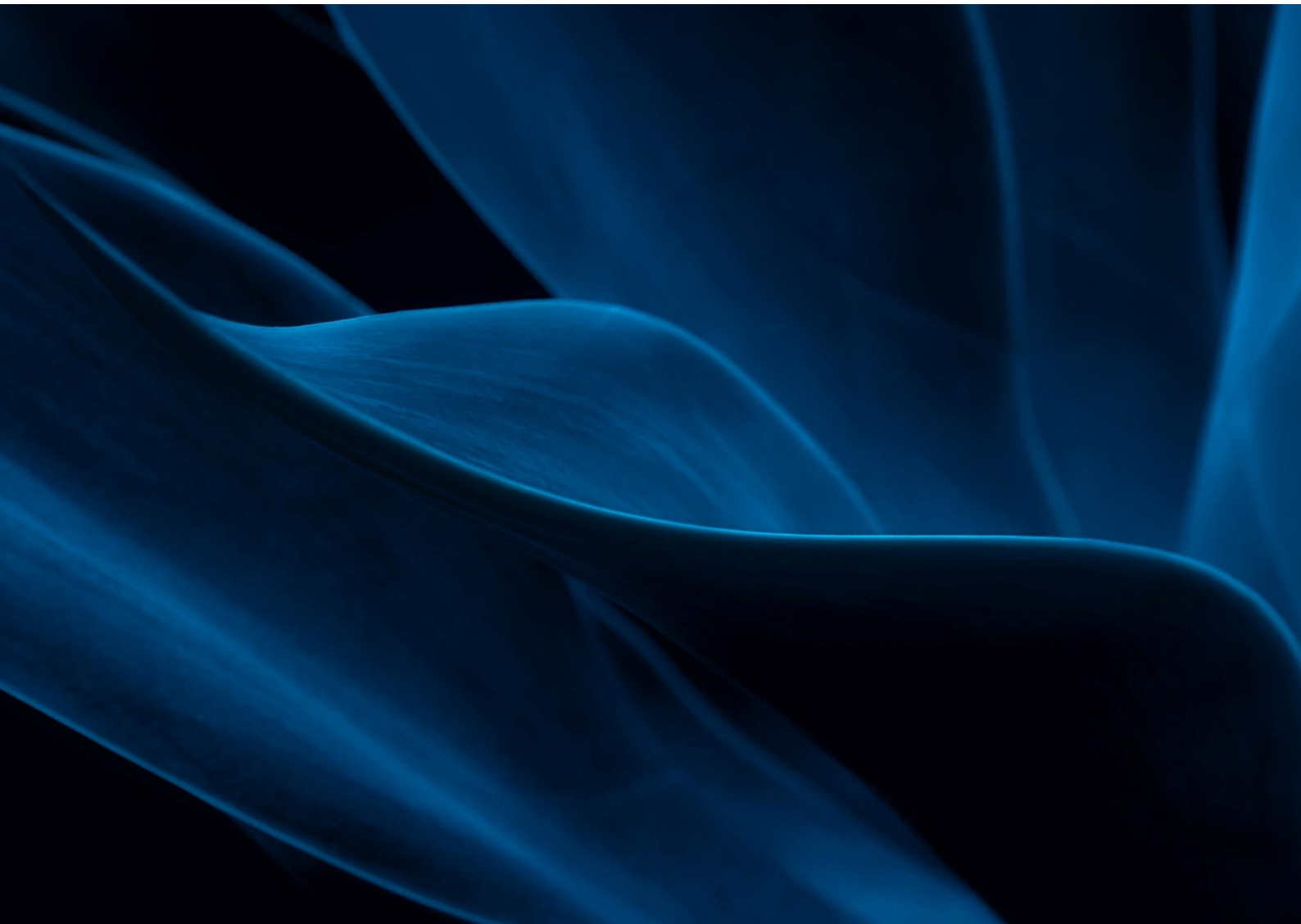
Sussex Air Quality Partnership

Sussex Annual Air Quality Monitoring Report 2024

April 2025



Document Control Sheet

Identification	
Client	Sussex Air Quality Partnership / East Sussex County Council
Document Title	Sussex Annual Air Quality Monitoring Report 2024
Client Reference	Contract Reference: Sussex Air Quality Network Contract
Bureau Veritas Ref No.	AIR13115731 – Sussex Air Quality Network Annual Report 2024

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Configuration				
Version	**Date**	**Author**	**Reason for Issue/Summary of Changes**	**Status**
1.0	April 2025	N Jenkins	First Issue	Issued to client
1.1	April 2025	N Jenkins	Second Issue – NO_2 averaging error correction	Issued to client

	Name	Job Title	Signature
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Glossary of Terms

AQMS	Air Quality Monitoring Station (cabin)
AQO	Air Quality Objectives for UK
AQS	Air Quality Strategy for UK
AURN	Automatic Urban and Rural Network - UK national air quality monitoring network
BV	Bureau Veritas (acting as CMCU)
DAQI	Daily Air Quality Index
Defra	Department for Environment Food and Rural Affairs
LAQM PG(22)	Local Air Quality Management Policy Guidance 2022
LAQM TG(22)	Local Air Quality Management Technical Guidance 2022
NO_2	Nitrogen Dioxide
$PM_{2.5}$	Particulate Matter 2.5 microns in diameter or smaller (mass)
PM_{10}	Particulate Matter
QA/QC	Quality Assurance and Quality Control unit for the AURN
SAQN	Sussex Air Quality Network
SO_2	Sulphur Dioxide
Sussex-air	Sussex Air Quality Partnership
$\mu g/m^3$	micrograms per cubic metre – concentration of a pollutant in air
UK-AIR	Defra UK Air Quality information website https://uk-air.defra.gov.uk/
WHO	World Health Organization

Sussex Air Quality Network Annual Report 2024: Executive Summary

Bureau Veritas UK Ltd are contracted by East Sussex County Council on behalf of the Sussex local authorities (who collectively form the Sussex Air Quality Partnership (Sussex-air)), to manage, provide support and report on air quality monitoring data collected from the Sussex Air Quality Network.

This report provides an overview of the monitoring data collected from the Sussex Air Quality Network air quality monitoring stations (AQMS) during 2024.

The Network

The Sussex Air Quality Network is made up of local authority (LA) owned AQMSs and additional stations that are in the UK Automatic Urban and Rural Network (AURN), the latter of which are operated by the Environment Agency on behalf of Defra. By the end of 2024 there were fourteen (14) LA owned AQMSs in the network with an additional six (6) national AURN stations also providing data to the network.

Data capture

Overall, the data capture was excellent across the Sussex authority owned AQMS during 2024. All the Sussex owned stations achieved high data capture rates above 90%, with only those AQMS which did not monitor for the full year not achieving the 90% data capture rates. Those new AQMS or monitoring instruments added to the Sussex Network during 2024 were: Brighton - Lewes Road, A270 (BH11), Brighton - Hollingdean Road (BH12) and the Horsham - Cowfold (HO5) $PM_{2.5}$ instrument.

Compliance with Local Air Quality Management Air Quality Objectives

The Local Air Quality Management (LAQM) statutory pollutants that each local authority is required to report and act on were compliant with their relevant Air Quality Objectives (AQOs). There were no exceedances of the long-term or short-term AQOs for particulate matter (PM_{10}), nitrogen dioxide (NO_2) or sulphur dioxide (SO_2).

Compliance with National Air Quality Standards

There are other pollutants which are monitored in Sussex that have national focus, these are $PM_{2.5}$ and Ozone (O_3). $PM_{2.5}$ measurements across Sussex in 2024 showed that there were no sites above the interim 2028 target of 12 µg/m³ and the 2040 annual mean target of 10 µg/m³. The national O_3 standard (8-hour mean of 100µg/m³ not to be exceeded more than 10 times a year) was however breached at one Sussex network location, Eastbourne- Devonshire Park AQMS.

Trends in Annual Mean Concentrations across Sussex

The annual mean concentrations for NO_2, PM_{10}, SO_2 $PM_{2.5}$ and O_3 showed a general levelling-off in concentrations from 2020 – 2024. None of the Sussex AQMS locations breached the annual LAQM AQO values for any pollutant.

WHO guideline values

A comparison of measured air pollutant concentrations at the Sussex Network stations to the World Health Organization (WHO) Guideline values is provided in the 2024 report. Note that the WHO guideline values are stricter than the UK AQO and national limit values and are not required to be reported against as part of the LAQM regime. WHO guideline values were exceeded at the majority of AQMS monitoring PM_{10}, $PM_{2.5}$, O_3 and NO_2. The Sussex sites which exceeded the WHO guideline values are presented in Section 6.

Occurrences of High and Moderate pollution days

2024 was dominated by ‘low’ air pollution days (Daily Air Quality Index (DAQI) 1 - 3) across the year. Only the following locations recorded ‘moderate’ (DAQI level 4 - 6) days across the Sussex AQMSs: Eastbourne - Devonshire Park (EB1) for 8 days, Hastings - Bexhill Rd, Bulverhythe (HT1) for 1 day, Horsham - Park Way, Horsham (HO2) for 1 day and Lewes - Little East Street, Lewes (LS8) for 1 day. No Sussex AQMS measured ‘high’ or ‘very high’ days during 2024.

1 Sussex Air Quality Partnership and Network

The Sussex Air Quality Network ("the network") was established in 1995 to support the local authorities (LAs) across Sussex in their duties to monitor and report air quality under the Local Air Quality LAQM framework requirements as set out under Part IV of the Environment Act 1995.

The network was developed by the Sussex Air Quality Partnership ("Sussex-air"), which is made up from the Sussex LAs and Public Health bodies. The members of Sussex Air Quality Partnership are:

Adur District Council	Horsham District Council
Arun District Council	Mid Sussex District Council
Brighton and Hove City Council	Lewes District Council
Chichester District Council	Rother District Council
Crawley Borough Council	Wealden District Council
Eastbourne Borough Council	West Sussex County Council
East Sussex County Council	Worthing Borough Council
Hastings Borough Council	

1.1 Sussex Air Quality Network

The Partnership has developed a comprehensive regional monitoring network, which at the end of 2024 consisted of fourteen (14) continuous air quality monitoring stations (AQMS). The network also presents air quality data from six (6) national Automatic Urban and Rural Network (AURN) AQMS that are in Sussex. This enhanced the network to a total of twenty (20) locations where air quality is continuously monitored across Sussex.

The Sussex Network site information and location map of all the Sussex AQMS are presented in Appendix 4. The full list of pollutants measured at each site Sussex and AURN site are provided in Table A4 1: Sussex Air Quality Network sites and Pollutant instrumentation list (2024).

All live monitoring data is provided on the Sussex-air website: https://sussex-air.net/air-quality-near-me/. All historical AQMS locations, information and monitoring data back to 2009 is provided on the Sussex-air website: https://sussex-air.net/air-quality-near-me/historical-monitoring-data/.

The Sussex-air website also provided health information and the Sussex-wide air pollution forecasting and alert service during 2024. This service supported vulnerable persons and the public with pollution alerts direct to the subscriber. Air pollution forecasts are shown on the homepage https://sussex-air.net/

Bureau Veritas manages the Sussex Air Quality Network and hosts the Sussex-air website (www.sussex-air.net) on behalf of the Sussex Air Quality Partnership.

1.2 Purpose of the Annual Report

The Annual report provides the overall summary of air quality measurements across Sussex provided by the Sussex authorities. The purpose of the report is to provide data and relevant statistics to support the Local Authorities to comply with their LAQM framework requirements. The report focuses on the Sussex owned and managed AQMS data but also provides supporting data from AURN AQMS which operate in Sussex.

2 Air Quality Legislation, Standards and WHO Guidelines

2.1 Local Air Quality Management (LAQM)

The Local Air Quality Management (LAQM) framework requirements were set out under Part IV of the Environment Act 1995. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether the air quality objectives are likely to be achieved.

Policy and Technical guidance were produced to support local authorities in their duties to comply with the LAQM regime. The latest LAQM Policy (LAQM PG(22) and Technical Guidance (LAQM TG(22)) produced in 2023 provide the most recent policy and technical support for the assessment of air quality for local authorities.

At the core of LAQM delivery are three pollutant objectives; these are: Nitrogen Dioxide (NO_2), Particulate Matter less than 10 micrograms per cubic metre (PM_{10}) and Sulphur Dioxide (SO_2). LAQM PG(22) and LAQM TG(22)) also provides further detail on the focus of actions for local authorities to measure and report against national targets for Particulate Matter less than 2.5 micrograms per cubic metre ($PM_{2.5}$). Ozone (O_3) is not included under the LAQM regime but is pollutant of concern at national level, hence there is no reporting requirement by local authorities.

2.2 Air Quality Standards Regulations

In the UK, concentrations of key pollutants in outdoor air are regulated by the Air Quality Standards Regulations 2010, the Air Quality Standards (Wales) Regulations 2010, the Air Quality Standards (Northern Ireland) 2010 and the Air Quality Standards (Scotland) Regulations 2010.

