



# Vale of Glamorgan 2023 Air Quality Progress Report

In fulfilment of Part IV of the Environment Act  
1995, as amended by the Environment Act 2021

Local Air Quality Management

Date: September 2023

<b>Information</b>	Vale of Glamorgan Council
<b>Local Authority Officer</b>	Adam Spear
<b>Department</b>	Shared Regulatory Services
<b>Address</b>	Civic Offices, Holton Road, Barry CF63 4RU
<b>Telephone</b>	0300 123 6696
<b>E-mail</b>	
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## Executive Summary: Air Quality in Our Area

What has become distinctly apparent is that air Pollution is a local and national problem. Long-term exposure reduces life expectancy by increasing mortality, as well as increasing morbidity risks from heart disease and strokes, respiratory diseases, lung cancer and other effects.

What we know is that poor air quality in Wales poses a significant concern for Public Health and is regarded as the most significant environmental determinant of health. Its associated adverse risk to public health is particularly prevalent within urban areas and near major roads. The pollutants of primary concern for public health are particulate matter and primary/ secondary derived nitrogen dioxide (NO<sub>2</sub>). Both pollutants primarily originate from motor vehicles.

The UK expert Committee on the Medical Effects of Air Pollution (COMEAP) estimated that air pollution is responsible for “an effect equivalent of between 28,000 and 36,000 deaths (at typical ages) each year” in the UK. In 2022, the UK Health Security Agency updated this estimate; the burden range is now reported as the equivalent of between 29,000 and 43,000 deaths per year<sup>1</sup>.

The burden range does not reflect ‘actual’ deaths from air pollution exposure but is an estimate of the ‘equivalent’ reduced life expectancy, when summed, which everyone experiences because of air pollution exposure (6-8 months on average but could range from days to years).

In Wales – based on modelled air pollution data pre-pandemic – Public Health Wales estimated the burden of long-term air pollution exposure to be around the equivalent of 1,000 to 1,400 deaths each year<sup>2</sup>. This estimate was calculated using a more

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<sup>1</sup> <https://airquality.gov.wales/about-air-quality/health-advice>

<sup>2</sup> <https://phw.nhs.wales/services-and-teams/environmental-public-health/air-quality/air-pollution-and-health-fact-sheet/>

accurate method that considers the combined effects of different pollutants, meaning that the overlapping effects of PM<sub>2.5</sub> and NO<sub>2</sub> are accounted for.

Impact estimates are uncertain, however, which is why they should always be presented as a range of values, rather than a single, central estimate. The estimates are also relevant only to a single time and place and should not be used for comparisons.

Although estimating the burden of air pollution is difficult, there is clear and strong evidence that it does harm health. It is therefore important to take action to reduce air pollution and the harms that go with it.

### **Pandemic Restrictions and the Impact on Air Quality**

The emergency public health restrictions introduced during the pandemic (e.g. lock down and working from home policies) showed just how closely travel, transport and air pollution are connected.

In work commissioned by Welsh Government<sup>3</sup>, the changes in concentrations of different air pollutants during lock-down phases were assessed. It showed that travel and transport are significant contributors to air pollution, and that changes in the need to travel and mode of travel can improve air quality.

Policies that recognise these changes and aim to support them being adopted in the long-term are likely to benefit air quality and health.

Remote and Hybrid working has remained higher than pre-pandemic levels. These working practices contribute towards decreased traffic and emission on our roads. Data is presented by the ONS (Office of National Statistics) for the UK Annual Population Survey in 2019<sup>4</sup>. In the 12-month period from January to December 2019, in the UK there were an estimated 1.7 million people who said that they work mainly from home; this represents just over 5% of the total workforce.

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<sup>3</sup> <https://airquality.gov.wales/reports-seminars/reports?page=1>

<sup>4</sup> [Coronavirus and homeworking in the UK labour market - Office for National Statistics \(ons.gov.uk\)](https://www.ons.gov.uk/peoplepopulationandcommunity/employmentandworkinghours/articles/coronavirusandhomeworkingintheuklabourmarket/2020-07-23)

Levels of working from home peaked during the pandemic, with almost half of working adults (49%) reporting having worked from home at some point in the past seven days in the first half of 2020 (3 to 13 April and 11 to 14 June 2020). Two years later (27 April to 8 May 2022), when guidance to work from home was lifted in Great Britain, around 38% of working adults reported having worked from home. In the most recent period (25 January to 5 February 2023) around 40% of working adults reported having worked from home at some point in the past seven days.

### **The Environment (Air Quality and Soundscapes) (Wales) Bill**

The Environment (Air Quality and Soundscapes) (Wales) Bill<sup>5</sup> was introduced to the Senedd on Monday 20 March 2023, giving the Welsh Government greater ability to tackle air and noise pollution.

The new Bill is part of a package of measures to improve the quality of the air environment in Wales.

It will give powers to Welsh Government to introduce new long-term targets for air quality under a national framework taking account of the latest scientific knowledge including the World Health Organisation Air Quality Guidelines

The Bill will help create low emission zones on Welsh Government trunk roads where needed and will give local authorities more power to tackle vehicle idling.

## **Air Quality in the Vale of Glamorgan**

Local authorities have a statutory duty under Part IV of the Environment Act 1995 & Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 to manage local air quality. Under Section 82 of the Environment Act 1995 the Local Air Quality Management (LAQM) process places an obligation on all local authorities to

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<sup>5</sup> <https://www.gov.wales/new-powers-tackle-air-and-noise-pollution-will-lead-cleaner-healthier-and-greener-future>

regularly review and assess air quality in their areas, and to determine whether air quality objectives are likely to be achieved.

