2023 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: July, 2023

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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 29,000 to 43,000 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 2022 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, January 2023

[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 2022 there were 22 diffusion tubes located across the district. Their location is regularly reviewed and altered where data or local knowledge indicate a new location should be investigated. 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 updated in 2020 and is due a further review in 2023. 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, this now forms part of the Climate Change Board. Our strategy and commitment - West Sussex County Council

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[6] details the approach to reduce exhaust

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[5] Defra. Environmental Improvement Plan 2023, January 2023

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

emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

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 service. [Sussex-air :: Promoting better Air Quality in Sussex :: sussex-air.net :: Home](#)

- Continued delivery of the Sussex-air, Defra funded intervention programme into primary and secondary schools. The project again employed Sustrans to deliver the programme, aiming to raise awareness of air quality issues. A Sustrans Air Quality officer engaged with new schools and those already working with Sustrans to investigate local air quality.

- 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 continued to be negotiated for new developments until these were required by new Building Regulations. Arun District Council's Parking

Standards Supplementary Planning Document was adopted in January 2020 setting out minimum requirements. The Planning Policy team have noted that changes to Building Regulations will take precedence over elements of the Arun Parking Standards where appropriate. A planning condition requiring EV charge points was recommended for most new residential developments.

- To support the Council's transition to electric vehicles, a total of 10 EVCP have been installed in Arun District Council office car parks, including 4 at Harewood Road and 6 at the Civic Centre.

- The Council has worked with other District and Boroughs and the County Council to adopt an EV Strategy, establish a partnership and appoint a concession contractor to install, operate and maintain a network of on and off-street EV chargepoints over 15+5 years. Groundworks have begun on EV chargepoints in phase 1 which will become operational in car parks and on street in 2023 with Phase 2 chargepoint locations being consulted on in 2023.

- The Council's vehicle fleet has been reduced to 16 vehicles (from 21), 14 new electric vehicles have been ordered in 2023. Due to requirements not all vehicles had an electric/hybrid alternative. As technology evolves alternative vehicles will be sought.

- Sussex Air bid for funds to cover projects which included upgrading the exhausts of around 40 double-decker buses serving Brighton & Hove and surrounding Districts (one route runs into Arun) to reduce the emissions they produce. An additional project will fund work with taxi operators in West Sussex to facilitate a transition to electric vehicles. [Sussex-air :: Promoting better Air Quality in Sussex :: sussex-air.net :: Air Quality Guidance Planning](#)

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.

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. 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's priorities for the coming year are:

- To produce an air quality strategy

- To continue to encourage take-up and use of electric and other low-emission vehicles by working with West Sussex County Council on delivering our 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.

- To continue work related to the declaration of a climate emergency in January 2020, 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

- Review of the Council's Taxi licensing policy with the possibility of including age and emission based criteria and incentives for early adopters of lower emission vehicles. The final report will go to committee at the end of 2023 for approval.

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" service. 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 Air Quality Service for Sussex - Sussex-air :: Promoting better Air Quality in Sussex

- 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 Air quality | Arun District Council

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Arun District Council with the support and agreement of the following officers and departments:

Jamie Dallen – Transport Planning and Policy, Senior Planner, West Sussex County Council

William Page – Climate Change and Sustainability Manager, Arun District Council.

This ASR has been approved by:

Nat Slade, Group Head of Technical Services

This ASR has not been signed off by a Director of Public Health but has been sent to them for their information.

If you have any comments on this ASR please send them to:

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1 Local Air Quality Management

This report provides an overview of air quality in Arun during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), 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 order to achieve and maintain the objectives and the dates by which each measure will be carried out. 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 18 months. The AQAP should specify how air quality targets will be achieved and maintained and provide dates by which measures will be carried out.

Arun District Council currently does not have any declared AQMAs. A local Air Quality Strategy is under development to prevent and reduce polluting activities. Air quality is being addressed through existing Transport Plans and the 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

Defra's appraisal of last year's ASR concluded *"On the basis of the evidence provided by the local authority the conclusions reached are **accepted** for all sources and pollutants. Following the completion of this report, Arun District Council should submit an Annual Status Report in 2023 and draw up an Air Quality Strategy."* It was also noted that monitoring of new sites in relation to improvements to major roads in the area should continue to ensure data is accurate and representative. Monitoring continued in 2022 and the next annual review of all monitoring sites will take place at the end of 2023.

Arun District Council and West Sussex County Council have taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. 19 measures are included within Table 2.1, with the type of measure and the progress the authorities have made during the reporting year of 2022 presented. 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 major projects webpage information:

  Roadworks and projects – 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

- the West Sussex Transport Plan 2022-2036 -

  West Sussex Transport Plan – West Sussex County Council

- County wide air quality plan for West Sussex Air Quality Plan (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 has now been reviewed and sets the strategy for guiding future investment in highways and transport infrastructure and was adopted in April 2022. It sets 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 Service Improvement Plan (BSIP)* sets out joint priorities of bus operators and West Sussex County Council for investment and spending on local bus services, and how the County Council will do more with partners and bus operators to promote bus travel. Funding has been requested from government, for emission reductions, service enhancement, information provision, and infrastructure.

- *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 partners want to see one consistent, affordable, easy to use, reliable, widely accessible and recognisable charging network across the county, providing renewable energy charging. Chargepoints are being 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 who would be unable to switch to EV without public charging. The County Council and six of the seven District

and Borough Councils in the County, including Arun District Council, has procured Connected Kerb as a market based supplier. The supplier is 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 repairs to ensure the network is fully operational at all times.