These Regulations seek to control human exposure to pollutants in outdoor air to protect human health and the environment by requiring concentrations to be within specified limit values. In the event of exceedances, the Regulations require the publication of Air Quality Plans setting out "appropriate measures" that will ensure that the exceedance period is kept "as short as possible".

These Regulations set:

- Legally binding limits for concentrations in outdoor air of major air pollutants that impact public health: sulphur dioxide, nitrogen oxides, particulate matter (as PM_{10} and $PM_{2.5}$), lead, benzene, carbon monoxide and ozone.
- Targets for levels in outdoor air for four elements; cadmium, arsenic, nickel and mercury, together with polycyclic aromatic hydrocarbons (PAH).

These Air Quality Standards Regulations set 'limit values', 'target values' and 'long-term objectives' for ambient concentrations of the pollutants listed above. More information on these values and how they differ can be found on the UK Air Quality Limits page and are set-out in Appendix 1 and Table A1-1 and Table A1-2.

2.3 Air Quality Strategies and 25 Year Environment Plan

The importance of existing and future air quality can be assessed in relation to the national air quality standards and objectives established by Government. The Air Quality Strategy (AQS)[1] provides the over-arching strategic framework for air quality management in the UK and contains national air quality standards and objectives established by the UK Government and Devolved Administrations to protect human health. The updated strategy for England " Air quality strategy: framework for local authority delivery[2]" (Aug 2023) This document provides the strategic framework for local authorities

[1] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007), Published by Defra in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland.

[2] https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery

and other partners and sets out their powers, responsibilities, and further actions the government expects them to take.

The Clean Air Strategy 2019 provided a more focused strategy on $PM_{2.5}$; linkages with Net Zero goals and a re-focus on other pollutants that remain challenging from a compliance or health perspective. This was followed up by the 25 Year Environment Plan (2024) "*A Green Future: Our 25 Year Plan to Improve the Environment*". The 25 Year Environment Plan included a 25-year goal of "clean air" amongst other objectives and supporting policies.

2.4 The Environment Act 2021

The Environment Act 2021 established a legally binding duty on Government to set an annual mean target on the level of fine particulate matter ($PM_{2.5}$), in addition to a longer-term target, by 31st October 2024 for England. The Act states:

> "*Whilst the responsibility for meeting the $PM_{2.5}$ targets sits with national government; local authorities have a role to play in delivering reductions in $PM_{2.5}$."* and
>
> *"Local authorities in England will need to work towards reducing $PM_{2.5}$ in their area. Action to tackle PM_{10}/NOx can be expected to contribute towards this."*

2.5 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 sets the target to ensure that the annual mean concentration of $PM_{2.5}$ in ambient air is equal to or less than 10 micrograms per cubic metre (µg/m^3) by 31st December 2040. There is also an interim annual average target of 12 µg/m^3 for $PM_{2.5}$ is not exceeded at any monitoring station by January 2028. The annual Environmental Improvement Plans for England set out the basis of progress against the targets and provides a review each year to track progress towards all Environment Act 2021 targets.

2.6 World Health Organization (WHO) Guidelines

The World Health Organization (WHO) provides air quality guideline (AQG) values for a range of pollutants which was updated in September 2021 (WHO global air quality guidelines (Sept 2021)). The pollutants of concern include particulate matter of a diameter equal or smaller than 10µm (PM_{10}) or equal or smaller than 2.5µm ($PM_{2.5}$), ozone (O_3) nitrogen dioxide (NO_2) and sulphur dioxide (SO_2). The WHO guideline values are provided in Appendix A2, Table A2-1.

The WHO global air quality guidelines aim to protect populations from the adverse effects of air pollution. They are designed to serve as a global reference for assessing whether, and how much, exposure of a population (including particularly vulnerable and/or susceptible subgroups) to various levels of the considered air pollutants results in health concerns.

WHO highlighted the key facts on why air pollution is one of the greatest global environmental risks:

- In 2019, 99% of the world's population was living in places where the WHO air quality guidelines levels were not met.
- The combined effects of ambient air pollution and household air pollution are associated with 6.7 million premature deaths annually.
- Ambient (outdoor) air pollution is estimated to have caused 4.2 million premature deaths worldwide in 2019.
- Some 89% of those premature deaths occurred in low- and middle-income countries, and the greatest number in the WHO South-East Asia and Western Pacific Regions.

3 Sussex Air Quality Network Performance

3.1 Sussex Network Data Reviews

Data from the Sussex Air Quality Monitoring Network is reviewed and goes through a thorough data validation process to provide confidence in data reported from air quality instruments to the Sussex-Air website.

As the Sussex network provides data from both local authority (LA) owned air quality monitoring stations (AQMS) and the UK national Automatic Urban and Rural Network (AURN) AQMS, it is important to understand and distinguish the differences in the quality of data provided by each type of station. The process of data collection, review and verification (also termed as ratification) can be complex and has numerous influencing factors, on which ultimately the reporting of a final data set is dependent.

3.2 Quality Assurance and Quality Control (QA/QC) and Data Sources

Within the Sussex network it should be recognised that there are two separate QA/QC regimes in operation, these are:

3.2.1 AURN sites - formal ISO 17025 QA/QC

- For the AURN sites, initial data is termed as “provisional” data, then moves to “verified” data on a quarterly basis (in arrears) across an operating year, after QA/QC audits and data ratification reviews. All AURN data and status are available on UK-AIR https://uk-air.defra.gov.uk/ and should always be referenced as the source of AURN data.

- AURN site data are ratified under a separate national network contract, as such the data and data capture rates that are presented in this 2024 report are provided from the data sets available on UK-AIR at the time of publishing. AURN data is ratified independently by the AURN QA/QC unit and as a result may change after this report is published.

3.2.2 Sussex LA sites – reviews of ‘approved’ data

- The Sussex LA AQMS have no QA/QC audits, therefore reference to different status is made to differentiate this with the AURN data. Initial data collected from the AQMS are still termed “provisional” data which is provided in near real-time on the Sussex-air website. Quarterly reviews of the data are undertaken to identifying any short and long-term issues and trends. This is followed by an annual data review to provide the final annual “approved” data set published in May of each year on Sussex-air. Data quality is made in the absence of any QA/QC audits.

3.3 Sussex Network Data Capture Rates

All the Sussex owned sites achieved high data capture rates above 90% with only those AQMS which did not monitor for the full year not achieving the 90% data capture rates. The Sussex authorities are not responsible for the AURN data capture rates, however all those sites operating over the full calendar year achieved >90% data capture. Only the AURN Worthing Ten Acres AQMS was below the 90% threshold as it did not start operationally monitoring until September 2024.

AURN site data are ratified under a separate national network contract and data capture rates are provided from the data sets available on UK-AIR at the time of publishing.

Complete data capture rates for each AQMS site are presented in Table 3-1. The data capture rates are presented for the pollutant instrumentation used at each site as well as the average data capture percentage for the AQMS. These results reflect the data capture for each instrument over a calendar year. Instruments that were introduced during the year are also provided in (brackets). However, if these instruments were not in the network for more than 75% of the year, then these data are excluded from the average (Avg.) data capture values.

Low data capture rates can also be caused by a variety of reasons including:

- analyser or logging system issues;
- on-site communications problems;
- interruptions in power supply to the monitoring stations;
- environmental site issues such as flooding or leaks; or
- routine maintenance or calibration visits undertaken by local site operators (LSO) or their equipment support unit (ESU).

3.4 Data Capture Statistics

Data capture results for all AQMS in Sussex, including the AURN sites are presented in Table 3-1. These results reflect the data capture for each instrument over a calendar year and the average (Avg.) data capture values reflecting the overall performance of the AQMS.

Overall, all Sussex Network AQMS (non-AURN) achieved >90% data capture during 2024. Only one (1) instrument did not achieve the 90% data capture rate, this was the $PM_{2.5}$ at Hastings - Bexhill Rd, Bulverhythe which recorded 88.4% data capture.

Other AQMS on the network Instruments that were introduced or withdrawn to the network during the year are also provided in the Table with the exception of Lewes Newhaven (LS7) AQMS which was not operational during 2024.

Table 3-1 :Data capture rates (%) per pollutant and the AQMS for 2024.

Site ID	Site Name	NO_x	NO	NO_2	PM_{10}	$PM_{2.5}$	O_3	SO_2	Avg.
AD1	Adur - Shoreham-by-sea	97.7	97.7	97.7		99.6			98.2
BH10	Brighton - North Street	99.6	99.6	99.6		99.9			99.7
BH11	Brighton - Lewes Road, A270	(73.9)	(73.9)	(73.9)	(71.2)	(71.1)			N/A
BH12	Brighton - Hollingdean Road	(46.1)	(46.1)	(46.1)				(45.6)	N/A
CI1	Chichester - A27 Chichester Bypass	96.5	96.4	96.4	94.6	97.2			96.2
CI5	Chichester - Westhampnett Road	97.0	97.0	97.0					97.0
CA2	Crawley - Gatwick Airport	(29)	(29)	(29)	(29.9)	(29.9)			N/A
EB1	Eastbourne - Devonshire Park	99.9	99.9	99.9	96.3		98.3		98.9
HT1	Hastings - Bexhill Rd, Bulverhythe	94.6	94.6	94.6	95.4	88.4			93.5
HO5	Horsham - Cowfold	95.5	95.5	95.5		(13.1)			95.5
HO2	Horsham - Park Way, Horsham	92.9	92.9	92.9	99.6				94.6
LS8	Lewes – Little East Street, Lewes	98.9	98.9	98.9	95.6	99.1			98.3
MS1	Mid Sussex - London Road, East Grinstead	97.9	97.9	97.9	99.3				98.3
RY2	Rother - De La Warr Road, Bexhill	95.7	95.7	95.7	91.9	91.8			94.2
EB3	AURN – Eastbourne, Holly Place	86.0	86.6	86.0	99.9	99.9	98.6		92.8
LL1	AURN - Lullington Heath	95.7	95.7	95.7	99.4	99.4	93.4	83.0	94.6
BH0	AURN - Preston Park, Brighton	99.1	99.1	99.1	(35.6)	86.2	98.1		96.3
HO4	AURN - Storrington	96.7	96.7	96.7	(50.2)	(50.2)			96.7
WT2	AURN - Worthing A27 Grove Lodge	99.4	99.4	99.4		94.2			98.1
WT3	AURN - Worthing East Ten Acres				(36.5)	(36.5)			N/A

Note: Data in (brackets) are data below 75% data capture rates.

3.4.1 Sussex Network AQMS Data Capture Review

There were five (5) Sussex network AQMS or instruments with low data capture rates, as seen in Table 3-1. Table 3-2 below provides the summary of reasons as to why these sites had low data capture rates during 2024. It also provides information on the AURN AQMS for comparison.

The AURN AQMS data capture rates are also provided for reference. These data capture rates were those rates that were available on UK-AIR at the time of publishing.

Table 3-2 : AQMS or instrumentation reduced data capture reasons (2024).

ID	Site name	Pollutant	Comment
HT1	Hastings - Bexhill Rd, Bulverhythe	$PM_{2.5}$	The $PM_{2.5}$ instrument had a reduced data capture rate due to faulty met sensor.
BH11	Brighton - Lewes Road, A270	NO_2, $PM_{2.5}$,PM_{10}	New site introduced May 2024.
BH12	Brighton - Hollingdean Road	NO_2, SO_2	New site introduced September 2024.
CA2	Crawley - Gatwick Airport	AQMS	AQMS withdrawn from the network in June 2024. This was due to local power connection issues at the location. Data capture rates are included for this site, however as there was only 5 months of data available over the year, it was below the 75% data capture rate threshold.
HO5	Horsham - Cowfold	NO_2, $PM_{2.5}$	NO_2 instrument was removed on 18th Dec 2024 and $PM_{2.5}$ introduced 19th Nov 2024.
LS7	Lewes – Newhaven	AQMS	AQMS continued to be off-line during 2024 as it was to relocate to a new site within Newhaven, which has yet to have power provided to it. It is expected to be online in early 2025.
BH0	AURN - Preston Park, Brighton	PM_{10}	Instrument installed from August 2024 (Fidas)
WT3	AURN - Worthing East Ten Acres	$PM_{2.5}$,PM_{10}	New AURN AQMS introduced on 24th August 2024 (Fidas).
HO4	AURN - Storrington	$PM_{2.5}$,PM_{10}	Fidas instrument affiliated to AURN 1st July 2024.

4 Annual statistics for 2024

4.1 Annual Mean Data for All Sussex Sites

Table 4-1 provides annual mean pollutant concentration results for 2024.

