ADUR DISTRICT
COUNCIL

2018 Air Quality Annual Status Report (ASR)

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

June 2018

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Executive Summary: Air Quality in Our Area

Air Quality in Adur

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 billion[3].

This report covers monitoring and actions taken during 2017. There are two Air Quality Management Areas (AQMA's) within Adur: AQMA 1 – High Street, Shoreham-by-Sea and AQMA 2 – Old Shoreham Road, Southwick.

Our automatic (continuous) Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}) monitoring equipment located in Shoreham High Street remained out of action during 2017. However the site will be up and running again in Spring 2018.

Adur District Council undertook passive monitoring of NO_2 using diffusion tubes at 24 sites during 2017. Six sites recorded a decrease in levels whilst all others showed a small increase.

One monitoring site exceeded the annual mean objective of 40µg/m^3 – Upper Brighton Road, Sompting. This site is at the kerb and when the measured annual mean is predicted back to the nearest relevant exposure 12m away (as required by national guidance), levels reduce to 28µg/m^3 well below the annual mean objective.

Levels measured within AQMA1 High Street Shoreham decreased from 2016 levels by an average of 1.6µg/m^3. This monitoring site is also at the kerbside with the nearest relevant exposure just under 5m away and when the level is predicted back levels reduce to 28.5µg/m^3, well below the annual mean objective. As yet we have no hard evidence as to why the levels are decreasing, other than the general trend that

[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

the (national) vehicle fleet is becoming cleaner. There is currently no automatic traffic counter (ATC) in the High Street so we cannot look at levels of traffic (Note, Adur DC will be funding a short ATC during 2018).

Monitoring around AQMA 1 has given mixed results. Levels at Pond Road decreased slightly, West Street increased very slightly whilst new sites at Victoria Road and Humphrey's Gap gave façade levels of 21.9µg/m^3 and 39.1µg/m^3 respectively.

As stated in last years report we want to keep under review the measured levels in AQMA1, when the automatic monitor has been up and running again in 2018, before making decisions on the future of the AQMA. With a number of major developments planned for the Adur District we do not consider revocation of the AQMA to be an option at this time. This was confirmed in the review of last year's ASR by Defra.

Last year we stated that we would consider revoking AQMA2 in Southwick as measured levels had been below the annual mean objective. However measured levels at the two monitoring sites within this AQMA increased during 2017 and there appears to have been a slight upward trend in levels recently, although they are still below the annual mean objective. As levels have increased we would like to see if levels measured during 2018 continue to rise before considering this AQMA for revocation.

Air quality action plans (AQAP) rely on partnership work with West Sussex County Council and other partners to deliver actions to improve traffic flows, encourage alternatives to conventional vehicles and therefore improve air quality. We continue to engage with partners through an action plan working group which meets a number of times a year to discuss measures and progress actions.

More information is available on our website at https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/local-air-quality-management/#page-content

Actions to Improve Air Quality

We enhanced our use of the Sussex Air Quality Emissions Mitigation Planning Guidance within the planning process ensuring major developments completed an emissions mitigation assessment in order to provide mitigation schemes. We were successful in negotiating significant sums of money via planning agreements to help

fund air quality improvements. We also consulted with planning colleagues at both District and County level to ensure air quality was highlighted during pre-application discussions with developers, the aim being to ensure developers design appropriate mitigation into schemes from the outset. We continued to develop our electric vehicle charge point strategy and this resulted in the provision of the first public charge points in Adur in the Council's car park at Pond Road Shoreham. We were successful in a 2017 Defra air quality grant bid through Sussex-air. This will target a few schools and businesses in or close to the High Street AQMA with the aim of reducing idling, increasing walking and cycling rates and reducing local emissions from fixed and mobile plant (from businesses). West Sussex County Council (WSCC) continued their "Walk To" programme led by Living Streets, working with a number of schools in Adur. WSCC Public Health actively supported the promotion of the Sussex *'Air Alert'* scheme.

The update to the 2007 Adur Air Quality Action Plan was delayed, but will be completed during 2018.

Conclusions and Priorities

Measured concentrations of NO_2 remained below the annual mean objective at all but one monitoring site in 2017, Brighton Road Sompting. However when predicted back to the nearest receptor levels reduce to well below the annual mean objective. Six monitoring sites recorded a decrease in levels whilst all others showed an increase. Levels measured within AQMA1 in Shoreham High Street have decreased slightly over 2016 levels. Concentrations within AQMA2 in Southwick increased over 2016 levels and as a result we propose to defer any decision to revoke this AQMA.

Specific priority actions for 2018 include delivery of the Defra grant funded school and business anti-idling/behaviour change project through Sussex-air, a revised Air Quality Action Plan, expansion of the local electric vehicle charging network, working with planning and highway departments at Adur DC and West Sussex County Council to ensure major developments incorporate appropriate air quality mitigation within their plans at an early stage, replacement and successful operation of the continuous air quality monitoring station in Shoreham High Street, a revised Adur & Worthing Council's staff travel plan and simplification and consolidation of the Council's Air Quality information web pages.

There are a number of large scale developments planned for the Adur District and balancing the demand for development with the need to improve (or not worsen) air quality will bring challenges. These developments also bring opportunities to improve infrastructure, especially for walking and cycling, and thus limit the impacts on existing AQMA's and avoid creating new hotspots.

Local Engagement and How to get Involved

We are engaging with interested parties in the District, including an action group, elected members, transport planners, planning policy and other interested parties. We are active members of the Sussex Air Quality Partnership (Sussex-air). The Partnership provides assistance to members and information to the public via their web-site with air quality data, news updates, educational resources, links and other services such as airAlert. See http://www.sussex-air.net/ for more information.

With the number and scale of developments planned across Adur, it is important that all parties work together to achieve favourable outcomes. The problems of air pollution will only be addressed if all parties work together.

The Council is interested in hearing from residents who may have innovative ideas to reduce traffic congestion/air pollution in and around the District. You may contact us using our online form at https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/local-air-quality-management/#have-your-say.

Road vehicles produce over 50 per cent of the emissions of nitrogen oxides in the UK.

Before using your car, ask yourself:

- could I walk or cycle instead of taking the car?
- could I take a bus or train?
- are the levels of air pollution high today? (See our website for forecasts: https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/air-quality-monitoring/#airalert)

You can plan your journey using the West Sussex Journey Planner, which allows you to plan journeys using different modes of transport – see http://www.travelwestsussex.co.uk/.

- Using quieter streets when you're on a bike or on foot can lower your exposure to air pollution by 20%.

If you must drive:

- drive smoothly and don't rev your engine unnecessarily. You'll save fuel, and your engine will also pollute less;
- maintain your car. Keep the engine properly tuned and the tyres at the right pressure; and
- turn off your engine when your car is stationary for prolonged periods, particularly at main junctions and level crossings. By turning off your car engine you'll help to make the air cleaner for you, other drivers and pedestrians.

At home

- Buy water-based or low-solvent paints, varnishes, glues and wood preservatives.
- Half of all deliveries to workplaces are personal parcels for staff. By using pick-up points in corner shops or lockers in train stations you can help to reduce pollution from delivery vehicles.
- Open fires and wood-burning stoves have risen in popularity over recent years. This means we now see more smoke from chimneys, which has a negative effect on air quality. This can cause breathing problems such as asthma attacks and contribute to other health conditions. Fuels such as wood and coal can be used as long as the smoke from their combustion does not cause a statutory nuisance to neighbouring properties. However the use of inappropriate fuel can cause problems with local air quality.
  The leaflet at the link below provides information and advice for those that use wood burning stoves or open fires, to reduce environmental and health impacts. By following its advice you can help to minimise the effect of your burning: https://www.adur-worthing.gov.uk/media/media,149513,en.pdf

- Try to avoid lighting bonfires. If you must have a bonfire only burn dry material and never burn household waste, particularly plastic, rubber, foam or paint. Levels of pollution can be quite high on bonfire night and other events/festivals with bonfires, and sensitive people, including people with respiratory conditions, may notice some effects. However exposure can be considerably reduced by remaining indoors and keeping windows closed. Further information is available on our website - https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/bonfires-and-smoke/.

Information on Air Quality, including reports and monitoring results, is available on our website at https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/. Information is also available at http://www.sussex-air.net/.

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1 Local Air Quality Management

This report provides an overview of air quality in Adur during 2017. 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 Adur 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 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Adur District Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/local-air-quality-management/#local-aqma. Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA(s).