Key completed measures are:

- To support the Council's transition to electric vehicles, a total of ten EVCP have been installed in Arun District Council office car parks, including four at Harewood Road and six at the Civic Centre.
- Substantial completion of Active Travel Fund infrastructure schemes in Arun District, including the Findon Valley to Findon Village cycle scheme and a signal crossing for pedestrians and cyclists on the A259 to the south east of the Drayton Lane roundabout.
- Opening of the Fitzalan Link Road south in Littlehampton.

Arun District Council expects the following measures to be progressed over the course of the next reporting year (2023):

- Progression of an Active Travel Fund contraflow cycle route on the National Cycle Network (NCN) Route 2 at River Road, Littlehampton, which is expected to be implemented during Spring 2023.

- Completion of construction of A259 Littlehampton improvements, ongoing construction of the A284 Lyminster Bypass (North) (completion expected 2024) and commencement of construction of phase 1 (north) of the A29 realignment. Progression of planning/feasibility studies and design stages for other highway schemes (A259 Bognor Regis-Littlehampton, A259 Bognor Regis to Chichester, and A24 Worthing to Horsham including A280 Long Furlong) which should bring congestion relief and sustainable travel benefits.

- The Council has worked with other District and Boroughs and the County Council to adopt an EV Strategy, establish a partnership and appoint a concession contractor to install, operate and maintain a network of on and off-street EV chargepoints over 15+5 years. Groundworks have begun on EV chargepoints in phase 1 which will become operational in car parks and on street in 2023 with Phase 2 chargepoint locations being consulted on in 2023.

- The council is currently revising the taxi policy to include incentives to encourage drivers to switch to electric vehicles. The review will consider the possibility of including age and emission based criteria and incentives for early adopters of lower emission vehicles. The final report will go to committee at the end of 2023 for approval.

Arun's priorities for the coming year are:

- To produce an air quality strategy
- To continue to encourage take-up and use of electric and other low-emission vehicles by working with other Districts and Boroughs and the County Council to deliver on the adopted EV Strategy.
- 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 Council's vehicle fleet has already been reduced to 16 vehicles (from 21), with 14 new electric vehicles being ordered in 2023.
- Review of the Council's Taxi licensing policy with the possibility of including age and emission based criteria and incentives for early adopters of lower emission vehicles. The final report will go to committee at the end of 2023 for approval.
- Work with Sussex Air to bid for funding for projects that will improve air quality in Arun.

Arun worked to implement these measures in partnership with the following stakeholders during 2022:

- West Sussex County Council, five of the six District & Borough Councils in West Sussex and Connected Kerb as part of the EV Network Partnership
- All Local Authorities in Sussex as part of Sussex Air.

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

- Availability of legal and estates surveyor resources to grant leases and wayleave agreements adversely affecting speed with which EV chargepoints can be installed.

- Increasing cost of installing EV chargepoints adversely affecting viability and therefore number of chargepoints.

- Electricity Distribution Network cost and speed of connection adversely affecting number of EV chargepoints and speed of their roll out.

- Availability of resources due to other demands and priorities

Progress on the following measures has been slower than expected:

- Improvements to the A27 at Arundel – this project has been delayed for a number of years by National Highways.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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 Lyminster Road and at level crossing (Lyminster)	Traffic Management	UTC, Congestion management, traffic reduction	Construction started October 2022	Expected to complete in Autumn 2024	WSCC, ADC, C2CLEP and Developers	WSCC, C2CLEP, DfT and Developers	NO	Funded	> £10 million	Implementation	Reduced vehicle emissions	By-pass in use	Planning permission granted March 2019; Construction commenced October 2022	The Lyminster bypass (north) scheme is the second part of Lyminster Bypass. This will bypass the village and associated level crossing with a viaduct over Black Ditch River. The southern scheme is being completed by a developer and will cross over the railway line.
2	Congestion on A29 and at level crossing (Woodgate)	Traffic Management	UTC, Congestion management, traffic reduction	Phase 1 north (A29 south of Eastergate Ln to Barnham Rd) Construction estimated start Autumn 2023	Phase 1 estimated completion Winter2025; Phase 2 south (Barnham Rd to south of Lidsey Bends) TBC	WSCC & ADC. WSCC, C2CLEP and Developers	WSCC, C2CLEP and Developers	NO	Funded	> £10 million	Planning	Reduced vehicle emissions	New A29 section	Planning application was submitted in Spring 2021 – approved June 2021	£22.7m Northern section to be jointly funded by C2CLEP, WSCC and private developers; Southern section funding partly dependent on local housing S106 contribution
3	Congestion at peak hours - A27	Traffic Management	UTC, Congestion management, traffic reduction	Estimated scheme commencement 2025	Estimated scheme completion 2030	National Highways, WSCC, ADC & others	National Highways	NO	Partially Funded	> £10 million	Planning	Reduced vehicle emissions	New A27 section and junction improvements	Statutory consultation and consent application was started.	The Department for Transport has confirmed that this scheme will be deferred to RIS3 (third Road Investment Strategy) (covering 2025-30) to allow time for stakeholders' views to be fully considered/

