

AIR QUALITY.

REPORT OF: Lucy Corrie, Assistant Director Communities
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Wards Affected: ALL
Key Decision: No
Report to: Scrutiny Committee for Community, Customer Services and Service Delivery
1 February 2023

Purpose of Report

1. To inform Members about our Annual Status Report on air quality and highlight the air quality programme across the District.

Recommendations

The Committee is recommended to endorse the approach of the Council on Air Quality Management.

Background

2. The air quality around Mid Sussex continues to be generally good as demonstrated by the monitoring carried out within the District.
3. Statutory responsibility for monitoring and assessing air quality sits with the Council under Part IV of the Environment Act 1995. Areas where pollutants exceed, or are likely to exceed, Government health-based air quality objectives are declared as Air Quality Management Areas (AQMAs) and we are required to produce an air quality action plan (AQAP) to demonstrate how we will improve air quality in the AQMA. Councils are also required to produce an Annual Status Report (ASR) for the Department for Environment, Food and Rural Affairs (Defra) for their approval.
4. Where air quality problems resulting in AQMAs are related to traffic, which is the case for all AQMAs in West Sussex, West Sussex County Council as the highway authority, has a statutory responsibility to work with the relevant District or Borough Councils to develop and deliver the action plans for these AQMAs. Highways England has an equivalent responsibility to work with the relevant District and Borough Councils in relation to the Strategic Road Network (e.g. A27, M23, A23) where there are AQMAs.
5. The Annual Status Report (ASR) report provides an overview of air quality in Mid Sussex. It contains details of monitored pollutants and incorporates information on changes or potential changes to the environment due to new processes or developments. This allows us to identify potential impacts on air quality which we need to consider and mitigate. The report also includes an update on the actions within the AQAP to address air pollution in the district.
6. Mid Sussex District Council's Annual Status Report for 2022 was approved by Defra in July 2022 and is available to view on the MSDC website in the Environment section at <https://www.midsussex.gov.uk/environment/air-quality/>

7. As air pollutants do not recognise boundaries we work in partnership with our colleagues in the other districts, boroughs and counties to deliver air quality. The group is Sussex wide and is known as the Sussex-Air Partnership, with representatives from Public Health, County Highways, the Environmental Research Group at Imperial College London and the air quality specialists from the district and boroughs.
8. Generally, in Mid Sussex District we have good air quality, but we do have one hotspot where exceedances of one pollutant has been identified. On account of this, in 2012 we declared an Air Quality Management Area (AQMA) at the Stonepound Crossroads, Hassocks due to levels of nitrogen dioxide (NO₂) exceeding the air quality objective level of 40ug/m³ expressed as an annual mean concentration. Once the declaration had been made, we produced an Action Plan listing a number of measures to improve air quality and reduce the pollutant levels. Early indication is that the air quality is improving. We also have a Members' Air Quality Steering Group supported by the relevant officers from the district and county which meets annually to audit and direct the action plan.
9. The exceedance of the air quality objective level for nitrogen dioxide at the Stonepound Crossroads is assessed at the building façade and relates to the average exposure at that position measured or modelled over the period of a year for those living there. Within the AQMA there has been one façade of a residential building that has pollutant (NO₂) concentrations above the objective level, and this was the reason for the AQMA declaration. For 4 of the last 5 years, pollutant concentrations have been below the objective level. For all the other monitoring locations, where they represent relevant exposure, for the last 10 years these have remained consistently below the objective level.
10. The overall trend shows a steady decline in pollutant levels and the monitoring data indicates that the objective is likely to be met in the next couple of years. The objective level does not relate to short term exposure for people walking around the area or through it. There is a much higher limit for short term exposure to concentrations of nitrogen dioxide and the levels at Stonepound Crossroads are well below this level.
11. The measurement and assessment of the monitoring data for the Annual Status Report 2022 related to the data gathered throughout 2021. As expected, there has been a general increase in NO₂ levels compared to those recorded in 2020, as 2021 had a shorter Coronavirus lockdown period than 2020. As a result of impacts from COVID-19 and the associated restrictions on activity during the first seven months of 2021, it was anticipated that measured NO₂ levels would be lower than would have been expected in a "normal" year, and no long-term conclusions should be drawn from this year's data, given that restrictions in response to COVID-19 affected traffic levels significantly. DEFRA have advised that local authorities should not make any decisions on revocation of AQMAs based on data gathered during this time.

