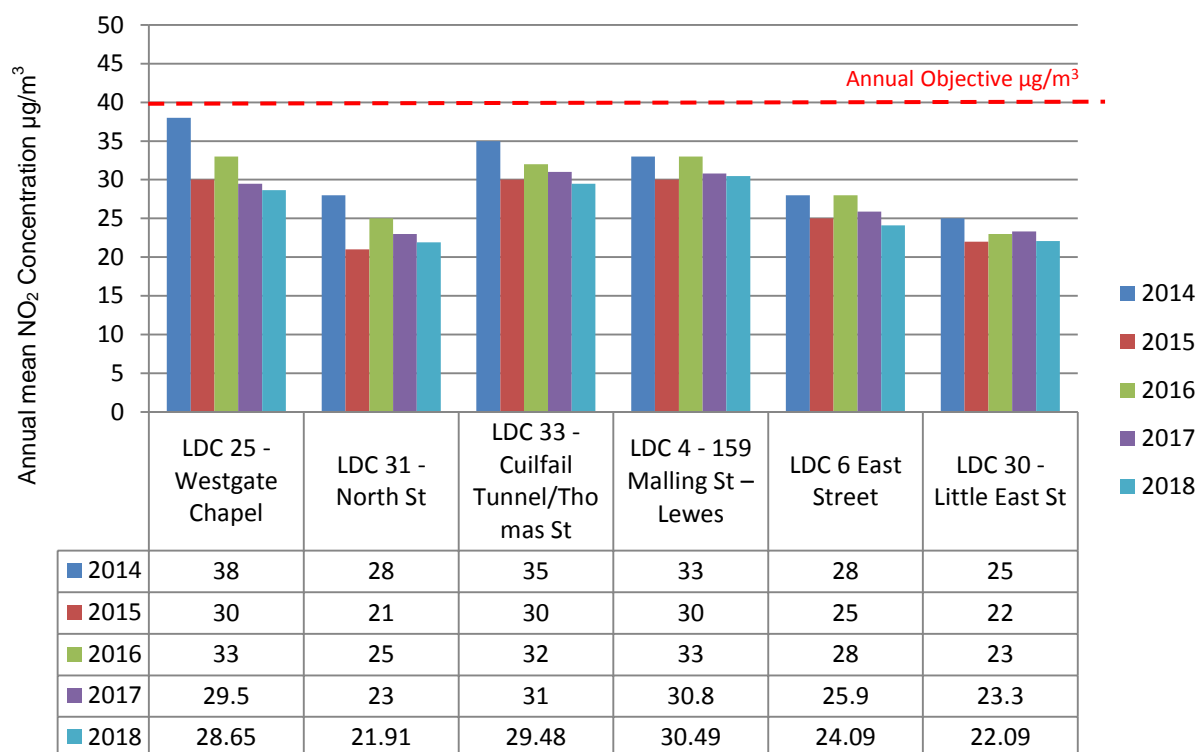


Figure 16 demonstrates all these sites are below the annual objective and have remained so for over 5 years. 2018 concentrations are showing slight decreases from 2017 concentrations.

Figure 17: Annual average NO₂ concentration (diffusion tubes) located within the Lewes area but not in the AQMA from 2014-2018

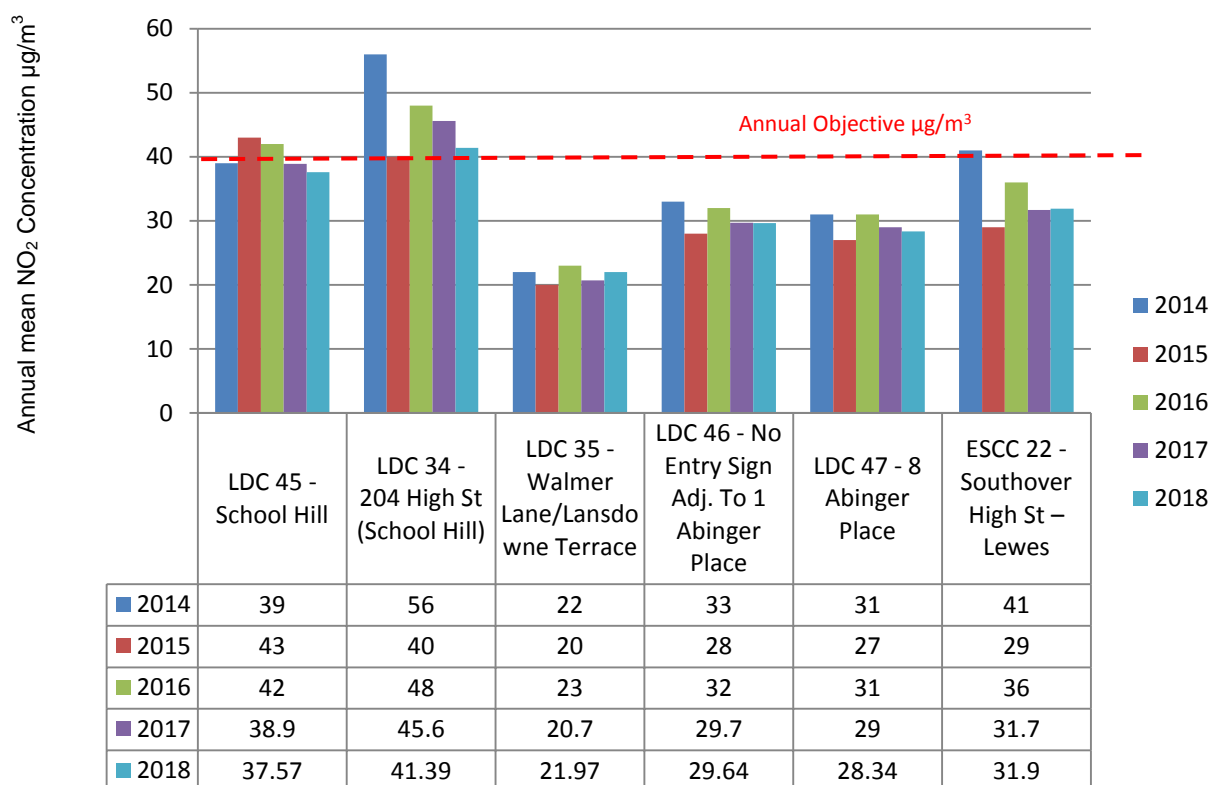


Figure 17 demonstrates that although all of these sites may be out of the Lewes AQMA but not all are meeting the annual objective. School Hill sits on a steep incline with a bus stop nearby and just above the area of site LDC 34- 204 High Str. This particular site was examined in the modelling for source apportionment (See Figures 10 & 11). When this road is busy, there is fume from vehicle 'launch' and often idling when waiting in traffic. However it is encouraging to see that the general trend of readings appears to be reducing over time. In 2014 readings at this site were 56µg/m³ so improvements are being recorded. ESCC 22 has shown reductions over the last 5 years but has remained more static over the last 2 years.

