2021 Air Quality Annual Status Report (ASR)

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

Date: August 2021

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Executive Summary: Air Quality in Our Area

Air Quality in Arun

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, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

Sussex local authorities jointly review air quality across the region to identify any breaches of air quality standards (the Sussex Air Quality Partnership). This has resulted in the declaration of a number of Air Quality Management Areas (AQMAs) in other local authorities in Sussex.

Air quality monitoring carried out by the Council continues to indicate that there is good air quality within the District, and in particular the air quality objectives for Nitrogen Dioxide (NO_2) are being met. Thus it has not been necessary to declare an AQMA in Arun District.

Despite pollution levels being generally low in the District, road traffic exhaust emissions are the major source and they have the potential to cause excessive levels of NO_2 when large volumes of road traffic are queuing. There were no new major sources of emissions in the District in 2020 and through joint-working, the Adopted Local Plan has paid specific attention to projected traffic loads and changes at high capacity junctions.

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[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

[3] Defra. Air quality appraisal: damage cost guidance, July 2020

[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

Data collection is through a diffusion tube network, in 2020 there were 22 diffusion tubes located across the district. Their location is regularly reviewed and altered where results or local knowledge indicate a new location should be investigated. A number of new sites were introduced in 2020 in order to investigate air quality in areas where there had been no previous monitoring or where new roads or homes are planned in the future. The latest monitoring data shows that levels of NO_2 continue to be well beneath the Government objective and have decreased slightly since 2018.

Air quality is a material consideration when a development is planned. Using the Sussex Air Quality Partnership (SAQP) guidance, Arun District Council will require an air quality assessment where necessary. The Guidance was published in 2013 and a revised document was published in 2020.

In February 2018 West Sussex County Council, along with districts and boroughs, reviewed action plans across the county and have developed a joint air quality action plan 'Breathing Better; a partnership approach to improving air quality in West Sussex'. This was recently updated in 2020. Air Quality Plan 2020 (westsussex.gov.uk)

In February 2019 an Inter Authority Air Quality Group of the relevant portfolio holder from each district, borough and county council was established to develop and monitor an annual action plan.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy[5] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[6] sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management

[5] Defra. Clean Air Strategy, 2019

[6] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Through the SAQP, Arun District Council continues to help fund both Air Alert and the Energise Network. General measures to limit NO_2 pollution from road traffic and prevent the exceedance of the Air Quality Objective include:

- Working with the county Council to ensure traffic light sequencing operates at optimum efficiency.
- Road traffic calming and routing away from residential and other areas where the public may suffer significant exposure.
- Education and raising awareness - increasing the availability of air quality information and incentivising people to change their travel behaviour. The Sussex Air website has information on clean burning to raise awareness of the health and environmental impact of burning solid fuels and reduce emissions of particulates and the AirAlert, coldAlert and heatAlert services. Sussex-air :: Promoting better Air Quality in Sussex :: sussex-air.net :: Home
- A bid to Defra's local authority air quality fund for £82K to work with 24 schools across Sussex was successful and is being delivered up to the end of July 2021.
- Cut Engine – Cut Pollution" signs where there are periodic stationary traffic queues at level crossings.
- "Travelwise" schemes to promote sustainable transport - to include more car share schemes and alternatives to the car. Promotion of school and work travel plans. Development and promotion of cycle routes.
- Working closely with Planners and other agencies to ensure appropriate mitigation measures are implemented for new developments and due consideration is given to Air Quality issues. The Sussex Air Quality Planning Guidance is used for major developments.
- EV charge points continue to be negotiated for new developments. Arun District Council's Parking Standards Supplementary Planning Document was adopted in January 2020 setting out minimum requirements. A planning condition requiring EV charge points is recommended for most new residential developments.

Conclusions and Priorities

Air Quality in Arun continues to be good; there remains no apparent need for the declaration of any Air Quality Management Areas. However, local housing and other developments planned or likely to take place in the short- to medium-term, have the potential to increase traffic flows and, if not carefully managed, congestion.

Continual assessments of the areas for potential development and new emission sources informs the collection of air quality data; a review of the sites for diffusion tubes took place in 2019 and resulted in a number of monitoring tubes being deployed in new locations and others being removed from areas which do not indicate any air quality problems. These new monitoring locations were installed in January 2020 and results are in line with other monitoring across the district showing levels below the Air Quality objective.

Trends nationally are reassuring as awareness of NO_2 pollution sources increases – low emission vehicle purchases are increasing in number and technology has seen strides taken in emission controls at source. Local trends do not raise concern, nonetheless, Arun is participating in the new West Sussex EV Partnership – a group of relevant officers from the County, Districts and Boroughs, aiming to:

- Agree a strategic approach for the location of EV charge points across West Sussex; and possibly pan Sussex.
- Use the same network providers for delivering a cohesive EV network across the County but recognising that local timescales may not allow this.
- Share knowledge, information and learning to aid progress in achieving this.
- Use our collective voice to lobby for simplified and coherent approach to charging across all infrastructure providers.
- Develop a collective approach to support planners to maximise the significant development opportunities across the County
- Work with the private sector to increase the installation of EV charge points and awareness of the advantages of electric vehicles.

This is in addition to the JAQAP mentioned above.

Although there may be additional traffic in Arun in the years ahead, as the improvements through reduced vehicle emissions become embedded, these may well offset any anticipated increases in pollution. Continued monitoring will provide data for assessment.

The Council recognises that the ongoing challenge of Covid-19 has and will continue to affect air quality in the district in both positive and negative ways. Movement restrictions reduced road traffic in the area, however the subsequent recommendation to avoid public transport may have increased the use of the private car. Whilst monitoring in Arun indicated that levels were well below the air quality objective we recognise that air quality was affected by Covid 19 in 2020 and that these levels may not be representative of a normal year. We will continue to monitor at these locations and note that the resulting changes in work and travel behaviour are likely to continue in 2021 and beyond and it will be interesting to monitor the changes that this may cause to air quality in Arun over future years.

Local Engagement and How to get Involved

Arun District Council is a member of the Sussex Air Quality Partnership which benefits from the co-ordinated monitoring of air pollutants across the region, including the "airAlert" and heat and cold Alert services. We all need to play a part in reducing air pollution. Please consider whether you can do any of the following:

- Walk or cycle on shorter journeys
- Join a car-sharing scheme – see West Sussex Car Share community - part of the Liftshare network
- Turn your engine off when you're not moving
- If you know anyone with asthma or other breathing difficulties, let them know about "airAlert" Sussex :: airAlert :: air quality early warning service ::
- Find out from your child's school about available travel options for getting to school
- Consider switching to a less polluting vehicle next time you change your car. For example: Green cars UK - Guide to low emission cars - Next Green Car
- Make use of the Energise network's electric vehicle charging points in the District Map of charging points for electric car drivers in UK: Zap-Map

If you have any questions or want more information please see the Council's website at Air quality | Arun District Council

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1 Local Air Quality Management

This report provides an overview of air quality in Arun during 2020. 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 Arun District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

Arun District Council currently does not have any declared AQMAs. Air quality is being addressed through existing Transport Plans and the new, West Sussex Joint Air Quality Action Plan, Breathing Better Air Quality Plan 2020 (westsussex.gov.uk)

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

1. Defra's appraisal of last year's ASR concluded: *"Overall the report is detailed, concise, satisfies the criteria of relevant standards and continues to be an example of good practice. The Council should continue their good work and submit an Annual Status Report in 2021."*

The following comment was made to inform future reports and has been addressed here;

- The national bias factor for South Yorkshire Air Quality Samplers (SYAQS) is based on only one intercomparison site, at Marylebone Road. The Council may wish to revisit the factor when later iterations of the bias adjustment spreadsheets are released incorporating more studies, to ensure this has no significant impact on reported concentrations.