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
Adur District Council AQMA 1	2005	NO_2 Annual Mean	High Street Shoreham-by-Sea	An area encompassing the A259 High Street, Shoreham-by-Sea between the Ropetackle Roundabout and Surry Street.	No	42 µg/m^3	29 µg/m^3	Adur Air Quality Action Plan 2007	2007	https://www.adur-worthing.gov.uk/media/media,104971,en.pdf
Adur District Council AQMA 2	2005	NO_2 Annual Mean	Old Shoreham Road Southwick	An area encompassing the A270 Old Shoreham Road, Southwick between Kinston Lane and Lower Drive	No	46 µg/m^3	34 µg/m^3	Adur Air Quality Action Plan 2007	2007	https://www.adur-worthing.gov.uk/media/media,104971,en.pdf

☒ **Adur 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 Adur

Defra's appraisal of last year's ASR concluded "*The report is well structured, very detailed and comprehensive, and provides the information specified in the Guidance. However, more additional information on recent planning applications and new developments could be provided to improve future reports."*

A number of remarks were then made, some of which required attention.

1. *"The report highlights that there are no current exceedances of air quality objectives, within either AQMA, after data corrections, reflecting the achievement of significant improvements in local air quality, through the development of detailed action plans in recent years."*
2. *"Distance corrections have been applied to data captured from all 23 monitoring sites."*
3. *"Annualisation has been carried out for Site S28 using an annual mean concentration of 28.84µg/m^3, yet from Table B.1 the annual mean for S28 is 26.6µg/m3."* The figure quoted in Table B.1 is the annualised figure and this is stated in the notes at the foot of that table.
4. *"Southwick AQMA has reported consistently low concentrations over the past 5 years. It is recommended that Adur Council apply for revocation of this site. Furthermore, the report notes a number of large scale developments within proximity to Shoreham AQMA. Due to this it is recommended that Shoreham AQMA remains operational for the foreseeable future, with the replacement of the continuous monitor.*" This has been noted.
5. *"It is noted that Table A.3 reports bias adjusted NO2 annual mean concentrations (as found in Table B.1), not distance corrected results. Although it is stated that data reported in Table A.3 has been corrected for distance."* This has been noted.
6. "Appendix C provides a number of example calculations for various corrections. It is noted that for the fall-off with distance calculations that the receptor to KERB distance is 16.6m. With reference to Table A.2 it is not clear

where this figure has been derived from." The distance is confirmed as 16.6m and this has been corrected in Table A.2.

7. *"It is good to see that the AQAP lists many objective measures with explicit reduction targets. It can be seen that the AQAP has been updated since the previous year, although it would be beneficial if implementation/completion dates for a number of measures were explicit, instead of reliance upon the phrase "on-going". Also in some cases there is no completion date for particular measures."* The term 'ongoing' is used for those measures where we see implementation being permanent rather than a one-off, however we have attempted to put timescales to some of these measures this year.

8. *"Further to the above, Table 2.1 states that air quality within the two AQMAs is influenced by roads controlled by Highways England, yet there are no measures which require Highways England to be the lead authority, or even collaborate with on certain measures."* The table was interpreted to mean HE roads assert some influence over the local roads (e.g. an accident on the A27 means traffic diverts to local roads including those in the AQMA's). This has been corrected this year and reference to HE removed.

9. *"The new AQAP should refer to the latest Technical Guidance LAQM TG(16) for developing the Action Plan, focussing on measures to deliver emissions reductions, including measures to address congestion and traffic management in the key hotspot locations."* Noted.

10. *"Maps provided in Appendix D are at such a large scale that is very difficult to identify road names."* This has been noted and a link to the Council's mapping system has been provided this year.

Adur District Council has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

Key completed measures are:

- ✓ Greater success in the use of the Sussex Air Quality Emissions Mitigation Planning Guidance as part of the planning process. All major planning applications are required to follow the guidance and produce an Emissions

Mitigation Assessment which assesses the local emissions from a development and determines the appropriate level (cost) of mitigation required to help reduce the potential effect on health and/or the local environment. We then negotiate with the developer to ensure appropriate mitigation is provided. The guidance is signposted within the Adur Local Plan and on our website. We were successful in negotiating significant sums of money via s.106 planning agreements, to help fund local air quality improvements. The funds will be released if and when the development progresses. We also consulted with planning colleagues at both District and County level to ensure air quality was highlighted during pre-application discussions with developers, the aim being to ensure developers design appropriate mitigation into schemes from the outset.

- We continued developing our electric vehicle charge point strategy for Adur (and Worthing), outlining the Councils approach to the provision of public charge points across the District to facilitate the switch to electric vehicles. This resulted in the provision of the first public charge points in Adur, in the Council's car park at Pond Road Shoreham (affiliated to the PodPoint network). We also participated in discussions at West Sussex County Council to devise a County-wide ultra-low emissions vehicle strategy (ULEV).

✓ We were successful in a 2017 Defra air quality grant bid through Sussex-air. The project aims consist of

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

✓ The "Walk To" programme led by Living Streets has been working with a number of schools in West Sussex, including Primary and Secondary schools across Adur. This provides an outreach project officer to work with

pupils to encourage them to walk to school. Working with highway authorities, including West Sussex County Council, Living Streets secured funding to continue its previous "Walk To" project through the Department for Transport Access Fund from 2017/18 to 2019/20.

- ✓ The LTIP team at West Sussex County Council have been working on schools and community supported improvements that link to the following areas - bus infrastructure, walking and cycling, accessibility, air quality management, school development/expansion and road safety.
- ✓ West Sussex County Council Public Health supported the promotion of Air Alert - www.airalert.info - through financial backing and supporting publicity throughout West Sussex.
- ✓ A feasibility study by West Sussex County Council to inform potential future funding bids and discussions in Adur. The study includes the development of high quality cycling facilities from Adur Ferry Bridge (in AQMA 1) to Brighton and Hove on the A259 and a network of facilities throughout Lancing and Sompting.
- ✓ Sussex-air (with input from Adur & Worthing Councils) commenced work on updating the Sussex Air Quality & Emissions Mitigation Guidance for Planning, which was published in 2013.
- ✓ The District Council continued to work with West Sussex County Council to explore alternatives to car use, including improved walking and cycling improvements through the District, mainly through the planning system.
- ✓ Highways England carried out a public consultation between July and September 2017 on a "*proposal to improve the A27 junctions at Worthing and Lancing*." The consultation stated "Air quality could improve due to a reduction in traffic congestion, though this could be offset by more vehicles using the road. The net effect is currently being assessed. Further consideration of the full scale of the impacts will be undertaken in the next stage of scheme development."

  https://highwaysengland.co.uk/projects/a27-worthing-and-lancing-improvement/.

We are still awaiting the outcome of the consultation, which was originally due at the start of 2018.

- ✓ Unfortunately a bid from Brighton & Hove City Council for a grant via the Defra clean bus transport fund was unsuccessful. The bid led by East & West Sussex County Council's and Brighton & Hove City Council, would have had an impact on bus routes through our AQMA's.

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

- ✓ Delivery of the school and business anti-idling project delivered through Sussex-air. It is our intention to report on the project next year.
- ✓ A revised Air Quality Action Plan for Adur. The original air quality action plan was published in 2007 and with many of the measures listed in that plan now outdated or redundant, we aim to draft a new Action Plan during 2018.
- ✓ The provision of further electric vehicle charge points in the Adur District as and when funding allows, in line with Adur & Worthing Council's and West Sussex County Council's emerging electric vehicle/ultra-low emission vehicle strategies. The aim is to encourage the local take up of electric vehicles and facilitate visitors using low emission vehicles to the area;
- ✓ West Sussex County Council trial of electric vehicle pool cars for staff;
- ✓ Work in partnership with West Sussex Public Health and West Sussex County Council to raise awareness of the facts around poor air quality, how to reduce the sources of air pollution, focusing on the co-benefits of active travel to health and wellbeing; and how to reduce exposure to air pollution during episodes of poor air quality (air-alert);
- ✓ The Council actively supports the Adur and Worthing Walking and Cycling Action group and will be working in partnership with WSCC and the local group to develop a Local Cycling and Walking Infrastructure plan;
- ✓ Revised West Sussex County Council Parking Standards, to include provision for electric vehicles;
- ✓ Bid(s) from bus operators to the Ultra-Low Emission bus grant from OLEV;

- ✓ Revised Sussex Air Quality & Emissions Mitigation Guidance for Planning;
- ✓ Examine incorporating further low emission vehicles into the Council's pool car fleet, possibly through the revised staff travel plan;
- ✓ Examine using the Council's pool car fleet to seed a local car club;
- ✓ Further implementation and embedding of the Sussex Air Quality Guidance and delivery of effective and meaningful emissions mitigation for local major developments;
- ✓ Further embedding air quality into the planning system during the early stages of development discussions (pre application stages);
- ✓ Replacement and successful operation of the continuous air quality monitoring station in Shoreham High Street;
- ✓ A decision from Highways England on the plans for the A27 in Lancing (and Worthing);
- ✓ Revision and consolidation of the Council's Air Quality information web pages.