Brief background to Air Quality Pollutants

12. There are a variety of different pollutants that have impacts on health for which the government has set objective levels to protect health. The main ones of concern are nitrogen dioxide (NO₂) and particulate matter (PM). Particulate matter is often referred to by size, so you may see references to PM₁₀, PM_{2.5} or PM_{0.1} and are a health concern due to their tiny size which can penetrate deep into the lungs.
13. Pollutants:

- Nitrogen dioxide (NO₂) -Road transport is responsible for some 80% of NO₂ concentrations at the roadside, with diesel vehicles of greatest concern at a local level. This is due in part to improvements in real world emissions testing showing that laboratory test-based emission standards have not delivered expected reductions under real world driving conditions.
 - Particulate matter (PM) is a generic term for tiny soot, grit and dust particles caused by combustion processes such as power plants and motor vehicles including tyre and brake wear. They are also produced when gases and particles interact with one another in the atmosphere. They are categorised by size and identified in microns (µm). Of the different sizes of particulate matter, PM_{2.5} has the strongest epidemiological link to health outcomes as this size particle can be inhaled deep into the lungs. The very smallest particles, ultra-fine PM_{0.1}, once inhaled are able to pass directly into the bloodstream. Unlike NO₂, where concentrations are high immediately adjacent to the source, particulate matter has a much wider geographical extent and guidance suggests we can use monitoring from up to 50 miles away as a reference to assess levels locally. Due to the large distances that PM can travel, it is harder to control at a local level. (See Appendix 1 for PM_{2.5} sources)
14. National and European objectives define levels based on the known effect these pollutants have on human health. Objectives are set in law and, where an AQMA has been designated, local authorities have a statutory obligation to work towards meeting them. Although the UK has exited the European Union, these objectives will remain in place and compliance will be overseen by the Office for Environmental Protection.
 15. For particulate matter (PM₁₀, PM_{2.5}) there is no evidence of a safe level of exposure or a threshold below which no adverse health effects occur. So the approach for this pollutant is generally accepted to be a reduction in background concentrations to ensure the best health outcomes for the widest geographic range of people. It is important to note that local authorities are not presently required to monitor PM_{2.5} but in the Environment Act 2021 the Secretary of State must set a target for the annual mean level of PM_{2.5} in ambient air with the intent of reducing people's exposure.
 16. There is consistent evidence demonstrating clear adverse effects of exposure to air pollutants on health, particularly on the very young, very old and those with existing health conditions. Poor air quality is linked with an increased risk of developing chronic conditions (e.g. chronic obstructive pulmonary disease), poor birth outcomes, lung cancer and respiratory disease.
 17. The health problems resulting from exposure to air pollution have a high cost to society and business, causing demand on our health services and resulting in illness and even premature death. These vulnerabilities are heightened among those living in the most deprived communities.
 18. The Public Health Outcomes Framework (PHOF) includes an indicator which quantifies the contribution of exposure to particulate matter on mortality. In 2020 the fraction of mortality attributable to anthropogenic PM_{2.5} was 5.7% for Mid Sussex. This compares to an estimated fraction of 5.6% for England, and a range between 6.2% (Crawley) and 5.4% (Chichester) for other districts in West Sussex. In summary, the air pollution in Mid Sussex is broadly in line with the regional average.

19. The figures for mortality in the PHOF for particulate matter are estimates of mortality attributable to this risk factor. Outdoor air pollution is a major public health issue costing the UK economy £20bn a year and contributing to over 25,000 deaths a year. It is important to understand that long-term exposure to air pollution is not thought to be the sole cause of deaths. Rather it is considered to be a contributory factor.
20. The importance of local air quality management was highlighted at a coroner's inquest in December 2020, where it was ruled that exposure to nitrogen dioxide and PM_{2.5} pollution, in excess of World Health Organisation guidelines, contributed to the death of a child in London who suffered with asthma. This was the first time in the UK that air pollution has been listed as a cause of death.

Annual Status Report

21. The latest Annual Status Report for air quality monitoring and action in 2021 was submitted in June 2022 and approved by Defra in July 2022. The next report on air quality in the district covering the year 2022 will be submitted in June 2023. The report format is prescribed by Defra and the monitoring data must be presented in the prescribed way.
22. The 2022 report, covering the 2021 monitoring period, states that air quality monitoring and modelling carried out by the Council indicated that the air quality in Mid Sussex is generally good.
23. Monitoring results across the district in 2021 are positive, with all sites showing a decrease in the nitrogen dioxide (NO₂) levels compared to those recorded in 2019 which was the last year before any of the Covid restrictions were in place. The long-term trend is continuing downwards (see Appendix 2). In 2021 we undertook non-automatic (passive) monitoring of NO₂ at 33 sites (see Appendix 3). The monitoring locations are reviewed annually.
24. The Council has been monitoring air quality at sites across the district since 1996. Long term monitoring in specific locations provides continuity of data and enables us to identify air quality trends. Most monitoring sites are chosen where there is relevant exposure, i.e. in locations where there are high traffic volumes and houses close to the road, as concentrations of pollutants drop off rapidly with increasing distance from the source. A small number of sites monitor long-term background levels.
25. The report details the work carried out on the AQMA at the Stonepound Crossroads in Hassocks and confirms that further monitoring and assessment is needed in East Grinstead to investigate the elevated levels of NO₂ at London Road that were identified in 2019.
26. The monitoring in London Road East Grinstead was widened in 2020 with 6 new locations installed. Since the Annual Status Report was published, we have completed a project to install an air quality station at London Road East Grinstead. In the air quality monitoring station there are 2 continuous analysers giving us measurements of NO₂ and PM₁₀ every 15 minutes and available to view in real-time. Data from the station will also benefit our diffusion tube monitoring as this will allow quality assurance of the measurements to be determined locally.