Since the appraisal of the previous report the factor has been slightly amended to incorporate 3 studies and the factor changed from 0.78 to 1.01. In general this has not had a significant impact on reported concentrations which remain well below the objective in most cases. However, the concentration reported at site 17 increased from 30 µg/m^3 to 40 µg/m^3 using the updated bias adjustment factor and is therefore just on the air quality objective. This site has remained active in 2020 and has seen a decrease in levels in line with other sites and is well below the objective using the existing bias adjustment factor for 2020. Additionally, the site is located 4.7m from the nearest relevant exposure where levels would be expected to be lower. This site will remain active in 2021 and onwards as it is located on a busy road, close to where major changes to the road layout are proposed. The bias adjustment figure for 2020 will be revisited if more studies are included in later versions of the spreadsheet.

Arun District Council and West Sussex County Council have taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

More detail on these measures can be found in;

- the County's Annual Delivery Programme - Highway, Transport and Planning Delivery Programme - West Sussex County Council
- the ADC Local Plan 2011-2031, chapter on transport - Our Local Plan | Arun District Council
- the walking and cycling strategy for 2016 to 2026 –West Sussex Walking and Cycling Strategy 2016-2026 - West Sussex County Council
- and the current West Sussex Transport Plan - West Sussex Transport Plan - West Sussex County Council
- County wide air quality plan for West Sussex Air Quality Plan 2020 (westsussex.gov.uk)

The county air quality plan contains detailed information from across the whole of West Sussex, including details of local strategies, plans and policies at both County and District level. The County's focus will be through:

- *The West Sussex Transport Plan* which is being reviewed and will set the strategy for guiding future investment in highways and transport infrastructure. It is expected that the new West Sussex Transport Plan will be adopted in early 2022. It will also set a framework for considering transport infrastructure requirements associated with future development across the county. Ensuring good air quality will have a number of links to the strategies that will sit within the Transport Plan and has particular relevance to improving public health.
- *The West Sussex Walking and Cycling Strategy 2016-26* sets out the aims and objectives for walking and cycling in West Sussex. The strategy contains a prioritised list of over 300 potential walking and cycling improvements suggested by a range of stakeholders and partner organisations. The importance of increasing levels of walking and cycling in helping to tackle poor air quality is a key focus of this strategy.
- *The Rights of Way Management Plan 2018-28* sets out West Sussex County Council's approach to managing the Public Rights of Way (PRoW) network, as well as signposting how improvements can be achieved over the next ten years. The Plan highlights the importance of green space in improving air quality.
- *The Bus Strategy 2018-2026* sets out West Sussex County Council's aims and objectives for local buses and community bus transport and how the County Council

will do more with partners and bus operators to promote bus travel. It is expected that the authority will work to develop Enhanced Partnerships with bus operators, and produce Bus Service Improvement Plans as part of the Government's National Bus Strategy 'Bus Back Better'.

- *Guidance on Parking at New Developments 2020* – The parking guidance outlines the expected requirements for car and cycle parking and electric vehicle charging provision at new developments within the county.
- *Electric Vehicles strategy* – In December 2019, the County Council adopted an Electric Vehicle Strategy which sets out an ambitious vision for electric vehicle take up across the county. The Strategy sets out that the County Council wants to see one consistent, affordable, easy to use, reliable, widely accessible and recognisable charging network across the county, providing renewable energy charging. Chargepoints will be located on-street, in public sector car parks, and on community assets county wide, providing charging primarily for those residents who do not have access to off road parking, and would be unable to switch to EV without public charging. The County Council is currently working in partnership with 6 of the 7 District Councils in the County, including Arun, towards procuring a market based supplier that will be responsible for planning, funding, building, marketing and operating a publicly accessible chargepoint network across West Sussex, as well as providing an on-going 24/7 service (including the management of payments and support), maintenance and repair to ensure the network is fully operational at all times. They hope to have a supplier in place before the end of the year.

Arun District Council expects the following measures to be progressed over the course of the next reporting year:

- The Government has announced funding through the Active Travel Fund (Phase 2) which will benefit schemes in or close to Arun District. This includes progression of the Findon Valley to Findon Village cycle scheme which subject to the outcomes of public consultation expected during 2021, is expected to be constructed in 2022. This funding is also expected to enable progression of a signal crossing for pedestrians and cyclists on the A259 to the south east of the Drayton Lane roundabout, as well as the progression of a contraflow cycle route on River Road, Littlehampton, which are both expected to be constructed during 2022.

- Continuation of construction of A259 Littlehampton improvements and of the Lyminster Bypass (South) and Fitzalan Link, and commencement of construction of the A284 Lyminster Bypass (North). Progression of planning/feasibility studies and design stages for other highway schemes (A27 Arundel, A284 Lyminster Bypass, A29 realignment, A259 Bognor Regis-Littlehampton, A259 Bognor Regis to Chichester, and A24 Worthing to Horsham including A280 Long Furlong (congestion relief and sustainable travel benefits).
- Appointment of a supplier partner to deliver a county wide network of EV charge points.

Arun District Council's priorities for the coming year are:

- To continue to encourage take-up and use of electric and other low-emission vehicles by working with West Sussex County Council on delivering their Electric Vehicle Strategy, with particular focus on delivering EV charge points across the County
- To assist in progressing road schemes that will provide congestion relief and local reductions in air pollution
- To encourage and, where possible require, the adoption and use of recognised mitigation measures in the planning consultation process
- The Council declared a climate emergency in January 2020 and is working on a number of projects which will also impact on air quality, specifically encouraging active travel by updating planning policies regarding road infrastructure, reviewing the vehicles it lease's and aiming to change to 100% electric fuelled vehicles. More information can be found here Climate change | Arun District Council