Adur District Council's priorities for the coming year are

- ✓ Delivery of the school and business anti-idling project through Sussex-air.
- ✓ A revised Air Quality Action Plan for Adur.
- ✓ Expand the local electric vehicle charging network and promote the use of low emission vehicles.
- ✓ Work with planning and highway departments at Adur DC and West Sussex County Council to ensure major developments incorporate appropriate air quality mitigation within their plans at an early stage;
- ✓ Further implementation of the Sussex Air Quality Guidance to ensure all major developments produce an emissions mitigation assessment and provide for appropriate AQ mitigation;
- ✓ Work in partnership with WSCC and the Adur and Worthing Walking and Cycling Action group to develop a Local Cycling and Walking Infrastructure plan;

- ✓ Ensure electric vehicle charge points are incorporated into major local developments;
- ✓ Replacement and successful operation of the continuous air quality monitoring station in Shoreham High Street.
- ✓ A West Sussex County Council trial of electric vehicle pool cars for staff.
- ✓ Embark on a revised Adur & Worthing Council's staff travel plan
- ✓ Revision and consolidation of the Council's Air Quality information web pages to make them easier to navigate.

The principal challenges and barriers to implementation that Adur District Council anticipates facing are

- ✓ The largest risks to the school and business anti-idling project are recruiting schools and businesses to take part and fitting in with their timetables. However, the risk of recruitment is considered to be manageable because: 1) WSCC are the Local Education Authority and their Transport teams have engaged with a range of schools over the years through school travel planning and LSTF-funded schemes, so there are well-established existing routes through which to engage schools; 2) there are a range of business support programmes in place across West Sussex through which businesses can be targeted, for instance the Local Enterprise Hubs, which have been set up specifically to broker support to local businesses.
- ✓ The Council is committed to replacing the air quality monitoring station in Shoreham High Street. Challenges will occur where issues arise during the replacement process, these will remain unknown until the station is being commissioned during 2018;
- ✓ Obtaining sufficient resources (personnel) in order to work on and deliver air quality measures;
- ✓ Identifying suitable sites for the installation of electric vehicle charge points can be problematic. The sites need to be close to a sufficient electricity supply, sited to ensure they are likely to be frequently used (i.e. in the correct place) and be in a safe and secure setting;

- ✓ Sourcing sufficient funding to install electric vehicle charge points. Budgets are tight so we will need to ensure sound business cases are put forward before any commitments are made by elected Members;
- ✓ There are a number of large scale developments planned for the Adur District and balancing the demand for development with the need to improve (and not worsen) air quality will bring challenges. These developments also bring opportunities to improve infrastructure, especially for walking and cycling, and thus limit the impacts on existing AQMA's and avoid creating new hotspots.
- ✓ The provision of additional low emission vehicles into the Council's pool car fleet will depend on funding being available.

Progress on the following measures has been slower than expected due to:

- ✓ Replacement Air Quality Monitoring Station in Shoreham High Street – we encountered difficulties with the costs and timeframes associated with installation of the new cabinet, primarily electrical connections. This extended the replacement programme period.
- ✓ We had anticipated producing a revised air quality action plan during 2017, however staff resources mean this had to be delayed until 2018.

Adur District Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in Adur District Council AQMA 1 in Shoreham High Street.

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	Adur/Worthing Car Club	Alternatives to private vehicle use	Car Clubs	Adur DC/Worthing BC. Funding: Developer contributions	2014-19	2019 on	Number of people using the service/Number of vehicles available	1%	Continue to seek funding via s.106 contributions from local developments. Some discussions on use of Adur & Worthing pool cars when not in use.	2019/20	V. small reduction, however principle of car sharing is key here. Seed funding vehicles a barrier.
2	LEZ/CAZ Feasibility	Promoting Low Emission Transport	Low Emission Zone (LEZ)	Adur DC Funding: unknown	2018/19	2019 on	Reduction in older Euro class HGV's/LGV's and buses within the AQMA	10-20%	No funding yet identified.	est. 2021 on	Feasibility study required to understand the benefits, costs, deliverability, enforceability, level of support and any unintended consequences. Dates have shifted due to lack of funding available.
3	Embed AQ Emissions Mitigation Planning Guidance for Sussex into the planning process	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Adur DC/Worthing BC. Funding: LA	2012	2014	LE mitigation secured in developments	1-5%	Guidance signposted within the Adur Local Plan. Discussions with WSCC to ensure Guidance and appropriate mitigation is flagged as a requirement at an early stage. Emission mitigation assessments being pursued with developers to ensure meaningful mitigation is proposed. Walking and cycling initiatives and eV charge points secured at	2018/19	Focus on minimising number of trips made by cars, provision of appropriate and meaningful mitigation and installation of EV chargepoints

									development sites. Shoreham Harbour JAAP includes policies for sustainable travel and infrastructure improvements.		
4	Improve emissions from the Council's vehicle fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Adur DC/Worthing BC/WSCC Funding: LA/WSCC	2014/15	2015	No. of vehicles replaced with better Euro standard models	<1%	New refuse vehicles procured and in use during 2017 - all Euro VI diesel. Replacement programme ongoing. Hybrids added to pool car fleet.	Ongoing	Council to demonstrate leadership. Low reduction within AQMA
5	Reduce AQ impact of ADC/WSCC staff travel	Promoting Travel Alternatives	Encourage / Facilitate home-working	Adur DC/Worthing BC/WSCC Funding: Adur DC/WSCC	2012/13	2013/14	Staff travel surveys reduced commuting and business travel by car	<1%	New ways of working implemented. Staff car allowances under review. Public transport staff discount schemes being considered;, increase in hybrid pool car provision.	2019/20	Focus on reducing traffic congestion and promoting sustainable travel for trips to and from work
6	HGV/LGV assessment	Vehicle Fleet Efficiency	Other	Adur DC	2018/19	2019/20	Data on Euro Classes	<5%	Successful Defra AQ grant funding bid (via Sussex-air) submitted Dec 2017 - part funding for business fleet advice. Some discussions on feasibility with highway authorities. Discussions with Sussex-air on process.	2020	By identifying operator and Euro Class we can better target fleets that regularly pass through the AQMA. Funding and time issues.
7	eV charging infrastructure	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Adur DC/Worthing BC/WSCC/Developer contributions	2016/17	2017-20	Number of charge points provided	1-5%	ADC provided a twin eV chargepoint at Pond Rd car park. WSCC is in the early stage of developing an ULEV strategy which is expected to be published by the end of the financial year 2018/19. Discussions continued with	2020 on	Focus is to increase the number of eV's on the District's roads.

									developers as part of AQ mitigation packages.		
8	Bus fleet improvements	Transport Planning and Infrastructure	Bus route improvements	Adur DC/WSCC Funding: WSCC or OLEV grants	2009	2011 to date	Journey time and passenger number improvements	1-5%	Bus operators in West Sussex are considering low emission fuel technologies in their fleets and local authorities are in dialogue with operators as plans develop, including consideration of any future funding opportunities	Ongoing	Improvement in journey times points towards improved traffic flow. Retrofitting or fleet replacement targeted next and should bring reductions in emissions; small in AQMA
9	Traffic light/pelican crossing optimisation/MOVA traffic control	Traffic Management	UTC, Congestion management, traffic reduction	WSCC Funding: WSCC	2007/09	Ongoing	Improvement in traffic flows	5-10%	Signals continue to be optimised as far as reasonably practicable.	Ongoing	Improved flow/decrease in stop start driving will have a significant beneficial impact on emissions
10	Travel Plans secured through the planning process for all significant development sites in West Sussex	Promoting Travel Alternatives	Other	WSCC/Adur DC Funding: developer contributions	Process established	Ongoing	Number of plans delivered	1-5%	Plans continue to be secured as and when developments come forward. The new Adur Local Plan adds weight to the requirement for travel plans; Shoreham Harbour JAAP submitted late 2017 includes policies for sustainable travel and infrastructure improvements.	Ongoing	Focus on minimising number of trips made by car. Discussions must include emissions mitigation considerations, can be protracted.
11	Promotion of walking and cycling	Promoting Travel Alternatives	Personalised Travel Planning	WSCC/Adur DC Funding: WSCC/developer contributions	2014/15	2015/16	Automatic cycle counters and travel surveys	1-5%	The “Walk To” programme led by Living Streets is working with a number of schools in West Sussex, including Primary and Secondary schools across Adur. This	WSCC Cycling Strategy published 2016	Focus on reducing traffic congestion and promoting sustainable travel for trips to and from work (see also item 12)