Figure 18: Annual average NO₂ concentration (diffusion tubes) located within the Lewes District area as a whole and not in the AQMA's from 2014-2018

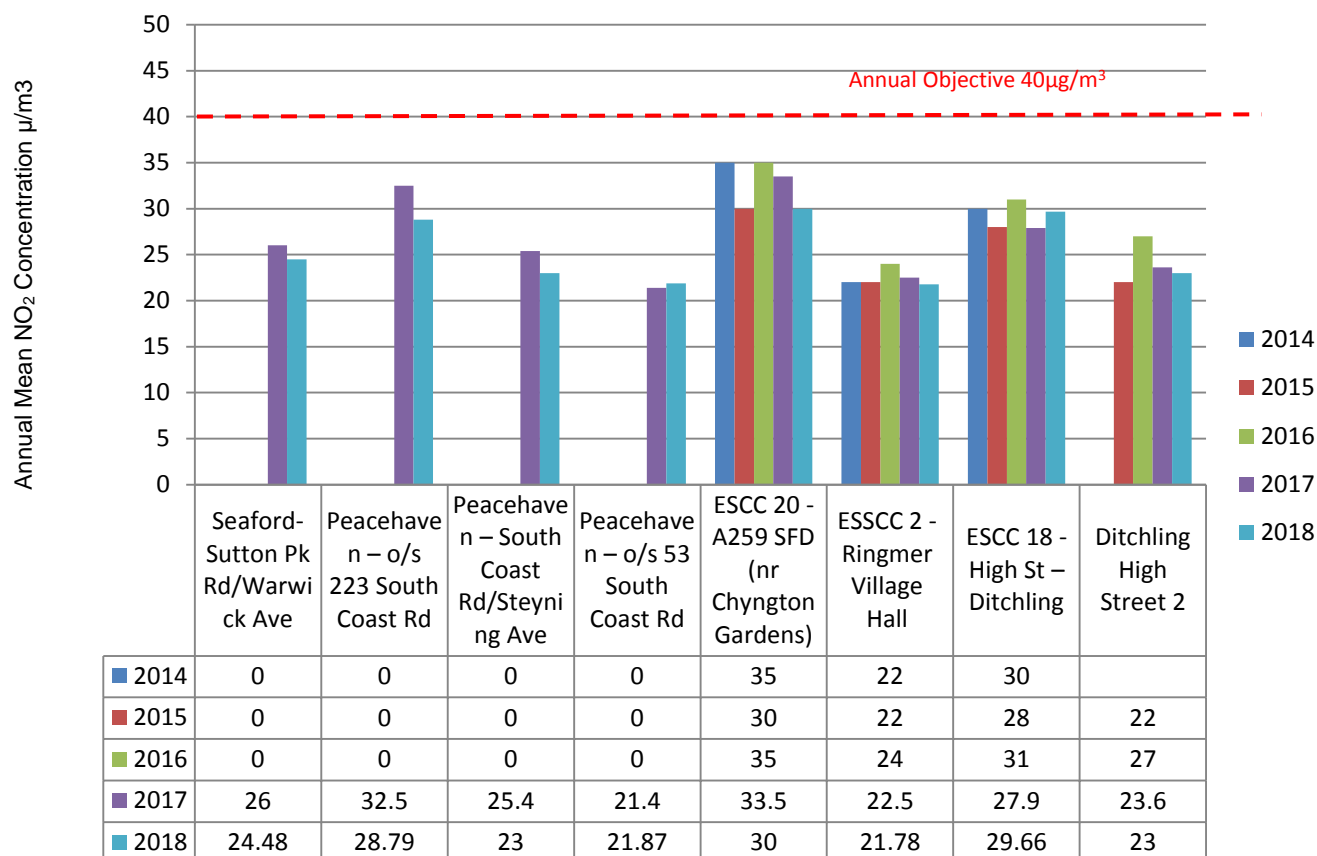


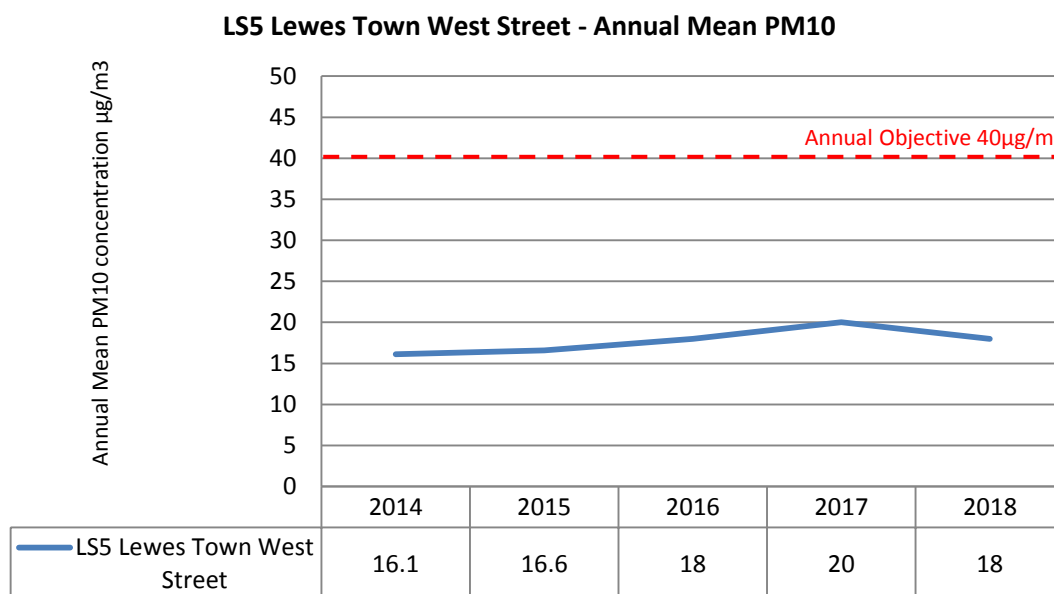
Figure 18 shows all sites that are located in more outlying Lewes District areas. All indicate concentrations within the annual objective. Most sites are showing a decrease over time although a couple of sites have shown slight increases (Peacehaven- South Coast Road/Steyning Ave and ESCC18).

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year. There have been no exceedances of the hourly objective of 200µg/m³ since monitoring began.

3.2.2 Particulate Matter (PM₁₀)

Table A.5 Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³

Figure 19: Annual average PM₁₀ concentration measured at LS5 Lewes Town West Street (Automatic Monitoring site) 2014-2018

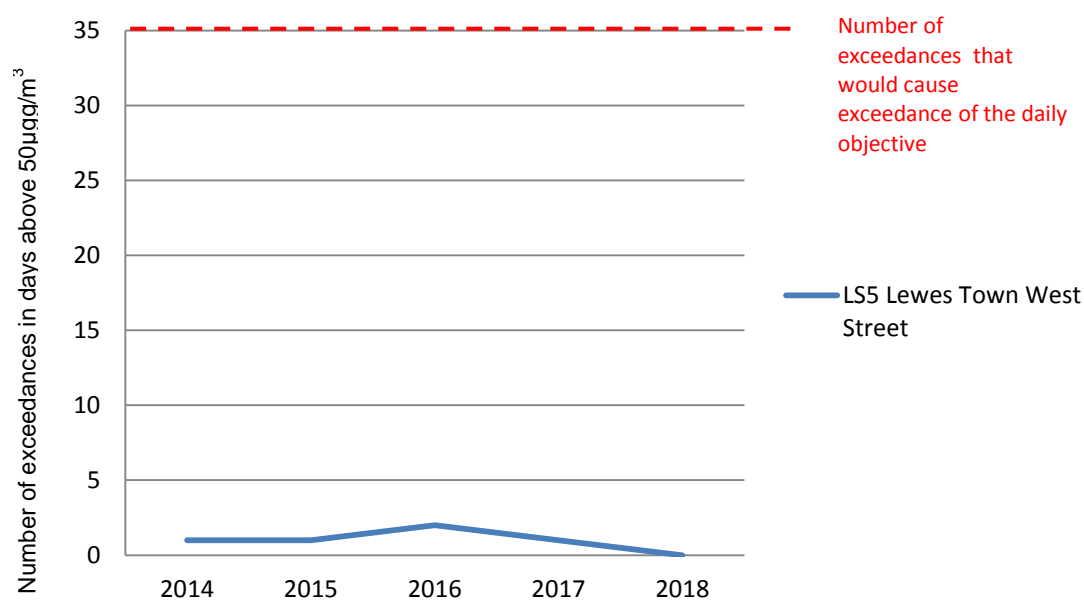


From Figure 19 it is clear to see that PM₁₀ annual mean concentrations have remained well below the annual objective.

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations (24 hour means) for the past 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

Figure 20: Number of exceedances of the $50\mu\text{g}/\text{m}^3$ daily average at LS5 Lewes Town West Street (Automatic Monitoring site) 2014-2018 ($50\mu\text{g}/\text{m}^3$ as a 24 hour mean not to be exceeded more than 35 times a year)



The above figure shows that the monitoring station has not had any exceedances over the last 5 years. The data capture for PM_{10} this site in 2018 was only 67% and had to be annualised (see Table 8).