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
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	Main construction phase commenced in September 2020	Estimated completion Spring 2023	WSCC, ADC,	Developer contributions & Coast to Capital LEP funding	NO	Funded	> £10 million	Implementation	Reduced vehicle emissions	Improvements to A259	Construction approaching completion.	Works approaching completion. £29.5m approved budget.
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	Feasibility study completed in Autumn 2021	2025-30	WSCC, ADC,	DfT MRN and LLM funding	NO	Not Funded	>£10m	Planning	Reduced vehicle emissions	Improvements to A259	Public Consultation, design development and business case development	Dependent on local housing S106 contributions and DfT MRN (Majopr Road Network)/LLM (Local Large Majors) funding
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	Feasibility study complete 2022	2025-2030	WSCC, ADC, WBC & HDC.	DfT MRN and LLM funding	NO	Not Funded	>£10,m	Planning	Reduced vehicle emissions	Improvements to A280/ A24 Findon	Feasibility study completed	Dependent on scheme prioritisation to progress. Dependent on local housing S106 contributions and DfT MRN (Majopr Road Network)/LLM (Local Large Majors) funding
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	Feasibility study to complete 2023	2025-2030	WSCC/CDC/ADC	tba	NO	not Funded	>£10m	Planning	Reduced vehicle emissions	Improvements to A259	Feasibility study in progress	Dependent on local housing S106 contribution and DfT MRN (Major Road Network)/LLM (Local Large Majors) funding

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
			priority, bus priority, high vehicle occupancy lane												
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	ongoing	WSCC and West Sussex LAs	Private Investment; Government Funding	NO	Partially Funded	Private funding of charging infrastructure	Planning	Reduced vehicle emissions	Installation of EV Chargepoints	Contract awarded to ConnectedKerb	Delivery of on and off - street charging point infrastructure programme to start early 2023.
10	Membership of SAQP	Public Information	Via television	2010	ongoing	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 Village cycle scheme	Transport Planning and Infrastructure	Cycle network	2022	2023	WSCC	Active Travel Fund	NO	Funded	£1 million - £10 million	Implementation	Behavioural change	Improvements to A24	Funding award from Active Travel Fund, scheme under construction	N/A
12	Additional Active Travel Fund cycle & pedestrian schemes	Transport Planning and Infrastructure	Cycle network	2022	2023	WSCC, ADC	Active Travel Fund	NO	Funded	£100k - £500k	Implementation	Behavioural change	Improvements to infrastructure	Funding award from Active Travel Fund; signal-controlled crossing for A259 to the south east of Drayton Lane roundabout under construction; contraflow cycle route for River Road, Littlehampton consultation planned	Outcomes of consultation

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
13	Electric Vehicles Charging Developer 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 continued to be negotiated for new developments until the changes to Building Regs came into effect in June 2022.	Reluctance from developers to install sufficient chargers of suitable charging capability.
14	Bognor Regis seafront regeneration plans	Promoting travel alternatives	Other	2022	2023	ADC, WSCC	WSCC design funding	NO	Partially Funded	£1 million - £10 million	Planning	Reduced vehicle emissions	Delivery of infrastructure improvements	Preliminary Design Stage	Potential cost increases which may require scope alteration
15	Littlehampton Terminus Place and wider Town Centre Public Realm Improvement Project	Promoting travel alternatives	Other	2022	2023	ADC, WSCC	WSCC, ADC, Littlehampton Town Council, C2C LEP	NO	Fully funded	£1 million - £10 million	Implementation	Reduced vehicle emissions	Delivery of infrastructure improvements	On schedule	No issues at this stage
16	Arun Active Travel Connectivity Study routes	Transport Planning and Infrastructure	Cycle network	2020	TBC	ADC, WSCC, National Highways	TBC	NO	Not funded	£1 million - £10 million	Planning	Reduced vehicle emissions	Delivery of infrastructure improvements	Active Travel Study published 2020, pre-feasibility assessments for example, Arundel to Littlehampton Ford Route and River Arun routes	Securing funding
17	Installation of 10 EV charge points in Council car parks	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2022	2022	ADC		NO	Funded		Completed	Reduced vehicle emissions	Installation of EV charge points	Completed	
18	Changes to Council vehicle fleet	Vehicle Fleet Efficiency	Other	2022	2022	ADC		NO	Funded		Implementation	Reduced vehicle emissions	Vehicles in use	In progress	
19	Review of Taxi policy	Promoting Low Emission Transport	Taxi Licensing conditions		2022	ADC		NO			Planning	Reduced vehicle emissions	Revised policy in place	In review	To be agreed by Councillors

2.3 PM$_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations.

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), 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)](https://www.arun.gov.uk)

- Responding to complaints of dust nuisance using investigation and enforcement powers through Environmental Protection legislation

- Participation in reviews of the *Air Quality and Emissions Mitigation Guidance for Sussex Authorities (2020)* to further encourage lower-emission 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

- The Council's vehicle fleet is currently made up of 18 vehicles, 16 of these are expected to be EV. It is expected that the two remaining vehicles will be replaced with EV, if and when they are able to provide the load capacity required at a responsible cost. Where this is not appropriate, low emission alternatives will be used instead. We are also working with our contractors to trial and introduce low-emission vehicles and machinery.

- To support the Council's transition to electric vehicles, a total of ten EVCP have been installed in Arun District Council office car parks, including 5 at Harewood

Road and five at the Civic Centre. The council will continue to review opportunities to install additional EVCPs in its building car parks.

- 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.

- The Clean Burn Sussex scheme will be promoted again this winter.

- Initial research into declaring some or all of the district a Smoke Control Area has begun, this may be progressed further with other Sussex local authorities, potentially as part of a bid for funding to Defra in 2023.

- The council is currently revising the taxi policy to include incentives to encourage drivers to switch to electric vehicles. This includes only licensing electric/hybrid vehicles from 2030. Due to vehicles generally having 15 years running age the Council is now actively encouraging drivers to go down the electric/hybrid route when they change vehicles. We will also be reviewing if offering lower fees to electric/hybrid vehicles will be achievable next year when fees are reviewed.