									provides an outreach project officer to work with pupils to encourage them to walk to school. Working with highway authorities, including WSCC, Living Streets secured funding to continue its previous "Walk To" project through the Department for Transport Access Fund from 2017/18 to 2019/20.		
12	School Travel Plans.	Promoting Travel Alternatives	School Travel Plans	WSCC Funding: WSCC	Approach established	Ongoing	Hands-up travel mode surveys in schools	0.01	98% of schools in county have travel plans. Continuation of engagement with schools to encourage and support roll out of initiatives (see also item 11)	Ongoing	Focus on promoting sustainable travel amongst young people and reducing peak time car traffic. WSCC Bikeability and WSFRS have been engaging the schools with cycle training (lots of work with the secondary schools and other partners - police, community safety - have also engaged with the schools.
13	Promotion of LEV's	Public Information	via the Internet	Adur DC/Worthing BC Funding: LA/OLEV grants	2015	Ongoing	Number of LEV's	0.01	New public eV chargepoint provided at Pond Road Car Park. New sites being examined. Grant funding signposted on Council website.	Ongoing	Developer contributions/installation sought at new developments.
14	Car Sharing	Public Information	via the Internet	WSCC Funding: WSCC	Webpage	Ongoing	Website hits/journeys planned/Number of registrants/take-up of initiatives	1-5%	Multi modal online journey planner Travel West Sussex discontinued due to platform no longer being supported by the provider. Car share website - https://liftshare.com/uk/community/westsus	Ongoing	Focus on promoting sustainable travel/car reductions

									sexcarshare		
15	Health & Wellbeing Promotion	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	Adur DC/Worthing BC/WSCC Funding: LA & WSCC	Ongoing	Ongoing	Fewer car journeys	<1%	Liaison with WSCC PH and Worthing BC Communities and Wellbeing Team. WSCC Public Health have supported the promotion of Sussex Air Alert through financial backing and supporting publicity throughout West Sussex.	Ongoing	Attempt to reduce car journeys/increase walking and cycling, particularly through the AQMA, promotion of text alerts etc.
16	Air Quality Monitoring and availability of AQ information	Public Information	via the Internet	Adur DC Funding: LA	2006	Ongoing	Reduction in levels of NO2/No. of hits on AQ pages	N/A	AQM station set up in 2007. Switched off in 2016. Funding identified for replacement to be installed in 2018. AQ information updated on Council's website; widget added to show pollution forecasts for Adur.	Ongoing	Measure success of AQAP, funding to replace and maintain the monitoring station has been an issue, funding now identified.
17	Transport network infrastructure improvements for new development	Traffic Management	UTC, Congestion management, traffic reduction	WSCC Funding: WSCC/developer contributions	Approach established	Ongoing	Number of infrastructure improvements	<1%	Infrastructure initiatives continue to be developed. Improvements identified in 2013 Shoreham Town Centre Study, awaiting appropriate funding.	Ongoing	Focus on minimising traffic congestion. Funding an issue.
18	Anti-idling promotion	Traffic Management	Anti-idling enforcement	WSCC/Adur DC Funding: WSCC/LA	2007	Ongoing	Localised air quality monitoring	N/A	Successful anti idling around schools campaign Defra AQ grant bid via Sussex-air - due 2018. Advisory signs provided at level crossings in Shoreham, Shoreham station - sign on approach	Ongoing	This action amended from 'Switch off engine signs'. Campaigns to promote anti-idling more generally e.g. anti-idling stickers on the back of LA vehicles/buses?

									road relocated.		
19	New infrastructure for cyclists and pedestrians	Transport Planning and Infrastructure	Cycle network	WSCC Funding: WSCC/developer contributions	Ongoing	Ongoing	Length of new cycle routes provided	<1%	Cycle route improvements across the Borough, mainly through contributions from developments. Schemes/routes identified in West Sussex Walking and Cycling Strategy 2016	Ongoing	Minimising the impacts of traffic on local streets
20	Shoreham High Street infrastructure improvements to reduce traffic flow conflicts with car, bus and taxi bays, and improve access and public realm within the High Street	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	WSCC Funding: WSCC	Ongoing	Ongoing	Number of projects delivered	1-5%	Feasibility work undertaken through Shoreham Town Centre Study 2014. Awaiting prioritisation within the WSCC Local Transport Investment Programme	Ongoing	Focus on promoting bus travel as an alternative to the car/smooth traffic flow and bus timetable reliability
21	Shoreham Area Sustainable Transport Package	Transport Planning and Infrastructure	Other	WSCC Funding: WSCC/Local Enterprise Partnership	Ongoing	2015/16 is the first implementation year for Local Growth Funding	Public transport patronage, cycle counter flows, traffic counts, travel behaviour surveys		Shoreham Harbour JAAP includes policies for sustainable travel and infrastructure improvements. Includes the development of high quality cycling facilities from Adur Ferry Bridge to Brighton and Hove on	Ongoing	Focus on promoting sustainable transport and minimising car use and vehicle congestion

									the A259.		
22	Taxi Fleet Emission Improvements	Promoting Low Emission Transport	Taxi Licensing conditions	Adur DC Funding LA/OLEV grants	2017	2018	Number of taxi's replaced with better Euro standard models	0.01	Presentation to Adur Taxi trade on electric vehicles		District wide improvement will have some limited effect in High Street, particularly at taxi rank

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 Adur District Council is 4.4 %. This information is available from the following web link:
http://www.phoutcomes.info/search/air#page/1/gid/1/pat/6/par/E12000008/ati/101/are/E07000223/iid/30101/age/230/sex/4

The figure below shows that the mortality calculated for Adur District Council is less than that calculated for south east England (4.9 %) and England (5.1 %) as a whole.

Fraction of mortality attributed to particulate air pollution in Adur District Council

Indicator	Period	Adur		Region	England	England		
		Count	Value	Value	Value	Worst/ Lowest	Range	Best/ Highest
3.01 - Fraction of mortality attributable to particulate air pollution	2014	-	4.4%	4.9%	5.1%	8.3%		2.6%

Adur District Council is currently developing its approach to address $PM_{2.5}$ in partnership with West Sussex Public Health and other local authority officers through Sussex-air.

Adur & Worthing Councils now monitor levels of $PM_{2.5}$ through an AURN affiliated continuous monitoring station at Grove Lodge, Worthing (A27), which will help to show us the extent of any $PM_{2.5}$ issue in the area.

We have considered introducing a smoke control area into Adur. However there are considerable barriers to this, most notably how existing fireplaces achieve compliance. We will continue to look into this. We have also updated our guidance on

our website relating to domestic burning in an attempt to reduce smoke and Particulate Matter.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

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

Table A.1 in Appendix A shows the details of the automatic monitoring site in Adur. The site remained dormant during 2017 so no data is available.

Previous monitoring results are available at www.sussex-air.net/.

National monitoring results are available at https://uk-air.defra.gov.uk/.

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.

3.1.2 Non-Automatic Monitoring Sites

Adur District Council undertook non- automatic (passive) monitoring of NO_2 at 24 sites during 2017. Table A.2 in Appendix A shows the details of the sites.

One monitoring site was removed for 2017 as levels monitored since 2015 were well below 30µg/m^3

- S28 South Street Lancing.

Two sites just outside either end of AQMA 1 (Shoreham High Street) were added for 2017:

- S36 Victoria Road, Shoreham close to the western end of AQMA 1; and
- S37 Humphrey's Gap, Shoreham close to the eastern end of AQMA 1. This site was selected to determine levels prior to a residential development on adjacent land.

Maps showing the location of the monitoring sites are available in Appendix D. Scalable maps are also available at https://www.adur-worthing.gov.uk/maps/general-

map/ (tick the Air Quality Management Areas box to the left side of the map). Further details on how the data has been adjusted 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 (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations obtained using diffusion tubes for the past 5 years with the air quality objective of 40µg/m^3. The full 2017 dataset of monthly mean values is provided in Appendix B.