Table 4-1: Annual mean concentrations (µg/m³) for all pollutants in 2024

Site ID	Site Name	NO_2	PM_{10}	$PM_{2.5}$	O_3	SO_2
AD1	Adur - Shoreham-by-sea	18.2		8.2		
BH10	Brighton - North Street	26.3		8.3		
BH11	Brighton - Lewes Road, A270	(32.9)	(14.4)	(8.4)		
BH12	Brighton - Hollingdean Road	(24.6)				(0.9)
CI1	Chichester - A27 Chichester Bypass	20.2	14.9	8.3		
CI5	Chichester - Westhampnett Road	19.1				
CA2	Crawley - Gatwick Airport	(17)	(12.4)	(7.5)		
EB1	Eastbourne - Devonshire Park	9.2	17.0		61.7	
HT1	Hastings - Bexhill Rd, Bulverhythe	9.5	18.9	8.9		
HO5	Horsham - Cowfold	16.2		(7.6)		
HO2	Horsham - Park Way, Horsham	15.7	16.1			
LS8	Lewes – Little East Street, Lewes	12.8	13.3	7.5		
MS1	Mid Sussex - London Road, East Grinstead	19.0	16.1			
RY2	Rother - De La Warr Road, Bexhill	11.4	15.7	8.0		
EB3	AURN – Eastbourne, Holly Place	8.9	10.7	6.7	58.1	
LL1	AURN - Lullington Heath	4.8	10.3	6.4	61.6	0.5
BH0	AURN – Brighton, Preston Park	10.1	(11.6)	8.1	50.8	
HO4	AURN - Storrington	16.6	(12.2)	(6.7)		
WT2	AURN - Worthing A27 Grove Lodge	21.7		7.6		
WT3	AURN - Worthing East Ten Acres		(14.6)	(8.6)		

Notes: Particulate data is corrected to gravimetric equivalent measurement values. All corrections are applied for the instrument type and size fraction measured. Data in (brackets) is data below 75% data capture rates

The Volatile Correction Method (VCM) was not used at the Sussex TEOM sites (MS1 and BH10),as no localised FDMS 8500 series instruments were available in the region to make the correction calculations. The standardised 1.3 multiplier correction factor was used instead.

All AURN data is reported from UK-Air. Data from AURN sites may differ from these reported, see Section 3.2.

5 Air Quality Strategy Objectives and Targets

The following data presented in the following tables compare Sussex monitoring results with the Government's AQS Objectives for 2024. There is often more than one Air Quality Objective (AQO) per pollutant reflecting the differing health effects of short and long-term exposure. The AQOs are set out in Appendix 1. Where a site did not achieve a minimum of 75% data capture for the year, the measurements cannot be accurately compared to the AQOs and are entered as 'not applicable' (N/A).

5.1 Nitrogen Dioxide (NO_2)

Table 5-1 provides a comparison of NO_2 annual mean concentrations and 1-hour mean with the AQOs for 2024 and shows whether an AQMS achieved the objective, i.e. under the objective (Yes) or not (No).

Table 5-1: 2024 NO_2 Comparison with Air Quality Objectives.

Site ID	Site Name	Annual mean (µg/m³) 40µg/m³	Achieved (Yes/No)	1-hour mean 200 µg/m³ not to be exceeded more than 18 times per year	Achieved (Yes/No)
AD1	Adur - Shoreham-by-sea	18.2	Yes	0	Yes
BH10	Brighton - North Street	26.3	Yes	0	Yes
BH11	Brighton - Lewes Road, A270	(32.9)	N/A	(1)	N/A
BH12	Brighton - Hollingdean Road	(24.6)	N/A	(0)	N/A
CI1	Chichester - A27 Chichester Bypass	20.2	Yes	0	Yes
CI5	Chichester - Westhampnett Road	19.1	Yes	1	Yes
CA2	Crawley - Gatwick Airport	(17.0)	N/A	(0)	N/A
EB1	Eastbourne - Devonshire Park	9.2	Yes	0	Yes
HT1	Hastings - Bexhill Rd, Bulverhythe	9.5	Yes	0	Yes
HO5	Horsham - Cowfold	16.2	Yes	0	Yes
HO2	Horsham - Park Way, Horsham	15.7	Yes	0	Yes
LS8	Lewes – Little East Street, Lewes	12.8	Yes	0	Yes
MS1	Mid Sussex - London Rd, E Grinstead	19.0	Yes	1	Yes
RY2	Rother - De La Warr Road, Bexhill	11.4	Yes	0	Yes
EB3	AURN – Eastbourne, Holly Place	8.9	Yes	0	Yes
LL1	AURN - Lullington Heath	4.8	Yes	0	Yes
BH0	AURN – Brighton, Preston Park	10.1	Yes	0	Yes
HO4	AURN - Storrington	16.6	Yes	0	Yes
WT2	AURN - Worthing A27 Grove Lodge	21.7	Yes	0	Yes

Note: Data in (brackets) is data below 75% data capture rates.

All Sussex Network AQMS were below the annual mean and 1-hour mean AQO.

5.2 Particulate matter (PM_{10})

Table 5-2 provides a comparison of PM_{10} annual mean concentrations and 24-hour mean with the AQOs for 2024 and shows whether the location achieved the objective, i.e. under the objective (yes) or not (no).

Table 5-2: PM_{10} Comparison with Air Quality Objectives

Site ID	Site name	Annual mean (µg/m³) 40 µg/m³	Achieved (Yes/No)	24-hour mean 50 µg/m³ not to be exceeded more than 35 times per year	Achieved (Yes/No)
BH11	Brighton - Lewes Road, A270	(14.4)	N/A	(0)	N/A
CI1	Chichester - A27 Chichester Bypass	14.9	Yes	0	Yes
CA2	Crawley - Gatwick Airport	(12.4)	N/A	(0)	N/A
EB1	Eastbourne - Devonshire Park	17.0	Yes	1	Yes
HT1	Hastings - Bexhill Rd, Bulverhythe	18.9	Yes	1	Yes
HO2	Horsham - Park Way, Horsham	16.1	Yes	1	Yes
LS8	Lewes – Little East Street, Lewes	13.3	Yes	1	Yes
MS1	Mid Sussex - London Road, East Grinstead	16.1	Yes	0	Yes
RY2	Rother - De La Warr Road, Bexhill	15.7	Yes	0	Yes
EB3	AURN – Eastbourne, Holly Place	10.7	Yes	0	Yes
LL1	AURN - Lullington Heath	10.3	Yes	0	Yes
BH0	AURN – Brighton, Preston Park	(11.6)	N/A	0	N/A
HO4	AURN - Storrington	(12.2)	N/A	0	N/A
WT3	AURN - Worthing East Ten Acres	(14.6)	N/A	(1)	N/A

Notes: . Particulate data is corrected to gravimetric equivalent measurement values. All corrections are applied for the instrument type and size fraction measured. Data in (brackets) is data below 75% data capture rates.

All Sussex Network AQMS were below the Annual mean and 24-hour mean AQO for PM_{10}.

5.3 Particulate matter ($PM_{2.5}$)

Table 5-3 provides a comparison of 2024 $PM_{2.5}$ annual mean concentrations with the Environment Act 2021 and Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 Interim Year (2028) and final Target Year (2040).

Table 5-3: $PM_{2.5}$ Comparison with Environment Act 2021 $PM_{2.5}$ Targets (2028) and final Target Year (2040)

Site ID		Annual mean (µg/m³)	2028 Target 12µg/m³	2040 Target 10µg/m³
AD1	Adur - Shoreham-by-sea	8.2	Yes	Yes
BH10	Brighton - North Street	8.3	Yes	Yes
BH11	Brighton - Lewes Road, A270	(8.4)	N/A	N/A
CI1	Chichester - A27 Chichester Bypass	8.3	Yes	Yes
CA2	Crawley - Gatwick Airport	(7.5)	N/A	N/A
HT1	Hastings - Bexhill Rd, Bulverhythe	8.9	Yes	Yes
HO5	Horsham - Cowfold	(7.6)	N/A	N/A
LS8	Lewes – Little East Street, Lewes	7.5	Yes	Yes
RY2	Rother - De La Warr Road, Bexhill	8.0	Yes	Yes

Site ID		Annual mean (µg/m³)	2028 Target 12µg/m³	2040 Target 10µg/m³
EB3	AURN – Eastbourne, Holly Place	6.7	Yes	Yes
LL1	AURN - Lullington Heath	6.4	Yes	Yes
BH0	AURN – Brighton, Preston Park	8.1	Yes	Yes
HO4	AURN - Storrington	(6.7)	N/A	N/A
WT2	AURN - Worthing A27 Grove Lodge	7.6	Yes	Yes
WT3	AURN - Worthing East Ten Acres	(8.6)	N/A	N/A

Notes: . Particulate data is corrected to gravimetric equivalent measurement values. All corrections are applied for the instrument type and size fraction measured. Data in (brackets) is data below 75% data capture rates.

All Sussex Network AQMS were below the annual mean interim annual mean 2028 target (12µg/m³) and the 2040 target (10µg/m³) for $PM_{2.5}$.

5.4 Sulphur dioxide (SO_2)

There were two locations in Sussex measuring SO_2, Brighton Hollingdean Road (BH12) and AURN - Lullington Heath (LL1). BH12 is an urban roadside AQMS in central Brighton and LL1 is stationed at a remote rural background location on the Sussex Downs near Lullington. Neither AQMS exceeded the Air Quality Objectives for 2024. Note that BH12 was only operational from September 2024, thus had only 46% data capture during 2024.

The AQOs for SO_2 are measured in the number of exceedances in a calendar year for different averaging periods, as follows:

- 15-minute mean value of 266 µg/m³ not to be exceeded more than 35 times a year
- 1-hour mean value of 350 µg/m³ not to be exceeded more than 24 times a year
- 24-hour mean value of 125µg/m3 not to be exceeded more than 3 times a year

Table 5-4 presents the AQO values for 2024 and shows whether the location achieved the objective, i.e. under the objective (yes) or not (no).

Table 5-4: SO_2 Comparison with Air Quality Strategy Objectives.

	Site Name	Air Quality Objective	Measured as:	Max. conc. (µg/m³)	Number of exceedances	Achieved (Yes/No)
BH12	Brighton - Hollingdean Road	266 µg/m³ not to be exceeded more than 35 times a year	15-minute mean	4.2	0	Yes
BH12	Brighton - Hollingdean Road	350 µg/m³ not to be exceeded more than 24 times a year	1-hour mean	2.9	0	Yes
BH12	Brighton - Hollingdean Road	125µg/m3 not to be exceeded more than 3 times a year	24-hour mean	1.6	0	Yes
LL1	AURN - Lullington Heath	266 µg/m³ not to be exceeded more than 35 times a year	15-minute mean	6.2	0	Yes
LL1	AURN - Lullington Heath	350 µg/m³ not to be exceeded more than 24 times a year	1-hour mean	4.8	0	Yes
LL1	AURN - Lullington Heath	125µg/m3 not to be exceeded more than 3 times a year	24-hour mean	2.0	0	Yes

None of the Sussex Network AQMS breached the AQO max concentration and number of exceedances for SO_2.

5.5 Ozone (O_3)

The O_3 is a national objective under the Air Quality Standards Regulations 2010 and is not required to be reported by Local Authorities under the LAQM regime. It is a requirement for national government to assess the levels of O_3 in ambient air across the UK, however Sussex does undertake measurements of O_3 at one (1) network location Eastbourne - Devonshire Park (EB1)

Table 5-5 provides a comparison of O_3 8-hour mean with the AQO values for 2024 and shows whether a location achieved the objective, i.e. under the objective (yes) or not (no).

Table 5-5: O_3 Comparison with Air Quality Objectives.

Site ID	Site Name	Number of exceedances: 100 µg/m³ not to be exceeded more than 10 times per year (8-hour mean)	Achieved (Yes/No)
EB1	Eastbourne - Devonshire Park	52	No
EB3	AURN – Eastbourne, Holly Place	111	No
LL1	AURN - Lullington Heath	107	No
BH0	AURN – Brighton, Preston Park	46	No

There were 52 exceedances of the 8-hour mean 100 µg/m³ concentration value over the year at the Sussex network AQMS at Eastbourne Devonshire Park (EB1).

By comparison the AURN – Eastbourne, Holly Place (EB3) which is also an urban background location, measured twice as many exceedances over the same period. However, this AQMS is located on the northern edge of Eastbourne. AURN - Lullington Heath (LL1) which 8km NNW of Eastbourne and at an elevated rural background location also recorded 106 exceedances. AURN – Brighton, Preston Park (BH0) is an urban background AQMS located in the urban conurbation of Brighton and Hove, also exceeded the AQO 46 times which is similar to the number of exceedances at Eastbourne - Devonshire Park.

6 WHO Air Quality Guideline Value Intercomparison

The data presented in the following tables compare Sussex monitoring results with the WHO Guideline values (2021) for 2024. The full WHO Guideline values (2021) are provided in the Appendix Table A1-3. The WHO Guideline values are stricter than the UK AQO values and not required to be reported under LAQM.