The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138) and Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298).

Where the air quality reviews indicate that the air quality objectives may not be met the local authority is required to designate an Air Quality Management Area (AQMA). Action must then be taken at a local level and outlined in a specific Air Quality Action Plan (AQAP) to ensure that air quality in the identified area improves.

In line with the Vale of Glamorgan Council's (VoGC) statutory duties, under Part IV of the Environment Act 1995 Shared Regulatory Services (SRS) on behalf of VoGC undertakes regular air quality monitoring at specifically allocated locations across the Vale District using automated and non-automated principles for ambient air, nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub>) and particulate matter (PM<sub>2.5</sub>)

With regards to prioritising ambient air quality sampling locations, the Council adopts a risk-based approach to any allocation of monitoring sites, considering the requirements of The Department for Environment, Food and Rural Affairs' (Defra) Local Air Quality Management (LAQM) Technical Guidance. The designated monitoring locations are assigned based on relevant exposure and where the certain Air Quality Objective levels for a particular pollutant applies. LAQM Technical Guidance states that annual mean objectives should apply at "All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, care homes etc."

In 2022, there were no monitoring locations in which there was an exceedance in the legal annual for any pollutant in the Vale of Glamorgan. All monitored locations remain well below the annual mean objective with no receptor classed as 'at risk' of exceedance.

Overall, in the Vale of Glamorgan we have seen a downward trend in NO<sub>2</sub> levels since before the Covid-19 pandemic in 2019. Since January 2021 and the revocation of the Windsor Road, Penarth Air Quality Management Area AQMA, there are no Air Quality Management Areas (AQMAs) within the Vale of Glamorgan.

## Actions to Improve Air Quality

The Vale of Glamorgan Council continue to support measures to reduce emissions as part of Project Zero<sup>6</sup>, it's strategy to achieve net zero by 2030.

**Figure 1 - Project Zero Logo**



All relevant planning applications are required to be accompanied by a travel plan to promote sustainable travel choices and prevent unnecessary car use. Since March 2019 at least 10% of car parking spaces on non-residential developments are required to have electric vehicle charging points infrastructure.

Active Travel schemes have been delivered to improve opportunities for walking and cycling in a number of areas including Cowbridge, Llantwit Major, Penarth Heights, Lavernock Road/Cosmeston, Sully Road/St Josephs School and South Road/Hayes Road/Sully Moors Road.

The Council has taken delivery of its first electric vehicles in the authority's latest step to implement Project Zero, its strategy for reaching net zero by 2030.

An Electric Vehicle charge points installation programme is underway with 36 points installed in public places across the Vale and 80 points on council premises at January 2023.

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<sup>6</sup> <https://www.valeofglamorgan.gov.uk/en/living/Climate-Change/Project-Zero.aspx>

The Council will ensure a programme of Local Air Quality Management (LAQM) monitoring throughout the local authority area continues to meet high standards.

## **Local Priorities and Challenges**

As all areas remain in compliance with Air Quality Objectives, the priority for 2023 is to ensure pollutant concentrations continue a downward trend. This will be achieved by continuing to promote the use of active travel, sustainable travel, and the use of public transport.

## **How to Get Involved**

The Vale of Glamorgan Council welcomes any correspondence relating to air quality enquiries or concerns. Shared Regulatory Services (SRS) Specialist Services Team represents VoGC for air quality management and therefore is contactable via the webpage [www.srs.wales/en/Home.aspx](http://www.srs.wales/en/Home.aspx).

Further information including previous Annual Progress Reports for Air Quality can be found at the following link <https://www.srs.wales/en/Environmental-Health/Noise-and-Air-Pollution/Air-quality-and-pollution/Air-Quality-and-Pollution.aspx>



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# 1 Actions to Improve Air Quality

## Previous Work in Relation to Air Quality

### First Round of Review and Assessment

Between 1999 and 2001, the Vale of Glamorgan Council published reports corresponding to stages 1, 2 and 3 of the first round of review and assessment of air quality. These assessments predicted no exceedances of any of the objectives but concluded that monitoring should continue for nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>) and particulate matter (PM<sub>10</sub>).

### Second Round of Review and Assessment

Following new technical and policy guidance issued by Defra, the Vale published its first Updating and Screening Assessment (USA) in June 2003. The USA concluded that no nitrogen dioxide or (PM<sub>10</sub>) exceedances were likely but that monitoring should continue. However, it was suggested that there was a requirement to continue to a Detailed Assessment for the 15- minute limit of SO<sub>2</sub> in Rhoose.

The Council proceeded to publish Progress Reports in 2004 and 2005, which identified exceedances of the 15-minute SO<sub>2</sub> objectives in Rhoose. The Council therefore proceeded to publish a Detailed Assessment in 2005 which concluded that there was no need to declare an AQMA but to continue monitoring.

### Third Round of Review and Assessment

The published its second USA in June 2006, which again concluded that there was no requirement to go onto the detailed stage. However, the USA did note that NO<sub>2</sub> concentrations were close to the limit at Penarth due to road works and recommend that a Detailed Assessment to be carried out if there was no change.

The Council published Progress Reports in 2007 and 2008, which identified that nitrogen dioxide concentrations continued to be close to the limit value at Penarth. A Detailed Assessment was recommended.

The Detailed Assessment of NO<sub>2</sub> in the Penarth area was published in June 2009. It concluded that there were no exceedances of either NO<sub>2</sub> limit but recommended continued monitoring.