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
LS5	Lewes Town West Street	Roadside	541541	110246	NO2 PM10	Y	Chemiluminescence and TEOM	2m	Yes	2

Data for LS5 has been ratified

Notes:

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

(2) N/A if not applicable.

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

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 a Continuous Analyser?	Height (m)
1	Seaford- Sutton Pk Rd/Warwick Ave	Roadside	548420	99223	NO2	N	Y(4.5m)	R (2.8)	No	2.8
2	LDC 10 - 9 Southway – Newhaven	Kerbside	544354	101388	NO2	Y	Y(5m)	K (1)	No	2.5
3	LDC - 16 Southway – Newhaven	Kerbside	544414	101273	NO2	Y	Y(2.5m)	K(1)	No	2.5
4	LDC 11 - Lewes Rd – Newhaven	Roadside	544273	101532	NO2	N	Y(4m)	R (2)	No	2.5
5	Telscombe – South Coast Rd/Central Ave	Roadside	540063	101263	NO2	N	Y(6m)	R(1.8)	No	2.6
6	LDC 8 - 8 Bay Vue Rd - Newhaven	Background	544521	101089	NO2	N	Y(3m)	SB	No	2.5
7	LDC 25 - Westgate Chapel	Roadside	541285	109969	NO2	N	Y(2.2m)	R (1.9)	No	2.3
8	LDC 26 - Mount Pleasant/Sun Street	Roadside	541481	110277	NO2	Y	Y(0.5m)	R (2)	No	2.5
9	LDC 27 - West St Police Station	Roadside	541541	110246	NO2	Y	Y(5m)	R (2.6)	Yes	2.3
10	LDC 18 - Fisher Street	Kerbside	541505	110236	NO2	Y	Y(0m)	K (1.4)	No	2.5

11	LDC 36 - Fisher St West	Kerbside	541519	110167	NO2	Y	N	K (1)	No	2.2
12	LDC 1- Fisher St East	Kerbside	541540	110130	NO2	Y	N	K (1)	No	3.5
13	LDC 29 - Market St	Kerbside	541598	110169	NO2	Y	Y(5m)	K (1)	No	2.5
14	Peacehaven – o/s 223 South Coast Rd	Kerbside	540969	100974	NO2	N	Y(2.9m)	K(1.4)	No	2.7
15	LDC 31 - North St	Kerbside	541646	110370	NO2	N	Y(5m)	K (1)	No	3
16	LDC 33 - Cuilfail Tunnel/Thomas St	Roadside	542178	110454	NO2	N	Y (8m)	R (5)	No	3
17	LDC 4 - 159 Malling St – Lewes	Roadside	542315	110733	NO2	N	Y(3m)	R (2)	No	3.5
18	LDC 6 East Street	Roadside	541669	110278	NO2	N	Y (0m)	R (3.5)	No	2.5
19	LDC 30 - Little East St	Roadside	541726	110335	NO2	N	Y (1m)	R(2.7)	No	2.5
20	LDC 45 - School Hill	Kerbside	541755	110206	NO2	N	Y (2.5)	K(1)	No	2.5
21	LDC 34 - 204 High St (School Hill)	Roadside	541684	110181	NO2	N	Y(0m)	R (2.7)	No	2.6
22	LDC 35 - Walmer Lane/Lansdowne Terrace	Roadside	541709	109990	NO2	N	Y(1.8m)	R (3)	No	2.4
23	LDC 23 - Station St/Lansdowne Terrace	Roadside	541615	109968	NO2	Y	N	R (1.8)	No	2.5
24	LDC 14 - Station St - Lewes	Roadside	541603	110001	NO2	Y	Y(2)	R (1.9)	No	3

25	LS6 - Denton Community Centre	Urban background	545142	102433	NO2	N	N	SB	No	2
26	Peacehaven – South Coast Rd/Steyping Ave	Roadside	541231	100957	NO2	N	Y(10m)	R (3)	No	2.7
27	LDC 46 - No Entry Sign Adj. To 1 Abinger Place	Roadside	541438	110293	NO2	N	Y (4m)	R (1.5)	No	2
28	LDC 47 - 8 Abinger Place	Roadside	541430	110328	NO2	N	Y (1.2)	R (1.5)	No	2.5
29	Peacehaven – o/s 53 South Coast Rd	Roadside	542168	100675	NO2	N	Y (10)	R (3)	No	2.7
30	ESCC 20 - A259 SFD (nr Chyngton Gardens)	Roadside	550077	99291	NO2	N	Y(10m)	R (1.5)	No	3
31	ESCC 23 - Railway Rd – Newhaven	Kerbside	544996	101264	NO2	N	Y(5m)	K (1)	No	3
32	ESCC 24 - 35 Heighton Crescent - Denton	Back-ground	544908	102704	NO2	N	Y(10m)	SB	No	1.8
33	ESSCC 2 - Ringmer Village Hall	Roadside	544681	112441	NO2	N	N	R (1.8)	No	2
34	ESCC 18 - High St – Ditchling	Roadside	532605	115203	NO2	N	Y(5m)	R (2)	No	2.5
35	Ditchling High Street 2	Kerbside	532587	115410	NO2	N	Y (1m)	K (1)	No	1.8
36	ESCC 22 - Southover High St – Lewes	Roadside	541032	109613	NO2	N	Y (1m)	R (2)	No	2.1

37	Newhaven - Bridge Pub	kerbside	544603	101485	NO2	Y	N	K (0.5)	No	2
38	Newhaven- Essex Place	Roadside	544497	101499	NO2	Y	Y (5m)	R (1.2)	No	2
39	Newhaven - Rathan Court	Roadside	544330	101423	NO2	Y	Y (10)	R (1.5)	No	2
40	Newhaven - The Old Chapel	Roadside	544497	101285	NO2	Y	Y(10m)	R (1.5)	No	2.5
41	Drove Rd - Newhaven	Roadside	544948	101549	NO2	NO	N	R (4)	NO	2.5

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
LS5 Lewes Town West Street	Roadside	Automatic	98	98	19	23	24	21	19
Seafood- Sutton Pk Rd/Warwick Ave	Roadside	Diffusion Tube	100	100	0	0	0	26	24.48
LDC 10 - 9 Southway – Newhaven	Kerbside	Diffusion Tube	100	100	41	33	36	33.6	37.19
LDC - 16 Southway – Newhaven	Kerbside	Diffusion Tube	100	100	47	42	49	47.6	39.88
LDC 11 - Lewes Rd – Newhaven	Roadside	Diffusion Tube	92	92	33	28	31	31.5	28.06
Telscombe – South Coast Rd/Central Ave	Roadside	Diffusion Tube	100	100	0	0	0	25.6	23.01
LDC 8 - 8 Bay Vue Rd - Newhaven	Urban Background	Diffusion Tube	100	100	18	15	18	18	18.66
LDC 25 - Westgate Chapel	Roadside	Diffusion Tube	100	100	38	30	33	29.5	28.65
LDC 26 - Mount Pleasant/Sun Street	Roadside	Diffusion Tube	100	100	27	23	24	24.9	22.30

LDC 27 - West St Police Station	Roadside	Diffusion Tube	100	100	25	22	23	22.3	20.83
LDC 18 - Fisher Street	Kerbside	Diffusion Tube	100	100	26	22	25	23.7	23.44
LDC 36 - Fisher St West	Kerbside	Diffusion Tube	92	92	40	31	32	31	32.36
LDC 1- Fisher St East	Kerbside	Diffusion Tube	100	100	46	41	43	43	42.16
LDC 29 - Market St	Kerbside	Diffusion Tube	100	100	44	40	41	39.3	36.00
Peacehaven – o/s 223 South Coast Rd	Kerbside	Diffusion Tube	100	100	0	0	0	32.5	28.79
LDC 31 - North St	Kerbside	Diffusion Tube	100	100	28	21	25	23	21.91
LDC 33 - Cuilfail Tunnel/Thomas St	Roadside	Diffusion Tube	83	83	35	30	32	31	29.48
LDC 4 - 159 Malling St – Lewes	Roadside	Diffusion Tube	100	100	33	30	33	30.8	30.49
LDC 6 East Street	Roadside	Diffusion Tube	100	100	28	25	28	25.9	24.09
LDC 30 - Little East St	Roadside	Diffusion Tube	100	100	25	22	23	23.3	22.09
LDC 45 - School Hill	Kerbside	Diffusion Tube	100	100	39	43	42	38.9	37.57
LDC 34 - 204 High St (School Hill)	Roadside	Diffusion Tube	100	100	56	40	48	45.6	41.39