Out of the 24 monitoring tubes 8 (at 6 sites) recorded a decrease in levels of NO_2 (S10, S14, S17, S18, S19, S20, S26 and S34). All others (other than new sites) showed an increase, ranging from +0.1 µg/m^3 at S25 Mash Barn Lane Lancing and S35 Middle Road Shoreham, to +2.4 µg/m^3 at S8 Underdown Road Southwick (within AQMA 2).

One monitoring site exceeded the annual mean air quality objective of 40µg/m^3 – S13 Upper Brighton Road Sompting - at 40.3µg/m^3. This monitoring site is at the kerbside (defined as within 1m of a busy road) and close to a busy 4 way junction controlled by traffic lights. The nearest relevant exposure is 12m away and when the measured annual mean is predicted back to the nearest receptor, the levels reduce to 28µg/m^3, well below the annual mean objective of 40µg/m^3.

Levels measured within the High Street AQMA – sites S17/18/19 co-located – decreased from 2016 levels by an average of 1.6µg/m^3. This monitoring site is also at the kerbside with the nearest relevant exposure just under 5m away. When the measured annual mean is predicted back to the nearest receptor, the levels reduce to 28.5µg/m^3, well below the annual mean objective of 40µg/m^3.

As yet we have no hard evidence to suggest why the levels are decreasing, other than the general assumption that the (national) vehicle fleet is getting cleaner. We cannot examine traffic volumes as unfortunately there has been no automatic traffic counter (ATC) in the High Street since summer 2016. West Sussex County Council

are currently reviewing the options for replacement and we as a District Council will be funding a short ATC survey during 2018 in order to inform our revised Action Plan.

Levels around the AQMA – at sites S20, S27 and S36 – have shown mixed results. S20 is an urban background site in Pond Road which decreased by 0.6µg/m^3. S27 West Street increased by just under 0.4µg/m^3. S36 Victoria Road is a new site, so it is too early to draw conclusions from the data and produced a level of 21.9µg/m^3 at the nearest residential façade.

A tube at Humphrey's Gap close to a development of flats currently under construction unfortunately had to be removed part way through the year due to the influence of adjacent construction works, so we only have 6 months data. The annual mean for this site has therefore been annualised (see Appendix C). When predicted back to the façade the level reduces slightly to 39.1µg/m^3, just below the annual mean objective. This façade level is based on the façade of the previous building on the site and the building currently under construction is set slightly further back from the kerb. We will keep this site under scrutiny and the tube will be replaced when possible.

As stated in last years report monitoring results in the High Street AQMA are below the annual mean objective. However we wish to review the measured levels when the automatic monitor has been up and running again before making any decisions on the future of the AQMA. Furthermore, with developments earmarked in and around the AQMA, we do not consider revocation of the Shoreham High Street AQMA to be an option at this moment in time. This was confirmed by the review of last year's ASR.

In last year's ASR we stated that we would consider revoking AQMA 2 in Southwick as measured levels were below the annual mean objective. The levels for sites S8 and S9 within this AQMA have shown an increase during 2017 of 2.4 and 1.3µg/m^3 respectively. This is unfortuante and there appears an upward trend in levels over the past 3 years. The nearest receptors are only 4m and 2m respectively from the monitoring points, so levels reduce to 27µg/m^3 at S8 and 34µg/m^3 at S9. Levels are still below the annual mean objective, however as they have risen we wish to see if measured levels during 2018 continue to rise before further considering revoking this AQMA. We do not wish to revoke and then have to declare again a few years later

due to an increase in levels. We will seek traffic data from West Sussex County Council to see if volumes have changed significantly.

Levels measured at site S11 Lancing manor increased slightly during 2017. This site has hovered just below the annual mean objective for a number of years, as Figure A.4 shows. In 2012 it was 38.2µg/m^3, but reduced to 33µg/m^3 in 2015. In 2016 the level rose again to 35.6µg/m^3 and in 2017 it rose slightly to 36.3µg/m^3. This is a kerbside location and when projected back to the nearest receptor some 14m away, the level reduces significantly to 23.3µg/m^3, well below the annual mean objective. With a number of developments planned in the area, we shall continue to keep this site under scrutiny.

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)
AD1	High Street Shoreham	Kerbside	521399	105040	NO2; PM10	YES	Chemiluminescent; BAM	5.0	1.0	1.7

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)
S1	Albion Street Southwick	Kerbside	523773	104979	NO2	NO	5.0	1.0	NO	3.0
S2	Old Mill Close Fishersgate	Roadside	525330	105085	NO2	NO	3.5	1.5	NO	2.5
S3	St. Aubyns Crescent Fishersgate	Urban Background	525562	105313	NO2	NO	5.5	2.0	NO	3.0
S7	Queens Road Southwick	Urban Background	524139	106320	NO2	NO	3.0	2.5	NO	3.0
S8	Underdown Road Southwick	Roadside	524020	106070	NO2	YES	4.0	2.0	NO	3.0
S9	Old Shoreham Road Southwick	Roadside	523785	106080	NO2	YES	2.0	3.0	NO	2.5
S10	Holmbush Roundabout Shoreham	Roadside	522330	106113	NO2	NO	27.0	2.0	NO	3.0
S11	Lancing Manor Lancing	Kerbside	518841	105592	NO2	NO	14.0	1.0	NO	3.0
S12	Boundstone Lane Lancing	Kerbside	517732	105505	NO2	NO	N/A	1.0	NO	3.0
S13	Upper Brighton Road Lancing	Kerbside	517290	105547	NO2	NO	12.0	1.0	NO	2.5

S14	West Street Sompting	Urban Background	516021	105203	NO2	NO	14.5	2.5	NO	3.0
S15	Western Road Lancing	Roadside	517512	103367	NO2	NO	6.0	1.5	NO	3.0
S16	Kings Road Lancing	Urban Background	518754	103971	NO2	NO	5.5	1.5	NO	3.0
S17	High Street AQMS 1 Shoreham	Kerbside	521399	105040	NO2	YES	5.5	0.5	YES	3.0
S18	High Street AQMS 2 Shoreham	Kerbside	521399	105040	NO2	YES	5.5	0.5	YES	3.0
S19	High Street AQMS 3 Shoreham	Kerbside	521399	105040	NO2	YES	5.5	0.5	YES	3.0
S20	Pond Road Shoreham	Urban Background	521517	105261	NO2	NO	N/A	26.0	NO	3.0
S25	Mash Barn Lane Lancing	Kerbside	519117	105709	NO2	NO	N/A	6.0	NO	2.5
S26	Loose Lane Sompting	Suburban	516537	104781	NO2	NO	12.0	0.5	NO	2.5
S27	West Street Shoreham	Roadside	521381	105119	NO2	NO	0.5	1.5	NO	3.0
S34	Winston Road Lancing	Roadside	517511	103560	NO2	NO	10.5	1.5	NO	3.0
S35	Middle Road Shoreham	Roadside	522493	105537	NO2	NO	5.0	1.5	NO	3.0
S36	Victoria Road Footpath Shoreham	Roadside	521282	105254	NO2	NO	5.7	2.0	NO	3.0
S37	Humphrey's Gap Shoreham	Roadside	522103	105126	NO2	NO	0.5	1.7	NO	3.0

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 NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2013	2014	2015	2016	2017
AD1	Kerbside	Automatic	0.00	0.00	N/A	**42.60**	**48.3 (45.2)**	N/A	N/A
S1	Kerbside	Diffusion tube	100.00	100.00	34.5	32.6	30.9	32.2	33.0
S2	Roadside	Diffusion tube	100.00	100.00	26.6	26.0	23.9	24.9	26.4
S3	Urban Background	Diffusion tube	100.00	100.00	17.0	16.9	15.5	17.5	17.2
S7	Urban Background	Diffusion tube	100.00	100.00	16.7	15.3	12.9	14.8	15.1
S8	Roadside	Diffusion tube	100.00	100.00	32.3	31.7	27.8	30.4	32.8
S9	Roadside	Diffusion tube	100.00	100.00	36.6	34.9	32.1	34.5	35.8
S10	Roadside	Diffusion tube	100.00	100.00	29.7	24.7	22.2	25.2	24.6
S11	Kerbside	Diffusion tube	82.47	82.47	37.8	34.4	33.0	35.6	36.3
S12	Kerbside	Diffusion tube	100.00	100.00	34.2	34.1	30.1	31.1	31.4
S13	Kerbside	Diffusion tube	100.00	100.00	38.1	**40.5**	35.5	38.3	**40.3**
S14	Urban Background	Diffusion tube	91.78	91.78	20.5	20.4	18.8	20.4	19.5
S15	Roadside	Diffusion tube	99.97	99.97	31.0	30.0	27.3	29.3	30.5
S16	Urban Background	Diffusion tube	100.00	100.00	18.4	15.8	14.3	16.0	16.4
S17	Kerbside	Diffusion	100.00	100.00	**40.1**	39.0	38.1	38.4	38.1

