



2018 Air Quality Annual Status Report West Somerset Council

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

June 2018



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Executive Summary: Air Quality in Our Area

Air Quality in West Somerset

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

The main pollutants of concern in West Somerset are associated from road traffic along the principal arterial roads (A39 and the A358) plus emissions associated from solid fuel appliances. Because large parts of the area is off-mains gas the district has the largest number of boilers burning biomass (wood) fuel in Somerset. The principal pollutants are nitrogen dioxide (NO₂) and also particulate matter of less than 10 microns (PM₁₀ and PM_{2.5}).

In terms of traffic emissions, the Council has air quality monitoring stations located at what are considered the most sensitive parts of the road network. Details of the monitoring for NO₂ is provided in section 3. Traffic emissions at these stations continue to be less than the annual mean objective (40 ug/m³ NO₂) and furthermore trends (see Figure 1) continue to show a reduction in this mean.

For new emission sources, Hinkley Point-C remains the largest development of potential impact on air quality in the area. Consent was granted by the Secretary of State for Energy and Climate Change in March 2013 to build and operate two nuclear European Pressurised Reactors (EPR) at Hinkley Point C and commencement of works occurred in September 2015. The principal pollutants associated with this site are from particulate matter emissions associated with the construction activities (on-going), traffic entering the site and once operational emissions from associated diesel backup generators (35 MW capacity).

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

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

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

There are planning obligations that have been agreed for this site for an air quality scheme to monitor the dust, particulate matter and noise outside the southern boundary, and which are close to the residential properties. There are four automatic monitoring stations that analyse and report on PM₁₀, PM_{2.5} and TSP with trigger levels set for PM₁₀ 200ug/m³ for 15min and 1-hr. The concentrations are reported to the Council by EDF via an on-line website. If concentrations exceed these trigger levels it requires actions by EDF and if prolonged, notification / investigation to this Council. The scheme is intended to prevent particulate matter / dust complaints arising, rather than to quantify results suitable for this review and assessment work as they are considered non-reference.

In terms of the large biomass boilers as mentioned above, these large point sources are a known source for particulate matter emissions of less than 10 microns (PM₁₀ and PM_{2.5}) plus oxides of nitrogen e.g. NO₂ and as such require careful assessment of these pollutants. We work closely with planning to provide advice on the emission rates of these new boilers. Whilst none have been found as likely to individually cause a breach in the particulate matter and nitrogen dioxide objectives, some have been shown to increase particulate matter emissions significantly.

Actions to Improve Air Quality

In the absence of a designated AQMA, in terms of actions to improve air quality and to reduce emissions, these are primarily achieved through development control and complying with relevant policies. There are two planning authorities for the West Somerset Council area (West Somerset Council as well as Exmoor National Park Authority).

In West Somerset Council area planning policy NH9 (West Somerset Local Plan to 2032) requires;

- *“development that generates atmospheric emissions which would cause harm to human health, senses or property will not be permitted and where such uses exist the local planning authority will not permit such uses within a reasonable distance of such uses”*

In Exmoor National Park, policy CC-S7 explains where;

- *“pollution cannot be avoided development proposals will be expected to demonstrate that there will be no unacceptable adverse impacts individually or cumulatively on the environment”*

Given the scale of the development at Hinkley Point C the following actions are explained below, but critically been agreed across both West Somerset and neighbouring Sedgemoor areas such as;

1. To limit the parking on site to reduce need for travel to and from the site
2. Construction of four park and ride facilities (one in West Somerset and other three in Sedgemoor). The site in West Somerset (Williton) is still to be completed.
3. New campus type development to house employees on site consisting of 510 modular bed space accommodation and with associated parking. This will reduce need to travel to the site. The campus is due to open in July 2018.
4. Freight consolidation facilities located in Sedgemoor at junctions off the M5 to ensure deliveries are bulked to help reduce overall number of vehicles travelling into the site. Whilst this is within the neighbouring authority (Sedgemoor) it will help to ensure HGV movements do not travel through the western approach (West Somerset)
5. Construction of a jetty to transport construction materials e.g. aggregates
6. A by-pass around Cannington, Sedgemoor (already completed)
7. Grants for local housing improvements e.g. housing improvements that potentially reduce emissions from heating.
8. Contingency funding where necessary, for additional air quality monitoring owing to the predicted additional traffic flows occurring in West Somerset. The total predicted additional vehicles through Williton as a result of the Hinkley development was predicted as 827 vehicles per day at all scenarios modelled.