27. As the main source of air pollution in the district is road traffic emissions, Mid Sussex District Council must rely on the Highways Authority at West Sussex County Council to bring forward and implement traffic management and road layout initiatives for air quality improvement. West Sussex County Council members and officers are part of the air quality steering group which is responsible for the air quality action plan for the AQMA at Hassocks. The last meeting of the steering group was in October 2022. The action plan measures were reviewed and half yearly updates are circulated amongst members of the group.

Air Quality Management Area

28. Within the AQMA at Stonepound Crossroads exceedances of NO₂ have been due to the topography, the volume of road traffic at the junction and the proximity of residential properties to the road. Since the AQMA was declared in 2012 there has been an overall reduction in measured NO₂.

29. The monitoring sites around the Stonepound Crossroads have been selected to measure NO₂ levels as close as possible to relevant receptors (in this case residential property facades). Where monitoring sites are not at relevant receptors, a distance correction can be applied to the measured level to give the pollutant concentration at the relevant receptor. In 2020, the monitoring indicated that there were no exceedances of the air quality objective around the Stonepound Crossroads. The overall trend for NO₂ has been a steady decline over the years 2011-2022. Appendix 4 displays the NO₂ trend at the monitoring locations at Stonepound Crossroads over the last 5 years.

30. Having declared an AQMA, we fulfilled a requirement to draw up an Air Quality Action Plan (AQAP). The purpose of the AQAP is to identify measures designed to reduce the pollutant levels so they fall within the air quality objective level which for NO₂ is 40ug/m³ expressed as an annual mean concentration.

31. Table 1 provides an overview of the actions endorsed by the Steering group to date and the work yet to be completed:

Table 1 – Air quality action plan measures investigated

	CURRENT ACTIONS	STATUS
1	“Cut Engine, Cut Pollution” signs	On-going
2	Improve and promote cycle routes	On-going
3	Encourage alternate transport modes (shared approach between HDC, CBC and MSDC)	On-going
4	Installation of pollutant sensors to optimize traffic signalling	To be completed by Spring 2023
	COMPLETED OR NON-VIABLE ACTIONS	
1	Better driving techniques	Completed
2	Vehicle emission testing	Not viable
3	Speed limits and/or traffic calming	Not viable

4	Satnav companies to include advisory lorry routes	Not viable
5	Install signage to cut pollution	Completed
6	MSDC travel plan (Green Travel Scheme)	Completed
7	School travel plans	Completed
8	Encourage alternative/public transport (South East Traveline; eV infrastructure; "Get Hassocks Cycling")	Completed
9	Car share promotion	Completed
10	Partnership work with bus and train operators	Completed
11	Increase air quality information	Completed
12	"Airalert" for vulnerable sections of society	Completed
13	Promote national energy efficiency (Green Deal)	Completed
14	Enforcement of emissions from industrial sources	Completed
15	MSDC Local Plan to include environmental considerations	Completed
16	Incorporate Sussex Air emissions mitigation into Local Plan	Completed
17	Air quality monitoring	Completed
18	Parking enforcement around Hassocks	Not viable
19	Re-assess traffic light sequencing	Completed
20	Development of school travel plans/bike-it events	Completed

Mid Sussex District Council's priorities to promote good air quality in the coming year

32. The adoption of the District Plan has enabled us to embed policies on transportation and pollution. This will enable us to effectively use the planning regime to ensure appropriate mitigation measures are incorporated into development schemes, especially close to the AQMA. The National Planning Policy Framework has, as its overriding aim, the presumption in favour of sustainable development. So, whilst air quality is a material planning consideration when determining applications, there needs to be clear evidence that a development will either create a new air quality management area, conflict with the air quality action plan of an existing AQMA or have a significant adverse impact on existing air quality for an application to be refused on air quality grounds. The Environmental Protection Team will continue to scrutinise applications where air quality is a material consideration.