		tube							
S18	Kerbside	Diffusion tube	100.00	100.00	**40.6**	38.7	38.0	39.1	37.8
S19	Kerbside	Diffusion tube	100.00	100.00	39.4	38.5	**40.1**	**40.9**	37.8
S20	Urban Background	Diffusion tube	91.78	91.78	19.1	17.1	15.7	17.1	17.7
S25	Roadside	Diffusion tube	100.00	100.00	31.9	29.2	27.2	28.8	28.9
S26	Suburban	Diffusion tube	90.68	90.68	16.8	15.2	13.3	15.4	14.3
S27	Kerbside	Diffusion tube	100.00	100.00	N/A	N/A	N/A	33.5	33.9
S34	Roadside	Diffusion Tube	100.00	100.00	N/A	N/A	N/A	21.7	20.6
S35	Roadside	Diffusion Tube	100.00	100.00	N/A	N/A	N/A	19.6	19.7
S36	Roadside	Diffusion Tube	100.00	92.33	N/A	N/A	N/A	N/A	26.1
S37	Roadside	Diffusion Tube	100.00	47.67	N/A	N/A	N/A	N/A	39.1 [3]

☒ **Diffusion tube data has been bias corrected**

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

Notes:

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

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

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

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

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

Figure A.5 – Trends in Annual Mean NO_2 Concentrations

Figure A.6.1 Trend in average measured NO_2 at co-located sites S17/18/19 within AQMA 1 Shoreham High Street, 2013 – 2017

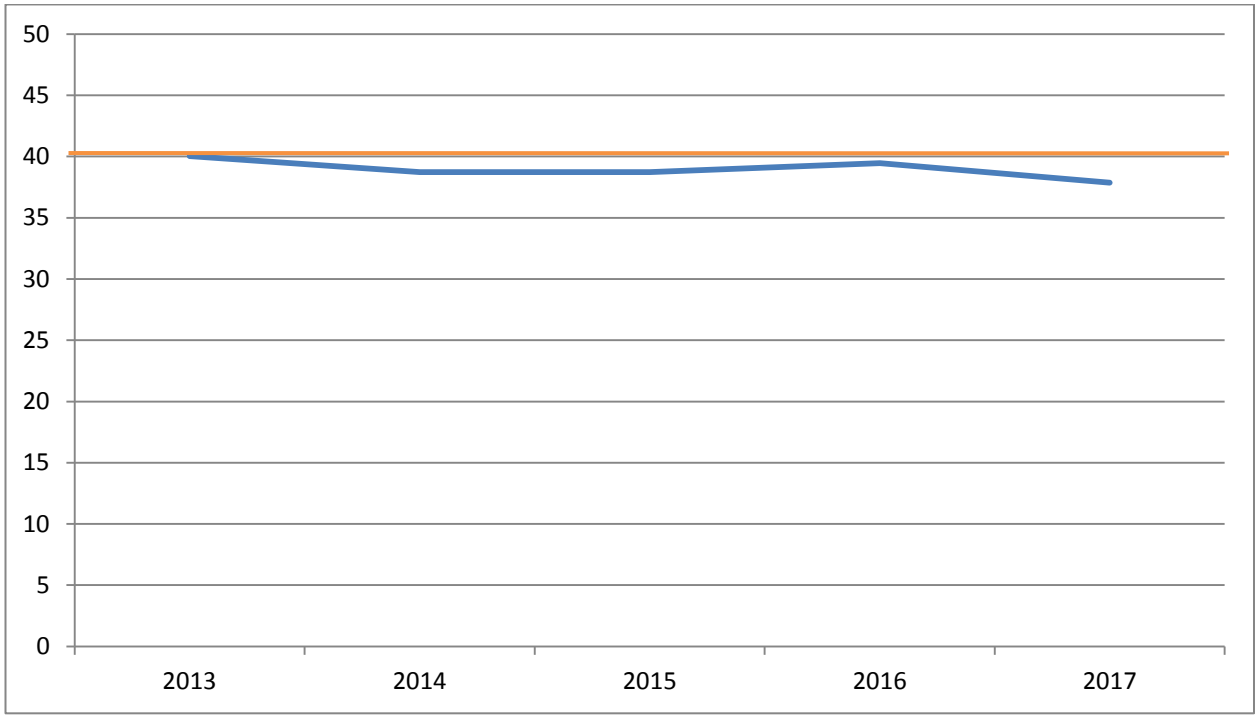


Figure A.7.2 Trends in measured NO_2 at sites S8 and S9 within AQMA 2, 2013 – 2017

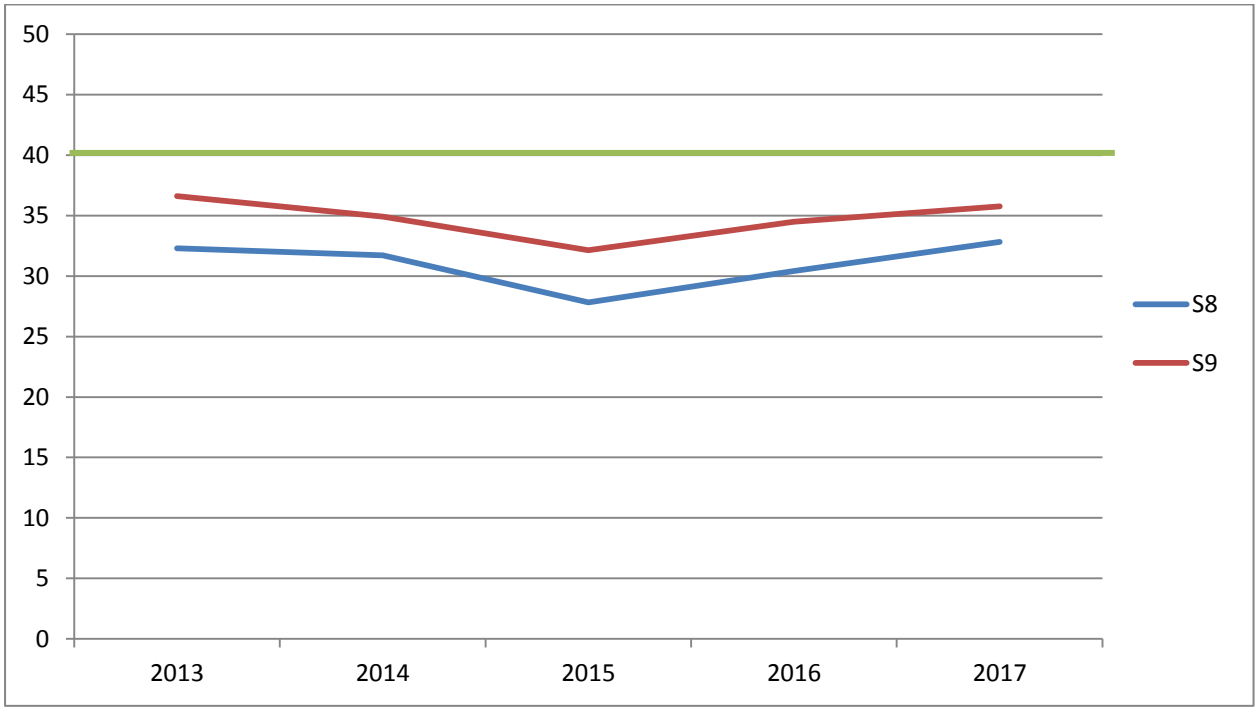


Figure A.8.3 Trend in measured NO_2 at site S11 (Lancing Manor, Lancing), 2013 – 2017