Table 6-1: PM_{10} Comparison with WHO Air Quality Guideline values

Site ID	Site Name	Annual Mean (µg/m³) 15µg/m³	Achieved AQG (yes/no)	24-hour mean* (µg/m³) 45µg/m³	Achieved AQG (yes/no)
BH11	Brighton - Lewes Road, A270	(14.4)	N/A	34.6	Yes
CI1	Chichester - A27 Chichester	14.9	Yes	34.6	Yes
CA2	Crawley - Gatwick Airport	(12.4)	N/A	34.0	Yes
EB1	Eastbourne - Devonshire Park	17.0	No	42.8	Yes
HT1	Hastings - Bexhill Rd, Bulverhythe	18.9	No	45.4	No
HO2	Horsham - Park Way, Horsham	16.1	No	39.7	Yes
LS8	Lewes – Little East Street, Lewes	13.3	Yes	37.2	Yes
MS1	Mid Sussex - London Road, East Grinstead	16.1	No	38.2	Yes
RY2	Rother - De La Warr Road, Bexhill	15.7	No	37.0	Yes
EB3	AURN – Eastbourne, Holly Place	10.7	Yes	32.0	Yes
LL1	AURN - Lullington Heath	10.3	Yes	31.4	Yes
BH0	AURN – Brighton, Preston Park	(11.6)	N/A	38.8	Yes
HO4	AURN - Storrington	(12.2)	N/A	37.6	Yes
WT3	AURN - Worthing East Ten Acres	(14.6)	N/A	52.3	No

Notes: * 24-hour mean values presented are calculated as 99th percentile (i.e. 3–4 exceedance days per year).

During 2024 five (5) Sussex Network AQMS's exceeded the WHO Annual AQG value and only one (1) Sussex AQMS exceeding the 24-hour PM_{10} AQG value at Hastings - Bexhill Rd, Bulverhythe.

Table 6-2: $PM_{2.5}$ Comparison with WHO Air Quality Guideline values

Site ID	Site Name	Annual Mean (µg/m³) 5 µg/m³	Achieved AQG (yes/no)	24-hour mean* (µg/m³) 15 µg/m³	Achieved AQG (yes/no)
AD1	Adur - Shoreham-by-sea	8.2	No	23.5	No
BH10	Brighton - North Street	8.3	No	19.5	No
BH11	Brighton - Lewes Road, A270	(8.4)	N/A	24.6	No
CI1	Chichester - A27 Chichester Bypass	8.3	No	24.7	No
CA2	Crawley - Gatwick Airport	(7.5)	N/A	27.8	No
HT1	Hastings - Bexhill Rd, Bulverhythe	8.9	No	28.3	No
HO5	Horsham - Cowfold	(7.6)	N/A	N/A (4)**	N/A
LS8	Lewes – Little East Street, Lewes	7.5	No	25.1	No
RY2	Rother - De La Warr Road, Bexhill	8.0	No	27.8	No
EB3	AURN – Eastbourne, Holly Place	6.7	No	24.3	No
LL1	AURN - Lullington Heath	6.4	No	25.4	No
BH0	AURN – Brighton, Preston Park	8.1	No	26.0	No
HO4	AURN - Storrington	(6.7)	N/A	25.3	No
WT2	AURN - Worthing A27 Grove Lodge	7.6	No	25.0	No
WT3	AURN - Worthing East Ten Acres	(8.6)	N/A	34.8	No

Note: * 99th percentile (i.e. 3–4 exceedance days per year).
** N/A =not enough data capture for 99th percentile. 15 µg/m³ 24-hour mean was exceeded four times. Data in (brackets) is data below 75% data capture rates

During 2024 all the Sussex Network AQMS exceeded the WHO Annual AQG value and 24-hour $PM_{2.5}$ AQG value.

Table 6-3: O_3 Comparison with WHO Air Quality Guideline values

Site ID	Site Name	Maximum daily 8-hour mean* (µg/m³) 100 µg/m³	Achieved AQG (yes/no)	Peak season mean** (µg/m³) 60 µg/m³	Achieved AQG (yes/no)
EB1	Eastbourne - Devonshire Park	111.8	No	77.8	No
EB3	AURN – Eastbourne, Holly Place	145.0	No	81.8	No
LL1	AURN - Lullington Heath	125.0	No	80.0	No
BH0	AURN – Brighton, Preston Park	114.3	No	73.1	No

Note: * 99th percentile (i.e. 3–4 exceedance days per year).
** Average of daily maximum 8-hour mean O_3 concentration in the six consecutive months with the highest six-month running- average O_3 concentration.

During 2024 Eastbourne - Devonshire Park (EB1) exceeded the WHO AQG value for the O_3 maximum daily 8-hour threshold and the peak season mean threshold.

Table 6-4: NO_2 Comparison with WHO Air Quality Guideline values

Site ID	Site Name	Annual Mean (µg/m³) 10 µg/m³	Achieved AQG (yes/no)	24-hour mean* (µg/m³) 25 µg/m³*	Achieved AQG (yes/no)	Max 1-hour mean (µg/m³) 200 µg/m³	Achieved AQG (yes/no)
AD1	Adur - Shoreham-by-sea	18.2	No	39.0	No	144.7	Yes
BH10	Brighton - North Street	26.3	No	48.6	No	93.2	Yes
BH11	Brighton - Lewes Road, A270	(32.9)	N/A	62.1	No	131.7	Yes
BH12	Brighton - Hollingdean Road	(24.6)	N/A	49.1	No	90.5	Yes
CI1	Chichester - A27 Chichester Bypass	20.2	No	47.2	No	129.7	Yes
CI5	Chichester - Westhampnett Road	19.1	No	38.7	No	163.7	Yes
CA2	Crawley - Gatwick Airport	(17.0)	N/A	44.1	No	84.6	Yes
EB1	Eastbourne - Devonshire Park	9.2	Yes	25.1	No	71.6	Yes
HT1	Hastings - Bexhill Rd, Bulverhythe	9.5	Yes	21.6	Yes	50.6	Yes
HO5	Horsham - Cowfold	16.2	No	36.6	No	134.9	Yes
HO2	Horsham - Park Way, Horsham	15.7	No	38.9	No	89.0	Yes
LS8	Lewes – Little East Street, Lewes	12.8	No	30.9	No	88.4	Yes
MS1	Mid Sussex - London Road, East Grinstead	19.0	No	45.5	No	135.1	Yes
RY2	Rother - De La Warr Road, Bexhill	11.4	No	30.1	No	87.2	Yes
EB3	AURN – Eastbourne, Holly Place	8.9	Yes	25.9	No	72.5	Yes
LL1	AURN - Lullington Heath	4.8	Yes	15.0	Yes	40.1	Yes
BH0	AURN – Brighton, Preston Park	10.1	No	28.9	No	88.5	Yes
HO4	AURN - Storrington	16.6	No	39.9	No	104.9	Yes
WT2	AURN - Worthing A27 Grove Lodge	21.7	No	40.6	No	87.1	Yes

Note: * 99th percentile (i.e. 3–4 exceedance days per year). Data in (brackets) is data below 75% data capture rates

During 2024, nine (9) out of eleven (11) (82%) of Sussex Network AQMS locations exceeded the WHO NO_2 annual mean AQG value. Additionally, 13 out of 14 (93%) Sussex Network AQMS locations exceeded the WHO NO_2 24-hour mean AQG value. No AQMS exceeded the WHO NO_2 maximum 1-hour mean.

Table 6-5: SO_2 Comparison with WHO Air Quality Guideline values

Site ID	Site Name	24-hour mean (µg/m³) 40 µg/m³	Achieved (yes/no)	10 minutes mean* (µg/m³) 500 µg/m³	Achieved (yes/no)
BH12	Brighton - Hollingdean Road	1.5	Yes	4.2*	Yes
LL1	AURN - Lullington Heath	1.9	Yes	6.2*	Yes

Note: *No AQMS (Sussex or AURN) measure 10-minute mean SO_2 data, so the 15 minutes mean data was used for comparison.

During 2024, there were no Sussex Network AQMS that exceeded the WHO 24-hour and 10-minute mean SO_2 AQG values.

7 Air Quality Trends (5 years)

7.1 Nitrogen Dioxide 5-year Trend

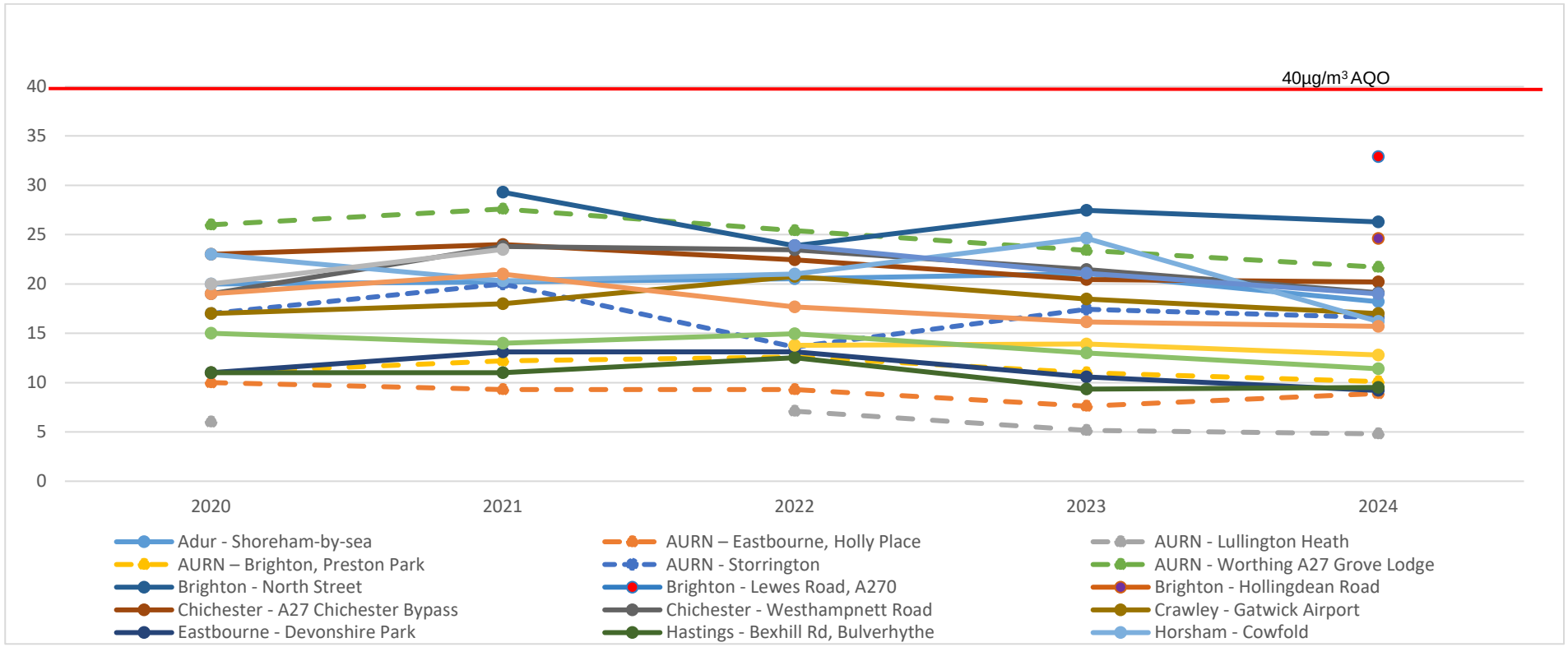
Table 7-1 and Figure 7-1 present the 5-year trend data for NO_2 annual mean concentrations from 2020 - 2024.

Table 7-1: Annual mean concentration (µg/m^3) NO_2 for 2020 – 2024.

Site ID	Site Name	2020	2021	2022	2023	2024
AD1	Adur - Shoreham-by-sea	20	20	21	21	18
BH10	Brighton - North Street	-	29	24	27	26
BH11	Brighton - Lewes Road, A270	-	-	-	-	(33)
BH12	Brighton - Hollingdean Road	-	-	-	-	(25)
CI1	Chichester - A27 Chichester Bypass	23	24	22	20	20
CI5	Chichester - Westhampnett Road	19	24	23	21	19
CA2	Crawley - Gatwick Airport	17	18	21	18	(17)
EB1	Eastbourne - Devonshire Park	11	13	13	11	9
HT1	Hastings - Bexhill Rd, Bulverhythe	11	11	13	9	9
HO5	Horsham - Cowfold	23	20	21	25	16
HO2	Horsham - Park Way, Horsham	19	21	18	16	16
LS7	Lewes - Newhaven	20	24	-	-	-
LS8	Lewes – Little East Street, Lewes	-	-	14	14	13
MS1	Mid Sussex - London Road, East Grinstead	-	-	24	21	19
RY2	Rother - De La Warr Road, Bexhill	15	14	15	13	11
EB3	AURN – Eastbourne, Holly Place	10	9	9	8	9
LL1	AURN - Lullington Heath	6	-	7	5	5
BH0	AURN – Brighton, Preston Park	11	12	13	11	10
HO4	AURN - Storrington	17	20	14	17	17
WT2	AURN - Worthing A27 Grove Lodge	26	28	25	23	22

Note: Data in (brackets) is data below 75% data capture rates

Figure 7-1: Annual mean concentration (µg/m³) NO_2 for 2020 - 2024.



Note: All units are µg/m³.