Conclusions and Priorities

The local priority for emission reduction as explained is to ensure air quality and transport concerns are fully considered at development control stage and with responsibility resting with all those involved in air quality e.g. environmental health, planning, public health and transport etc.

Furthermore, with introduction of the new LAQM Policy Guidance as introduced by Defra (2016), the challenge is recognised now as one based on general emission reduction as well as the more traditional methods to focus attention at the pollution hot spots AQMA's of which as explained there are none in the West Somerset area.

It has been recognised for a while (Defra, 2007) that policies aimed solely at tackling the hot spots, will ignore wider health benefits associated with an exposure reduction approach to the small particulates fraction for which it is thought there is no accepted threshold effect.

The updated policy guidance as introduced by Defra (2016) explains that whilst there is no regulatory standard specific to PM_{2.5}, there were a number of options available, for example to move towards a lower specific target i.e. below the existing 25ug/m³ EU limit value for PM_{2.5} for the benefit of public health. Whilst no lower value has as yet been agreed with public health professionals, the WHO guideline value for PM_{2.5} (10ug/m³) is of importance when considering wider exposure reduction approach to the pollution sources of particulate matter.

In terms of pollution sources, the National Atmospheric Emission Inventory (NAEI) shows that largest source of PM_{2.5} by mass is from the domestic sector burning wood (Figure-2). In addition, and to put these sources into further context, the NAEI also adds that around 78% of all benzo-a-pyrene (BaP) emissions is derived from the wood burning⁴.

Given these increases being reported by NAEI and the allocation to the toxic BaP emissions, the priority is to help direct public attention towards the main pollution sources and to provide advice and information to help ensure best practice is followed when choosing to burn wood and also when selecting a combustion appliance by the lowest emission factor. For larger biomass boilers we will continue

⁴ Defra analysis of 2016 BaP emissions from the National Atmospheric Emissions Inventory (NAEI) 2018, full inventory will be published in summer 2018.

to assess the emission rates and ensure that none will lead to an exceedance in the relevant air quality objectives, but moreover do not lead to significant increase in exposure to the principal emissions (PM_{2.5} and NO₂).

Large developments (>50 dwellings) that are required to have a full travel plan are shown in section 2.3. None are considered likely to impact air quality.

We have also been working closely with public health colleagues and have reviewed the regional air quality strategy for Somerset⁵ and published a new website⁶ to take forward these air quality initiatives across the wider Somerset area. A regional air quality group for the South West of England has also recently formed which should help to further facilitate improvements and communicate best practice. This Council was invited to give a presentation on PM_{2.5} emissions at this conference.

The recent consultation on Clean Air Strategy 2018⁷ from Defra is welcomed.

The conclusion drawn from this period of review and assessment is that there is no requirement to proceed to a Detailed Assessment for any of the air quality pollutants as concentrations of primary pollutants are unlikely to breach relevant objectives.

Local Engagement and How to Get Involved

The traditional view that air quality is a problem only for the local Council or where an AQMA has been declared clearly ignores the potential for wider public health benefits. Responsibility instead must rest with everyone including the public and also those with a responsibility for air quality e.g. environmental health, planning, public health, transport etc.

To put the issue further into context, it is explained in the Briefing Paper for Directors of Public Health (Defra and PHE, 2017) that even with relatively small reductions in PM_{2.5} such as 1ug/m³ across a population, there would be an increase in life expectancy from birth of about 20 days. Clearly, this shows the importance of actions taken in reducing the primary sources of particulate matter, plus also the precursors like NO_x that form secondary particulates.