33. The Sussex-Air partnership has prepared the Air Quality and Emissions Mitigation Guidance for Sussex (2021) and is now the Council's air quality guidance regarded by planning officers to be a material consideration when air quality impacts are anticipated through development proposals. The Site Allocations DPD which was adopted in June 2022 includes a policy on air quality (Policy SA38) and this specifically references the Sussex-wide guidance. Air quality assessments will need to be undertaken in line with best practice and the Council's air quality guidance, and this includes consideration of any mitigation measures.
34. The transition to low carbon forms of transport, such as electric vehicles will support the delivery of improved air quality in relation to nitrogen dioxide. Supporting this, the District Council, in partnership with West Sussex County Council and other West Sussex District and Boroughs, is committed to delivering a widely accessible electric vehicle charge point network for residents across the county. Installation of a further 26 fast charge points are planned through the council delivery partnership during 2021-22. To date, 33 charge points are already in operation throughout the District, these being managed by several providers. In addition, improved cycle and walking routes and infrastructure will further encourage people out of their cars. Plans to develop a long-term strategic approach to promote the use of walking and cycling routes are already underway for the District's three towns.
35. Parking strategies can also be a valuable tool in incentivising low emission vehicles. The recently adopted MSDC Parking Strategy identifies the need to work in partnership with WSCC, local businesses and other key partners to identify how technology and different types of mobility could reduce congestion to improve air quality and local townscapes.

Future considerations for air quality management

36. The Environment Act 2021 received Royal Assent on 9th November 2021 and will be the legal framework of environmental stewardship for the UK. It will address the environmental governance gaps following withdrawal from the EU and sets a series of environmental principles. There will be a new Office for Environmental Protection (OEP) which will become an independent watchdog monitoring progress in improving the natural environment. The OEP will hold public authorities to account in the way the European Commission monitored member states.
37. The Act makes a clear commitment to improve air quality by setting legally binding targets for fine particulate matter (PM_{2.5}), the most damaging pollutant to human health. The Secretary of State has set a PM_{2.5} limit of 10µg/m³ to be achieved by 2040.
38. The Government produced a Clean Air Strategy in 2019 to tackle all sources of air pollution with the aim of making the air healthier to breathe, protecting nature and boosting the economy. Amongst other things it commits to reducing exposure to PM_{2.5}, providing a personal air quality messaging system to alert vulnerable people of forecasted pollution episodes (in a similar way to that currently provided locally by Sussex Air called "Air Alert"), tackling smoke emissions from wood burning in the home and reducing emissions from all types of transport.
39. The Clean Air Strategy acknowledges that 2 tier local government has been a barrier in bringing about prompt air quality improvement. The issue is that District and Boroughs have the responsibility to monitor, assess and report on air quality in their areas while the mechanisms to bring about significant air quality improvement rests with County authorities which, being the highways authority, have the power to implement highway improvements and improve highway infrastructure. The strategy suggests some options to address this regulatory misalignment.

40. The Department for Transport published a transport strategy in July 2018 called Road to Zero with the ambitious aim of all new cars and vans being zero emissions by 2030. This target date was subsequently tightened by the government in November 2020 when introducing a “green industrial revolution”. There will be increases to the supply of low carbon fuels, an extension to the accreditation scheme for retrofitting vans and cabs to cleaner options, offering grants for the transition to plug-in cars, as well as measures to tackle emissions from HGVs and investing in eV infrastructure.

Policy Context

41. Since 1995 local authorities are required to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives set by the Government are likely to be achieved. Where exceedances are considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP), setting out the measures it intends to put in place in pursuit of achieving the objectives.

Financial Implications

42. Costs related to monitoring of air quality from laboratory analysis of diffusion tubes and officer time in installing and collecting the tubes are covered in the Environmental Health budget. There are annual maintenance costs for the air quality station in East Grinstead and officer time implications for the calibration of the equipment.

Risk Implications

43. We are legally required to produce an Annual Status Report on the air quality in the district. Failure to do so would see a formal challenge from Defra and/or our residents.

Equality and Customer Service implications

44. Air quality affects all our residents and our monitoring reflects the entire district. In recent years, air quality has increased in profile amongst the public and in the media and this has led to the Environmental Protection Team dealing with more enquiries and service requests.

Sustainability Implications

45. The work to improve air quality in the District provides a positive contribution to the Council's aim to deliver sustainability and sustainable development. The Council's Sustainability Strategy 2018-2023 specifically mentions air quality as one of the areas of activity to support sustainable economic growth.