LDC 35 - Walmer Lane/Lansdowne Terrace	Roadside	Diffusion Tube	100	100	22	20	23	20.7	21.97
LDC 23 - Station St/Lansdowne Terrace	Roadside	Diffusion Tube	92	92	29	27	29	27.4	25.83
LDC 14 - Station St - Lewes	Roadside	Diffusion Tube	100	100	34	32	31	35.9	34.39
LS6 - Denton Community Centre	Urban Background	Diffusion Tube	100	100	13	11	13	14.1	11.60
Peacehaven – South Coast Rd/Steving Ave	Roadside	Diffusion Tube	83	83	0	0	0	25.4	23.20
LDC 46 - No Entry Sign Adj. To 1 Abinger Place	Roadside	Diffusion Tube	100	100	33	28	32	29.7	29.64
LDC 47 - 8 Abinger Place	Roadside	Diffusion Tube	100	100	31	27	31	29	28.34
Peacehaven – o/s 53 South Coast Rd	Roadside	Diffusion Tube	100	100	0	0	0	21.4	21.87
ESCC 20 - A259 SFD (nr Chyngton Gardens)	Roadside	Diffusion Tube	100	100	35	30	35	33.5	30.20

Lewes District Council

ESCC 23 - Railway Rd – Newhaven	Kerbside	Diffusion Tube	100	100	23	21	23	21.5	22.00
ESCC 24 - 35 Heighton Crescent - Denton	Urban Background	Diffusion Tube	83	83	15	14	16	17	14.42
ESSCC 2 - Ringmer Village Hall	Roadside	Diffusion Tube	100	100	22	22	24	22.5	21.78
ESCC 18 - High St – Ditchling	Roadside	Diffusion Tube	100	100	30	28	31	27.9	29.66
Ditchling High Street 2	Kerbside	Diffusion Tube	100	100		22	27	23.6	23.08
ESCC 22 - Southover High St – Lewes	Roadside	Diffusion Tube	100	100	41	29	36	31.7	31.90
Newhaven - Bridge Pub	Kerbside	Diffusion Tube	100	100	41	35	42	39.3	38.74
Newhaven- Essex Place	Roadside	Diffusion Tube	100	100	36	27	32	31.5	31.22
Newhaven - Rathan Court	Roadside	Diffusion Tube	100	100	26	21	25	23.4	28.36
Newhaven - The Old Chapel	Roadside	Diffusion Tube	100	100	49	43	47	44.7	44.13
Drove Rd - Newhaven	Roadside	Diffusion Tube	50	50	0	0	0	0	<u>26.97(3)</u>

☒ 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.

Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2014	2015	2016	2017	2018
LS5 Lewes Town West Street	Roadside	Automatic	98	98	0	0	0	0	0

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

(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) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Table A.5 – Annual Mean PM₁₀ Monitoring Results over the last 5 years

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2014	2015	2016	2017	2018
LS5 Lewes Town West Street	Roadside	67	67	16.1 (84%)	16.6 (73%)	18 (94%)	20	18 (67%) ³

☒ Annualisation has been conducted where data capture is <75%

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

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

Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾				
				2014	2015	2016	2017	2018
LS5 Lewes Town West Street	Roadside	67	67	1	1	2	1	0(30) ³

Notes:

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

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

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)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor 0.93) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
Seaford - Sutton Pk Rd/Warwick Ave	28.05	26.35	26.42	27.25	26.42	23.24	26.37	26.22	24.43	28.70	31.46	21.02	26.33	24.48	
LDC 10 - 9 Southway – Newhaven	39.27	38.18	46.53	39.38	43.67	38.01	37.06	33.61	36.55	45.90	50.03	31.66	39.99	37.19	
LDC - 16 Southway – Newhaven	39.62	42.32	45.12	40.78	49.63	36.04	44.61	40.74	43.10	46.58	41.41	44.61	42.88	39.88	35.0 ²
LDC 11 - Lewes Rd - Newhaven	34.90	26.25	32.43	27.76	Missing tube	22.4	31.24	30.10	27.07	34.50	31.78	33.43	30.17	28.06	
Telscombe - South Coast Rd/Central Ave	28.10	23.37	26.54	24.09	23.40	19.63	28.11	23.17	23.20	26.41	25.61	25.24	24.74	23.01	
LDC 8 - 8 Bay Vue Rd - Newhaven	19.88	22.73	23.91	18.11	20.62	17.14	16.91	14.03	17.98	23.98	23.25	22.25	20.07	18.66	
LDC 25 - Westgate Chapel	25.99	31.06	31.62	27.77	27.19	28.32	31.14	27.45	31.02	33.01	37.28	37.85	30.81	28.65	
LDC 26 - Mount	28.10	25.47	25.90	21.23	19.65	16.55	21.58	23.91	25.51	28.92	26.56	24.30	23.97	22.30	

Lewes District Council

Pleasant/Sun Street															
LDC 27 - West St Police Station	28.20	28.72	24.31	17.10	17.89	15.50	20.13	21.14	21.72	23.90	27.10	23.12	22.40	20.83	
LDC - 18 Fisher Street	25.58	24.76	25.25	24.86	22.31	19.80	25.59	25.75	23.77	27.93	29.49	27.36	25.20	23.44	
LDC 36 - Fisher St West	30.90	34.66	34.03	Tube missing	35.61	30.77	37.02	32.64	34.36	42.78	37.50	32.52	34.80	32.36	
LDC 1- Fisher St East	40.46	40.38	43.82	43.19	44.75	44.56	48.12	47.68	43.10	50.63	49.29	47.98	45.33	42.16	Not corrected no receptor
LDC 29 - Market St	41.42	35.33	43.64	35.59	29.45	30.73	43.96	40.72	38.80	41.57	42.59	40.67	38.71	36.00	
Peacehaven - outside 223 South Coast Rd	32.18	32.08	35.48	32.60	27.00	24.67	36.47	21.43	29.34	35.54	32.73	32.02	30.96	28.79	
LDC 31 - North St	27.45	23.80	28.90	23.06	19.51	18.94	23.67	21.82	20.64	25.30	28.01	21.66	23.56	21.91	
LDC 33 - Cuilfail Tunnel/Thomas St	33.22	38.04	36.36	22.72	27.22	26.60	31.51	31.24	32.04	38.09	missing. Lampost been replaced	No data as new block and tube put up	31.70	29.48	
LDC 4 - 159 Malling St – Lewes	34.95	34.93	33.54	32.81	32.87	31.44	33.13	27.92	29.38	37.40	33.59	31.52	32.79	30.49	
LDC 6 - East Street	28.46	31.52	27.66	22.79	25.76	24.8	22.34	22.85	26.64	28.35	27.60	22.01	25.90	24.09	
LDC 30 - Little East St	26.92	25.74	26.86	22.29	23.92	18.14	25.92	18.01	15.36	26.11	28.50	27.25	23.75	22.09	
LDC - School Hill	42.34	37.31	43.96	39.21	37.66	36.73	41.03	39.74	40.68	43.23	43.59	39.25	40.39	37.57	
LDC 34 - 204 High St (School Hill)	43.16	41.97	44.61	38.22	41.07	41.95	48.75	47.65	51.62	46.56	45.88	42.66	44.51	41.39	41.0 ²