#### **Fourth Round of Review and Assessment**

The Council published its third USA in June 2009. Nitrogen Dioxide, Sulphur Dioxide and Particulate Matter (PM<sub>10</sub>) were being monitored in the area by both the Vale and RWENpower. There were no recorded nitrogen dioxide exceedances however; annual mean concentration at Windsor Road in Penarth was close to the limit. There were no exceedances of SO<sub>2</sub> 15-minute or 24-hour means. There were 6 exceedances of the PM<sub>10</sub> daily mean concentration and no exceedances of the PM<sub>10</sub> annual mean objective.

**The 2010 Progress Report** concluded that there were no exceedances of the relevant standards for any of the pollutants measured and that there was no need to proceed to a Detailed Assessment. The 2011 Progress Report concluded that there were no exceedances of the NO<sub>2</sub> or SO<sub>2</sub> objectives; however, NO<sub>2</sub> concentrations remain close to objective in some places. Several exceedances of the 24-hour mean for PM<sub>10</sub> were recorded in Fonmon and Penarth but remained within the permitted 35 exceedances per annum.

#### **Fifth Round of Review and Assessment**

The Vale of Glamorgan Council published its fourth USA in April 2012, which again concluded that some locations continued to be at or close to the annual mean NO<sub>2</sub> concentrations. Appendix D of the report contains a Detailed Assessment of the air quality in Cogan.

The Detailed Assessment identified several locations on Windsor Road in Penarth, where the annual mean NO<sub>2</sub> objective was likely to be exceeded and that no exceedances of the 1-hour mean were likely. It was therefore recommended that an Air Quality Management Area (AQMA) be declared to include, as a minimum the residential properties with concentrations  $\geq 36 \mu\text{g}/\text{m}^3$ . It was also recommended that the monitoring network be extended to include locations at the façade of properties on Windsor Road, the results of which could be used to inform a further assessment.

**The 2013 Progress Report** recommended that; diffusion tubes with consistently low, compliant concentrations, be re-deployed in new locations; additional tubes be placed at locations where the NO<sub>2</sub> concentrations are consistently close to the annual mean objective with relevant exposure; Penarth's automatic monitor be relocated to within the proposed AQMA; and that the indicative PM<sub>10</sub> monitor be replaced with a gravimetric equivalence monitor.

**The 2014 Progress Report** concluded that there was no need to proceed to a Detailed Assessment for any of the pollutants monitored. An AQMA was declared on 1st August 2013 for a section of Windsor Road, Penarth with respect to the annual mean objective NO<sub>2</sub>. NO<sub>2</sub> concentrations were high due to congested traffic moving through a partial 'street canyon' with residential exposure along the western flank. The AQMA is highlighted in Figure 1.

### **Sixth Round of Review and Assessment**

The Council published its fifth USA in May 2015 which confirmed that air quality within the Vale of Glamorgan continued to meet the relevant air quality objectives, including within the existing Air Quality Management Area (Windsor Road, Penarth). 2015's USA also highlighted the need for further investigations with regards to three biomass boiler installations.

**The 2016 Annual Progress Report** confirmed that air quality within the Vale of Glamorgan continued to meet the relevant air quality objectives, including within the existing Air Quality Management Area (Windsor Road, Penarth). It was highlighted that it would be decided following the examination of the 2016 dataset whether to revoke the Windsor Road, Penarth AQMA. Three biomass boiler installations were investigated, and it was ascertained if their emissions would breach targeted emission thresholds.

**The 2017 Annual Progress Report** confirmed that air quality within the Vale of Glamorgan continued to meet the relevant air quality objectives, including within the existing Air Quality Management Area (AQMA) on Windsor Road, Penarth.

Following a review of the 2016 NO<sub>2</sub> diffusion tube network, it was agreed to assign and relocate new monitoring locations. The new locations have been allocated based on known areas of particularly elevated traffic flows and foreseeable development, all with nearby relevant exposure. These newly monitored areas for 2017 are Llantwit Major, Gileston, St Athan, Rhoose (Fonmon), Barry Docks and Saint Brides Major.

**The 2018 Annual Progress Report** confirmed that air quality within the Vale of Glamorgan continued to meet the relevant air quality objectives, including within the existing Air Quality Management Area (AQMA) on Windsor Road, Penarth. It was made a priority that the decision to revoke the Windsor Road, Cogan, Penarth AQMA was supported by a detailed assessment and a public consultation was undertaken to review the supporting assessment prior to submission to Welsh Government to formalise the revocation of the AQMA Order.

**The 2019 Annual Progress Report** confirmed that air quality within the Vale of Glamorgan continued to meet the relevant air quality objectives, including within the existing Air Quality Management Area (AQMA) on Windsor Road, Penarth. It was made a priority that the decision to revoke the Windsor Road, Cogan, Penarth AQMA was supported by a detailed assessment and a public consultation was undertaken to review the supporting assessment prior to submission to Welsh Government to formalise the revocation of the AQMA Order.

**The 2020 Annual Progress Report** confirmed that air quality within the Vale of Glamorgan continued to meet the relevant air quality objectives, including within the existing Air Quality Management Area (AQMA) on Windsor Road, Penarth. The revocation order for the Windsor Road, Cogan, Penarth AQMA came into force on 1st January 2021.

**The 2021 Annual Progress Report** confirmed that air quality within the Vale of Glamorgan continued to meet the relevant air quality objectives. The Covid-19 pandemic and associated restrictions had a considerable impact on air quality during the period of 2020. In 2020 a reduction of 19% in the NO<sub>2</sub> annual mean concentration was experienced at all roadside diffusion tube monitoring sites relative to 2019. The automatic monitor located at Windsor Road; Penarth showed a reduction in NO<sub>2</sub> daily mean concentrations



of 41% for the months of April to June 2020 relative to the previous months of January to March 2020. A total reduction of 22% in NO<sub>2</sub> annual mean concentration was also experienced at Windsor Road, Penarth monitoring station compared to 2019.