Background Papers

- Annual Status Report June 2022 Found on MSDC website at <https://www.midsussex.gov.uk/media/5416/2020-air-quality-annual-statement-status-report.pdf>
- Clean Air Strategy 2019, Department for the Environment, Food and Rural Affairs, 2019 found at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf
- *Road to Zero Strategy – Next steps towards cleaner road transport and delivering our Industrial Strategy*, Department for Transport, July 2018 found at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/739460/road-to-zero.pdf

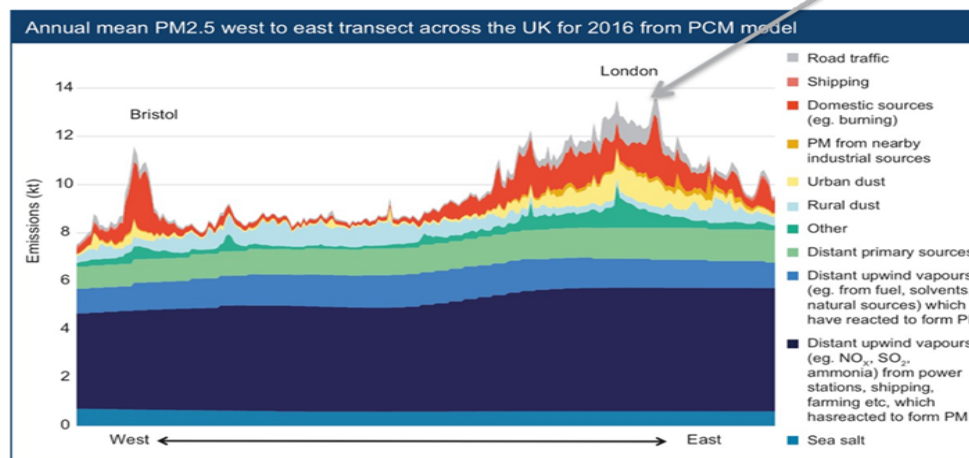
Particulate Matter – PM_{2.5}

Strategies for reducing PM_{2.5}

Domestic sources

– Well publicized issues of domestic burning, fuel and stove regulation?

Road traffic – some future reductions are likely, but PM is still emitted from Electric Vehicles. (Future AQG report)



Urban Dust – Very hard to control since it is agitated by even clean vehicles.

Distant primary – PM_{2.5} is long-lived and brought in to the UK from other countries, including North America

Sea salt – maritime aerosol when combined with other biogenic PM_{2.5} ~ 1-2 mg / m³. e.g ~20% of PM_{2.5} WHO limit is taken up by natural particles.

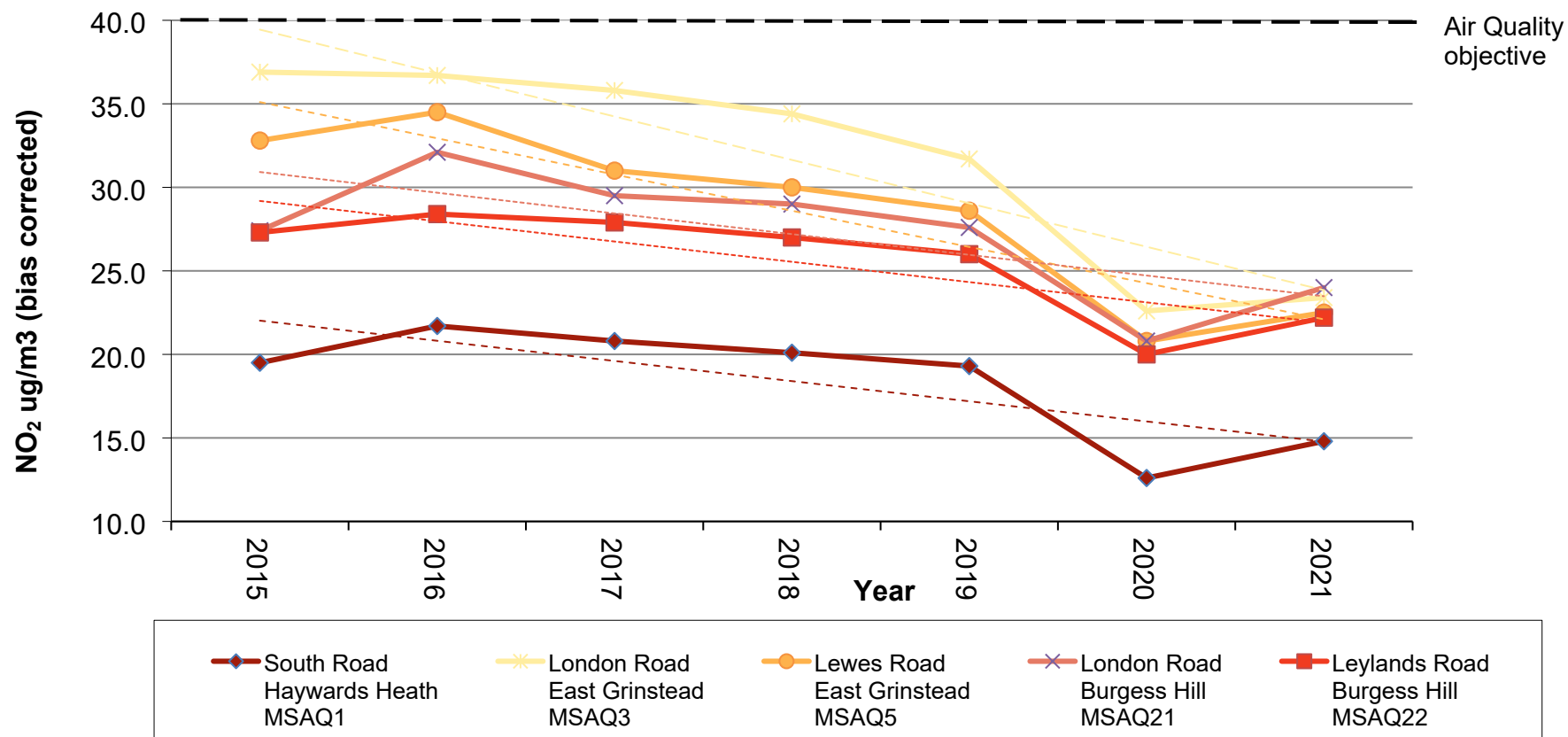
Upwind Vapours (inorganic)