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LDC 35 - Walwers Lane/Lansdowne Terrace	24.91	31.82	24.14	21.18	19.94	20.56	***19.06	19.17	21.60	26.92	26.12	23.49	23.62	21.97	
LDC 23 - Station St/Lansdowne Terrace	29.56	Entire pole and tube gone!	29.05	24.40	25.69	22.97	25.86	26.54	28.56	33.15	29.66	30.08	27.77	25.83	
LDC 14 - Station St - Lewes	38.83	35.97	38.19	34.48	32.16	32.07	39.39	35.61	39.88	38.83	40.20	38.09	36.98	34.39	
LS6 - Denton Community Centre	14.30	13.13	14.48	12.98	11.62	7.99	11.77	10.20	11.59	13.40	14.75	13.47	12.47	11.60	
Peacehaven - South Coast Rd/Steyning Ave	25.01	26.08	30.72	25.83	24.23	18.75	27.68	23.20	Tube not changed over	Data invalid - 2 months	23.00	24.99	24.95	23.20	
No Entry Sign Adj. To 1 Abinger Place	35.76	32.68	38.42	32.44	26.96	26.43	30.61	30.60	29.12	28.76	38.87	31.77	31.87	29.64	
8 Abinger Place	32.50	32.12	30.68	27.44	31.37	23.07	31.69	27.72	30.00	33.17	35.31	30.61	30.47	28.34	
Peacehaven - Outside 53 South Coast Rd	24.76	29.69	28.30	20.08	22.91	17.75	*16.56	17.94	18.24	28.23	26.29	24.54	23.52	21.87	
ESCC 20 - A259 SFD (nr Chyngton Gardens)	33.11	33.52	31.64	27.9	29.06	30.88	38.76	35.76	33.82	35.27	33.57	26.36	32.47	30.20	
ESCC 23 - Railway Rd – Newhaven	24.66	24.03	24.90	24.35	24.34	17.26	22.03	19.98	21.31	28.27	28.61	24.16	23.66	22.00	
ESCC 24 - 35 Heighton Crescent - Denton	18.37	17.64	18.14	16.59	13.59	10.93	15.27	13.37	14.68	16.49	Tube not changed over	No data as tube missed last	15.51	14.42	

Lewes District Council

												month			
ESSCC 2 - Ringmer Village Hall	28.26	26.34	23.60	21.55	*0.73	19.70	22.48	21.60	21.95	26.96	23.84	21.36	23.42	21.78	
ESCC 18 - High St – Ditchling	31.86	34.55	31.66	30.34	34.26	32.39	30.02	27.74	27.13	36.35	35.22	31.16	31.89	29.66	
Ditchling High Street 2	23.76	27.63	27.15	24.91	25.88	23.66	24.61	22.85	21.95	26.65	25.90	22.87	24.82	23.08	
ESSCC 22 - Southover High St – Lewes	38.78	43.89	26.13	30.05	33.3	29.47	**31.43	31.13	35.28	41.85	32.91	34.52	34.30	31.90	
Newhaven - Bridge Pub	39.98	46.64	43.81	38.63	43.33	37.05	45.78	41.66	33.35	45.25	40.37	43.97	41.65	38.74	
Newhaven - Essex Place	27.79	31.92	35.91	32.84	33.4	28.84	39.56	36.32	31.45	35.27	35.95	33.51	33.57	31.22	
Newhaven - Rathan Court	27.02	34.87	34.73	31.23	30.84	23.41	30.00	26.34	27.33	35.88	32.78	31.55	30.50	28.36	
Newhaven - The Old Chapel	46.66	44.06	49.36	43.62	42.88	47.83	52.03	53.16	47.83	49.76	45.12	47.07	47.45	44.13	32.0 ²
Newhaven - Drove Rd	N/A	N/A	N/A	N/A	N/A	28.7	24.36	23.27	27.74	29.73	25.11	25.75	26.38	26.97 ¹	

☐ 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

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

QC/QC of automatic monitoring

The continuous monitoring stations in Eastbourne Borough Council is managed by the Sussex Air Quality Partnership (<https://www.sussex-air.net>). All continuous monitoring activities are subject to the same quality assurance/quality control objectives set out in the AURN local site operator's manual. These procedures are:

- Overnight 24 hour IZS calibration checks (NO_x analyser);
- Fortnightly manual zero/span calibration using certified cylinders (carried out by Council employees fully trained in LSO duties);
- Full data analysis and ratification by the Environmental Research Group at King's College London for Devonshire Park and by Ricardo Energy & Environment for Holly Place;

Six monthly service visits and site audits

QA/QC of diffusion tube monitoring

The Ambient, Indoor, Workplace Air and Stack Emissions Proficiency Testing Scheme (AIR PT) is an independent analytical proficiency-testing scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the AIR PT scheme. AIR NO₂ PT forms an integral part of the UK NO₂ Network's QA/QC, and is a useful tool in assessing the analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM).

During 2018 Gradko participated in the AIR PT programme, and obtained a 100% rating for the whole year (AIR PT rounds AR024, AR025, AR027, AR028 and AR030). Further information can be found on this link:

<https://laqm.defra.gov.uk/assets/laqmno2performancedatauptofebruary2019v1.pdf>

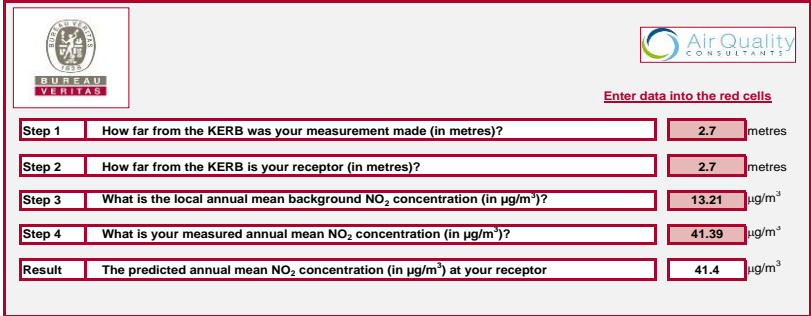
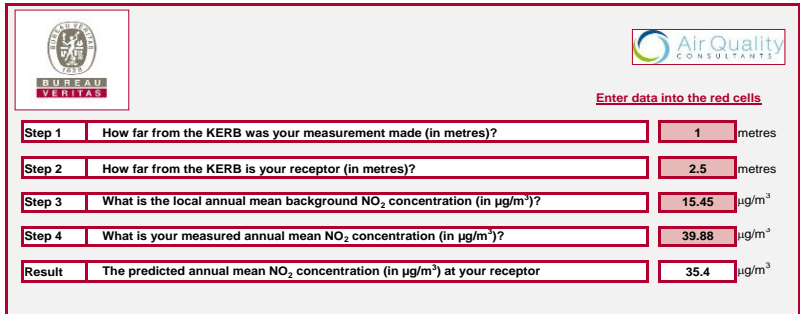
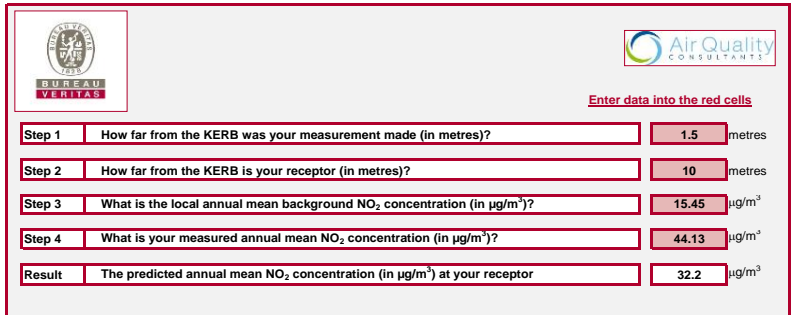
National bias adjustment factor spreadsheet.