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

- Difficulties in signing-off joint procurement methodologies due to the number of partners and different systems involved
- Availability of resources due to other demands and priorities
- The Covid-19 has affected resources such as staff time and availability to carry out monitoring in 2020 and may continue to do so over the coming months.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Congestion on A284 and at level crossing (Lyminster)	Traffic Management	UTC, Congestion management, traffic reduction			WSCC & ADC. WSCC, C2CLEP and Developers	WSCC, C2CLEP and Developers	NO	Funded	> £10 million	Planning	Reduced vehicle emissions	By-pass in use	Planning permission granted March 2019	£21.6m cost funded by C2cLEP, WSCC and developer funds
2	Congestion on A29 and at level crossing (Woodgate)	Traffic Management	UTC, Congestion management, traffic reduction			WSCC & ADC. WSCC, C2CLEP and Developers	WSCC, C2CLEP and Developers	NO	Not Funded	> £10 million	Planning	Reduced vehicle emissions	New A29 section	Planning application was submitted in Spring 2021	£11.7m Northern section to be funded by C2cLEP Southern section funding partly dependent on local housing S106 contribution
3	Congestion at peak hours - A27	Traffic Management	UTC, Congestion management, traffic reduction			Highways England, WSCC, ADC & others	Highways England, WSCC	NO	Partially Funded	> £10 million	Planning	Reduced vehicle emissions	New A27 section and junction improvements	Preferred route announcement October 2020	Development Consent Order submission 2021
4	A259 Littlehampton improvements	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2018		WSCC, ADC,	Developer contributions & Coast to Capital LEP funding	NO	Partially Funded	> £10 million	Implementation	Reduced vehicle emissions	Improvements to A259	Preparatory design work and permissions complete	Works commenced on site
5	A259 Bognor Regis to Littlehampton Corridor improvements	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane			WSCC, ADC,	DfT MRN and LLM funding	NO	Partially Funded		Planning	Reduced vehicle emissions	Improvements to A259	Prelim design in progress	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
6	A24 Worthing to Horsham Corridor improvements, including A280 Long Furlong	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane			WSCC, ADC, WBC & HDC.	DfT MRN and LLM funding	NO	Partially Funded		Planning	Reduced vehicle emissions	Improvements to A280 and A24 Findon	Feasibility study in progress	
7	A259 Bognor Regis to Chichester Corridor Enhancement	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane			WSCC/CDC/ADC	tba	NO	Partially Funded		Planning	Reduced vehicle emissions	Improvements to A259	Feasibility study in progress	Dependent on local housing S106 contribution and DfT MRN/LLM funding
8	NCN2 Cycle route (Bognor to Littlehampton section)	Transport Planning and Infrastructure	Cycle network	2016	2018	ADC, WSCC,NCN	tba	NO	Funded	£1 million - £10 million	Completed	Behavioural change	New section open	Completed 2018	Completed
9	Membership of West Sussex Electric Vehicle Charging Partnership	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2019		WSCC and West Sussex Las	Private Investment; Government Funding	NO	Partially Funded		Planning	Reduced vehicle emissions	Installation of EV Chargepoints	Tender is published	Suppliers may not be interested in the tender opportunity
10	Membership of SAQP	Public Information	Via television	2010		Sussex LAs, PHE, ESCC and WSCC	Sussex LAs, PHE, ESCC and WSCC	NO	Funded		Completed	Behavioural change	Delivery of data, Air Alert and other schemes	Ongoing	LA budget cuts
11	A24 Findon Valley to Findon Villagecycle scheme	Transport Planning and Infrastructure	Cycle network		2022	WSCC	Active Travel Fund	NO	Funded	£1 million - £10 million	Planning	Behavioural change	Improvements to A24	Funding award from Active Travel Fund	Delivery subject to outcomes of public consultation planned in 2021

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
12	Additional Active Travel Fund cycle & pedestrian schemes	Transport Planning and Infrastructure	Cycle network		2022	WSCC	Active Travel Fund	NO	Funded	£100k - £500k	Planning	Behavioural change	Improvements to infrastructure	Funding award from Active Travel Fund	Schemes under development are a signal-controlled crossing for A259 to the south east of Drayton Lane roundabout, and contraflow cycle route for River Road, Littlehampton
13	Arundel traffic calming	Traffic Management	Reduction of speed limits, 20mph zones		2019	WSCC	WSCC	NO	Funded		Completed	Behavioural change	Improvements to The Causeway	Completed 2019	Completed
14	Ferring traffic calming	Traffic Management	Reduction of speed limits, 20mph zones		2019	WSCC	WSCC	NO	Funded		Completed	Behavioural change	Improvements to Sea Lane	Completed 2018/19	
15	Slindon traffic calming	Traffic Management	Reduction of speed limits, 20mph zones		2019	WSCC	WSCC	NO	Funded		Completed	Behavioural change	Improvements to A29	Completed 2019	Completed
16	Bognor traffic calming	Traffic Management	Reduction of speed limits, 20mph zones		2019	WSCC	WSCC	NO	Funded		Completed	Behavioural change	Improvements to Frith Road, by The Regis School	Completed 2019	Completed
17	Electric Vehicles Charging Infrastructure	Promoting Low Emission Transport	Procuring alternative refueling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging			ADC	Developers	NO	Funded		Implementation	Reduced vehicle emissions	Installation of EV charge points	EV charge points continue to be negotiated for new developments. Arun District Council's Parking Standards Supplementary Planning Document was adopted in January 2020 setting out minimum requirements.	Reluctance from developers to install sufficient chargers of suitable charging capability.

Much of the information in Table 2.1 is provided by West Sussex County Council and not all of the data required to complete every field of the table was available. This is particularly the case for dates when measures were introduced or expected to be completed and for numerical values of expected emissions reductions. This means that it has not been possible to show the expected efficacy of measures.

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.

Previous data monitoring decisions have ruled out current PM data collection in Arun. However, Arun District Council is taking the following measures to address $PM_{2.5}$:

- Requirement for dust control in Construction Management Plans for developments through the planning consultation process according to the merits of individual sites
- Publication of guidance document for small scale construction sites which includes dust control advice Construction Code of Practice (arun.gov.uk)
- Responding to complaints of dust nuisance using investigation and enforcement powers through Environmental Protection legislation
- Participation in the recent review of the *Air Quality and Emissions Mitigation Guidance for Sussex Authorities (2020)* to further encourage lower-emissions developments
- Continuing participation in, and funding for, the Sussex Air Quality Network which includes seven permanent automatic particulate monitoring sites measuring both PM_{10} and $PM_{2.5}$. Currently, none of which are in the district.
- Encouraging electric vehicle take-up by participation in the West Sussex EV Partnership and increasing the availability of on-street EVCPs
- Arun District Council will work in partnership with Public Health to communicate the impacts of air pollution including $PM_{2.5}$. Additionally, Arun District Council will utilise the revised Air Quality and Emissions Mitigation Guidance for Sussex Authorities, to encourage lower emission developments with planning and transport authorities to assist in reducing $PM_{2.5}$ emissions.
- A survey of stoves and solid fuel consumption across Sussex was carried out in partnership with Sussex-air over the winter of 2019/20 which had over 1700

responses. The survey provided useful information on the reason for stove use (more than 40% might be considered ‘recreational users’), 20-30% of stove users use coal (mostly with wood) to heat their homes, 88% of wood fuel users burned hardwood logs and the vast majority of wood users ’season’ their logs but the duration of seasoning is unknown. Most wood users had not heard of the Woodsure/Ready to Burn Certification scheme. Overall Sussex has a younger stock of appliances than the UK average and most are using closed stoves of 3-10 years old. This data and its future uses for Sussex are still being analysed but it is likely that information on Clean Burn Sussex will be promoted again this winter.