**The 2022 Annual Progress Report** confirmed that air quality within the Vale of Glamorgan continued to meet the relevant air quality objectives. Measured air pollutant concentrations remain lower than pre-pandemic levels at most monitoring receptors.

Previous Air Quality Annual Progress Reports can be found at the following link  
<https://www.srs.wales/en/Environmental-Health/Noise-and-Air-Pollution/Air-quality-and-pollution/Air-Quality-and-Pollution.aspx>

## **Air Quality Management Areas**

Air Quality Management Areas (AQMAs) are declared when air quality is close to or above an acceptable level of pollution (known as the air quality objective). After declaring an AQMA the authority must prepare an Air Quality Action Plan (AQAP) within 18 months setting out measures it intends to put in place to improve air quality to at least the air quality objectives, if not even better. AQMA(s) are seen by local authorities as the focal points to channel resources into the most pressing areas of pollution as a priority.

At present, the Vale of Glamorgan does not have any AQMAs.

## 2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

### Summary of Monitoring Undertaken in 2022

Local authorities have a statutory duty under Part IV of the Environment Act 1995 & Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 to ensure a programme of Local Air Quality Management (LAQM) is implemented. Under Section 82 of the Environment Act 1995 every local authority has an obligation to regularly review and assess air quality in their areas, and to determine whether air quality objectives are likely to be achieved.

The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138) and Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298). Table 1 highlights the air quality objectives included in regulations for the purpose of LAQM in Wales.

**Table 1 - Air Quality Objectives for the Purpose of LAQM in Wales**

<b>Pollutant</b>	<b>Air Quality Objective: Concentration</b>	<b>Air Quality Objective: Measured as</b>	<b>Date to be achieved by</b>
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	40µg/m <sup>3</sup>	Annual mean	31.12.2005
<b>Particulate Matter (PM<sub>10</sub>)</b>	50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
<b>Particulate Matter (PM<sub>10</sub>)</b>	40µg/m <sup>3</sup>	Annual mean	31.12.2010
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	350µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	125µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	266µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as	Date to be achieved by
<b>Benzene</b>	16.25µg/m <sup>3</sup>	Running annual mean	31.12.2003
<b>Benzene</b>	5µg/m <sup>3</sup>	Annual mean	31 12 2010
<b>1,3 Butadiene</b>	2.25µg/m <sup>3</sup>	Running annual mean	31.12.2003
<b>Carbon Monoxide</b>	10.0mg/m <sup>3</sup>	Maximum Daily Running 8-Hour mean	31.12.2003
<b>Lead</b>	0.25µg/m <sup>3</sup>	Annual Mean	31.12.2008

### 2.1.1 Automatic Monitoring Sites

The Vale of Glamorgan Council undertook automatic (continuous) monitoring at three sites during 2022. Table 2 presents the details of the sites.

In 2018 SRS on behalf of the VoGC has commissioned two near real-time indicative automatic (continuous) monitors. The AQMesh analysers continuously monitor for Nitric Oxide, Nitrogen Dioxide & Ozone, PM<sub>10</sub> & PM<sub>2.5</sub>, and do so every 15 minutes (data uploaded every hour). The data from the monitor is sent to a cloud server where it is corrected for temperature, pressure and relative humidity as well as cross gas interference.

In 2022, a monitor remained on Dock View Road from January until June. It was then removed due to instrument errors for the optical particle counter and a faults with the NO<sub>2</sub> gas sensor. There is no NO<sub>2</sub> data available for this automatic monitor in 2022. However, there are multiple non-automatic NO<sub>2</sub> diffusion tube monitor points in the area which demonstrate NO<sub>2</sub> concentrations well within the annual objective limit.

Another monitor has been located at Buttrills Road, Barry since 2021. In 2022 it operated between January and June. This monitor was removed due to errors with the optical particle counter and vandalism.

In February 2021, an indicative automatic monitor (AQMesh Pod) was installed on the B4265 at St Brides Major. The monitor captures datasets every 15 minutes and displays hourly average readings for NO<sub>2</sub>, PM<sub>10</sub> & PM<sub>2.5</sub>. The site is located within a designated 20mph pilot scheme area. This monitor does not form part of the regulated Welsh

automated monitoring network but is an indicative form of monitoring and a useful tool to look at datasets on a high-resolution basis. As with the Dock View Road monitor, NO<sub>2</sub> data is unavailable for this pod in 2022 due to instrument errors. Instead, there are multiple non-automatic NO<sub>2</sub> diffusion tube monitor points in the area which demonstrate NO<sub>2</sub> concentrations well within the annual objective limit of 40 µg/m<sup>3</sup>.

Due to the continued compliance in air quality objectives at these locations, indicated by both automatic and non-automatic monitoring, a decision for future monitoring using the indicative automatic monitors will be made in 2023. The running costs and necessity of automatic monitors installed these locations will be considered. There is the potential to use alternative technologies and automatic monitors at other locations displaying higher monitored or modelled concentrations of NO<sub>2</sub> and other pollutants.

It should be noted that due to the lack of QA procedures, regular instrument calibration and the use non-standard reference methods, the provided indicative automatic data cannot be used for formal assessment of compliance with any air quality objective.