The diffusion tubes are supplied and analysed by Gradko utilising the 20 % triethanolamine (TEA) in water preparation method. A bias adjustment of 0.93 for the year 2018 (based on 30 studies) has been derived from the national bias adjustment calculator. The spreadsheet is shown below in **Table 6: National Bias Adjustment Factor Spreadsheet**

National Diffusion Tube Bias Adjustment Factor Spreadsheet						Spreadsheet Version Number: 03/19						
Follow the steps below in the correct order to show the results of relevant co-location studies									This spreadsheet will be updated at the end of June 2019 LAQM Helpdesk Website			
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods												
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet												
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.												
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.						Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.						
Step 1:		Step 2:	Step 3:	Step 4:								
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor ⁴ shown in blue at the foot of the final column.								
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data ²	If you have your own co-location study then see footnote ⁴ . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953								
Analysed By ¹		Method <small>To undo your selection, choose (All) from the pop-up list</small>	Year ² <small>To undo your selection, choose (All)</small>	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ³	Bias Adjustment Factor (A) (Cm/Dm)	
Gradko		20% TEA in water	2018	R	Ards and North Down Borough Council	11	36	29	27.4%	G	0.78	
Gradko		20% TEA in water	2018	R	Gedling Borough Council	12	33	32	5.6%	G	0.95	
Gradko		20% TEA in water	2018	R	Lisburn & Castlereagh City Council	12	32	24	32.1%	G	0.76	
Gradko		20% TEA in water	2018	R	Monmouthshire County Council	12	38	36	4.7%	G	0.96	
Gradko		20% TEA in water	2018	UB	Northampton Borough Council	12	16	13	26.8%	G	0.79	
Gradko		20% TEA in water	2018	R	Bedford Borough Council	11	32	29	9.2%	G	0.92	
Gradko		20% TEA in water	2018	R	Borough Council of King's Lynn and West Norfolk	12	26	24	6.0%	G	0.94	
Gradko		20% TEA in water	2018	R	Cheshire West and Chester	12	36	37	-2.5%	G	1.03	
Gradko		20% TEA in water	2018	R	Cheshire West and Chester	12	43	40	6.1%	G	0.94	
Gradko		20% TEA in water	2018	R	Fareham Borough Council	12	28	34	-17.5%	G	1.21	
Gradko		20% TEA in water	2018	R	Fareham Borough Council	12	37	34	8.9%	G	0.92	
Gradko		20% TEA in water	2018	R	Fareham Borough Council	12	32	28	12.6%	G	0.89	
Gradko		20% TEA in water	2018	R	NOTTINGHAM CITY COUNCIL	12	35	34	0.3%	G	1.00	
Gradko		20% TEA in water	2018	R	Bracknell Forest Borough Council	12	44	37	19.4%	G	0.84	
Gradko		20% TEA in water	2018	R	Brighton & Hove City Council	9	48	50	-3.7%	G	1.04	
Gradko		20% TEA in water	2018	R	Eastleigh Borough Council	11	28	32	-12.0%	G	1.14	
Gradko		20% TEA in water	2018	R	Eastleigh Borough Council	12	42	38	10.2%	G	0.91	
Gradko		20% TEA in water	2018	UB	Eastleigh Borough Council	12	27	28	-4.4%	G	1.05	
Gradko		20% TEA in water	2018	R	Gateshead Council	12	29	25	13.9%	G	0.88	
Gradko		20% TEA in water	2018	R	Gateshead Council	12	32	29	10.8%	G	0.90	
Gradko		20% TEA in water	2018	R	Gateshead Council	9	40	41	-1.8%	G	1.02	
Gradko		20% TEA in water	2018	R	Wokingham Borough Council	12	38	33	13.2%	G	0.88	
Gradko		20% TEA in water	2018	R	Bath & North East Somerset	12	40	39	4.0%	G	0.96	
Gradko		20% TEA in water	2018	R	Bedford Borough Council	10	30	27	8.8%	G	0.92	
Gradko		20% TEA in water	2018	KS	Marylebone Road Intercomparison	11	93	85	9.3%	G	0.91	
Gradko		20% TEA in water	2018	R	South Gloucestershire Council	12	21	20	6.3%	G	0.94	
Gradko		20% TEA in water	2018	R	Thurrock Borough Council	12	53	52	2.3%	S	0.98	
Gradko		20% TEA in water	2018	R	Thurrock Borough Council	12	34	30	15.1%	G	0.87	
Gradko		20% TEA in water	2018	R	Thurrock Borough Council	12	31	24	28.8%	G	0.78	
Gradko		20% TEA in water	2018	UB	Thurrock Borough Council	12	27	25	9.2%	S	0.92	
Gradko		20% TEA in water	2018	Overall Factor ⁴ (30 studies)							Use	0.93

For 2018 the bias adjustment figure is 0.93

Table 7: Sites where the annual mean of $40\mu\text{g}/\text{m}^3$ for NO_2 has been exceeded and has been corrected for distance to receptor

Site	Concentration before distance correction $\mu\text{g}/\text{m}^3$	Concentration after distance correction $\mu\text{g}/\text{m}^3$	Screen capture for fall off with distance calculator. Background NO_2 taken from UK-Air Background mapping for local authorities 2017																								
LDC 34-204 High Str (School Hill)	41.39	41.4	 <p>Enter data into the red cells</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Question</th> <th>Value</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>Step 1</td> <td>How far from the KERB was your measurement made (in metres)?</td> <td>2.7</td> <td>metres</td> </tr> <tr> <td>Step 2</td> <td>How far from the KERB is your receptor (in metres)?</td> <td>2.7</td> <td>metres</td> </tr> <tr> <td>Step 3</td> <td>What is the local annual mean background NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?</td> <td>13.21</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> <tr> <td>Step 4</td> <td>What is your measured annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?</td> <td>41.39</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> <tr> <td>Result</td> <td>The predicted annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$) at your receptor</td> <td>41.4</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> </tbody> </table>	Step	Question	Value	Unit	Step 1	How far from the KERB was your measurement made (in metres)?	2.7	metres	Step 2	How far from the KERB is your receptor (in metres)?	2.7	metres	Step 3	What is the local annual mean background NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?	13.21	$\mu\text{g}/\text{m}^3$	Step 4	What is your measured annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?	41.39	$\mu\text{g}/\text{m}^3$	Result	The predicted annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$) at your receptor	41.4	$\mu\text{g}/\text{m}^3$
Step	Question	Value	Unit																								
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Step 4	What is your measured annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?	41.39	$\mu\text{g}/\text{m}^3$																								
Result	The predicted annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$) at your receptor	41.4	$\mu\text{g}/\text{m}^3$																								
LDC 16 Southway Newhaven	39.88	35.4	 <p>Enter data into the red cells</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Question</th> <th>Value</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>Step 1</td> <td>How far from the KERB was your measurement made (in metres)?</td> <td>1</td> <td>metres</td> </tr> <tr> <td>Step 2</td> <td>How far from the KERB is your receptor (in metres)?</td> <td>2.5</td> <td>metres</td> </tr> <tr> <td>Step 3</td> <td>What is the local annual mean background NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?</td> <td>15.45</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> <tr> <td>Step 4</td> <td>What is your measured annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?</td> <td>39.88</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> <tr> <td>Result</td> <td>The predicted annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$) at your receptor</td> <td>35.4</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> </tbody> </table>	Step	Question	Value	Unit	Step 1	How far from the KERB was your measurement made (in metres)?	1	metres	Step 2	How far from the KERB is your receptor (in metres)?	2.5	metres	Step 3	What is the local annual mean background NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?	15.45	$\mu\text{g}/\text{m}^3$	Step 4	What is your measured annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?	39.88	$\mu\text{g}/\text{m}^3$	Result	The predicted annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$) at your receptor	35.4	$\mu\text{g}/\text{m}^3$
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Step 4	What is your measured annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?	39.88	$\mu\text{g}/\text{m}^3$																								
Result	The predicted annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$) at your receptor	35.4	$\mu\text{g}/\text{m}^3$																								
The Old Chapel Newhaven	44.13	32.2	 <p>Enter data into the red cells</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Question</th> <th>Value</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>Step 1</td> <td>How far from the KERB was your measurement made (in metres)?</td> <td>1.5</td> <td>metres</td> </tr> <tr> <td>Step 2</td> <td>How far from the KERB is your receptor (in metres)?</td> <td>10</td> <td>metres</td> </tr> <tr> <td>Step 3</td> <td>What is the local annual mean background NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?</td> <td>15.45</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> <tr> <td>Step 4</td> <td>What is your measured annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?</td> <td>44.13</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> <tr> <td>Result</td> <td>The predicted annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$) at your receptor</td> <td>32.2</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> </tbody> </table>	Step	Question	Value	Unit	Step 1	How far from the KERB was your measurement made (in metres)?	1.5	metres	Step 2	How far from the KERB is your receptor (in metres)?	10	metres	Step 3	What is the local annual mean background NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?	15.45	$\mu\text{g}/\text{m}^3$	Step 4	What is your measured annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$)?	44.13	$\mu\text{g}/\text{m}^3$	Result	The predicted annual mean NO_2 concentration (in $\mu\text{g}/\text{m}^3$) at your receptor	32.2	$\mu\text{g}/\text{m}^3$
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Note: LDC1 Fisher Street East has no receptor and therefore not corrected for distance

Step 3 and 4 - The measurement and the background must be for the same year.