- To encourage active travel such as walking and cycling in the district, our planning policies have been updated regarding road infrastructure. We want to make sure that improved walking and cycling routes are accessible across Arun.

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 5.0, a slight decrease from last year's figure of 5.6 – this is lower than the National indicators for England, and the South East (5.4) and similar to the value of our neighbouring authorities (Worthing 5.3 and Chichester 5.0).

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 10.2 ug.m-3. This is below the current objective of 20 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 2022 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 2018 and 2022 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 Bureau Veritas, 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 2022. 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 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compares the ratified and adjusted monitored 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 2022 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. NO$_2$ levels in 2022 show an increase on levels from 2020 and 2021 as road traffic began to return to normal following strict covid-19 restrictions in 2020 and at the start of 2021. However, those sites which existed before 2020 show a reduction in NO$_2$ compared to 2018 levels with most sites also showing a reduction compared to 2019. Monitoring will continue at all sites in 2023 as traffic patterns begin to stabilise post pandemic. The monitoring network will be reviewed again at the end of 2023.

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 (Bus stop between train station and Albert Road)	Roadside	502568	102147	NO2	No	3.0	2.0	No	2.7
2	Worthing Road, Littlehampton (parallel to No. 1 Cornfield Close)	Roadside	503438	103365	NO2	No	7.0	2.0	No	2.8
8	Ford Road, Ford (opp Carleton Canine Centre on 40 mph sign)	Roadside	500297	104359	NO2	No	7.5	1.5	No	2.7
12	Chichester Road, Bognor (lamp post on junction with Town Cross Ave opp. car wash)	Roadside	493356	100090	NO2	No	0.5	1.5	No	2.8
13	Rowan Way,Bognor (Lampost A15 after Ash Grove	Roadside	493408	101228	NO2	No	14.8	1.3	No	2.7

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)
	but before the roundabout)									
16	The Causeway (hanging basket bracket on facia of 'Aundel Park Inn')	Roadside	502354	106527	NO2	No	0.0	8.1	No	2.3
17	Lyminster Road (BT post No. 741034 outside 'Coach House')	Kerbside	502865	105336	NO2	No	4.7	1.0	No	2.8
20	Barnham Road, Barnham (drain pipe of 2 Rose cottages/20 Barnham Road)	Roadside	495950	104396	NO2	No	0.0	1.5	No	2.3
21	Longford Road, Bognor (lamp post next to Reynolds Funeral Service)	Roadside	493371	099465	NO2	No	1.7	1.2	No	2.7
22	Lyminster Road, Littlehampton (Last lamp post on the left before train crossing)	Roadside	502746	103857	NO2	No	9.5	1.9	No	2.7
23	Queen Street, Arundel (Bus Stop just before Co-Op)	Roadside	502011	106929	NO2	No	1.7	3.2	No	2.7

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)
24	Ford Road, Arundel (lamp post left hand side on corner of penfolds place)	Roadside	501181	106638	NO2	No	4.2	4.5	No	2.7
25	Barnham Road,Barnham (Lamp post, left side of the road just past train station car park entrance)	Roadside	495772	104458	NO2	No	0.0	1.9	No	2.7
26	A29, Lidsey Road (Lamp post, left side of road opposite Price of Wales Pub)	Roadside	493801	104307	NO2	No	3.0	2.0	No	2.7
27	High Street, Bognor (down pipe outside Lloyds bank above cash point)	Urban Centre	493601	099012	NO2	No	0.0	6.6	No	2.7
28	Anchor Springs, Littlehampton (Lamp post opp. Bus stops)	Urban Centre	502888	102175	NO2	No	11.2	2.1	No	2.7
29	Mill Lane, Rustington (lamp post at entrance to Windmill pub car park)	Roadside	505605	102953	NO2	No	12.0	1.0	No	2.7

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 (1st lamp post after turning to south drive/ham manor. Best to park down this road)	Roadside	506003	103189	NO2	No	10.0	2.8	No	2.7
31	A259 Littlehampton Rd, Ferring (lamp post by bus stop just before Kilham Way)	Roadside	508900	103374	NO2	No	6.0	4.5	No	2.7
32	Old Worthing Rd, East Preston (lamp post on left just before the train crossing)	Roadside	507474	103002	NO2	No	12.5	1.0	No	2.7
33	Downs Way, East Preston (lamp post outside house no. 70)	Roadside	507040	103155	NO2	No	7.8	2.8	No	2.5
34	Station Rd, Angmering (sign post south of the train crossing, opp turning & same side as Co-Op)	Roadside	506480	102917	NO2	No	14.0	2.8	No	2.7

Notes:

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

Table A.2 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

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 2022 (%) [2]	2018	2019	2020	2021	2022
1	502568	102147	Roadside		100.0	23.0	20.1	15.7	18.0	20.5
2	503438	103365	Roadside		92.3	23.0	20.2	16.8	18.4	21.4
8	500297	104359	Roadside		100.0	18.0	15.2	12.4	13.0	13.8
12	493356	100090	Roadside		100.0	31.0	25.8	17.8	19.6	23.4
13	493408	101228	Roadside		100.0	28.0	24.1	19.9	21.1	26.5
16	502354	106527	Roadside		100.0	19.0	13.2	9.1	9.4	11.5
17	502865	105336	Kerbside		100.0	35.0	30.9	23.0	26.3	33.4
20	495950	104396	Roadside		100.0	20.0	18.5	12.9	13.9	16.0
21	493371	099465	Roadside		100.0	29.0	25.5	19.2	21.2	24.6
22	502746	103857	Roadside		100.0			17.6	19.8	21.8
23	502011	106929	Roadside		100.0			13.8	13.7	16.1
24	501181	106638	Roadside		100.0			15.5	16.7	18.8
25	495772	104458	Roadside		100.0			14.8	14.8	18.0