The local indicator for $PM_{2.5}$ in the district under the Public Health Outcomes Framework, Fraction of mortality attributable to particulate air pollution indicator’ value is now 4.7, a slight decrease from last years figure of 5.2 – this is lower than the National indicator for England (5.1), slightly less than the value for the South East (5.2) and between the value of our neighbouring authorities (Worthing 5.1 and Chichester 4.5). This change is in line with the National figures for England.

In the absence of $PM_{2.5}$ and PM_{10} monitoring the current Defra background mapping resource has been used to identify the maximum background annual mean $PM_{2.5}$ concentration within the Local Authority of 10.4 ug.m-3.

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

This section sets out the monitoring undertaken within 2020 by Arun District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Arun District Council has no automatic (continuous) monitoring stations. However, the Council benefits from the co-ordinated monitoring of air pollutants across the region Sussex-air :: Promoting better Air Quality in Sussex :: sussex-air.net :: Home. The Sussex Air Quality Monitoring Network is managed and Co-ordinated by Imperial College London ERG, on behalf of the SAQP and they provide data calibration and ratification of results.

National monitoring results are available at Monitoring Networks - Defra, UK

3.1.2 Non-Automatic Monitoring Sites

Arun District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 22 sites during 2020. This is an increase of 5 sites on those monitored in 2019. Table A.1 in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 33%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Error! Reference source not found. in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

The data shows a continued low level of NO_2 in the District with levels well below the objective and no areas of particular concern. No AQMAs are required within Arun District Council's area. NO_2 levels in the district have remained relatively stable over the last five years with only small fluctuations and a general downwards trend since 2018 at sites which were in existence prior to 2020.The general downward trend and continued low levels of NO_2 at monitoring sites prompted a review of the sites at the end of 2019 in order to monitor at other new sites where traffic is known to build up or where there have been or are planned to be changes to the roads or receptors.

Monitoring sites which indicated levels of NO_2 well below the objective or that were not representative of relevant exposure were removed. Monitoring sites remain within each of the major towns in the District although some have been moved to different areas within the town. Monitoring sites have also been added in the east of the District where previously there was no monitoring but where there are plans to convert a single carriageway road to dual carriageway, where level crossings cause a build-up of traffic close to residential properties on a regular basis and where new housing developments are planned.

Monitoring at these new sites show NO_2 levels are below the objective and similar to the rest of the district. However, monitoring will continue at these sites in order to observe any trends in the future, particularly given the changes in traffic flow caused by Covid 19 restrictions in 2020.

Appendix A: Monitoring Results

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
1	Terminus Road, Littlehampton	Roadside	502568	102147	NO2		3.0	2.0	No	2.0
2	Worthing Road, Littlehampton	Roadside	503438	103365	NO2		7.0	2.0	No	2.8
8	Ford Road, Ford	Roadside	500297	104359	NO2		7.5	1.5	No	1.7
12	Chichester Road, Bognor	Roadside	493356	100090	NO2		0.5	1.5	No	2.8
13	Rowan Way,Bognor	Roadside	493408	101228	NO2		14.8	1.3	No	2.3
16	The Causeway	Roadside	502354	106527	NO2		0.0	8.1	No	2.5
17	Lyminster Road	Kerbside	502865	105336	NO2		4.7	1.0	No	2.8
20	20 Barnham Road, Barnham	Roadside	495950	104396	NO2		0.3	1.5	No	2.0
21	Longford Road, Bognor	Roadside	493371	099465	NO2		7.7	1.2	No	2.0
22	Lyminster Road, Littlehampton	Roadside	502746	103857	NO2		9.5	1.9	No	2.5
23	Queen Street, Arundel	Roadside	502011	106929	NO2		1.7	3.2	No	2.0
24	Ford Road, Arundel near penfolds place	Roadside	501181	106638	NO2		4.2	4.5	No	2.0
25	Barnham Road,Barnham (train station car park entrance)	Roadside	495772	104458	NO2		0.0	1.9	No	2.5
26	A29, Lidsey Road	Roadside	493801	104307	NO2		3.0	2.0	No	2.5
27	High Street, Bognor	Urban Centre	493601	099012	NO2		0.0	6.6	No	2.5
28	Anchor Springs, Littlehampton	Urban Centre	502888	102175	NO2		11.2	2.1	No	2.5
29	Mill Lane, Rustington	Roadside	505605	102953	NO2		12.0	1.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
30	A259, Rustington	Roadside	506003	103189	NO2		10.0	2.8	No	2.5
31	A259 Littlehampton Rd, Ferring	Roadside	508900	103374	NO2		6.0	4.5	No	2.5
32	Old Worthing Rd, East Preston	Roadside	507474	103002	NO2		12.5	1.0	No	2.5
33	Downs Way, East Preston	Roadside	507040	103155	NO2		7.8	2.8	No	2.0
34	Station Rd, Angmering	Roadside	506480	102917	NO2		14.0	2.8	No	2.0

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
1	502568	102147	Roadside		100.0	22.6	24.5	23.0	20.1	15.7
2	503438	103365	Roadside		100.0	24.4	25.3	23.0	20.2	16.8
8	500297	104359	Roadside		100.0	16.6	18.5	18.0	15.2	12.4
12	493356	100090	Roadside		100.0	25.6	28.3	31.0	25.8	17.8
13	493408	101228	Roadside		100.0	25.8	25.7	28.0	24.1	19.9
16	502354	106527	Roadside		100.0	17.0	17.6	19.0	13.2	9.1
17	502865	105336	Kerbside		100.0			35.0	30.9	23.0
20	495950	104396	Roadside		100.0		20.7	20.0	18.5	12.9
21	493371	099465	Roadside		100.0		26.5	29.0	25.5	19.2
22	502746	103857	Roadside		100.0					17.6
23	502011	106929	Roadside		100.0					13.8
24	501181	106638	Roadside		100.0					15.5
25	495772	104458	Roadside		100.0					14.8
26	493801	104307	Roadside		100.0					14.9
27	493601	099012	Urban Centre		100.0					14.8
28	502888	102175	Urban Centre		100.0					12.4
29	505605	102953	Roadside		100.0					17.8
30	506003	103189	Roadside		100.0					23.3
31	508900	103374	Roadside		100.0					13.8
32	507474	103002	Roadside		100.0					15.6
33	507040	103155	Roadside		75.0					11.6
34	506480	102917	Roadside		100.0					13.4

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16**

☒ **Diffusion tube data has been bias adjusted.**

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

Notes:

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

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

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

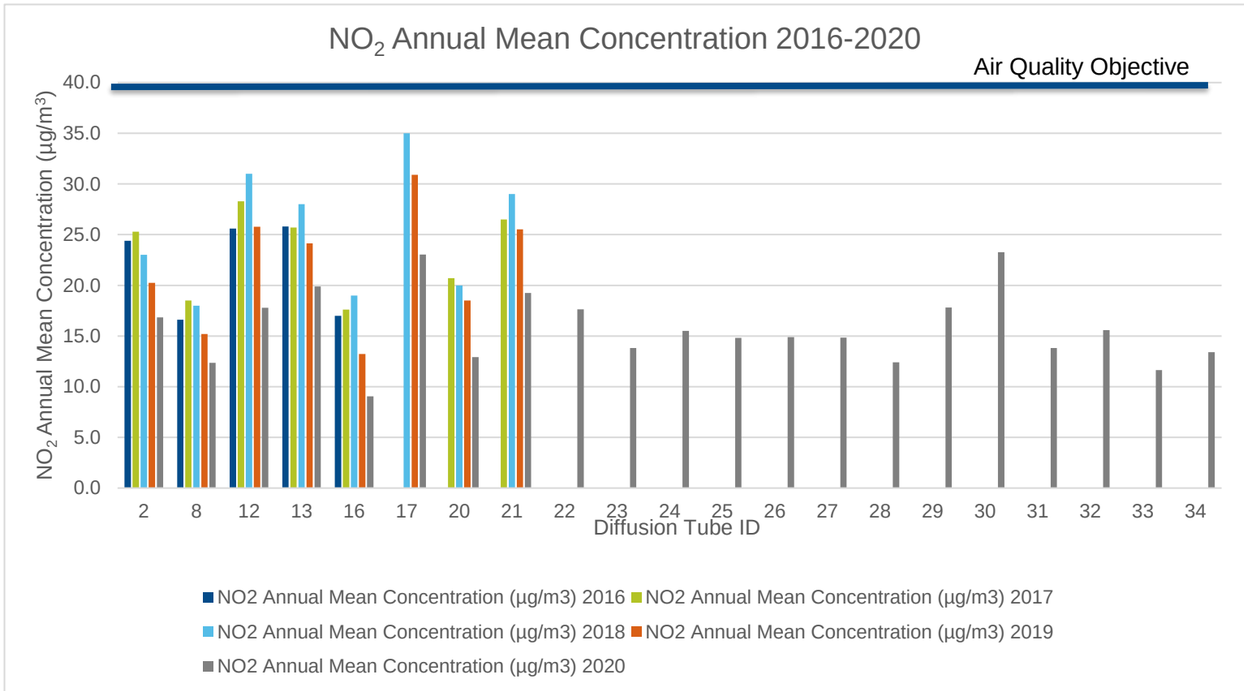
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	502568	102147	27.6	22.3	14.6			15.6	17.0	17.7	23.8	20.7	27.0	28.5	20.3	15.7	-	Exposure from March to May due to Covid restrictions
2	503438	103365	31.8	22.2	15.6			21.8	18.1	20.2	23.3	20.5	31.8	27.0	21.9	16.8	-	Exposure from March to May due to Covid restrictions
8	500297	104359	22.7	15.8	12.6			14.8	13.5	15.3	17.5	15.4	20.5	19.8	16.1	12.4	-	Exposure from March to May due to Covid restrictions
12	493356	100090	32.2	21.5	20.8			23.6	15.8	20.3	25.9	19.8	29.1	27.6	23.1	17.8	-	Exposure from March to May due to Covid restrictions
13	493408	101228	36.1	23.3	19.5			24.3	20.8	28.8	31.2	22.5	34.0	30.8	25.8	19.9	-	Exposure from March to May due to Covid restrictions
16	502354	106527	17.2	11.0	8.9			11.1	9.7	14.7	10.9	11.0	15.0	13.8	11.8	9.1	-	Exposure from March to May due to Covid restrictions
17	502865	105336	39.8	27.0	21.4			32.6	25.0	33.2	34.5	30.0	36.7	36.2	29.9	23.0	-	Exposure from March to May due to Covid restrictions
20	495950	104396	24.8	18.5	11.3			13.3	12.6	15.6	19.9	16.6	24.7	21.8	16.8	12.9	-	Exposure from March to May due to Covid restrictions
21	493371	099465	38.7	30.8	18.6			22.7	22.7	20.5	26.0	21.9	29.5	32.8	25.0	19.2	-	Exposure from March to May due to Covid restrictions
22	502746	103857	32.1	26.0	15.3			21.9	18.8	21.3	25.0	23.8	30.5	30.1	22.9	17.6	-	Exposure from March to May due to Covid restrictions
23	502011	106929	25.1	21.1	12.3			16.1	17.2	18.2	18.1	17.9	25.7	19.6	17.9	13.8	-	Exposure from March to May due to Covid restrictions
24	501181	106638	28.7	20.7	14.7			16.2	12.4	19.3	22.1	19.8	32.2	26.1	20.1	15.5	-	Exposure from March to May due to Covid restrictions
25	495772	104458	29.2	18.5	13.7			13.8	15.2	17.4	24.5	21.4	26.4	23.7	19.2	14.8	-	Exposure from March to May due to Covid restrictions
26	493801	104307	30.2	19.7	13.6			17.2	14.6	19.8	19.2	18.3	25.0	27.1	19.3	14.9	-	Exposure from March to May due to Covid restrictions
27	493601	099012	27.4	20.9	16.3			18.6	15.7	18.3	19.2	18.7	21.7	22.3	19.3	14.8	-	Exposure from March to May due to Covid restrictions
28	502888	102175	23.3	16.4	13.2			12.5	11.7	13.8	15.5	14.5	22.1	23.9	16.1	12.4	-	Exposure from March to May due to Covid restrictions
29	505605	102953	33.9	23.6	15.5			18.2	17.4	25.1	26.3	23.5	31.9	30.9	23.1	17.8	-	Exposure from March to May due to Covid restrictions

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
30	506003	103189	42.0	40.6	18.3			29.8	31.0	31.8	29.1	34.0	38.7	32.2	30.2	23.3	-	Exposure from March to May due to Covid restrictions
31	508900	103374	28.0	21.8	10.2			14.6	12.4	16.8	22.0	16.7	27.1	25.9	17.9	13.8	-	Exposure from March to May due to Covid restrictions
32	507474	103002	26.4	22.8	16.4			13.4	14.2	22.5	22.6	19.5	28.5	23.2	20.2	15.6	-	Exposure from March to May due to Covid restrictions
33	507040	103155	21.7	16.6	11.2			11.6				16.8	22.4	21.5	16.1	11.6	-	Exposure from March to May due to Covid restrictions
34	506480	102917	23.9	17.4	12.9			14.4	12.3	17.7	17.0	16.9	28.7	22.1	17.4	13.4	-	Exposure from March to May due to Covid restrictions

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

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16**

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

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

☐ Arun District Council **confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Arun During 2020

No new sources of air pollution have been identified as currently operating within Arun, however we are aware of plans that may do so in the future. Several major road schemes are either in the planning or construction phase including the widening of sections of the A259 in Angmering and Littlehampton from single to dual carriageway. This brings traffic closer to existing residential properties and land which has been identified for housing in the future. The A27 Arundel bypass, the realignment of the A29, the Lyminster Bypass and Fitzalan Link Road are designed to improve traffic flow and thus air quality but may result in a deterioration in air quality in other areas. A number of the new monitoring sites have been located in these areas to monitor any changes.