Planned reductions in NO_x and SO₂ will help. Controls are proposed on farming ammonia, but PM_{2.5} formation is highly non-linear. Small NH₃ reductions have little effect on PM_{2.5}

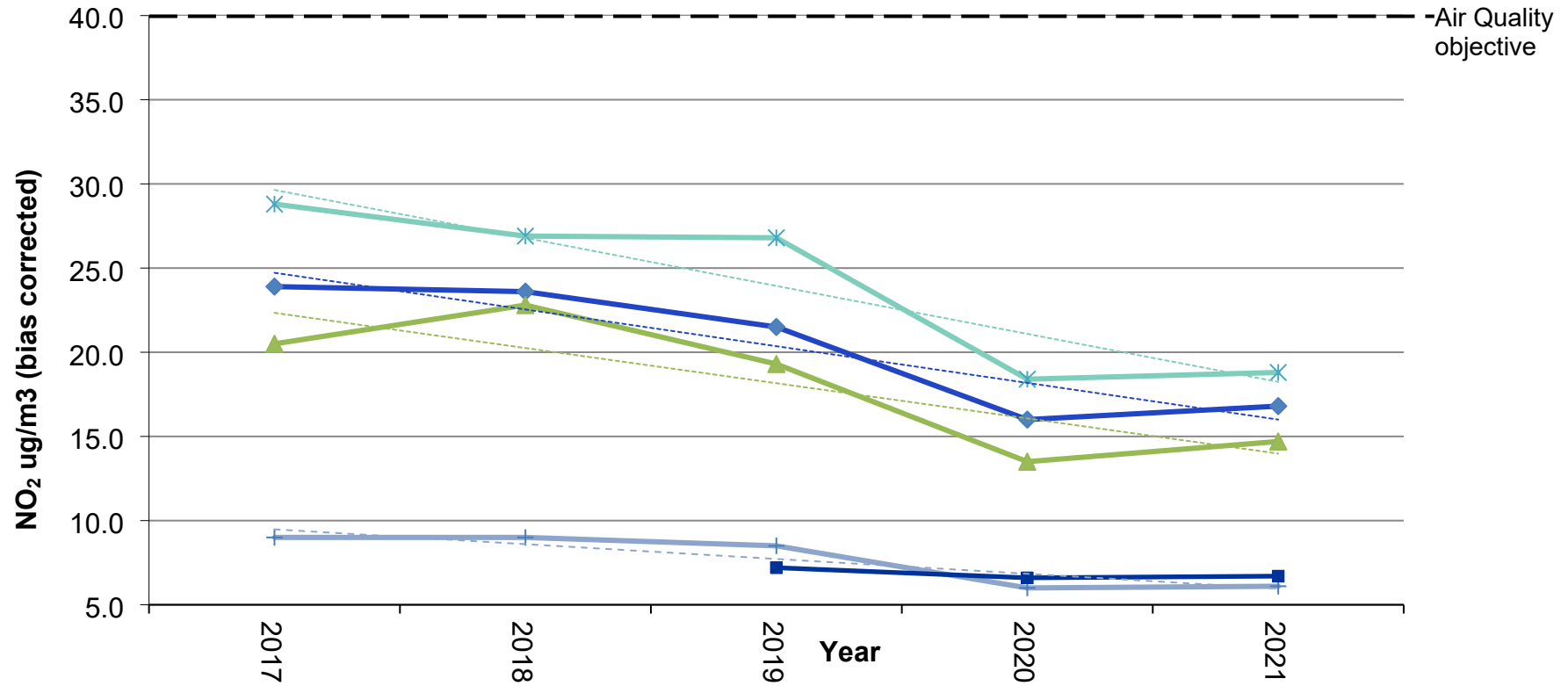
Upwind Vapours (organic)

Volatile Organic Compounds are precursors to both ozone and PM_{2.5}. UK needs to halve emissions by 2030. CAS focuses on domestic sources.