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 2022 (%) [2]	2018	2019	2020	2021	2022
26	493801	104307	Roadside		100.0			14.9	15.0	18.6
27	493601	099012	Urban Centre		100.0			14.8	15.0	18.7
28	502888	102175	Urban Centre		100.0			12.4	13.9	15.6
29	505605	102953	Roadside		100.0			17.8	20.0	21.3
30	506003	103189	Roadside		100.0			23.3	22.4	24.7
31	508900	103374	Roadside		100.0			13.8	14.8	16.7
32	507474	103002	Roadside		100.0			15.6	16.8	16.2
33	507040	103155	Roadside		100.0			11.6	13.5	13.6
34	506480	102917	Roadside		100.0			13.4	13.7	15.5

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **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 $\mu g/m^3$.

Exceedances of the NO_2 annual mean objective of $40\mu g/m^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu g/m^3$, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **<u>bold and underlined</u>**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 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 NO₂ Concentrations

NO₂ Annual Mean Concentration 2018-2022
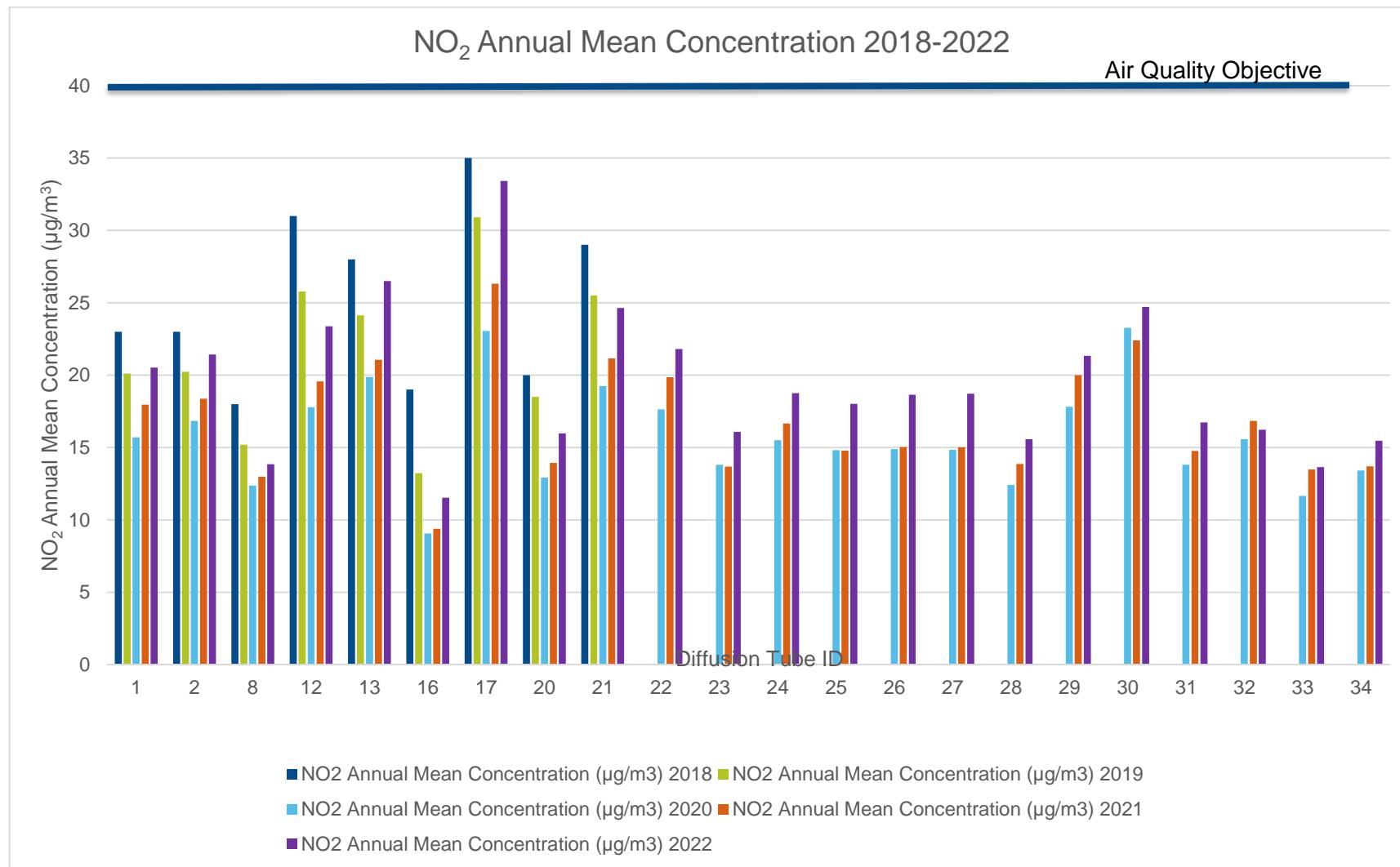
Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO₂ 2022 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	502568	102147	47.6	25.8	33.3	27.5	12.4	22.6	23.8	24.0	26.5	22.3	29.1	29.2	27.0	20.5	-	
2	503438	103365	36.5	20.7	NR	24.2	25.5	24.0	29.3	30.4	27.9	28.4	31.3	31.8	28.2	21.4	-	
8	500297	104359	22.1	18.5	16.6	18.3	17.2	16.3	15.1	19.7	17.1	17.4	19.8	20.3	18.2	13.8	-	
12	493356	100090	43.7	24.8	46.3	33.7	26.7	13.4	28.8	35.0	30.4	22.9	29.1	34.2	30.8	23.4	-	
13	493408	101228	52.7	31.2	40.5	36.6	28.5	28.3	32.4	36.7	36.1	28.8	29.1	37.4	34.9	26.5	-	
16	502354	106527	23.0	13.3	18.9	15.2	13.3	11.6	14.6	16.3	13.7	11.7	11.5	18.9	15.2	11.5	-	
17	502865	105336	55.1	38.8	49.7	46.0	37.6	41.0	43.8	47.4	46.8	31.2	40.9	49.4	44.0	33.4	-	
20	495950	104396	33.5	19.9	25.1	19.7	19.3	16.2	18.5	21.0	21.0	19.6	20.0	18.3	21.0	16.0	-	
21	493371	099465	44.3	29.5	31.3	31.2	30.4	29.5	27.3	30.7	30.1	31.6	31.8	41.3	32.4	24.6	-	
22	502746	103857	40.5	32.5	32.1	27.9	22.1	24.4	24.6	27.3	24.7	23.9	29.9	34.3	28.7	21.8	-	
23	502011	106929	29.1	24.8	21.8	18.9	19.5	11.6	21.0	21.3	17.2	20.1	24.1	24.5	21.2	16.1	-	
24	501181	106638	37.7	24.9	30.2	23.2	19.5	18.7	20.5	24.0	22.3	22.8	24.6	27.8	24.7	18.8	-	
25	495772	104458	38.7	25.6	23.4	21.3	23.2	18.0	19.2	20.4	22.2	18.8	27.1	26.4	23.7	18.0	-	
26	493801	104307	33.1	21.3	32.0	24.1	21.6	20.5	22.0	24.8	24.2	21.8	18.3	30.7	24.5	18.6	-	
27	493601	099012	33.0	21.6	30.2	24.7	23.7	21.1	24.8	22.6	19.1	21.8	23.2	29.8	24.6	18.7	-	
28	502888	102175	36.6	22.9	27.4	20.0	17.6	15.5	16.8	18.2	17.8	16.9	8.3	28.0	20.5	15.6	-	
29	505605	102953	43.7	28.4	29.3	27.0	25.2	23.2	24.0	25.6	24.8	25.2	27.8	32.8	28.1	21.3	-	
30	506003	103189	34.7	38.3	27.9	29.1	31.5	29.4	32.1	29.5	25.1	33.1	41.4	38.2	32.5	24.7	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
31	508900	103374	39.3	19.8	27.8	23.4	18.0	14.5	18.1	21.4	21.1	18.4	19.8	22.6	22.0	16.7	-	
32	507474	103002	33.8	15.6	26.9	25.0	16.9	17.7	19.7	21.4	23.2	19.5	12.6	23.9	21.4	16.2	-	
33	507040	103155	33.3	15.6	23.6	16.4	12.7	11.6	13.0	14.2	16.6	14.6	19.6	24.2	18.0	13.6	-	
34	506480	102917	30.9	19.4	23.8	20.5	18.2	15.2	17.4	18.7	18.2	17.2	20.0	24.6	20.3	15.5	-	