The Council has recently been consulted on proposals to site a new energy from waste incinerator at Ford which could impact air quality and the proposed Rampion 2 offshore wind farm could have temporary impacts on air quality as the cabling is laid across the district. A new crematorium has also been granted planning permission and a number of other processes which may require a Permit under the Environmental Permitting Regulations 2016 have either applied for planning permission or have approached the Council for advice on pre application proposals. Environmental Health will require and comment on submitted air quality assessments as part of the planning and permitting process and will adjust monitoring if required.

Additional Air Quality Works Undertaken by Arun District Council During 2020

Arun District Council has not completed any additional works within the reporting year of 2020.

QA/QC of Diffusion Tube Monitoring

Arun District Council undertakes monitoring with non-automatic methods using nitrogen dioxide (NO_2) diffusion tubes in various locations across the district. There are no Air Quality Management Area's in Arun District.

Arun District Council sub-contracts the supply and analysis of the NO_2 diffusion tubes with South Yorkshire Air Quality Samplers (SYAQS) – previously South Yorkshire Laboratory. The NO_2 tube preparation method used is 50% triethanolamine (TEA) in acetone. The South Yorkshire Laboratory was on the working group and follows the procedures set out in the Harmonisation Practical Guidance.

Monitoring was completed in adherence with the 2020 Diffusion Tube Monitoring Calendar, with the exception of March – June 2020. Tubes were put out in March in adherence with the calendar but were not changed again until June. This was due to Covid 19 restrictions which restricted all unnecessary travel and workplace health and safety risk assessments and prioritisations that deemed the changing of tubes as a low priority at the time.

Diffusion Tube Annualisation

Annualisation was required for monitoring site 33 in East Preston which had less than 75% data capture due to broken mountings and difficulties replacing these due to covid 19 restrictions on getting equipment from the office and the need for two members of staff to carry out the procedure for health and safety reasons. The Diffusion Tube Data Processing Tool was used to process all diffusion tube data and to carry out the annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Arun District Council have applied a national bias adjustment factor of 0.77 to the 2020 monitoring data. A summary of bias adjustment factors used by Arun District Council over the past five years is presented in Table C.1.

No co-location study has been undertaken in the district. Arun District Council utilises the national bias adjustment figures for SYAQS in 2020 of 0.77 based on one study. Data from NO_2 diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location data-base as collated by DEFRA Local Air Quality Management Helpdesk. Spreadsheet Version Number: 06/21

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	06/21	0.77
2019	National	03/20	0.78
2018	National	03/19	0.95
2017	National	03/18	0.88
2016	National	unknown	0.83

NO_2 Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

Distance correction has not been calculated for any of the data as none of the monitoring locations recorded an annual mean concentration that is above or within 10% of the NO_2 annual objective of 40µg/m^3. This is in line with guidance in Paragraphs 7.77-7.79 of Technical Guidance LAQM.TG16.

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

Site ID	Annualisation Factor Brighton Preston Park	Annualisation Factor Chilbolton Observatory	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
33	0.9397	0.9441	0.9419	16.1	15.1	