The data shows a levelling off in the annual mean concentration trend for NO_2 over the period of 2020 – 2024 across Sussex. There is a marginal decrease in the annual mean concentration of NO_2 from 2023 to 2024. No Sussex network AQMS exceeded the 40µg/m³ AQO.

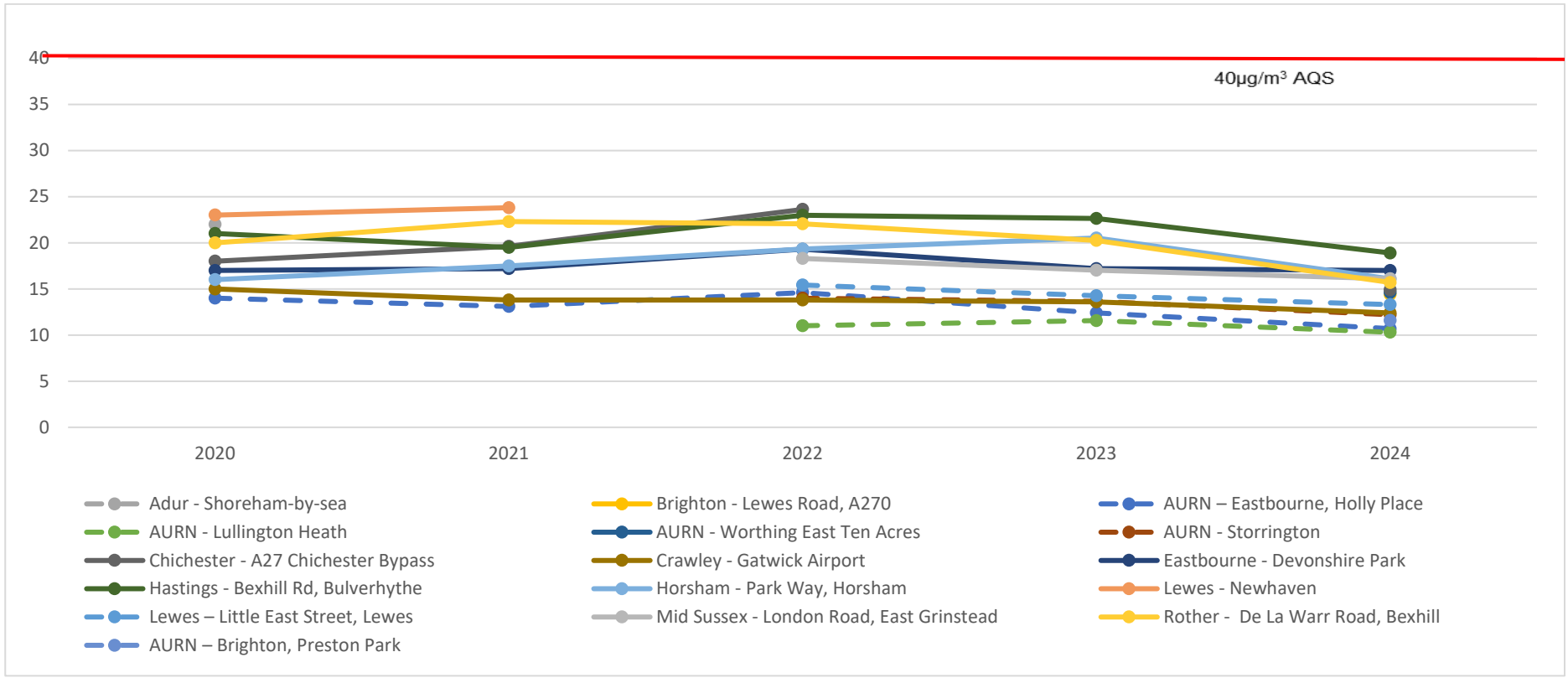
7.2 Particulate Matter (PM_{10}) 5-year Trend

Table 7-2 and Figure 7-2 present the 5-year trend data for PM_{10} annual mean concentrations from 2020 to 2024.

Table 7-2: Annual mean concentration (µg/m^3) PM_{10} 2020 - 2024.

Site ID	Site Name	2020	2021	2022	2023	2024
AD1	Adur - Shoreham-by-sea	22	-	-	-	-
BH11	Brighton - Lewes Road, A270	-	-	-	-	14
CI1	Chichester - A27 Chichester Bypass	18	20	24	-	15
CA2	Crawley - Gatwick Airport	15	14	14	14	12
EB1	Eastbourne - Devonshire Park	17	17	19	17	17
HT1	Hastings - Bexhill Rd, Bulverhythe	21	20	23	23	19
HO2	Horsham - Park Way, Horsham	16	18	19	21	16
LS7	Lewes - Newhaven	23	24	-	-	-
LS8	Lewes – Little East Street, Lewes	-	-	15	14	13
MS1	Mid Sussex - London Road, East Grinstead	-	-	18	17	16
RY2	Rother - De La Warr Road, Bexhill	20	22	22	20	16
EB3	AURN – Eastbourne, Holly Place	14	13	15	12	11
LL1	AURN - Lullington Heath	-	-	11	12	10
BH0	AURN – Brighton, Preston Park	-	-	-	-	12
HO4	AURN - Storrington	-	-	14	14	12
WT3	AURN - Worthing East Ten Acres	-	-	-	-	15

Figure 7-2: Annual mean concentration (µg/m³) PM_{10} 2020 - 2024.



The data initially showed a levelling off in annual mean concentrations of PM_{10} between 2020 to 2023, however the 2024 data indicates a minor downward trend in concentrations at most network AQMS across Sussex. This is reflected in the following 5-year $PM_{2.5}$ data trends also.

7.3 Particulate matter ($PM_{2.5}$) 5-year Trend

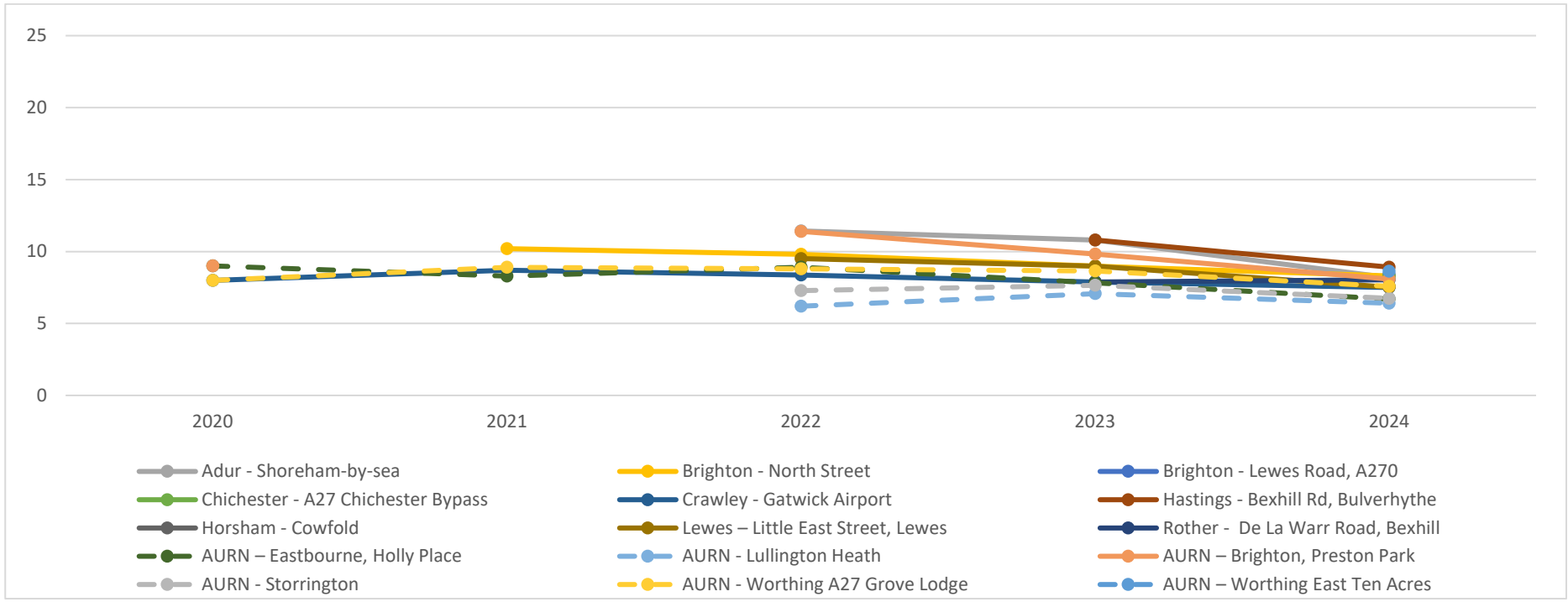
Table 7-3 and Figure 7-3 present the 5-year trend data for $PM_{2.5}$ annual mean concentrations from 2020 to 2024.

Table 7-3: Annual mean concentration (µg/m^3) $PM_{2.5}$ 2020 - 2024.

Site ID	Site Name	2020	2021	2022	2023	2024
AD1	Adur - Shoreham-by-sea	-	-	11	11	8
BH10	Brighton - North Street	-	10	10	9	8
BH11	Brighton - Lewes Road, A270	-	-	-	-	(8)
CI1	Chichester - A27 Chichester Bypass	-	-	-	-	8
CA2	Crawley - Gatwick Airport	8	9	8	8	(8)
HT1	Hastings - Bexhill Rd, Bulverhythe	-	-	-	11	9
HO5	Horsham - Cowfold	-	-	-	-	(8)
LS8	Lewes – Little East Street, Lewes	-	-	10	9	8
RY2	Rother - De La Warr Road, Bexhill	-	-	v-	8	8
EB3	AURN – Eastbourne, Holly Place	9	8	9	8	7
LL1	AURN - Lullington Heath	-	-	6	7	6
BH0	AURN – Brighton, Preston Park	9	-	11	10	8
HO4	AURN - Storrington		-	7	8	7
WT2	AURN - Worthing A27 Grove Lodge	8	9	9	9	8
WT3	AURN - Worthing East Ten Acres	-	-	-	-	9

Note: Data in (brackets) is data below 75% data capture rates

Figure 7-3: Annual mean concentration (µg/m^3) $PM_{2.5}$ 2020 – 2024.



The data initially showed a levelling off in annual mean concentrations of $PM_{2.5}$ between 2020 to 2023, then the 2024 data indicates a minor downward trend in concentrations at most network AQMS across Sussex.

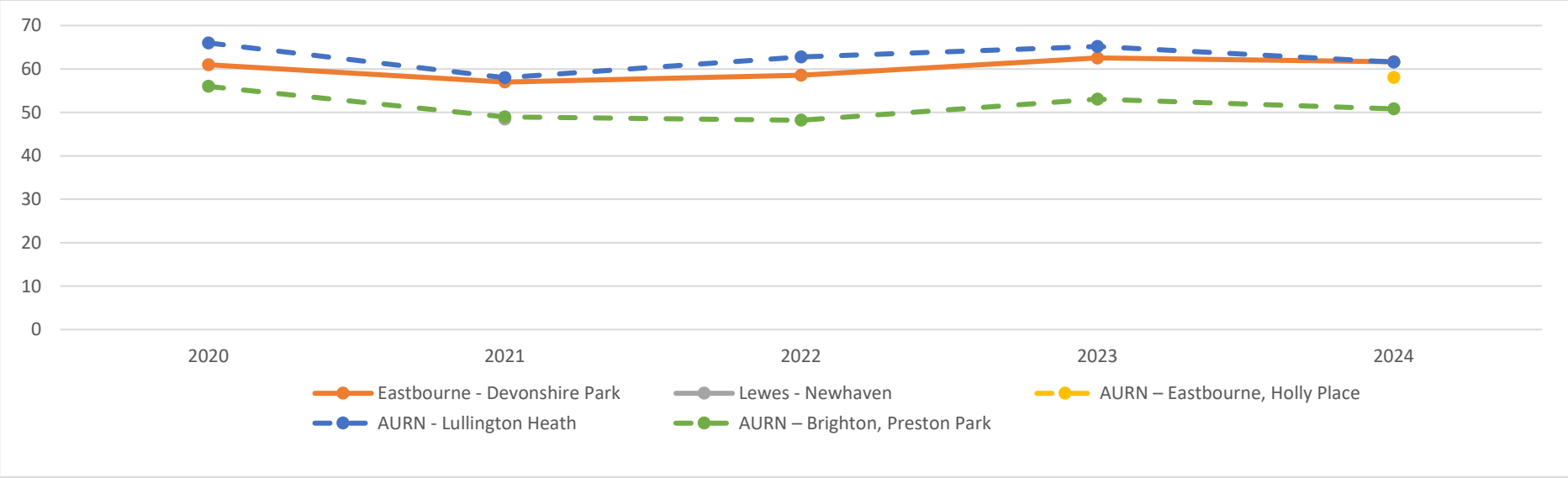
7.4 Ozone 5-year Trend

Table 7-4Table 7-3 and Figure 7-4 present the 5-year trend data for O_3 annual mean concentrations from 2020 to 2024.