Maps showing the location of the monitoring sites are provided in Figure 2. Further details on how the monitors are calibrated are included in Appendix C: Air Quality Monitoring Data QA/QC

### **2.1.2 Non-Automating Monitoring Sites**

The Vale of Glamorgan Council undertook non- automatic (passive) monitoring of NO<sub>2</sub> at 50 sites during 2022. Table 3 presents the details of the sites.

New non-automatic sites were installed at Murch Road, Dinas Powys, and Leckwith Road.

Analysis of the exposed tubes is carried out by Socotec UK Ltd, Didcot operating procedure ANU/SOP/1015. The tubes are prepared by spiking acetone:triethanolamine (50:50) on the grids prior to the tubes being assembled. The tubes are desorbed with distilled water and the extract analysed using a segmented flow auto analyser with ultraviolet detection. As set out in the practical guidance, the results were initially calculated assuming an ambient temperature of 11°C and then adjusted to 20°C to allow direct comparison with EU limits. Adopting best practice guidance and adopting a conservative approach a national bias adjustment factor of 0.76 was obtained and applied using the DEFRA website which is available using the following link: <https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>.

Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C: Air Quality Monitoring Data QA/QC.

Table 5 compares the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40 µg/m<sup>3</sup>.

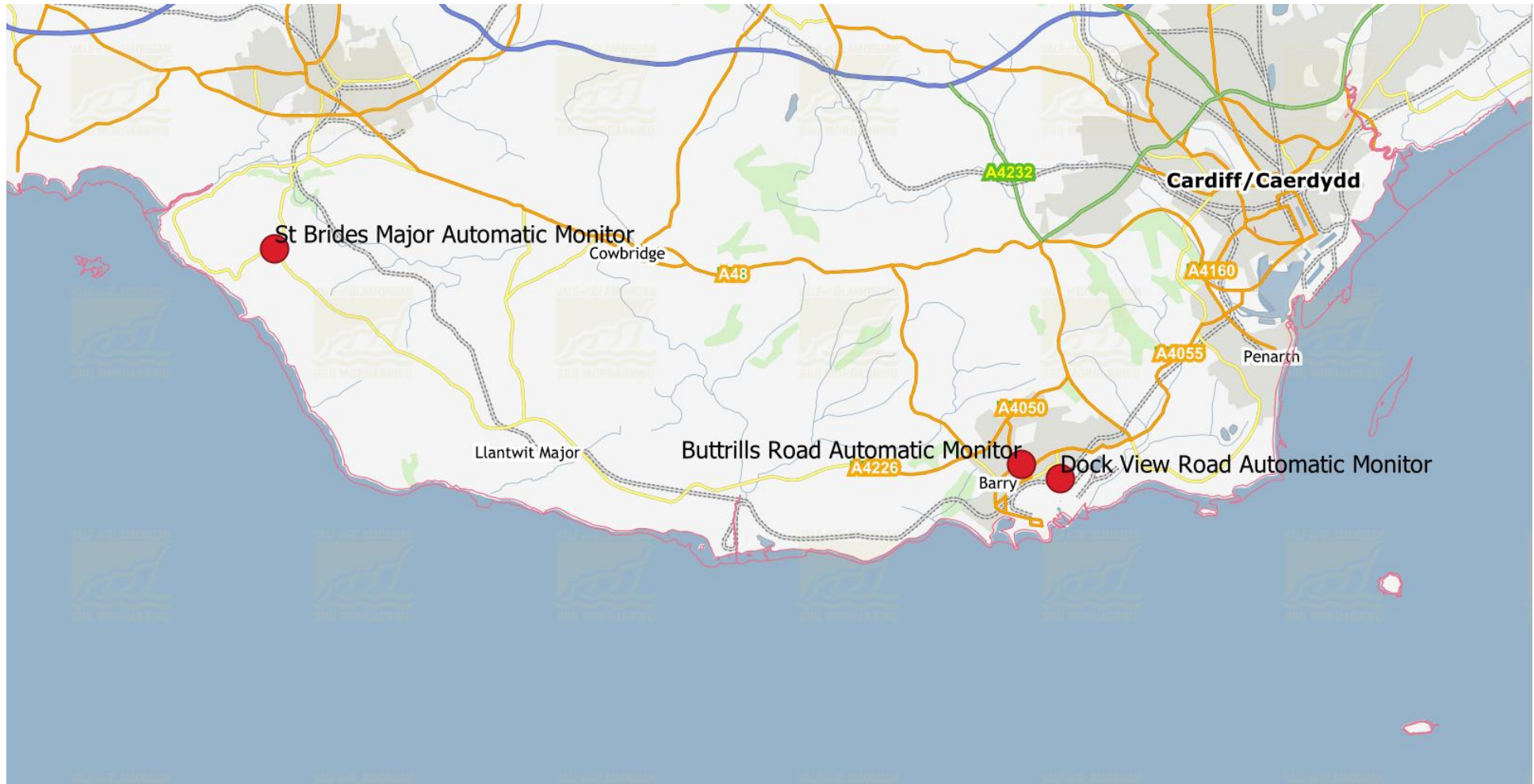
Table 2 – Details of Automatic (Continuous) Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
<b>St Brides Major</b>	Ewenny Road, St Brides Major	Roadside	289439	174660	2.5	NO <sub>2</sub> , PM <sub>10</sub> & PM <sub>2.5</sub>	N	Electrochemical Sensor / Optical Particle Counter	Y (2m)	2m	N
<b>Dock View Road</b>	Dock View Road, Barry	Roadside	312401	167947	3.5	NO <sub>2</sub> , PM <sub>10</sub> & PM <sub>2.5</sub>	N	Electrochemical Sensor / Optical Particle Counter	Y (2.5m)	1.5m	Y
<b>Buttrills Road</b>	Buttrills Road, Barry	Roadside	311269	168362	4	NO <sub>2</sub> , PM <sub>10</sub> & PM <sub>2.5</sub>	N	Electrochemical Sensor / Optical Particle Counter	Y (3m)	0.5m	N

**Notes:**

(1) 0m indicates that the sited monitor represents exposure and as such no distance calculation is required.