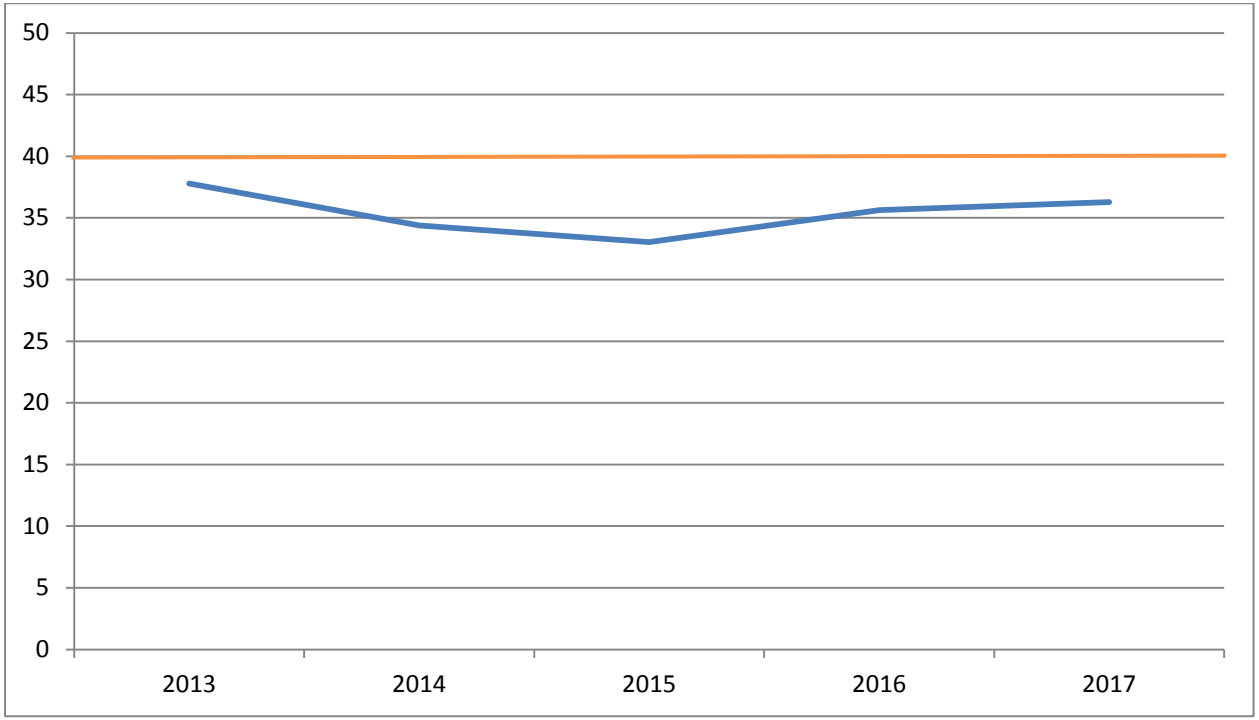
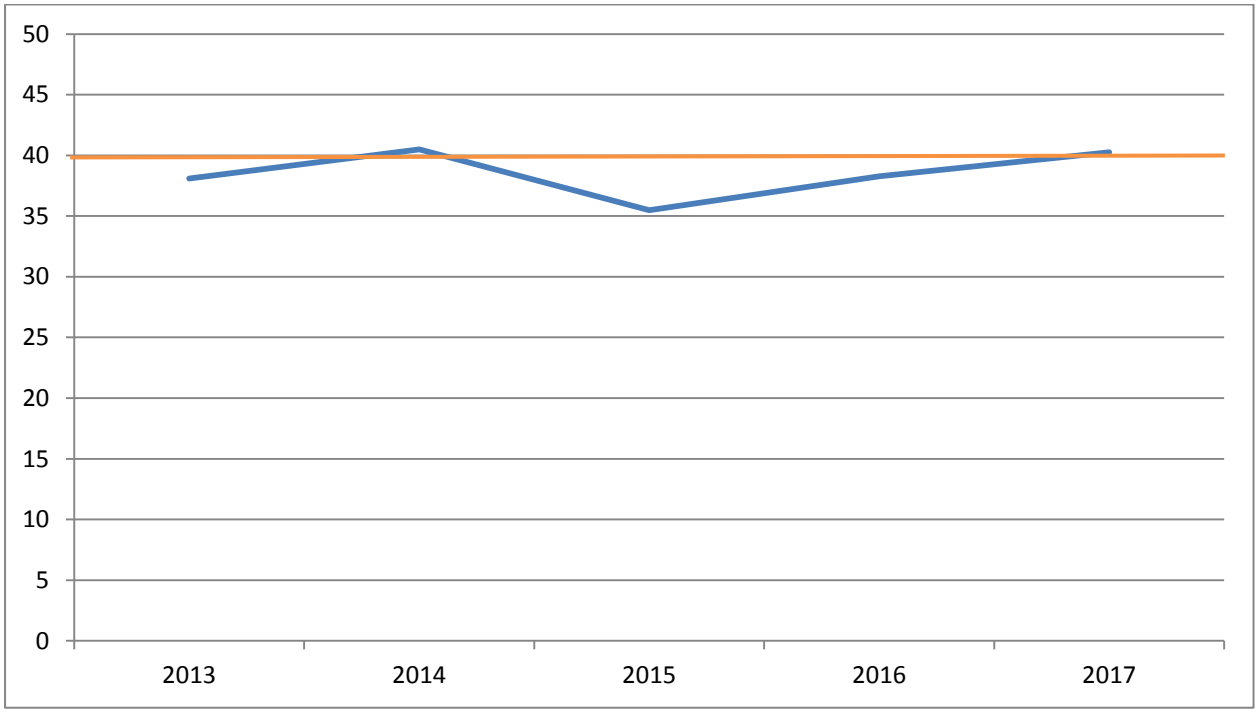


Figure A.9.4 Trend in measured NO_2 at site S13 (Upper Brighton Road Lancing), 2013 – 2017



Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2017

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.97) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
S1	**46.33**	36.57	33.30	29.83	29.50	32.68	31.36	31.48	29.30	32.54	38.29	37.05	34.02	33.00	24.7
S2	34.30	34.73	24.15	22.26	28.77	27.83	22.98	22.69	25.63	25.92	27.93	28.92	27.18	26.36	23.8
S3	27.29	21.89	17.60	14.49	14.98	14.94	13.20	14.60	15.62	16.61	21.33	20.25	17.73	17.20	16.4
S7	27.26	20.10	15.58	12.00	16.20	12.59	9.84	10.19	11.88	12.59	19.64	18.31	15.52	15.05	14.7
S8	**46.71**	**41.42**	36.62	25.79	30.36	32.51	26.56	29.22	28.60	32.29	39.69	36.39	33.85	32.83	27.0
S9	**49.17**	39.87	35.18	38.19	34.46	35.17	32.64	30.86	33.40	35.78	39.46	38.23	36.87	35.76	33.9
S10	**40.38**	28.25	24.16	24.73	26.25	19.62	19.74	16.69	22.18	22.57	32.49	27.31	25.36	24.60	18.3
S11	**45.92**	32.48	37.95	-	-	32.63	35.84	30.81	35.33	38.24	**43.99**	**40.85**	37.40	36.28	23.3
S12	**50.38**	31.62	29.70	27.76	29.91	27.33	25.80	25.15	32.10	31.17	41.51	35.70	32.34	31.37	22.2
S13	**45.73**	**45.04**	47.12	36.85	**40.90**	**48.49**	**40.38**	39.78	38.19	**41.48**	35.53	38.59	**41.51**	**40.26**	28.0
S14	29.94	22.39	18.40	13.70	-	17.29	16.80	15.83	18.93	19.59	23.99	23.75	20.06	19.45	17.1
S15	42.26	35.77	27.75	28.39	28.99	31.30	26.48	27.62	26.74	29.46	38.59	34.20	31.46	30.52	26.1
S16	25.95	20.01	15.35	14.11	13.52	16.21	12.19	12.13	14.01	15.86	22.63	20.53	16.88	16.37	14.5
S17	**51.23**	**43.97**	39.30	34.34	39.62	**44.07**	36.41	34.56	33.36	38.21	37.88	37.82	39.23	38.05	28.6
S18	**46.14**	**41.44**	**41.17**	35.43	**40.74**	**45.34**	36.11	36.44	33.38	37.81	38.53	34.92	38.95	37.79	28.4

S19	**42.59**	**43.32**	34.90	37.03	39.96	**47.42**	35.64	33.90	36.65	**40.84**	36.19	38.83	38.94	37.77	28.4
S20	31.04	22.20	17.73	17.03	-	13.96	12.50	9.92	14.98	16.72	23.73	21.22	18.28	17.73	25.8
S25	38.37	32.58	27.81	25.00	28.02	24.04	26.44	25.99	28.51	31.46	34.26	35.37	29.82	28.93	27.0
S26	26.53	17.80	14.30	11.09	13.34	13.38	11.82	10.56	11.77	14.22	-	17.81	14.78	14.34	13.5
S27	**43.80**	35.20	31.94	33.78	30.95	39.33	30.31	30.34	34.34	33.80	38.25	36.92	34.91	33.87	33.6
S34	29.88	25.05	20.14	19.65	20.21	18.27	17.06	18.09	17.76	19.69	25.41	23.60	21.23	20.60	18.1
S35	32.59	26.34	19.71	17.55	18.77	16.74	15.77	13.59	17.22	19.16	23.92	22.31	20.31	19.70	17.7
S36	-	32.54	27.66	26.78	25.42	33.38	22.96	20.27	25.17	25.10	27.19	29.55	26.91	26.10	21.9
S37	-	**40.10**	37.15	35.88	35.32	39.18	34.86	-	-	-	-	-	37.08	41.0*	39.1

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

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

(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

Diffusion Tube Bias Adjustment Factors

NO_2 diffusion tubes are provided and analysed by Gradko laboratory. The NO_2 tube preparation method used is 50% triethanolamine (TEA) in Acetone**.**

Data from the NO_2 diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location data-base available from Defra, http://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html

The bias adjustment factor used for 2017, obtained via tools at the aforementioned website, was **0.97**.