Table 7-4: Annual mean concentration (µg/m^3) O_3 2020 - 2024

Site ID	Site Name	2020	2021	2022	2023	2024
EB1	Eastbourne - Devonshire Park	61	57	59	63	62
LS7	Lewes - Newhaven	-	49	-	-	-
EB3	AURN – Eastbourne, Holly Place	-	-	-	-	58
LL1	AURN - Lullington Heath	66	58	63	65	62
BH0	AURN – Brighton, Preston Park	56	49	48	53	51

Figure 7-4: Annual mean concentration (µg/m^3) O_3 2020 - 2024



The data shows a levelling off in annual mean concentrations of O_3 over the period across Sussex.

7.5 Sulphur dioxide 5-year Trend

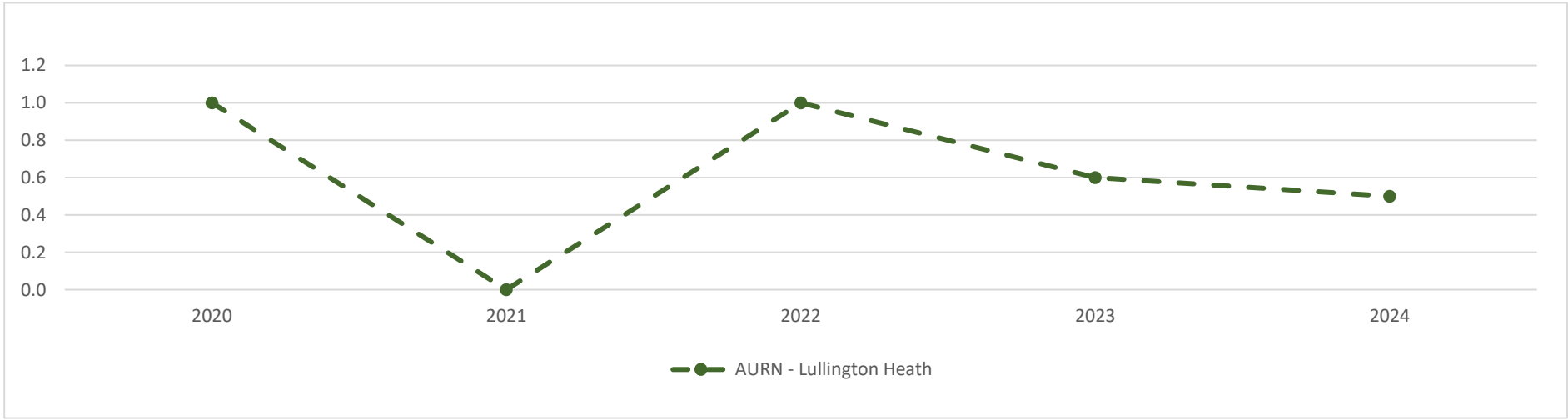
Table 7-5 and Figure 7-5 present the 5-year trend data for SO_2 annual mean concentrations from 2020 to 2024.

Table 7-5: Annual mean concentration (µg/m^3) SO_2 2020 - 2024

Site ID	Site Name	2020	2021	2022	2023	2024
BH12	Brighton - Hollingdean Road	-	-	-	-	(0.9)
LL1	AURN - Lullington Heath	1.0	0.0	1.0	0.6	0.5

Note: Data in (brackets) is data below 75% data capture rates

Figure 7-5: Annual mean concentration (µg/m^3) SO_2 2020 - 2024



Data from the newly installed SO_2 monitoring location at Brighton - Hollingdean Road (BH12) did not achieve >75% data capture, so was not available for trend analysis. The SO_2 trend data for the AURN – Lullington Heath (LL1) AQMS shows a continued levelling-off of very low SO_2 concentrations.

8 Air Quality Forecasts and the DAQI System

There are several pollutants monitored across Sussex and each of these or the combination of these pollutants can affect people's health differently. To provide a health-based information service in the UK there is an Air Quality Banding system which is used to inform the public about the levels of pollution that they may be exposed to and are based on health advice approved by the UK Committee on Medical Effects of Air Pollution Episodes (COMEAP).

The UK uses Daily Air Quality Index (DAQI) categories which set out specific health impact related pollutant thresholds and exposure periods. The system uses an index divided into four bands to provide more detail about air pollution levels in a simple way; these bandings range from Low, Moderate, High to Very High. The overall air pollution index is calculated from the highest index value of five pollutants: NO_2, PM_{10}, $PM_{2.5}$, O_3 and SO_2.

The DAQI categories are: "Low" (Air Quality Index 1- 3), "Moderate" (Air Quality Index 4- 6), "High" (Air Quality Index 7-9) and "Very High" (Air Quality Index 10), see Appendix 3, Table A3-1.

Sussex has an air quality Alert forecasting service which uses these DAQIs to send out alerts to vulnerable people across Sussex. For more information visit https://sussex-air.net/sussex-air-quality-service-for-sussex/what-is-sussex-air-quality-service/

8.1 The 2024 DAQI results

The following tables show the number of days where exceedances of these DAQI categories occurred at the Sussex and at AURN AQMS sites in 2024. Note that 2024 was a leap year, therefore there were 366 days in the year.

8.1.1 "Low" DAQI days

2024 was dominated by 'low' air pollution days (Daily Air Quality Index 1 - 3) across the year. Most locations did not breach the "low" DAQI threshold all year for all the available days that were monitored.

Only Eastbourne - Devonshire Park (EB1), Hastings - Bexhill Rd, Bulverhythe (HT1), Horsham - Park Way, Horsham (HO2) and Lewes - Little East Street, Lewes (LS8) breached the "low" DAQI threshold in 2024.

*Sites such as Brighton - Lewes Road, A270 (BH11), Brighton - Hollingdean Road (BH12), Crawley – Gatwick Airport (CA2) and Horsham - Cowfold (HO5) have fewer number of days registered as "low" due to the AQMS or instrument not being operational for part of the year. See section 3.4.1 for further details.

Table 8-1: Number of days 'Low' air pollution during 2024 (Daily Air Quality Index 1-3).

Site ID	Site Name	NO_2	PM_{10}	$PM_{2.5}$	O_3	SO_2
AD1	Adur - Shoreham-by-sea	366		366		
BH10	Brighton - North Street	366		366		
BH11	*Brighton - Lewes Road, A270	279	267	267		
BH12	*Brighton - Hollingdean Road	173				173
CI1	Chichester - A27 Chichester Bypass	359	351	360		
CI5	Chichester - Westhampnett Road	366				
CA2	*Crawley - Gatwick Airport	111	111	111		
EB1	Eastbourne - Devonshire Park	366	355		358	
HT1	Hastings - Bexhill Rd, Bulverhythe	358	365	328		
HO5	*Horsham - Cowfold	*352		*53		
HO2	Horsham - Park Way, Horsham	343	365			
LS8	Lewes – Little East Street, Lewes	366	353	365		
MS1	Mid Sussex - London Road, East Grinstead	366	366			
RY2	Rother - De La Warr Road, Bexhill	358	344	343		

Site ID	Site Name	NO_2	PM_{10}	$PM_{2.5}$	O_3	SO_2
EB3	AURN – Eastbourne, Holly Place	322	366	366	350	
LL1	AURN - Lullington Heath	355	363	363	348	322
BH0	AURN – Brighton, Preston Park	366	130	315	358	
HO4	AURN - Storrington	360	184	184		
WT2	AURN - Worthing A27 Grove Lodge	366		343		
WT3	*AURN - Worthing East Ten Acres		136	136		

Note: *Sites or instruments not operational the full year, thus have reduced measurement days

8.1.2 "Moderate" DAQI days

Table 8-2 shows the number of days that were measured as 'moderate' air pollution (Daily Air Quality Index 4- 6) at each of the Sussex AQMSs.

Table 8-2: Number of days 'Moderate' air pollution during 2024 (Daily Air Quality Index 4- 6).

Site ID	Site Name	NO_2	PM_{10}	$PM_{2.5}$	O_3	SO_2
EB1	Eastbourne - Devonshire Park	0	1		8	
HT1	Hastings - Bexhill Rd, Bulverhythe	0	1	0		
HO2	Horsham - Park Way, Horsham	0	1			
LS8	Lewes – Little East Street, Lewes	0	1	1		
EB3	AURN – Eastbourne, Holly Place	0	0	0	16	
LL1	AURN - Lullington Heath	0	0	0	18	0
BH0	AURN – Brighton, Preston Park	0	0	0	8	
WT3	AURN - Worthing East Ten Acres		1	1		

8.1.3 "High" DAQI days

There were no days of 'High'(Air Quality Index 7-9) air pollution during 2024.

8.1.4 "Very High" DAQI days

There were no days of 'Very High'(Air Quality Index 10) air pollution during 2024.

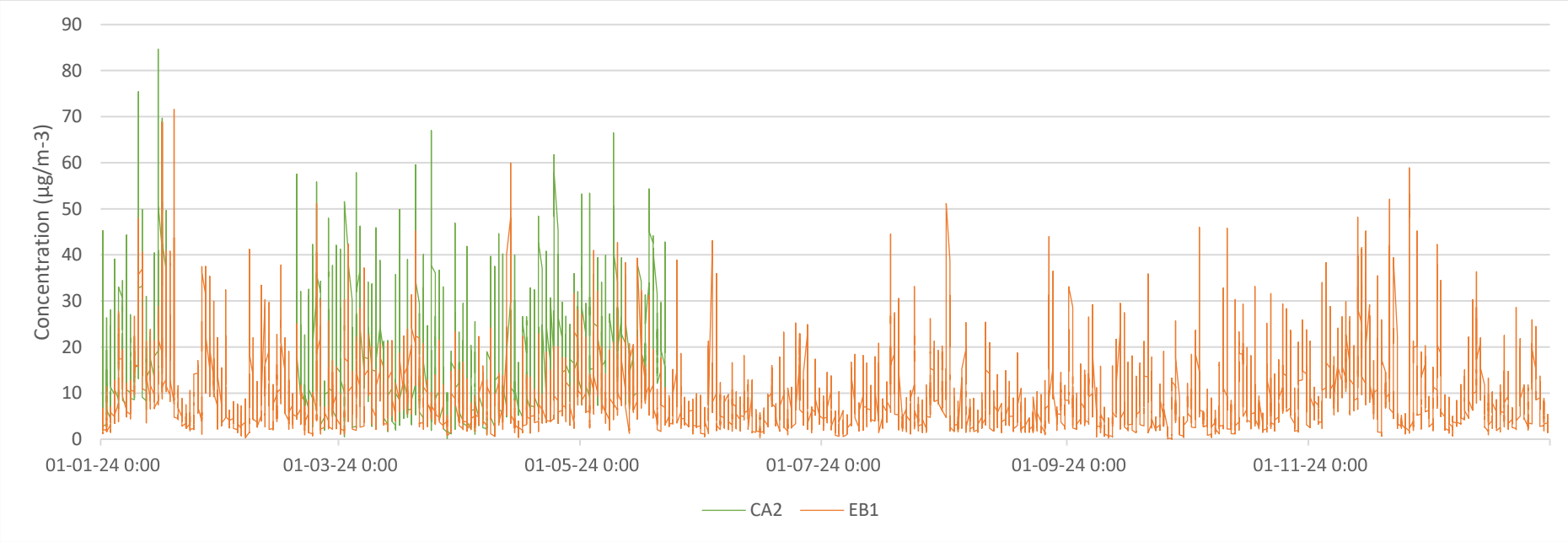
9 Air Quality Measurements by Pollutant

9.1.1 Nitrogen Dioxide

Figure 9-1 presents the 1-hour mean data from the Sussex urban background with Figure 9-2 presenting the 1-hour mean data from the Sussex urban traffic sites in 2024.