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

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

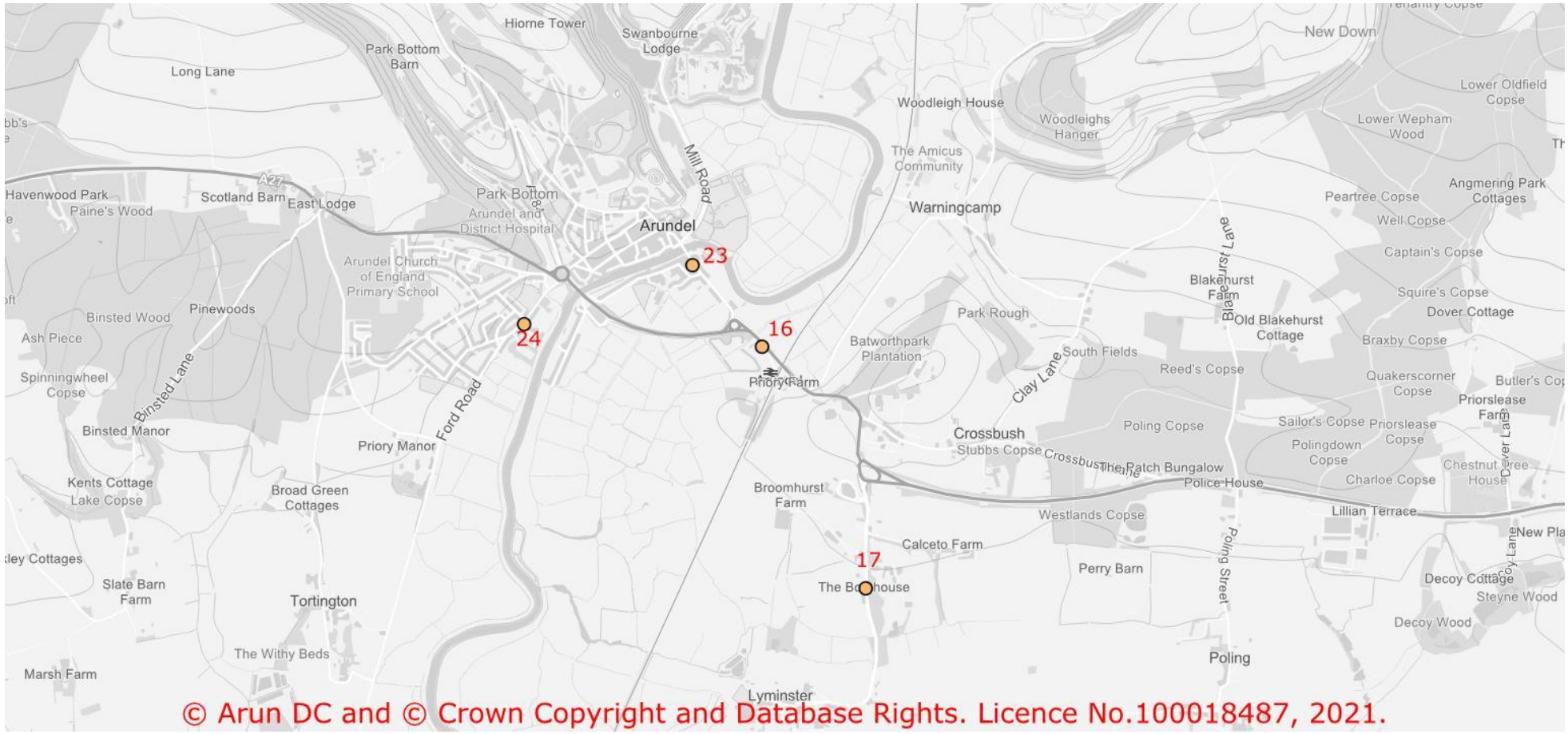


Figure D.2 – Map of Non-Automatic Monitoring Sites – Barnham and Ford

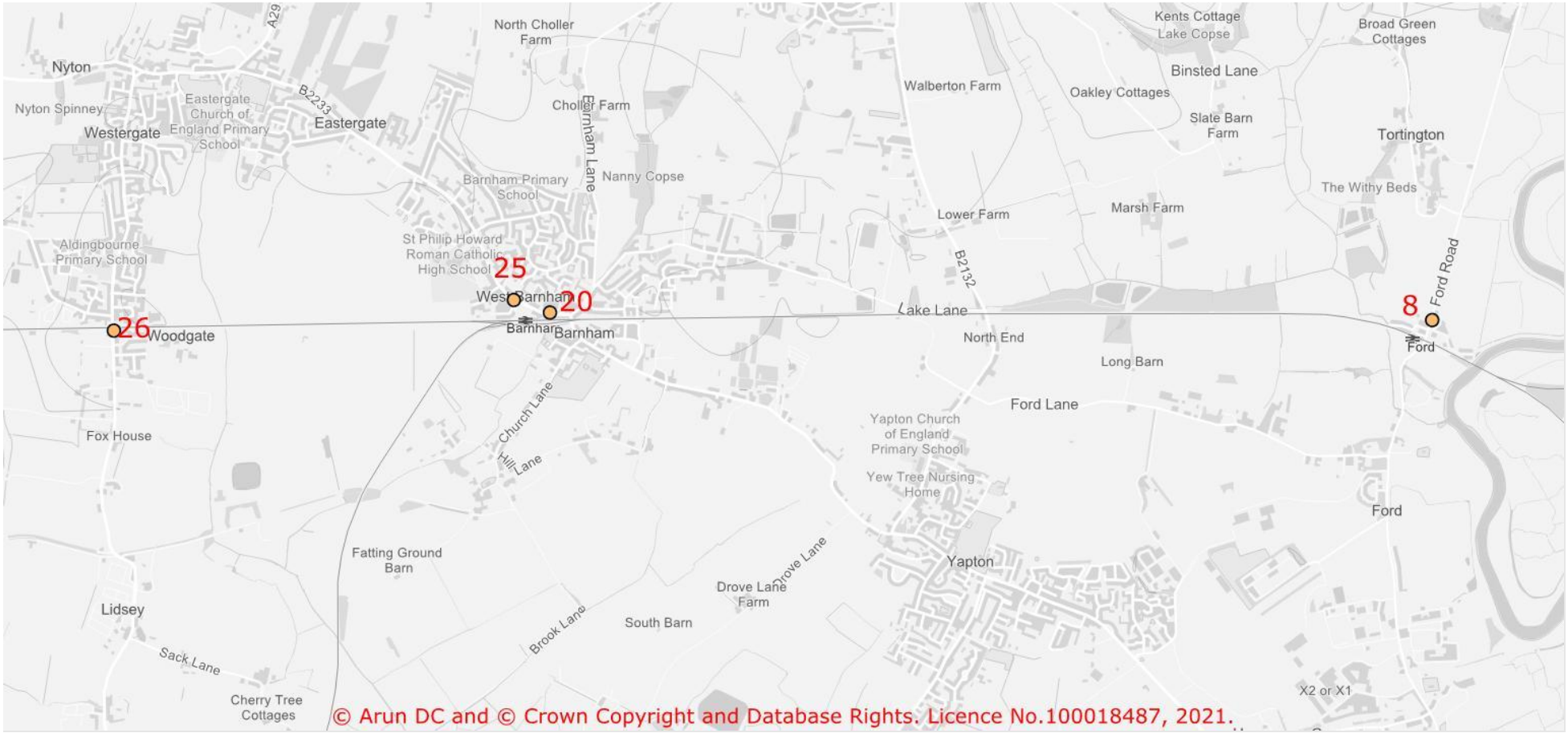


Figure D.3– Map of Non-Automatic Monitoring Sites – Bognor Regis

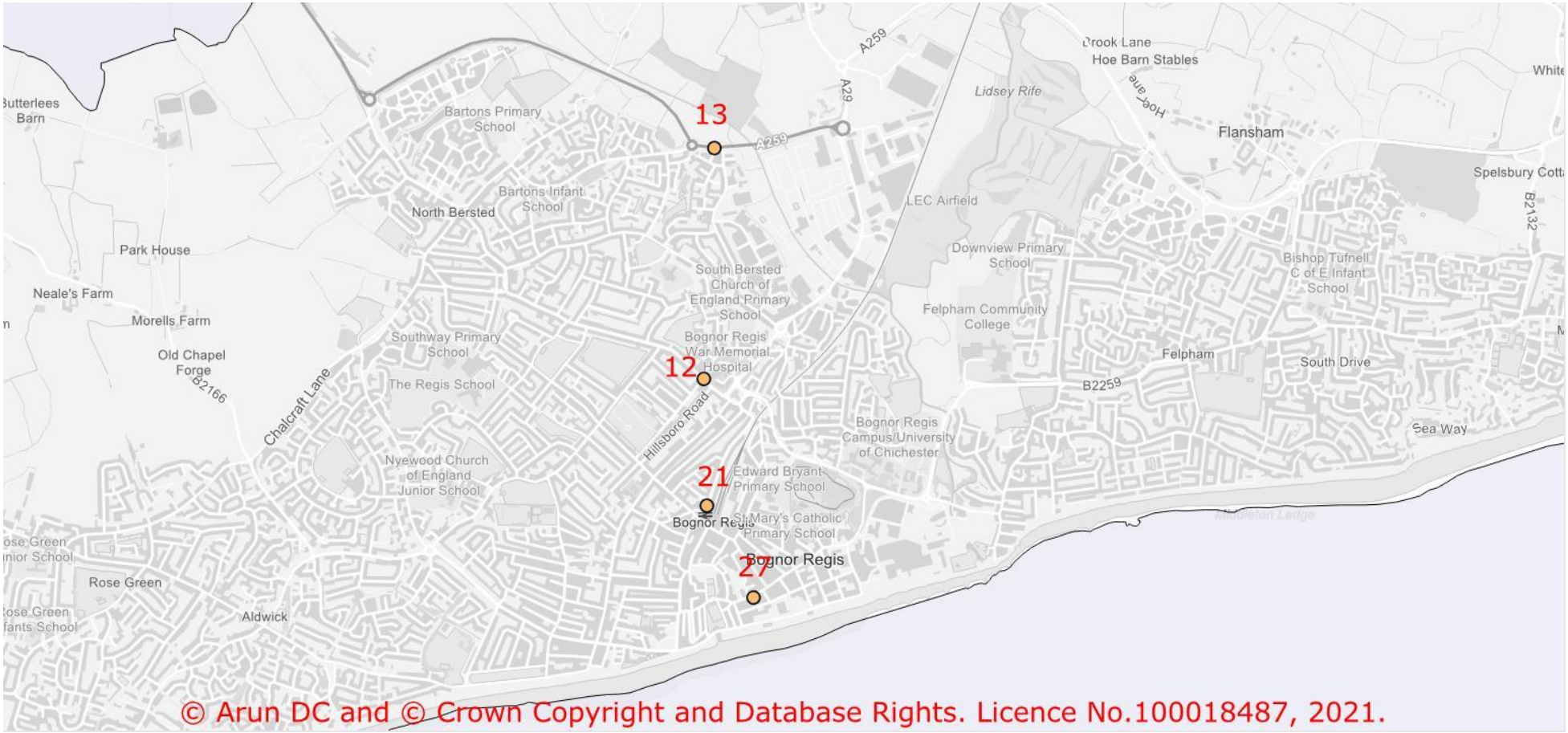
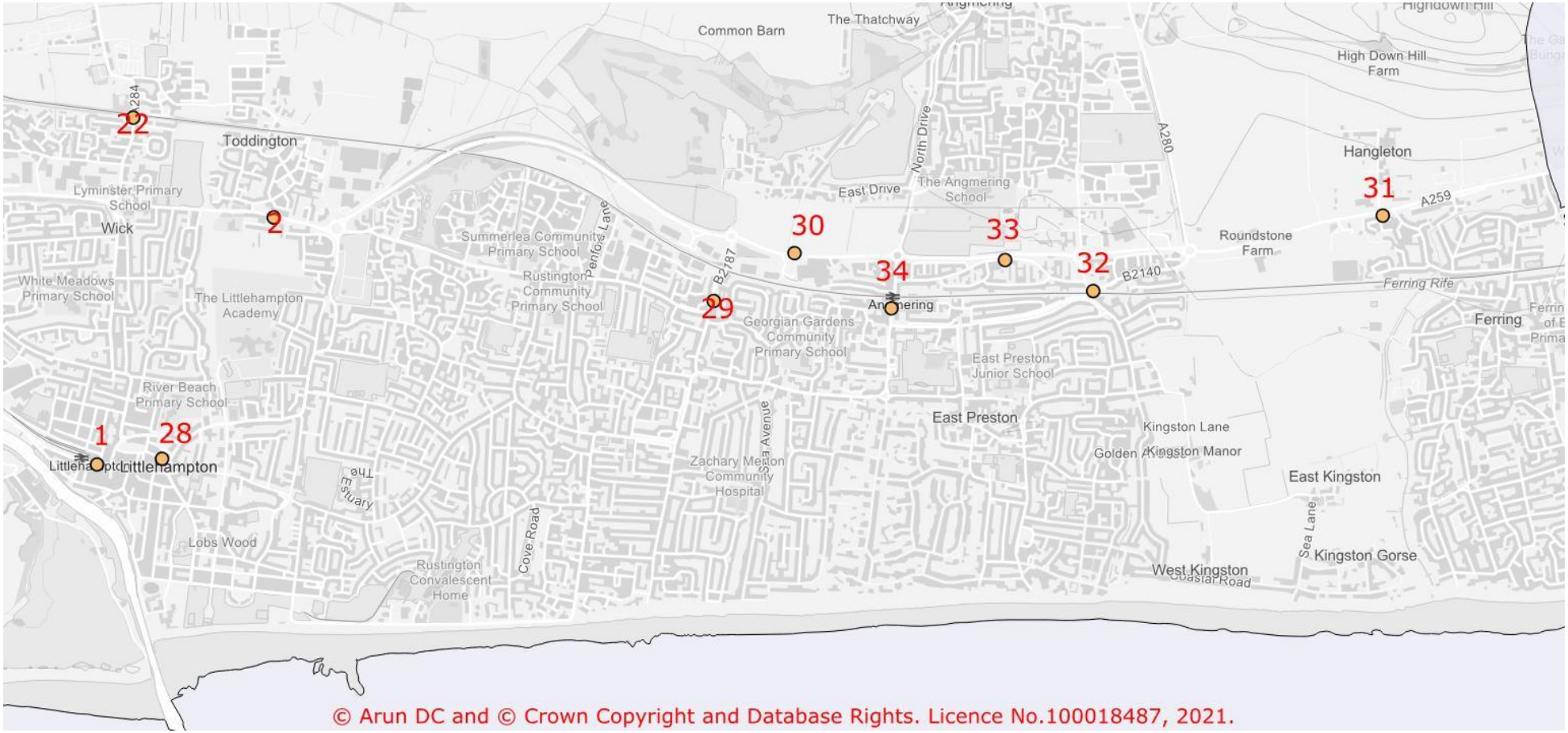


Figure D.4– Map of Non-Automatic Monitoring Sites – Littlehampton and Angmering



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data[8] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)[9] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

[8] Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

[9] Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

represents an absolute reduction of between 10 to 20µg/m^3 if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5µg/m^3 lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within Arun

- Reductions of annual mean NO_2 concentrations of between 20 and 33% were experienced at diffusion tube monitoring sites across the district which had data prior to 2020.
- Traffic counts from permanent traffic monitoring sites in West Sussex (not in Arun) showed significant reduction in vehicle numbers during the first period of movement restrictions in Spring 2020. However, by August numbers had increased, albeit not to pre covid levels. From March 2020 there were noticeable reductions in peak hour traffic flows with a corresponding increase in interpeak traffic flows. This initial data shows that traffic in West Sussex was reduced and is likely to have resulted in the reduction in levels of NO_2 across the district.

Opportunities Presented by COVID-19 upon LAQM within Arun

West Sussex County Council put forward safe space cycling schemes to the Department for Transport to consider for grant funding in May 2020. This proposed 21km of temporary cycle lanes across West Sussex to promote cycling as a replacement for journeys in areas which, until the COVID-19 crisis, were heavily reliant on public transport.

In Arun the proposal was to widen the temporary surface of the A259 in Bognor Regis, cutting back overhanging vegetation and removing growth on the existing path. Consideration was also given to converting one lane of western dual carriageway to cycle/bus lane although this was not progressed.

Other schemes across West Sussex which involved reallocating road space to cycle ways were in place for several months but were removed in November 2020. Feedback showed