⁵ [Somerset Air Quality Strategy, 2008](#)

⁶ <https://somerseairquality.wordpress.com/>

⁷ Defra, 2018, Clean Air Strategy; <https://consult.defra.gov.uk/environmental-quality/clean-air-strategy-consultation/>

West Somerset Council

To encourage local engagement on seeking emission reductions, the priority as explained above is in providing advice and information to encourage best practice and to help direct public attention of the main sources of PM_{2.5} (Figure-2).

Information is made available through this [Council's](#) and also [Somerset County Council's](#) websites to help encourage best practice.

In terms help towards car-sharing and minimising travel, Somerset County Council also offer a [car sharing initiative](#) to help individuals to locate a car share or to offer these services to others.

There are also other community forums, which meet regularly to discuss the Hinkley Point-C development including the impacts from traffic.

To get up to date information on air quality in the area, there is an App available to download and is compatible with iPhone or Android devices ([UBreathe](#)).

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1 Local Air Quality Management

This report provides an overview of air quality in West Somerset Council during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by West Somerset Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

West Somerset Council currently does not have any AQMAs.

Maps showing the locations of the Council's diffusion tube network is available in Appendix-D.

2.2 Progress and Impact of Measures to Address Air Quality

Defra's appraisal of last year's ASR concluded that it was well structured, detailed, and provides the information specified in the Guidance. The following comments were made and actions have been noted against each of these:

1. It is noted that the local authority continue to monitor nitrogen dioxide at 6 diffusion tube sites representative of relevant public exposure. Concentrations have remained well below the national air quality objectives over the last 5 years, particularly at sites 3, 4, 5 and 6.
2. It may therefore be appropriate for the local authority to consider reviewing their current monitoring strategy, and consider relocating some of their monitors to other areas of relevant public exposure where there may be exceedances of national objectives, where monitoring has not previously taken place. **Action** Monitoring at site 6 (Silvermead) has ceased and instead a new roadside location in Williton along the A39 has been set up outside the Egremont Court (from **Jan 2018**). Results of this site will be reported in next year's ASR.
3. There are inconsistencies between the maps presented in Appendix D and the information in Table A.1. The Y OS grid reference appears to be incorrect for site 6 (Silvermead Alcombe), and the given grid references

for site 4 (The Avenue Minehead) also appear to be incorrect, placing the site in Washford rather than Minehead. We recommend these are corrected in future reports. **Action:** NGR Grid references have been checked and corrected.

4. The report does not follow the latest ASR report template. The latest Template has an amended Table B.1 that requires consideration of distance corrections, with some additional checks that request a response. Please use the most up to date Template for future reports. **Action:** Table B.1 has been enclosed with distance corrections. However Section 7.7 of LAQM TG-2016 explains that NO₂ fall-off distance correction applies where the annual mean concentration exceeds 36ug/m³. After correcting for bias there are no sites where NO₂ concentration exceeded annual mean 36ug/m³ and therefore no distance correction has been applied.

2.3 PM_{2.5} – Local Authority Approach to Reducing Emissions and or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

West Somerset Council recognises the public health benefits of seeking a wider exposure reduction approach to the pollution sources of particulate matter. This is especially relevant in this area without designated local AQMA's e.g. average annual background concentration for PM_{2.5} in the area is 8.2ug/m³, when compared an EU limit value (25 ug/m³).

Background data however, does not take into account local sources of PM_{2.5} pollution which is the subject of this report. The main sources of primary PM_{2.5} are shown in Figure-2 (taken from NAEI). This shows that wood burning in the domestic sector is the largest source by mass and with an upwards trend.

Wood fuel quality is thought to be critical, as damp wood will reduce the temperature and lead to increased products of incomplete combustion, such as BaP.

However, there is currently no regulatory standard that applies to moisture content of wood. Smoke Control areas for example only control the sale of coal not wood, and furthermore, the RHI grant scheme centres on the sustainability of the wood being burnt rather than a minimum standard on moisture content. There are Woodsure (HETAS) accredited (less than 20% moisture content) wood suppliers, but currently only a few registered in the area.