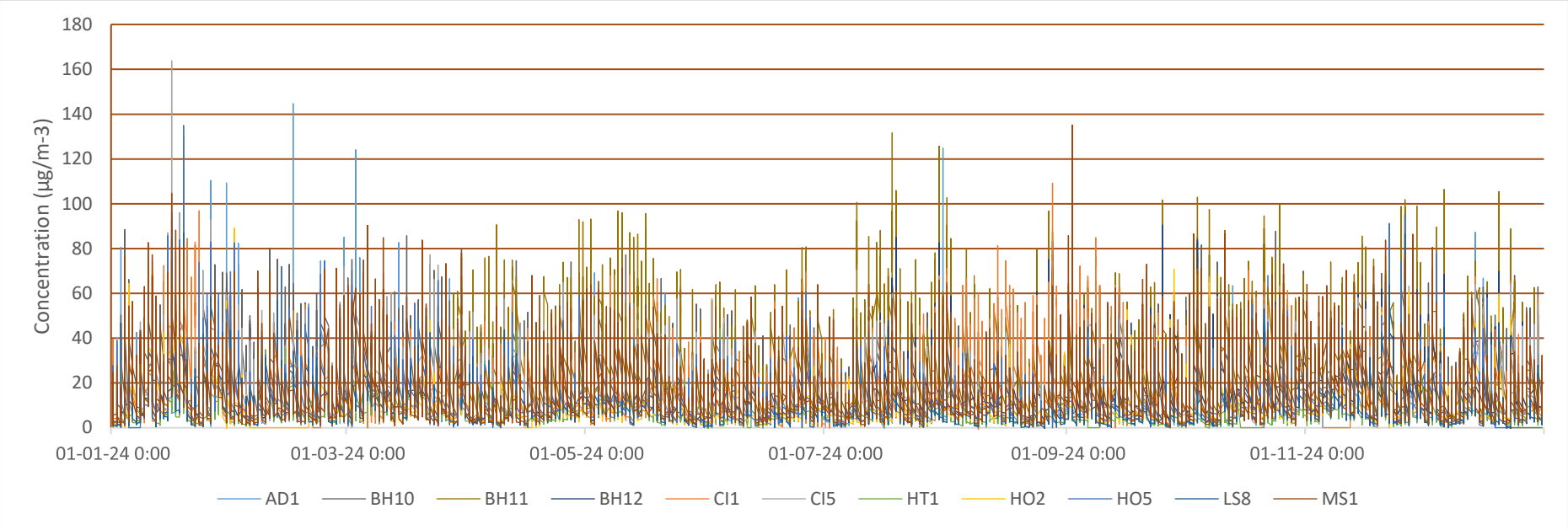
No site across the Sussex Network exceeded the 'Moderate' levels (1-hour means >200µg/m^3), the 'High' levels (1-hour means >400µg/m^3) or the 'Very High' levels (1-hour means >600µg/m^3) for NO_2 during 2024.

Figure 9-1: NO_2 hourly mean concentrations (µg/m^3) in 2024 (Sussex Urban background sites)



Note: To present the 1-hour mean data for a site, there are 8784 (366 x 24 (leap year)) data points in a full year's data set. This graph is presented to provide an illustration of the data trends and if required these data can be downloaded directly from the Sussex-Air website (www.sussex-air.net).

Figure 9-2: NO_2 hourly mean concentrations (µg/m³) in 2024 (Sussex Urban traffic sites)



Note: To present the 1-hour mean data for a site, there are 8784 (366 x 24 (leap year)) data points in a full year's data set. This graph is presented to provide an illustration of the data trends and if required these data can be downloaded directly from the Sussex-Air website (www.sussex-air.net).

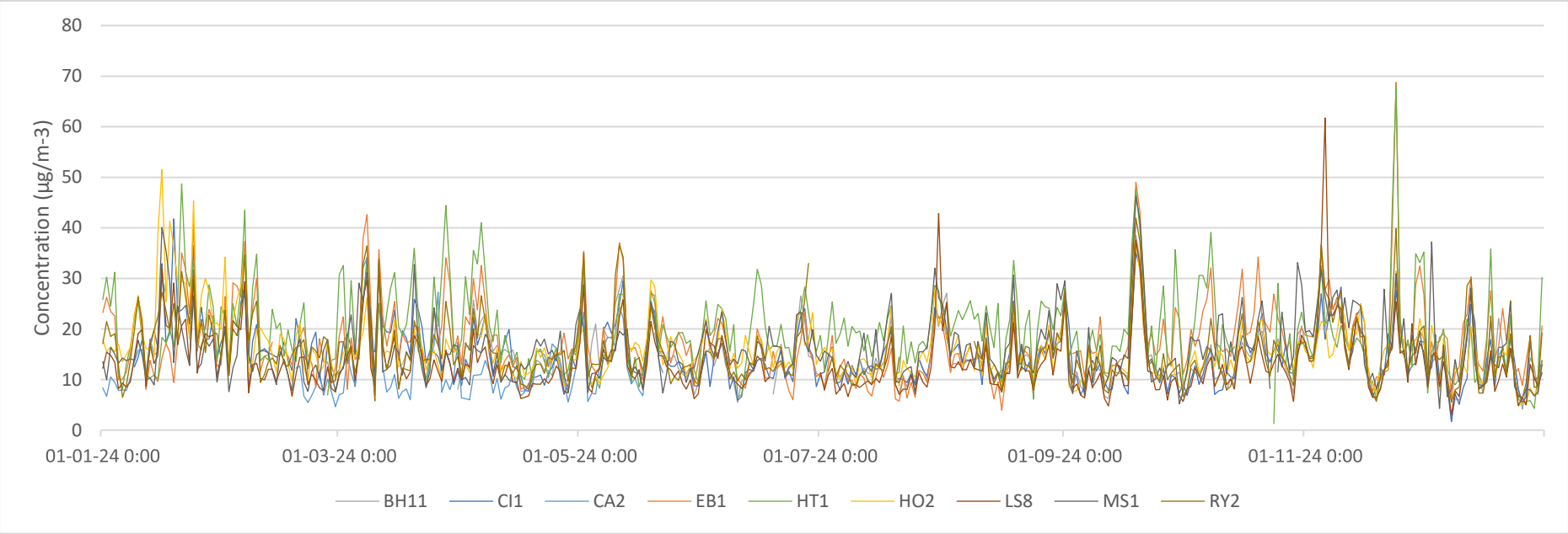
9.1.2 Particulate matter (PM_{10})

Figure 9-3 presents the 24-hour mean data from the Sussex PM_{10} sites in 2024.

Four sites exceeded the 24-hour mean AQO concentration of 50 µg/m³, but no site exceeded it more than 35 times per year, thus all sites achieved the AQO. Four locations (Eastbourne - Devonshire Park (EB1), Hastings - Bexhill Rd, Bulverhythe (HT1), Horsham - Park Way (HO2) and Lewes – Little East Street (LS8)) exceeded the “Moderate” DAQI threshold for 1 day in 2024. No sites exceeded the “High” or “ Very High” DAQI threshold in 2024.

Peak concentrations of PM_{10} tended to occur in the winter, when there are cold still atmospheric conditions which do not allow the pollutants to disperse. The highest concentrations were seen in November 2024, which coincided with events such as Diwali and Guy Fawkes celebrations.

Figure 9-3: PM_{10} 24hr mean concentrations (µg/m³) in 2024.



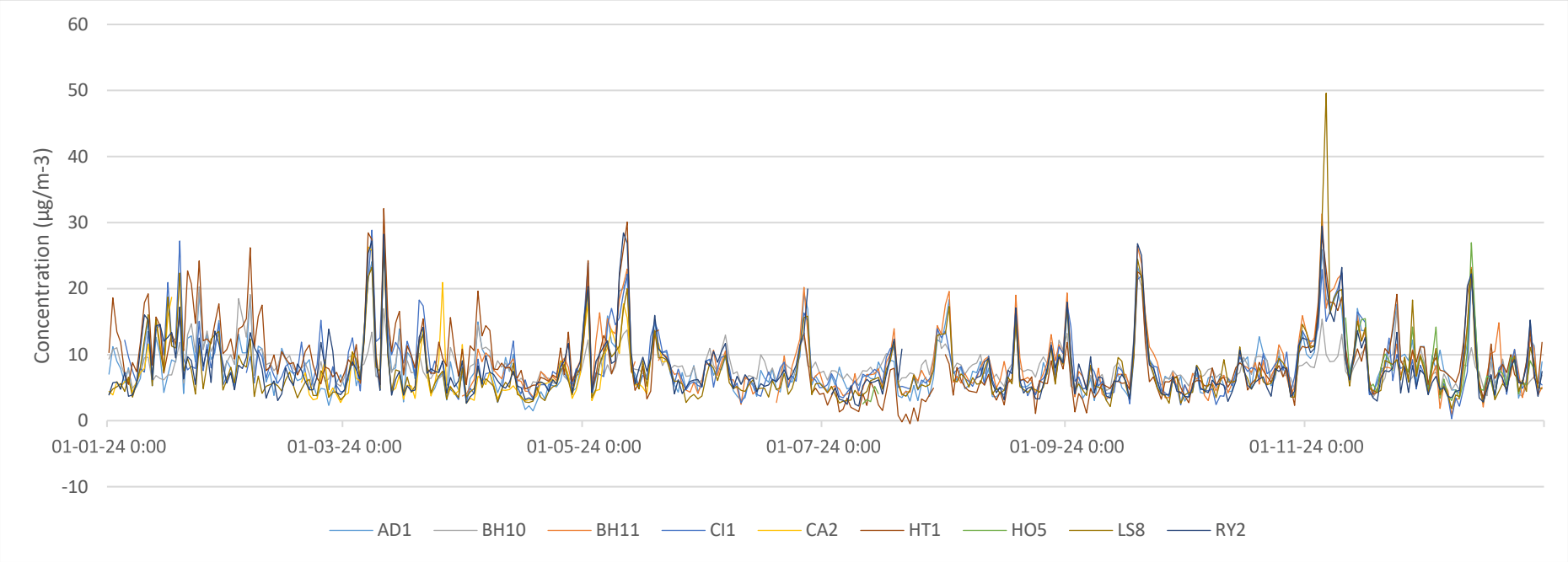
Note: To present the 24-hour mean data for a site, there are 366 data points in a full year’s data set. This graph is presented to provide an illustration of the data trends and if required these data can be downloaded directly from the Sussex-Air website (www.sussex-air.net).

9.1.3 Particulate matter ($PM_{2.5}$)

Figure 9-4 presents the 24-hour mean data from the Sussex $PM_{2.5}$ sites in 2024. All AQMS locations were below the AQO 2028 Interim annual mean target value of 12µg/m^3 and the 2040 AQO annual mean target value of 10µg/m^3 There was one site (Lewes – Little East Street (LS8)) that exceeded the "Moderate" DAQI threshold for 1 day in 2024. No sites exceeded the "High" or "Very High" DAQI threshold in 2024.

Peak concentrations of $PM_{2.5}$ were seen in November 2024, which also coincided with peak periods of PM_{10}.

Figure 9-4: $PM_{2.5}$ 24hr mean concentrations (µg/m^3) in 2024.



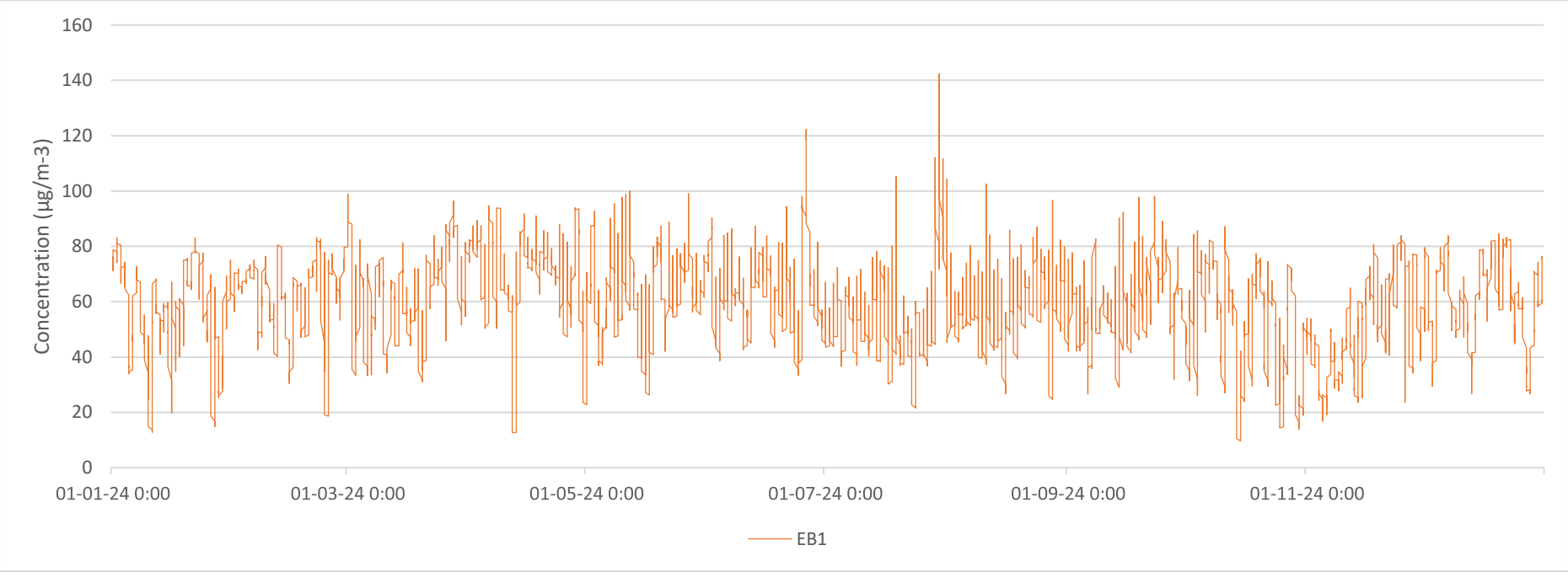
Note: To present the 24-hour mean data for a site, there are 366 data points in a full year's data set. This graph is presented to provide an illustration of the data trends and if required these data can be downloaded directly from the Sussex-Air website (www.sussex-air.net).