The background concentration could come from the national maps published at www.airquality.co.uk or alternatively from a nearby monitor in a background location.

In this instance UK air background maps were used for step 3 (background mapping was from 2017 data).

Result – The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

After distance correction the two sites in Newhaven fall below $40\mu\text{g}/\text{m}^3$, however the site LDC34-204 High Str (School Hill) shows an annual mean concentration over $40\mu\text{g}/\text{m}^3$. This location is just outside the AQMA. Due to this fact and that it is so intrinsically linked into the one way system of the town centre it is deemed unnecessary to extend the AQMA boundary to include it, as any actions that we take to reduce NO_2 concentrations would encompass this road anyway. This site is outside a shop but above there is residential property.

Annualisation had to be carried out for PM_{10} at the Lewes automatic monitoring station (LS5) as data capture was 67% (if data capture is less than 75% then annualisation is required). The annual mean for LS5 was $19\mu\text{g}/\text{m}^3$ before annualisation. A ratio has to be worked out from data and this factor is derived from using the monitoring stations below. These sites all have data capture % of over 85% for the year 2018.

The annual mean and associated period mean concentrations (corresponding to when Lewes Town Centre station had valid data) were then calculated. The values are illustrated below in Table 8:

Table 8: PM_{10} Annualised Mean for Lewes Town Centre (automatic monitoring) site:

Site	PM_{10} Annual Mean 2018 $\mu\text{g}/\text{m}^3$ (A_m)	PM_{10} Period Mean 2018 $\mu\text{g}/\text{m}^3$ (P_m)	Ratio (A_m/P_m)
EB1 Devonshire Park (Eastbourne) Urban background site with 93% data capture	19	20	0.95
Reigate & Banstead (Horley) Suburban site 100% data capture	17	18	0.94
		Annual Ratio Factor = 0.95	

The annual mean for Lewes town centre (LS5) was: $19\mu\text{g}/\text{m}^3$ – therefore $19 \times 0.95 =$ **$18\mu\text{g}/\text{m}^3$** (best estimate of annual mean for PM_{10} at this site).

Table 9: NO_2 Annualised Mean for Drove Road Diffusion Tube site:

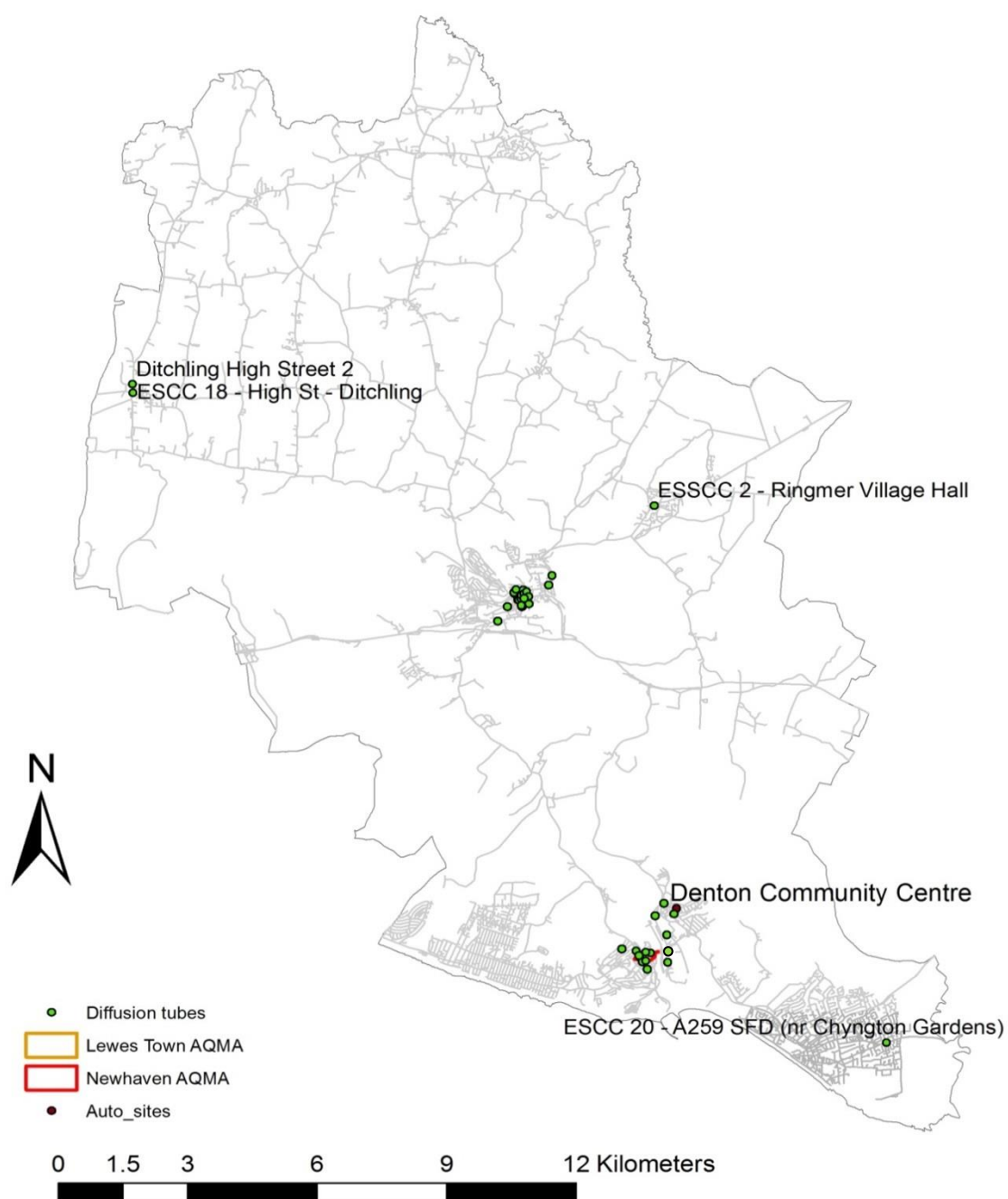
Site	NO_2 Annual Mean 2018 $\mu\text{g}/\text{m}^3$ (A_m)	NO_2 Period Mean 2018 $\mu\text{g}/\text{m}^3$ (P_m)	Ratio (A_m/P_m)
EB1 Devonshire Park (Eastbourne) Urban background site with 93% data capture	14	12.3	1.14
Brighton & Hove - Urban background with 99% data capture	16	15.08	1.06
		Annual Ratio Factor = 1.10	

The annual mean for Drove Road (based on 6 months data) was: $26.38\mu\text{g}/\text{m}^3$ – therefore $26.38 \times 1.10 = 29.02$, then bias adjusted (0.93) ($29.02 \times 0.93^*$) = **$26.97\mu\text{g}/\text{m}^3$** (best estimate of annual mean for NO_2 at this site).