Nitrogen Dioxide Monitoring Trends at 3 Urban Centres 2015 - 2021



Nitrogen Dioxide Monitoring Trends at 3 Villages and 2 Rural Background Sites 2017 - 2021



Warninglid
(rural background)
MSAQ9

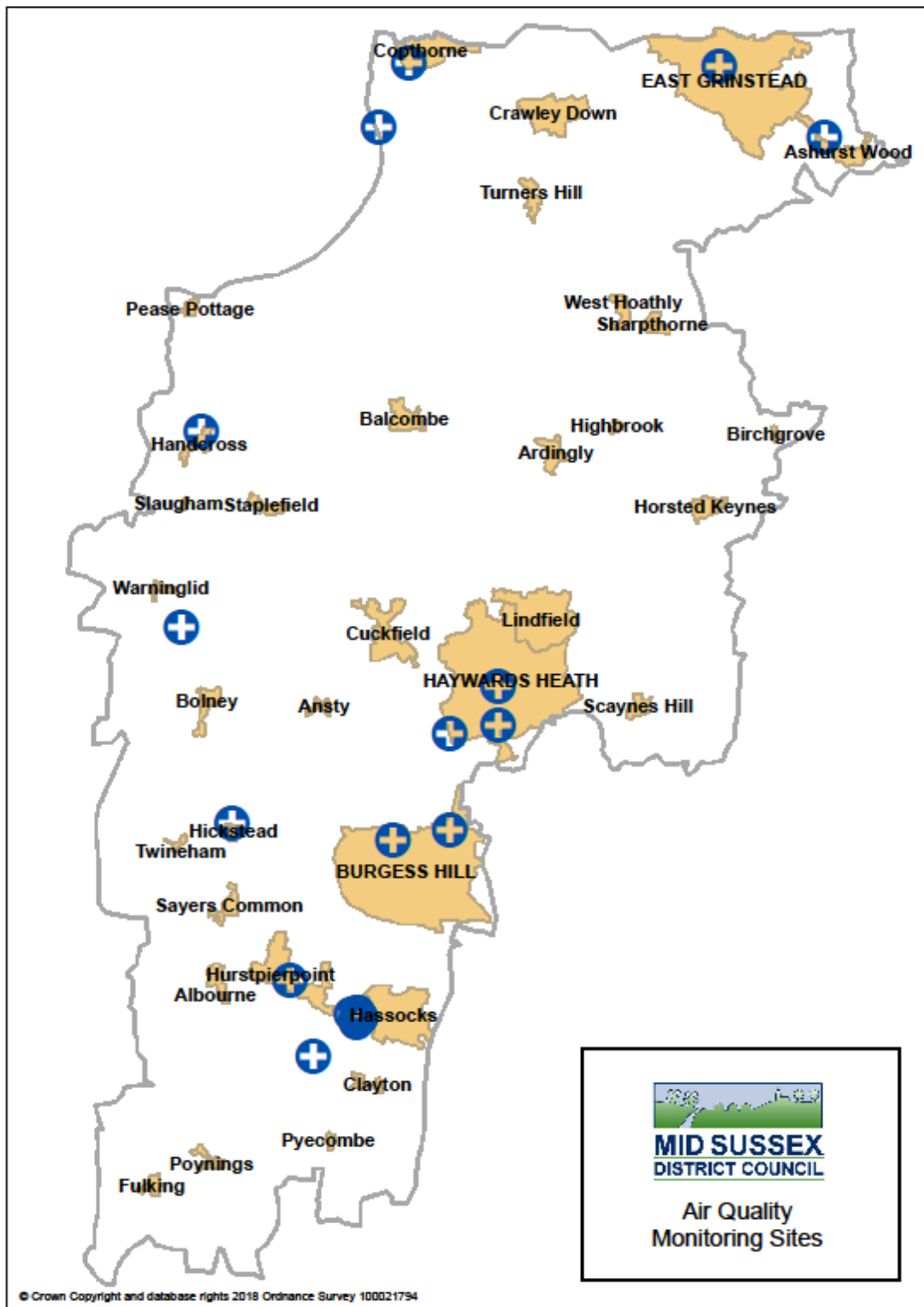
Hurstpierpoint
(rural background)
MSAQ35