☒ **All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☐ **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 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

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 2022

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 were either in the planning or construction phase during 2022 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 has been put on hold for a number of years, 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 new monitoring sites were set up in 2020 in these areas to monitor any changes. Data to date does not suggest any concerns but will have been affected by Covid restrictions in 2020 and 2021. The data from 2022 presented here is the first not to have been affected by restrictions but travel patterns have not returned to those seen in 2019.

The Council was consulted in 2022 on proposals to site a new energy from waste incinerator at Ford which could impact air quality but has not yet been approved 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 is currently under construction and due to open in 2023 and a planning approval was recently granted for a small waste incineration plant in Ford. 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 2022

Arun District Council has not completed any additional works within the reporting year of 2022.

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.

In January 2022 Arun District Council changed the laboratory that provides and analyses its NO_2 diffusion tubes. SOCOTEC has taken over this role from South Yorkshire Air Quality Samplers which closed at the end of 2021. The NO_2 tube preparation method used is 50% triethanolamine (TEA) in acetone. The samples have been analysed in accordance with SOCOTEC's standard operating procedure ANU/SOP/1015. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance. This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of their UKAS schedule. In the AIR PT intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a **Satisfactory** laboratory.

Monitoring was completed in adherence with the 2022 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Arun recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 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.TG22 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 0.76 to the 2022 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 SOCOTEC in 2022 of 0.76 based on 26 studies. 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: 03/23

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.76
2021	National	03/22	0.77
2020	National	06/21	0.77
2019	National	03/20	0.78
2018	National	03/19	0.95

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been 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.

No diffusion tube NO_2 monitoring locations within Arun required distance correction during 2022.