When considering these constraints and as explained above, the approach taken is to help ensure public attention is directed towards the principal sources of PM_{2.5}, and to provide advice and information to help ensure best practice is followed especially when burning wood in the domestic sector.

We will also ensure that air quality is fully considered on planning applications in the non-domestic sector for new boilers over 45kW. No new applications for boilers >45kW were received within this period of review.

The Council is also working with Public Health colleagues in adopting the Somerset air quality strategy, which is considered an important part of the Public Health Outcomes Framework (PHOF) indicator. This is a Department of Health data tool for England, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. It includes an indicator, based on the effect of particulate matter (PM_{2.5}) on mortality.

It must be recognised that since PM_{2.5} is one of the pollutants released in road traffic emissions, any improvements in reducing traffic will also have commensurate reduction in the finer fraction. NO_x from traffic for example is one of the precursors to secondary particulates which can be a significant proportion of the total mass. In terms actions (traffic), those listed above against Hinckley Point-C are therefore of relevance.

In relation to some other actions to reduce the need to travel, full travel plans for example are required on planning applications when based on scale of and use of new development. Developments of over 50 dwellings in West Somerset require a full travel plan. The various thresholds and criteria are set out within the Somerset County Council's travel planning procedures, which are derived from SCC Future Transport Plan for the period 2011-2026⁸. Within the current period of review the following applications were received in 2017 that required a full travel plan:

- 3/21/17/119 – 71 dwellings on land off Hopcott Road, Minehead – approved. This is a reserved matters application following approval of outline application 3/21/13/120 – on which there was a transport assessment and residential travel plan.
- 3/37/17/019 – 139 dwellings on land south of Doniford Road and Normandy Avenue, Watchet. – awaiting decision. Outline application with transport assessment.
- 3/37/17/020 – 250 dwellings at Liddymore Farm, Liddymore Lane, Watchet – awaiting decision. Outline application with transport assessment.

However, it was mentioned in last year's ASR that placing emphasis on travel plans for *only* new developments, ignores potential for larger emission reductions

⁸ [Somerset County Council Travel Plans](#)

associated with promoting travel plans for existing businesses. This has the potential for wider public health benefits.

There are also important planning policies that encourage active travel have the potential for wider public health benefits which are captured in other Public Health indicators such as increased physical activity (indicator 2.13) and reducing excess weight at various ages (indicators 2.6 & 2.12), that apply for new developments:

- West Somerset's CF2 (West Somerset Local Plan to 2032) explains that developments should be *“designed in order to maximise the attractiveness of walking and cycling as means of making journeys to local services and facilities and also to encourage recreational walking and cycling”*.
- There is a similar policy for Exmoor National Park (Policy CE-56) which explains that the *“design should have regard to health and well-being and ensure that sufficient public and/or private space is provided or available, and footpaths and cycleway are incorporated where appropriate”*.

Local Government procurement policy and setting example for others to follow also has a role to play in general emission reductions. In terms of this Council's procurement for new vehicles, there is no specific policy other than cost. The Council has replaced the essential car user scheme, with a corporate fleet of pool vehicles. This means that business miles are now done by mostly newer vehicles. Newly created Clean Air Zones⁹ to be implemented in parts of England will help to influence buying decisions.

⁹ [Clean Air Zones, Defra](#)

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

3.1 Summary of Monitoring Undertaken

This section sets out the monitoring that has taken place and how results compare with the objectives

3.1.1 Automatic Monitoring Sites

There are four automatic monitoring sites maintained and owned by EDF to analyse for PM₁₀, PM_{2.5} and TSP. They discharge planning condition ref 3/32/10/037 for the Hinkley Point-C power station.

As explained above the sites are considered **non-reference** for reporting purposes and furthermore, since no incidents / notifications were made to the Council in period of review it is not considered relevant to report further on this data.

3.1.2 Non-Automatic Monitoring Sites

West Somerset Council undertook non-automatic (passive) monitoring of NO₂ at 6 sites during 2017. Table A.2 (Appendix A) shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D.

Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section have been adjusted for bias. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

The measured concentrations are below the annual mean air quality objective at all monitoring sites in 2017. The concentrations are also below 60 µg/m³, indicating that an exceedance of the short term 1-hour mean objective is also unlikely at these sites.

Trends for the NO₂ annual mean concentrations for more than 5 years is presented in Figure 1, where it can be seen there is a progressive downward trend at all sites. However, it is recognised that caution should be exercised when interpreting NO₂ data trends, following comments by the Air Quality Expert Group (AQEG, 2007). It was explained by AQEG (2007) that a levelling off of NO₂ trends nationally was thought to be a result of increases in primary NO₂ emitted, which was considered in part due to an increase in market penetration of diesel vehicles and retrofitting of pollution control devices to vehicles.

Appendix A: Monitoring Results

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
DT1	Williton CS	Roadside	307737	140954	NO2	NO	0.1	0.5	NO	2
DT2	Williton PO	Roadside	307715	141013	NO2	NO	0.1	0.5	NO	2
DT3	Vulcan Rd, Minehead	Roadside	297804	145956	NO2	NO	162m	0.5	NO	2
DT4	The Avenue, Minehead	Roadside	296950	146248	NO2	NO	1	0.5	NO	2
DT5	May Terrace, Washford	Roadside	304694	141030	NO2	NO	5	0.5	NO	2
DT6	Silvermead, Alcombe	Roadside	297700	145164	NO2	NO	9.9	0.5	NO	2

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
DT1	Roadside	Diffusion Tube	100	100	33.5	32.02	30.1	33.2	26.19
DT2	Roadside	Diffusion Tube	100	100	32.4	33.63	30.7	32.6	28.13
DT3	Roadside	Diffusion Tube	100	100	14.8	13.2	12.7	15.5	12.05
DT4	Roadside	Diffusion Tube	100	100	21	20.1	19.5	21	16.78
DT5	Roadside	Diffusion Tube	100	100	30.4	30.8	25.8	22.9	13.81
DT6	Roadside	Diffusion Tube	100	100	18.1	16.5	17.7	17.9	13.15

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

Notes:

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

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

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2017

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.77) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
DT1	34.43	36.30	39.10	38.18	36.37	29.81	30.50	32.83	28.25	31.16	35.45	35.75	34.0	26.2	
DT2	35.42	39.69	38.87	41.75	32.87	34.86	32.07	33.67	34.67	36.80	40.04	37.65	36.5	28.1	
DT3	22.13	20.21	17.82	15.98	13.53	12.14	11.06	11.76	11.69	16.27	17.85	17.31	15.6	12.0	
DT4	28.23	26.15	22.78	22.76	20.25	18.64	15.86	19.63	17.08	20.39	25.00	24.80	21.8	16.8	
DT5	23.85	22.89	19.80	16.16	15.11	14.90	13.31	14.36	16.79	18.61	19.25	20.22	17.9	13.8	
DT6	23.66	18.57	20.03	17.74	18.91	15.94	11.87	11.90	11.75	18.66	17.24	18.65	17.1	13.1	

- NO Local bias adjustment factor used
 National bias adjustment factor used
 Annualisation has been conducted where data capture is <75
 Where applicable, data has been distance corrected for relevant exposure

Notes:

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

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

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

Figure 1; Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites

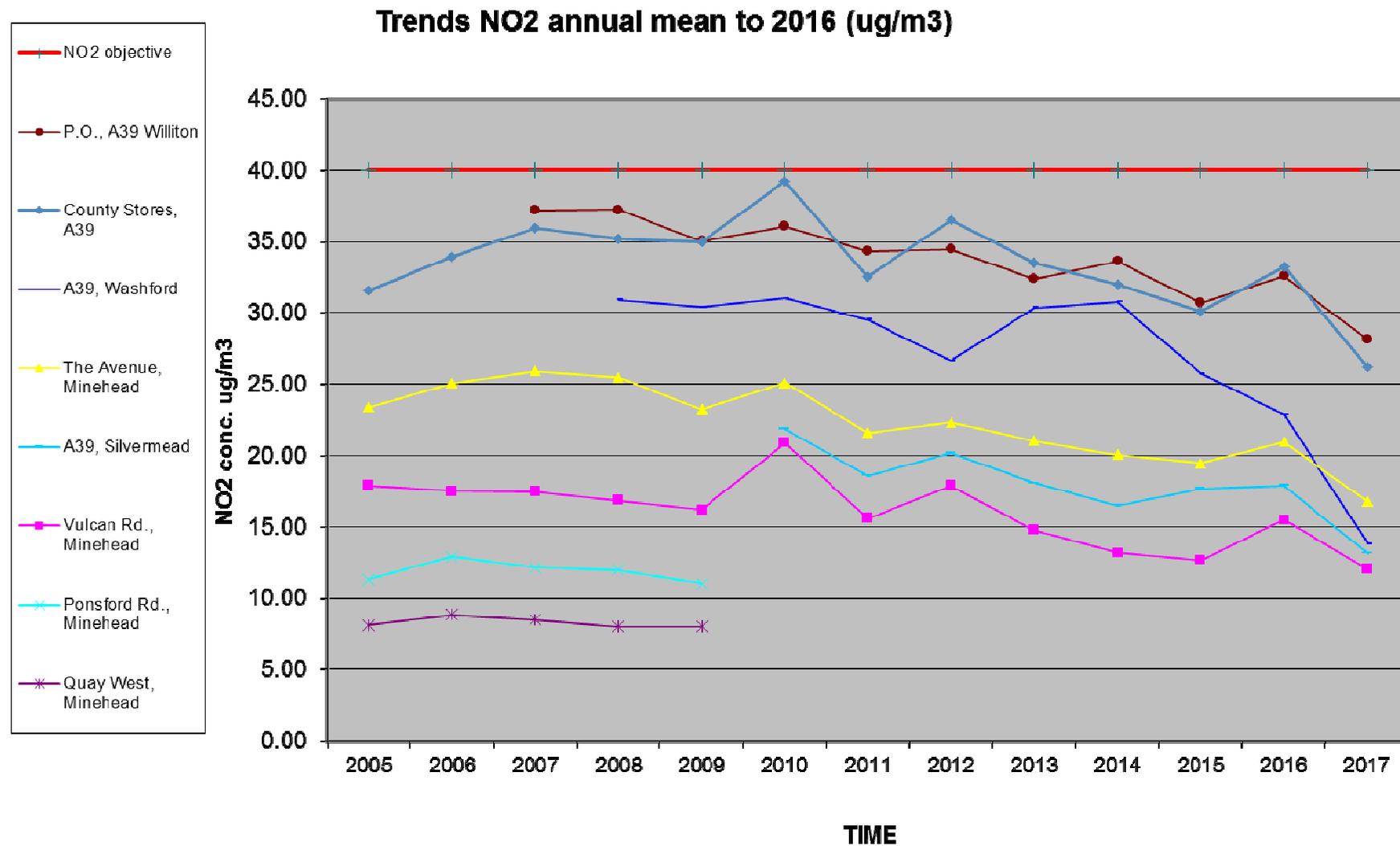
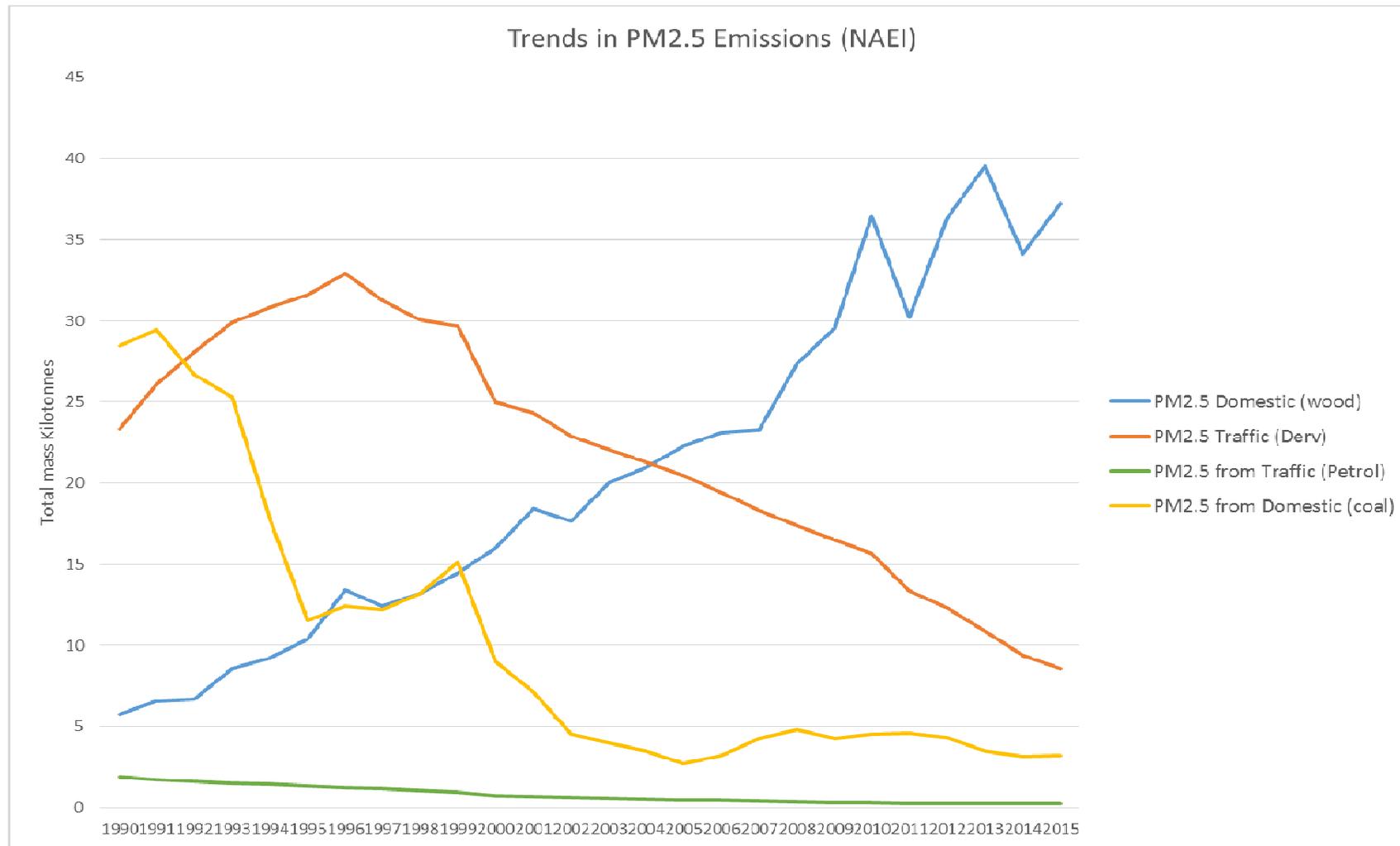