QA/QC of diffusion tube monitoring

All diffusion monitoring data has been ratified following the methods described in LAQM.TG(16). A quality assurance / quality control (QA/QC) programme including field duplicates and blanks, and instrument calibration with standard gases has been followed (AEAT, 2000).

Table C.1 Annualisation data for NO_2 at S37 Humphrey's Gap, Shoreham

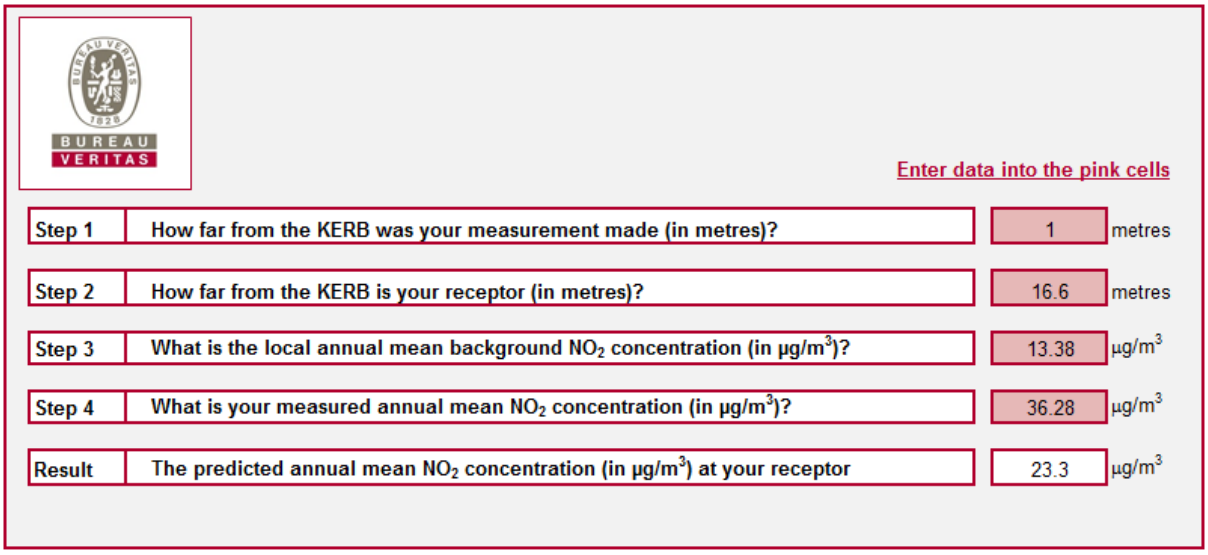
	Brighton Preston Park AURN	Eastbourne AURN	Portsmouth AURN	Average ratio
Annual mean 2017/ µg m^{-3}	16.9	12.3	19.2	
Period mean/ µg m^{-3}	14.2	11.3	17.0	
Ratio	1.19	1.10	1.13	1.14

Annual Mean at S37 = 37.1 µg m^{-3}
Annualised Mean = 37.1 x 1.14 = **42.3 µg m^{-3}**
Bias 0.97, bias adjusted mean = **41.0 µg m^{-3}**

Fall off with Distance Calculations

A screen shot of the Falloff of NO_2 concentration with distance from kerb calculator spreadsheet (downloaded from the LAQM website) is shown below, with the calculation for site S11, Lancing Manor, S17 Shoreham High Street and S13 Upper Brighton Road Lancing.

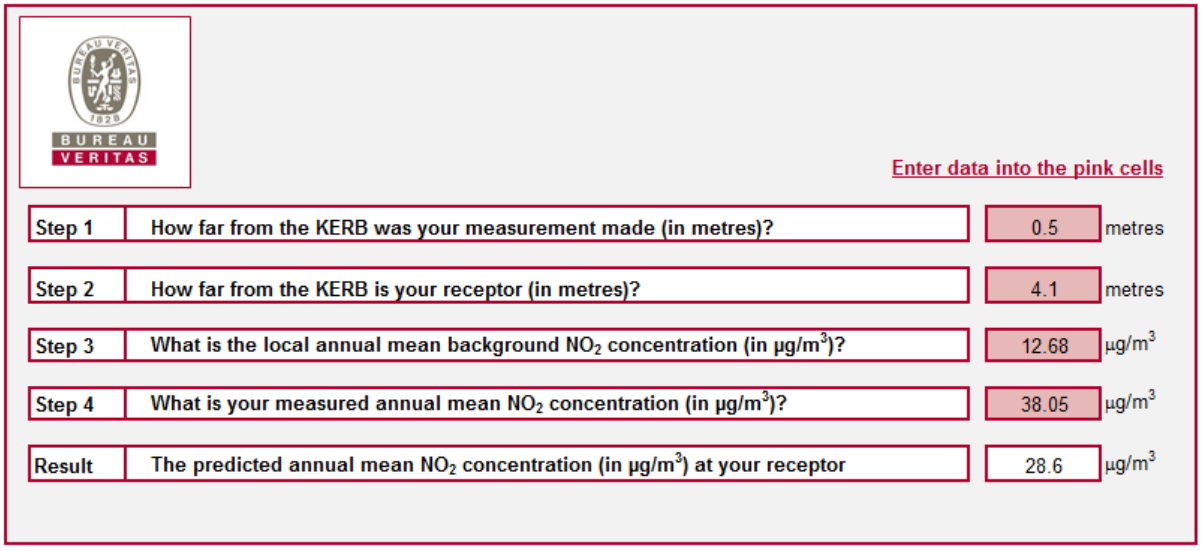
Figure C.1 S11, Lancing Manor



Enter data into the pink cells

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)?	16.6	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	13.38	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	36.28	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	23.3	$\mu g/m^3$

Figure C.2 S17 Shoreham High Street



Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	0.5	metres
Step 2	How far from the KERB is your receptor (in metres)?	4.1	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	12.68	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	38.05	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	28.6	$\mu g/m^3$

Figure C.3 S13 Upper Brighton Road Lancing

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	13	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	12.4	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	40.26	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	28.0	µg/m^3

Figure C.4 S37 Humphrey's Gap, Shoreham

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.7	metres
Step 2	How far from the KERB is your receptor (in metres)?	2.3	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	13.6	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	41	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	39.1	µg/m^3

The annual local mean background concentrations were derived from the background mapping data for Adur, produced by Defra for Local Authorities and available at https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2013.

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

Maps showing Adur Diffusion Tube Monitoring Locations for 2017

1. Maps are on the following two pages.
2. Areas in purple are AQMA's.
3. The site of the dormant automatic monitor is collocated with the triplicate diffusion tubes (S17, S18 and S19) at High Street Shoreham.

Figure D.1 Adur East

Figure D.2 Adur West

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/m^3).

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
WSCC	West Sussex County Council

References

Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006, Defra, Report Number AEAT/ENV/R/2170. Available from UK-AIR https://uk-air.defra.gov.uk/assets/documents/reports/cat09/0701110944_AQinequalitiesFNL_AEAT_0506.pdf

Local Air Quality Management Technical Guidance (TG16), Defra
Available from https://laqm.defra.gov.uk/documents/LAQM-TG16-April-16-v1.pdf

Local Air Quality Management Policy Guidance (PG16), Defra
Available from
https://consult.defra.gov.uk/communications/laqm_changes/supporting_documents/LAQM%20Policy%20Guidance%202016.pdf

Air Quality and Emission Mitigation Guidance for Sussex (2013)
Available from https://www.adur-worthing.gov.uk/environmental-health/pollution/air-quality-and-pollution/air-quality-and-planning/

NO_2 Fall-Off with Distance Calculator available from:
http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

Defra Background Maps for Adur
https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2013