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

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

**Figure D.2 – Map of Non-Automatic Monitoring Sites – Barnham and Ford**
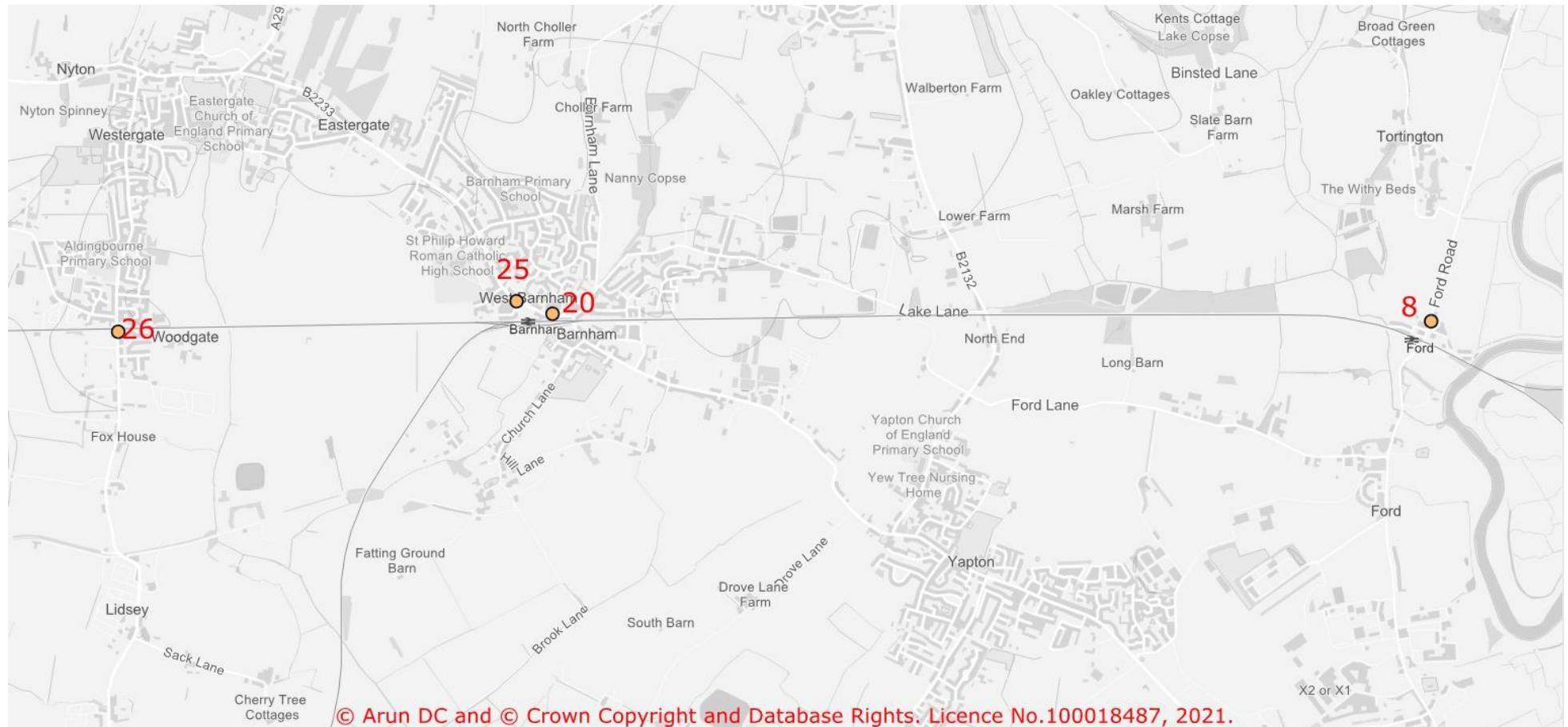
**Figure D.3– Map of Non-Automatic Monitoring Sites – Bognor Regis**
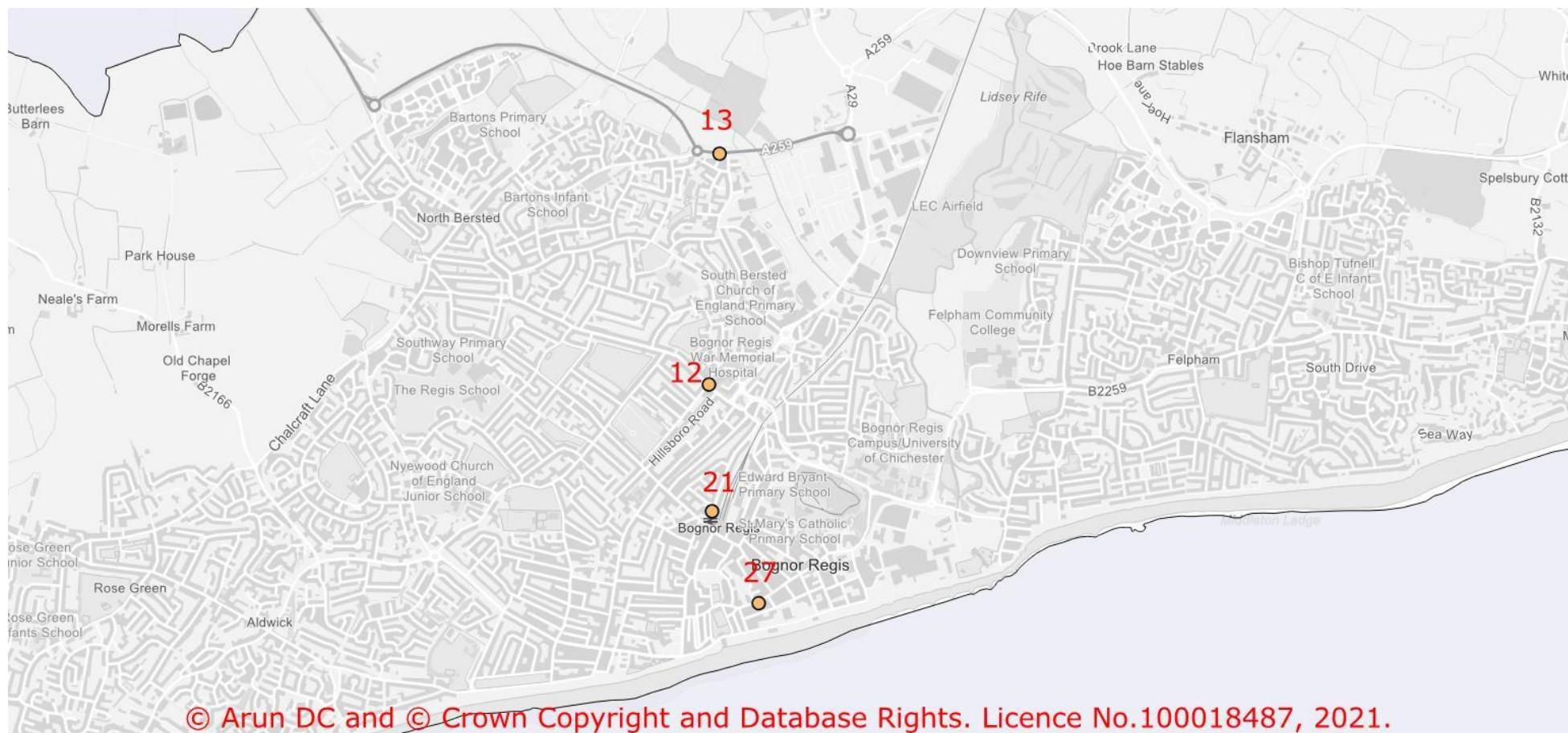
Figure D.4– Map of Non-Automatic Monitoring Sites – Littlehampton and Angmering