Figure-2; Trends / Main Sources PM2.5



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

Supporting Technical Information

There were no changed and new sources of pollution that have been investigated and no changes to existing sources, or new sources of pollution noted in the year under review (2017).

Air Quality Monitoring Data QC/QA

The choice of passive sampling methods by diffusion tubes and using national bias adjustment is considered a relatively simple and cost-effective method of monitoring the air quality in West Somerset. The results of the external AIR PT rounds in this period as noted below are satisfactory and with precision also reported as good.

It is recognised that correcting the Council's annual NO₂ mean results with this correction factor derived from other co-location studies provides the best estimate of the true annual mean concentration. Research shows that the bias adjustment uncertainty for tubes analysed this way is $\pm 20\%$ (at 95% confidence level). This compares with a typical value of $\pm 10\%$ for chemiluminescence subject to appropriate QA/QC procedures.

Tubes are stored in fridge on delivery from the laboratory and transported on site, enclosed inside plastic bag. Travel blanks are not used. Tubes are sent direct back to the laboratory in a sealed plastic bag.

Diffusion Tube Bias Adjustment Factors

Somerset County Council are the supplier of the Council's diffusion tubes. The preparation method is 20% TEA with bias adjustment factors taken from LAQM support version 03/18 (0.77 bias adjustment factor).

The Council does not co-locate the diffusion tubes, but instead it corrects the NO₂ data by applying the bias adjustment factor obtained from these studies. This factor

is a result of a number national co-location studies (2) all of which are reported to have good precision (coefficient of precision <20%).

QA/QC

For the current year under review (2017) Somerset County Council (Scientific Services) report 100% compliance with the external AIR PT scheme and with satisfactory z scores, apart from period Sept – Oct 2017 @ 75% compliance.

Short-term to Long-term Data Adjustment

The Council's monitoring at all sites was complete (100%) for the 12-months under review, and therefore no correction was made to annualise the data against AURN sites.

Distance correction to correct fall-off in NO₂

NO₂ fall-off distance correction applies where the annual mean concentration exceeds 36ug/m³. After correcting for bias there are no sites where NO₂ concentration exceeded annual mean 36ug/m³. No distance correction is necessary.

Appendix D: Map(s) of Monitoring Locations

Figure D.1; Location of Non-Automatic Monitoring Sites in Williton and Washford

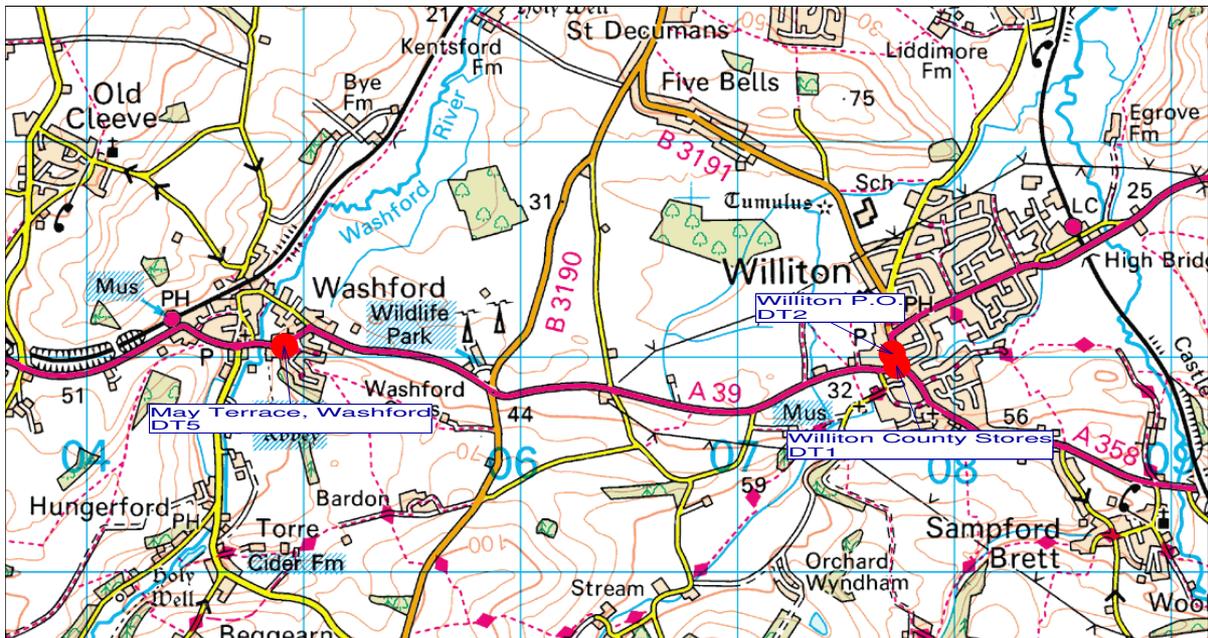


Figure D.2; Non-Automatic Monitoring sites located in Minehead



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Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ¹⁰	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

¹⁰ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control

References

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