Figure 2 - Map of Automatic Monitoring Sites



**Table 3 - Details of Non-Automatic Monitoring Sites**

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser	Height (m)
108	4 Cardiff Road, Cowbridge	Roadside	299967	174311	NO2	N/A	0.0	0.8	No	1.5
65	1 Riverside Mews, Cowbridge	Roadside	299614	174592	NO2	N/A	0.0	3.0	No	1.5
118	6 Middlegate walk, Cowbridge	Roadside	299646	174920	NO2	N/A	0.0	30.0	No	1.5
101	37 Westgate House, Cowbridge	Roadside	298903	174907	NO2	N/A	0.0	0.8	No	1.5
93	Le Pouliguen Way, Llantwit Major	Roadside	297171	168741	NO2	N/A	0.0	4.8	No	1.5
94	5 Boverton Road, Llantwit Major	Roadside	297069	168715	NO2	N/A	0.0	7.4	No	1.5
96	Old Froglands Farm, Llantwit Major	Roadside	299045	169126	NO2	N/A	0.0	86.0	No	1.5
103	September Cottage, St Brides Major	Roadside	289530	174896	NO2	N/A	0.0	6.5	No	1.5
104	Greengate Cottage, St Brides Major	Roadside	289496	174858	NO2	N/A	0.0	12.5	No	1.5
105	St. Brides Primary School Walkway Entrance	Roadside	289473	174752	NO2	N/A	0.0	1.0	No	1.5
106	Dany Bryn House, St Brides Major	Roadside	289454	174668	NO2	N/A	0.0	2.1	No	1.5
107	Hillboro, St Brides Major	Roadside	289512	174805	NO2	N/A	0.0	7.5	No	1.5



38	2 Horseshoes, Culverhouse Cross	Roadside	311892	174513	NO2	N/A	0.0	2.0	No	1.5
46	46 Cardiff Road, Dinas Powys	Roadside	315747	171369	NO2	N/A	0.0	5.0	No	1.5
61	Railway Terrace, Dinas Powys	Roadside	316433	171932	NO2	N/A	0.0	2.0	No	1.5
67	2 Matthew Terrace, Dinas Powys	Roadside	316488	172004	NO2	N/A	0.0	2.5	No	1.5
72a	Dinas Powys Infants School	Roadside	315841	171527	NO2	N/A	0.0	7.0	No	1.5
92	9 Wayside Cottages, Cardiff Road, Dinas Powys	Roadside	316447	171963	NO2	N/A	0.0	3.0	No	1.5
91	16 Railway Terrace, Cardiff Road	Roadside	316453	171945	NO2	N/A	0.0	3.0	No	1.5
109	85 Cardiff Road, Dinas Powys	Roadside	315739	171444	NO2	N/A	0.0	5.0	No	1.5
110	103 Cardiff Road, Dinas Powys	Roadside	315851	171555	NO2	N/A	0.0	4.0	No	1.5
120	Cross Common Road, Dinas powys	Roadside	312405	167951	NO2	N/A	0.0	0.5	No	1.5
123	Murch Road, Dinas Powys	Roadside	315803	171492	NO2	N/A	4.0	1.0	No	1.5
124	The Green, Leckwith Road	Kerbside	315736	174160	NO2	N/A	4.0	15.0	No	1.5
22	Stanwell Road, Penarth	Kerbside	318505	171496	NO2	N/A	8.0	1.0	No	1.5
112	Cogan Hill Flats, Cogan	Roadside	317434	172729	NO2	N/A	0.0	10.0	No	1.5
53	168 Windsor Road, Penarth	Roadside	317589	172411	NO2	N/A	0.0	5.0	No	1.5

55	159 Windsor Road, Penarth	Roadside	317597	172433	NO2	N/A	0.0	2.0	No	1.5
56	134 Andrew Road, Penarth	Roadside	316731	172391	NO2	N/A	0.0	10.0	No	1.5
62	154 Windsor Road, Penarth	Roadside	317633	172357	NO2	N/A	0.0	2.0	No	1.5
70	Ty-Isaf, Penarth	Roadside	316731	172391	NO2	N/A	0.0	2.0	No	1.5
74	114 Windsor Road, Penarth	Roadside	317708	172259	NO2	N/A	0.0	2.5	No	1.5
76	160 Windsor Road, Penarth	Roadside	317627	172371	NO2	N/A	0.0	2.5	No	1.5
100	141 Plassey Street, Penarth	Roadside	317968	172105	NO2	N/A	0.0	4.5	No	1.5
79	Marine Scene, Cogan	Kerbside	317549	172572	NO2	N/A	2.5	1.0	No	1.5
113	03 Plassey Street, Penarth	Roadside	317999	172067	NO2	N/A	0.0	3.0	No	1.5
82	98b Windsor Road, Penarth	Roadside	318061	171944	NO2	N/A	0.0	8.0	No	1.5
88	134 Windsor Road, Penarth	Roadside	317668	172312	NO2	N/A	0.0	3.5	No	1.5
8	Tynewydd Road, Barry	Roadside	311797	168503	NO2	N/A	0.0	1.0	No	1.5
41	Dispenser Road, Sully	Urban Background	315278	168451	NO2	N/A	0.0	128.0	No	1.5
64	Holton Road, Barry	Roadside	311690	168042	NO2	N/A	2.0	3.0	No	1.5
66	17 Churchill Terrace, Barry	Roadside	313342	168823	NO2	N/A	0.0	1.5	No	1.5