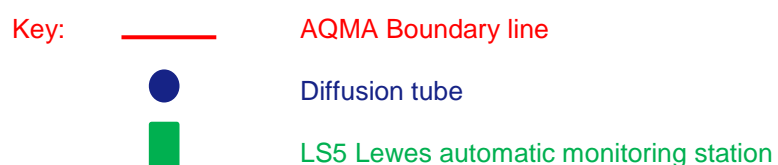
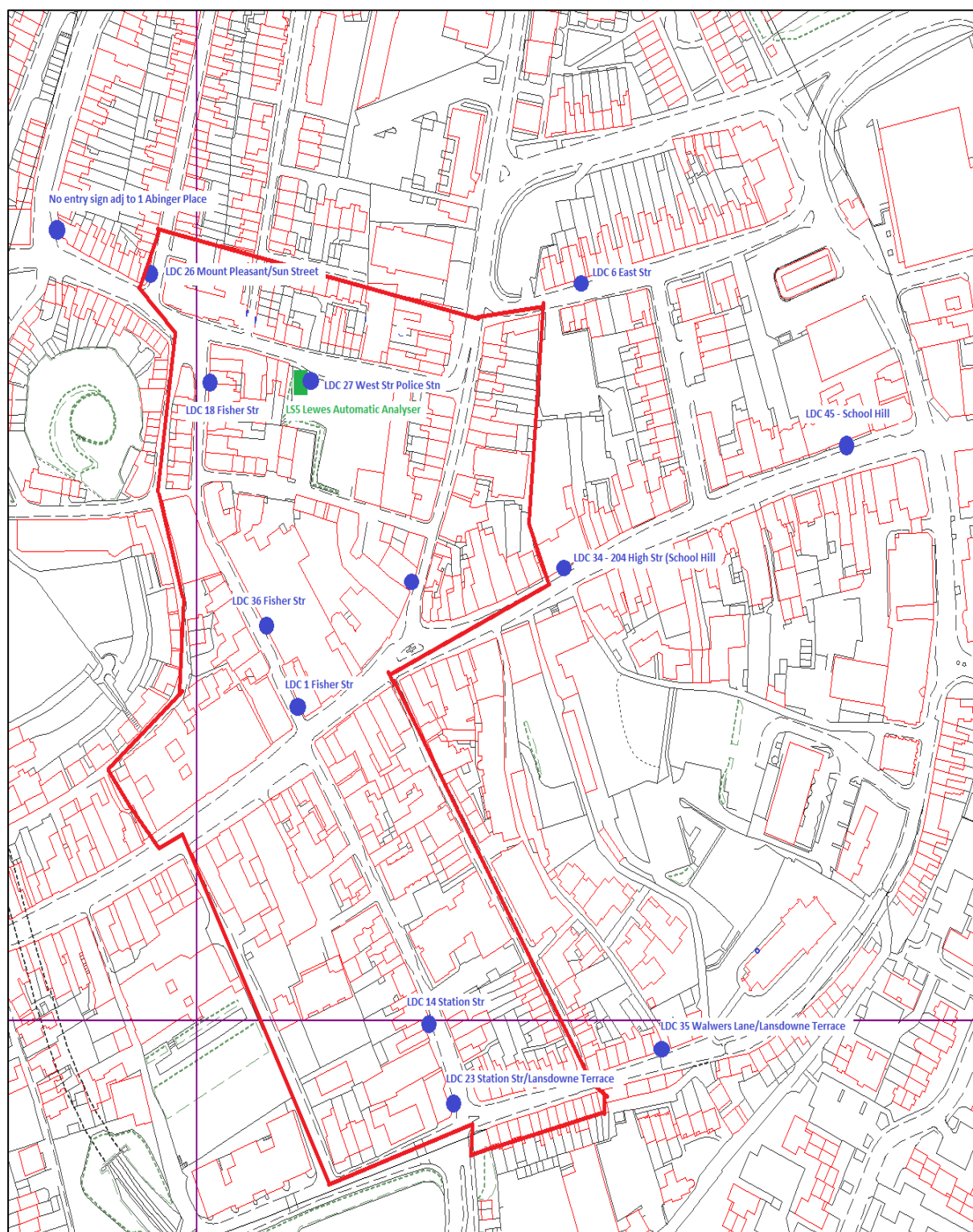
*Bias adjustment figure 0.93 from Table 6.

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

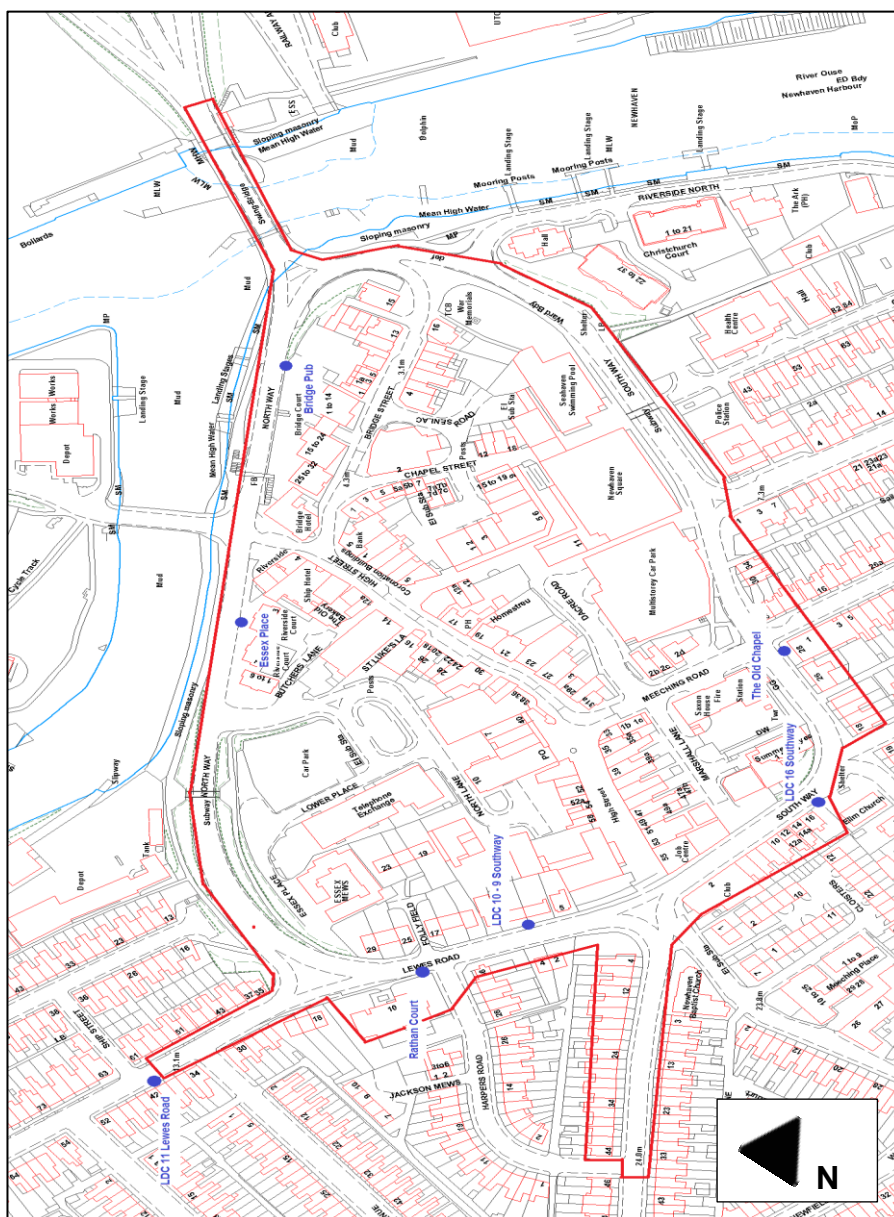
Map 1: Monitoring locations of Lewes District diffusion tubes and automatic monitoring stations



Map 2: The Lewes Town Centre AQMA and diffusion tubes within or adjacent to the AQMA



Map 3: The A259 Newhaven Ring Road AQMA and diffusion tubes within or adjacent to the AQMA



Key: — AQMA Boundary line
● Diffusion tube

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

- 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 Defra. Clean Air Strategy (2019)
- ⁵ Kings College London. Sussex Air Pollution Monitoring Network Annual Report (May 2019)
- ⁶ Air Quality Bulletin (May 2019) Environmental Management Publishing Ltd
- ⁷ <https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>
- ⁸ Health matters (2018) Public Health England
- ⁹ Lewes Town Council neighbourhood Plan 2015-2033 (Apr 2019)
- ¹⁰ Phlorum. Report 1 Baseline Modelling (May 2019)