9.1.4 Ozone

Figure 9-5**Error! Reference source not found.** presents the 8-hour running mean data from the only Sussex Network O_3 site at Eastbourne - Devonshire Park (EB1) in 2024. It shows the profile of 8-hour running mean data and where, if any locations exceeded the DAQI thresholds. 'Moderate' O_3 was recorded at EB1 for 8 days respectively. There were no days where the "High" or "Very High" DAQI was recorded at EB1.

The highest concentrations occurred during the warmer sunnier months in June and July 2024. It is also known that a proportion of the O_3 experienced in Sussex is transported from continental Europe under certain meteorological conditions.

Figure 9-5: O_3 8-hour running mean concentrations (µg/m³) in 2024.

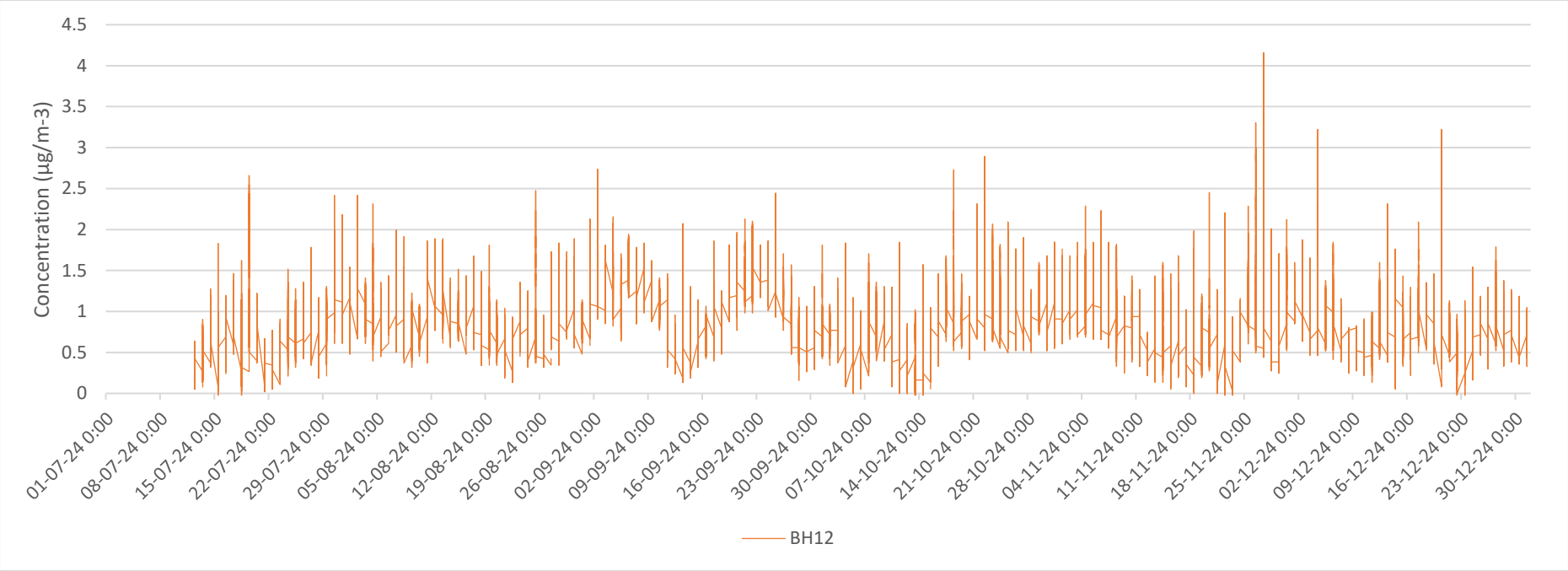


Note: To present the 8-hour running mean data for a site, there 8784 (366 x 24 (leap year)) data points in a full year's data set. This graph is presented to provide an illustration of the data trends and if required these data can be downloaded directly from the Sussex-Air website (www.sussex-air.net).

9.1.5 Sulphur Dioxide

Figure 9-6 presents the 15 minutes mean data from the only Sussex Network SO_2 monitoring site (Brighton - Hollingdean Road (BH12)) in 2024. There were no occurrences of 'Moderate' levels (15min mean >266µg/m^3) or above for SO_2 pollution during 2024.

Figure 9-6: SO_2 hourly mean concentrations (µg/m^3) in 2024.



Note: This graph is presented to provide an illustration of the data trends over the period July to December 2024 and if required these data can be downloaded directly from the Sussex-Air website (www.sussex-air.net).

Appendices

Appendix 1: Air Quality Objectives

The Air Quality Strategy Objectives apply at locations outside buildings or other natural or man-made structures above or below ground, where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period. Typically, these include residential properties and schools/care homes for long-term (i.e. annual mean) pollutant objectives and high streets for short-term (i.e. 1-hour) pollutant objectives.

The national Air Quality Objectives and Air Quality Standards Regulations limit and target values with which the UK must comply are summarised in the National air quality objectives (PDF 262 KB) of the Air Quality Strategy.

Definitions:

- Air Quality Standards are concentrations recorded over a given time period, which are considered to be acceptable in terms of what is scientifically known about the effects of each pollutant on health and on the environment. They can also be used as a benchmark to indicate whether air pollution is getting better or worse.
- An exceedance is a period of time (defined for each standard) where the concentration is higher than that set out in the Standard. In order to make useful comparisons between pollutants, (the Standards may be expressed in terms of different averaging times), the number of days on which an exceedance has been recorded is often reported.
- An objective is the target date on which exceedances of a Standard must not exceed a specified number.
- Limit values are legally binding parameters that must not be exceeded. Limit values are set for individual pollutants and are made up of a concentration value, an averaging time over which it is to be measured, the number of exceedances allowed per year, if any, and a date by which it must be achieved. Some pollutants have more than one limit value covering different endpoints or averaging times.
- Target values – are set out in the same way as limit values. They are to be attained where possible by taking all necessary measures not entailing disproportionate costs.

Table A1, taken from LAQM Technical Guidance (LAQM TG(22)), provides an indication of those locations that may or may not be relevant for each averaging period.

Table A1-1: Examples of where the Air Quality Objectives should apply.

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, care homes etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean and 8-hour mean	All locations where the annual mean objectives would apply, together with hotels. Gardens or residential properties[1].	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.

1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives would apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where the public might reasonably be expected to spend one hour or more. Any outdoor locations at which the public may be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-minute mean	All locations where members of the public might reasonably be expected to spend a period of 15 minutes or longer.	

Table A1-2 sets out the national Air Quality Standard Objectives for each pollutant. All objectives are national objectives however some are placed under the LAQM regime to assist delivering improvements in air quality and are the responsibility of Local Authorities to deliver.

Table A1-2: UK Air Quality Objectives

Pollutant	AQO	Concentration Measured as:	Responsible authority
Nitrogen Dioxide (NO_2)	200 µg/m³ not to be exceeded more than 18 times per year	1-hour mean	Local Authority (under LAQM)
	40 µg/m³	Annual mean	Local Authority (under LAQM)
Particulate Matter (PM_{10})	50 µg/m³ not to be exceeded more than 35 times per year	24-hour mean	Local Authority (under LAQM))
	40 µg/m³	Annual mean	Local Authority (under LAQM)
Particulate Matter ($PM_{2.5}$)	*Work towards reducing fine particulate matter 10 µg/m³ ($PM_{2.5}$)	Annual Mean	National Govt.
Sulphur dioxide (SO_2)	266 µg/m³ not to be exceeded more than 35 times a year	15 - minute mean	Local Authority (under LAQM)
	350 µg/m³ not to be exceeded more than 24 times a year	1-hour mean	Local Authority (under LAQM)
	125µg/m³ not to be exceeded more than 3 times a year	24-hour mean	Local Authority (under LAQM)
Ozone (O_3)	100µg/m³ not to be exceeded more than 10 times a year	8-hour mean	National Govt.

Notes:

***Regulation 4 of the Environmental Targets (Fine Particulate Matter) (England) Regulations 2024 sets the target to ensure that the annual mean concentration of $PM_{2.5}$ in ambient air is equal to or less than 10 micrograms per cubic metre by 31st December 2040.**

Under the LAQM regime and for the purpose of LAQM reporting, concentrations should be reported to 1 decimal place.

Appendix 2: WHO Guidelines

WHO air quality guideline values are provided in Table A2-1.

Table A2-1: WHO Air Quality Guideline values (2021)

Pollutant	Averaging period	WHO AQG value	Guideline
PM_{10}	1 day	45µg/m^3	99th percentile (3-4 exceedance days per year). Updated 2021 guideline.
	Calendar year	15µg/m^3	Updated 2021 guideline.
$PM_{2.5}$	1 day	15µg/m^3	99th percentile (3-4 exceedance days per year). Updated 2021 guideline.
	Calendar year	5µg/m^3	Updated 2021 guideline.
O_3	Maximum daily 8-hour mean	100µg/m^3	99th percentile (3-4 exceedance days per year). New 2021 guideline.
	Peak season [(b)]	60µg/m^3	New 2021 guideline.
NO_2	1 hour	200µg/m^3	99th percentile (3-4 exceedance days per year). New 2021 guideline.
	1 day	25µg/m^3	
	Calendar year	10µg/m^3	Updated 2021 guideline.
SO2	10 minutes	500µg/m^3	
	1 day	40µg/m^3	99th percentile (3-4 exceedance days per year). New 2021 guideline.

Appendix 3: Air Quality Bandings

Table A3-1: UK Air Quality Bandings: Daily Air Quality Index (DAQI)

Band	Index	Ozone	Nitrogen Dioxide	Sulphur Dioxide	PM2.5 Particles	PM10 Particles
		Running 8 hourly mean	Hourly mean	15 minute mean	24 hour mean	24 hour mean
		µg m-3	µg m-3	µg m-3	µg m-3	µg m-3
Low						
	1	0-33	0-67	0-88	0-11	0-16
	2	34-66	68-134	89-177	12-23	17-33
	3	67-100	135-200	178-266	24-35	34-50
Moderate						
	4	101-120	201-267	267-354	36-41	51-58
	5	121-140	268-334	355-443	42-47	59-66
	6	141-160	335-400	444-532	48-53	67-75
High						
	7	161-187	401-467	533-710	54-58	76-83
	8	188-213	468-534	711-887	59-64	84-91
	9	214-240	535-600	888-1064	65-70	92-100
Very High						
	10	241 or more	601 or more	1065 or more	71 or more	101 or more

Appendix 4: Sussex Network Sites and Map

Table A4-1: Sussex Air Quality Network sites and Pollutant instrumentation list (2024).

Site ID	Site Name	Local Authority/ AURN	NOx	NO	NO_2	PM_{10}	$PM_{2.5}$	O_3	SO_2
AD1	Adur - Shoreham-by-sea	Adur and Worthing Councils	Y	Y	Y		Y		
BH10	Brighton - North Street	Brighton and Hove City Council	Y	Y	Y		Y		
BH11	Brighton - Lewes Road, A270	Brighton and Hove City Council	Y	Y	Y	Y	Y		
BH12	Brighton - Hollingdean Road	Brighton and Hove City Council	Y	Y	Y				Y
CI1	Chichester - A27 Chichester Bypass	Chichester District Council	Y	Y	Y	Y	Y		
CI5	Chichester - Westhampnett Road	Chichester District Council	Y	Y	Y				
CA2	Crawley - Gatwick Airport	Crawley Borough Council	Y	Y	Y	Y	Y		
EB1	Eastbourne - Devonshire Park	Lewes and Eastbourne Councils	Y	Y	Y	Y		Y	
HT1	Hastings - Bexhill Rd, Bulverhythe	Hastings Borough Council	Y	Y	Y	Y	Y		
HO5	Horsham - Cowfold	Horsham District Council	Y	Y	Y				
HO2	Horsham - Park Way, Horsham	Horsham District Council	Y	Y	Y	Y			
LS8	Lewes – Little East Street, Lewes	Lewes and Eastbourne Councils	Y	Y	Y	Y	Y		
MS1	Mid Sussex - London Road, East Grinstead	Mid-Sussex District Council	Y	Y	Y	Y			
RY2	Rother - De La Warr Road, Bexhill	Rother District Council	Y	Y	Y	Y	Y		
EB3	AURN – Eastbourne, Holly Place	AURN	Y	Y	Y	Y	Y	Y	
LL1	AURN - Lullington Heath	AURN	Y	Y	Y	Y	Y	Y	Y
BH0	AURN – Brighton, Preston Park	AURN	Y	Y	Y		Y	Y	
HO4	AURN - Storrington	AURN	Y	Y	Y	Y*	Y*		
WT2	AURN - Worthing A27 Grove Lodge	AURN	Y	Y	Y		Y		
WT3	AURN - Worthing East - Ten Acres	AURN				Y	Y		

Notes: *AURN Storrington hosted an independent particulate research instrument within the AQMS during early 2024, however from the 1st July 2024 this instrument was affiliated into the AURN and is managed under the AURN contract.

Figure A4-2: Sussex Network Monitoring Locations.