116	Ffordd y Mileniwm, Barry	Roadside	311371	167628	NO2	N/A	0.0	5.0	No	1.5
117	1 Riverside Place, Barry	Roadside	313612	166807	NO2	N/A	0.0	1.0	No	1.5
102	Powell Dyfryyn Way, Barry	Roadside	311115	167041	NO2	N/A	0.0	1.0	No	1.5
114	107 Dock View Road, Barry	Roadside	312585	168171	NO2	N/A	0.0	5.0	No	1.5
115	20 Barry Road, Cadoxton, Barry	Roadside	312677	168171	NO2	N/A	0.0	2.0	No	1.5
119	Dock View Road Co-location, Barry	Kerbside	315445	170577	NO2	N/A	2.5	1.0	No	1.5
121	Buttrills Road, Barry	Roadside	311270	168363	NO2	N/A	2.5	0.5	No	1.5
122	Sycamore Cottage, A48, Bonvilston	Roadside	307283	174138	NO2	N/A	0.0	10.0	No	1.5

**Notes:**

(1) 0m indicates that the sited monitor represents exposure and as such no distance calculation is required.

Figure 3 – Map of Non-Automatic Monitoring Sites, Vale of Glamorgan West

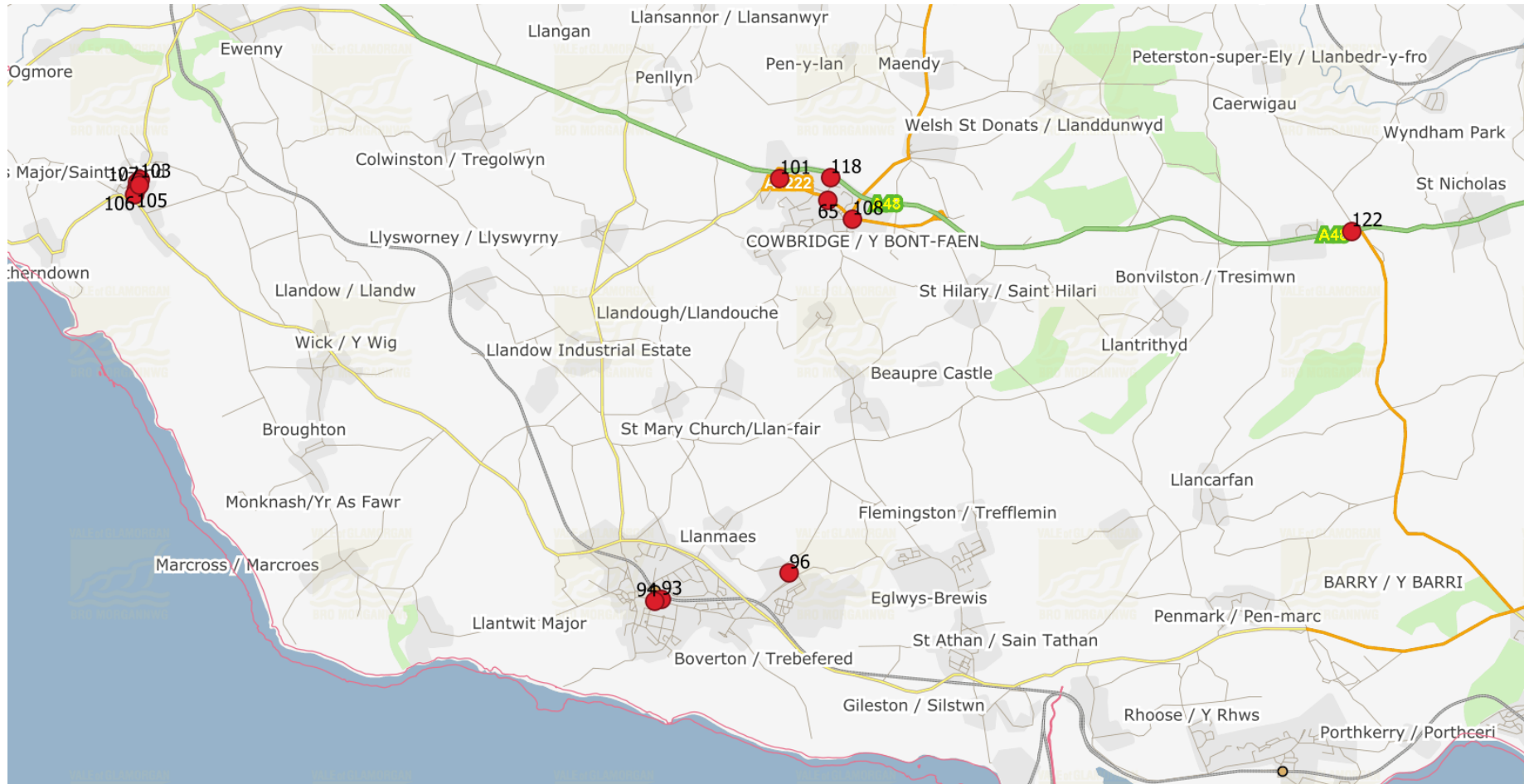


Figure 4 - Map of Non-Automatic Monitoring Sites, Vale of Glamorgan East



## 2022 Air Quality Monitoring Results

**Table 4 - Annual Mean NO<sub>2</sub> Concentrations from Buttrills Road Indicative Automatic Monitor**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2019	2020	2021	2022
Buttrills Road	Roadside	Automatic	100	57	23.7	20.2	26.6	31.1
Dockview Road	Roadside	Automatic	0	0	23.2	19	36.3	-
St Brides Major	Roadside	Automatic	0	0	-	-	23.2	-