the majority of responses were opposed to the cycleways, citing increased congestion as a key issue. Automatic traffic counters also indicated relatively low usage by cyclists in comparison with other traffic.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Arun

- During the initial period of restrictions at the beginning of 2020, staff were unable to change diffusion tubes and those exposed on the 4th March were left in place until the 4th June. All other exposure periods were in line with the national monitoring calendar. Therefore, whilst data was still available for this period its accuracy may have been affected by the longer than normal exposure period. Medium Impact
- The team responsible for air quality monitoring is a generic team who also have responsibility for health and safety, food hygiene and investigation of infectious diseases. The team were therefore responsible for enforcement of some Covid 19 legislation, investigation of Covid 19 infection outbreaks in workplaces and providing health and safety advice to businesses as well as the normal workload. This significant increase in workload forced the prioritisation of work on the basis of public safety risks and resulted in the need for an extension of the deadline to submit this report.
- Health and safety risk assessments meant that a single member of staff had to change the diffusion tubes instead of the normal pair which meant that it took considerably longer and repairs were more difficult and created gaps in data. The departure of two members of staff in February 2020 meant that only limited remaining staff were familiar with the locations of the tubes and so following the exposure calendar was more of a challenge, particularly covering periods of annual leave and taking into account child care responsibilities as a result of the closure of schools.

Whilst these issues did not have an impact on data collection it was a challenge that had to be overcome by the team. The impacts as presented above are aligned with the criteria as defined in Table F 1, with professional judgement considered as part of their application.

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: High
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by 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 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

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.