Copthorne
MSAQ25

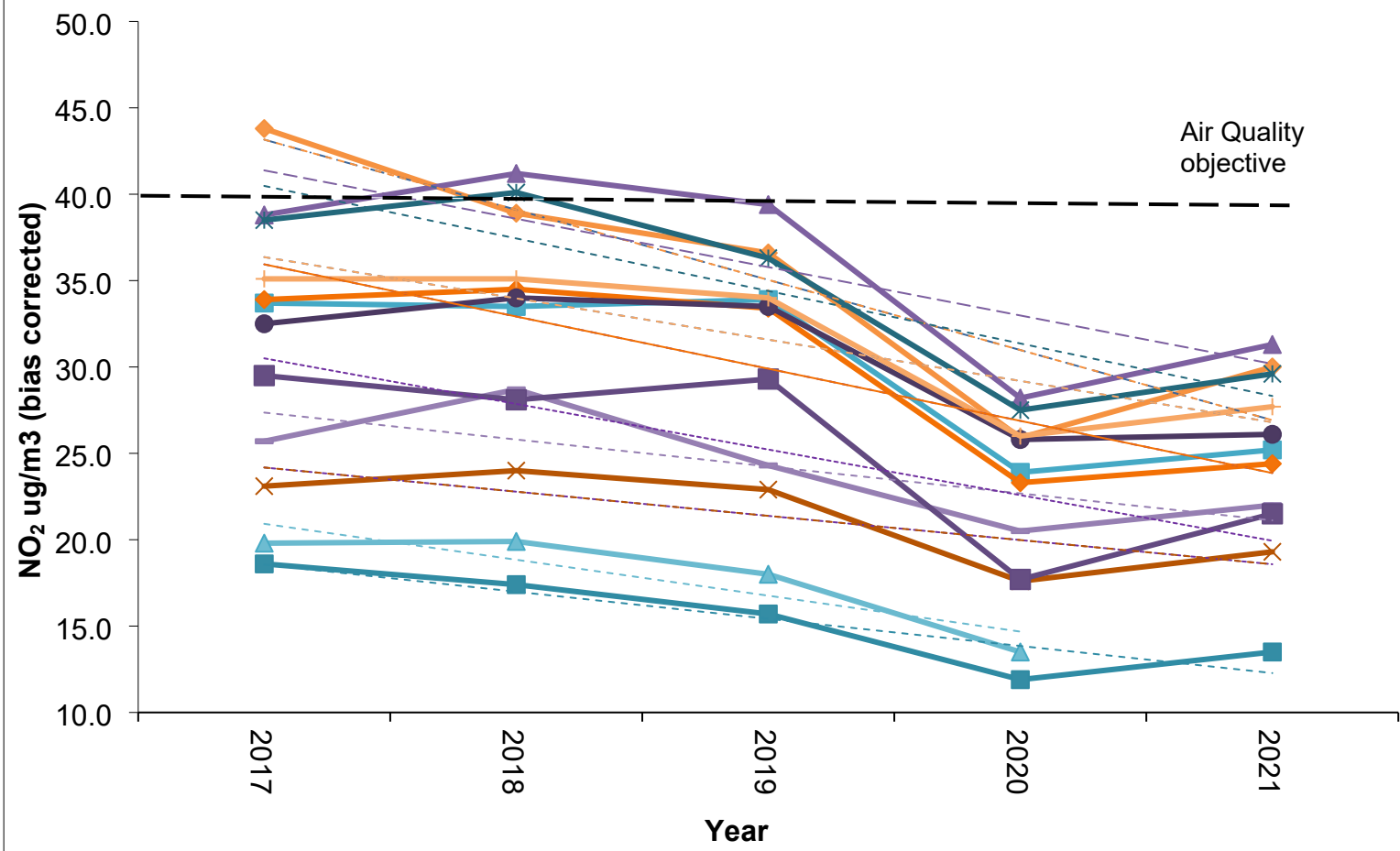
High Street
Hurstpierpoint
MSAQ26

London Road
Hickstead
MSAQ27

Map of Monitoring Locations across Mid Sussex District



Nitrogen Dioxide Monitoring Trends at Hassocks 2017 - 2021



- ◆— Lamp Post
Keymer Road
Hassocks
MSAQ13
- Telegraph Pole
Keymer Road
Hassocks
MSAQ12
- ▲— Traffic lights
Keymer Road
Hassocks
MSAQ10
- *— Northern Façade
(residential premises)
Keymer Road
Hassocks
MSAQ11
- ◆— Eastern Façade
(residential premises)
Keymer Road
Hassocks
MSAQ23
- x— Western Façade
(residential premises)
Keymer Road
Hassocks
MSAQ24
- Bus Stop
London Road
Hassocks
MSAQ14
- +— Traffic sign
London Road
Hassocks
MSAQ15
- ▲— Façade
(residential premises)
Brighton Road
Hassocks
MSAQ16
- Lamp Post
Brighton Road
Hassocks
MSAQ17
- Bus Stop
Brighton Road
Hassocks
MSAQ18