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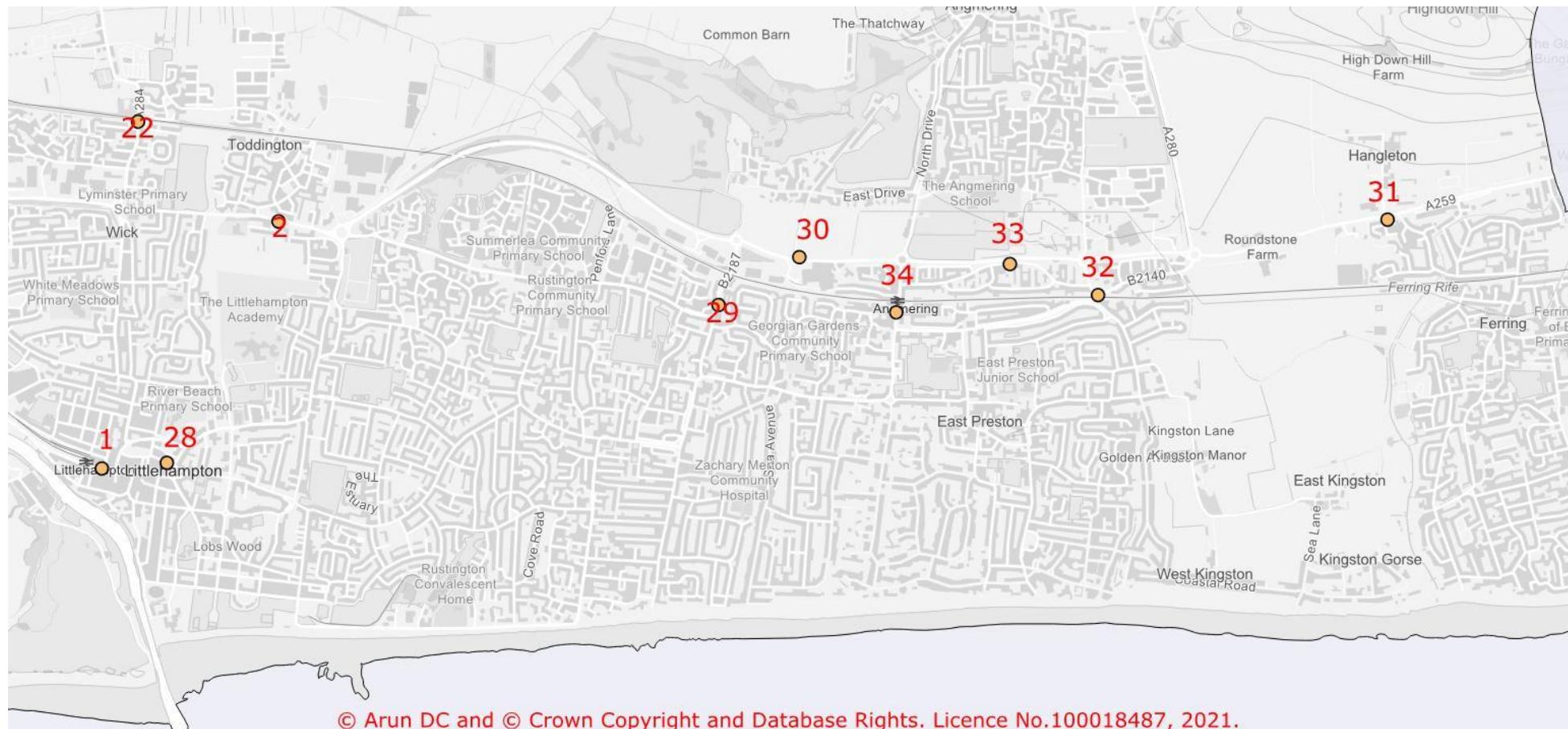
Appendix E: Summary of Air Quality Objectives in England

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

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[7] 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	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
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.TG22. August 2022. 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.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.