**Table 5 - Annual Mean NO<sub>2</sub> Non-Automatic Monitoring Results (µg/m<sup>3</sup>)**

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2022 (%)	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> )				
						2018	2019	2020	2021	2022
108	299967	174311	Roadside	100	100.0	19.9	24.4	23.3	18.5	17.9
65	299614	174592	Roadside	100	100.0	14.9	16.0	11.6	11.5	12.1
118	299646	174920	Roadside	100	100.0		8.4	6.6	7.0	6.8
101	298903	174907	Roadside	100	100.0	16.5	15.9	13.1	12.8	12.2
93	297171	168741	Roadside	100	100.0	10.9	10.4	8.1	8.6	8.3
94	297069	168715	Roadside	92.3	92.3	9.4	8.8	7.3	7.5	7.3
96	299045	169126	Roadside	100	100.0	10.2	7.9	5.7	6.1	6.1
103	289530	174896	Roadside	92.3	92.3	10.7	10.8	7.7	8.3	7.3
104	289496	174858	Roadside	92.6	92.6	11.2	11.9	8.3	9.3	8.7
105	289473	174752	Roadside	82.1	82.1	12.1	11.8	8.5	9.3	9.3
106	289454	174668	Roadside	100	100.0	10.3	10.3	7.3	8.1	7.6
107	289512	174805	Roadside	100	100.0	7.7	7.9	6.1	6.6	6.0

38	311892	174513	Roadside	100	100.0	19.4	18.6	14.4	14.6	14.3
46	315747	171369	Roadside	100	100.0	17.9	16.7	11.6	15.1	14.6
61	316433	171932	Roadside	100	100.0	31.0	28.8	26.5	20.7	27.6
67	316488	172004	Roadside	100	100.0	23.6	22.7	18.1	20.7	19.4
72a	315841	171527	Roadside	93.1	93.1	19.8	18.5	15.1	14.1	14.3
92	316447	171963	Roadside	100	100.0	27.9	26.2	21.7	20.2	24.0
91	316453	171945	Roadside	100	100.0	21.3	20.9	15.8	23.8	17.1
109	315739	171444	Roadside	100	100.0	19.4	19.6	17.0	17.4	16.7
110	315851	171555	Roadside	100	100.0	20.4	19.3	16.8	18.2	17.5
120	312405	167951	Roadside	100	100.0			13.2	14.8	14.8
123	315803	171492	Roadside	100	100.0					19.9
124	315736	174160	Kerbside	100	77.2					9.5
22	318505	171496	Kerbside	73.1	73.1	20.3	19.7	15.8	17.2	14.7
112	317434	172729	Roadside	100	100.0	19.4	19.8	15.9	17.4	17.4
53	317589	172411	Roadside	100	100.0	27.7	28.7	24.4	22.6	22.5



55	317597	172433	Roadside	92	92.0			18.1		18.9
56	316731	172391	Roadside	100	100.0	20.5	22.2	17.1	17.1	17.4
62	317633	172357	Roadside	100	100.0	28.1	29.2	22.2	24.5	24.4
70	316731	172391	Roadside	100	100.0	22.3	19.8	15.8	18.2	17.9
74	317708	172259	Roadside	100	100.0	22.7	25.4	27.5	21.1	20.7
76	317627	172371	Roadside	100	100.0	29.9	28.1	11.8	24.0	23.6
100	317968	172105	Roadside	92.3	92.3	24.0	22.9	17.6	17.2	18.2
79	317549	172572	Kerbside	100	100.0	31.6	30.1	27.5	30.9	31.5
113	317999	172067	Roadside	100	100.0	21.7	22.3	17.6	19.3	17.8
82	318061	171944	Roadside	100	100.0	17.1	16.0	17.1	13.6	13.9
88	317668	172312	Roadside	100	100.0	27.6	28.4	15.9	22.3	22.5
8	311797	168503	Roadside	82.7	82.7	28.1	27.5	22.9	24.1	25.0
41	315278	168451	Urban Background	100	100.0	10.9	10.6	8.4	8.3	8.3
64	311690	168042	Roadside	84.3	84.3	16.6	17.8	12.8	14.7	13.7
66	313342	168823	Roadside	100	100.0	26.7	26.3	23.8	24.4	22.4

116	311371	167628	Roadside	100	100.0		17.5	15.3	16.7	14.6
117	313612	166807	Roadside	100	100.0		26.7	21.9	22.2	22.3
102	311115	167041	Roadside	100	100.0	17.9	17.0	14.6	15.6	15.4
114	312585	168171	Roadside	100	100.0	13.5	13.4	11.5	11.8	11.6
115	312677	168171	Roadside	92.3	92.3	26.2	25.9	21.9	23.0	23.2
119	315445	170577	Kerbside	92.3	92.3			18.9	15.4	15.7
121	311270	168363	Roadside	100	100.0				22.4	23.3
122	307283	174138	Roadside	100	100.0				8.1	8.0

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

**Figure 5 – Trends in Annual Mean NO<sub>2</sub> Concentrations, Vale of Glamorgan West**

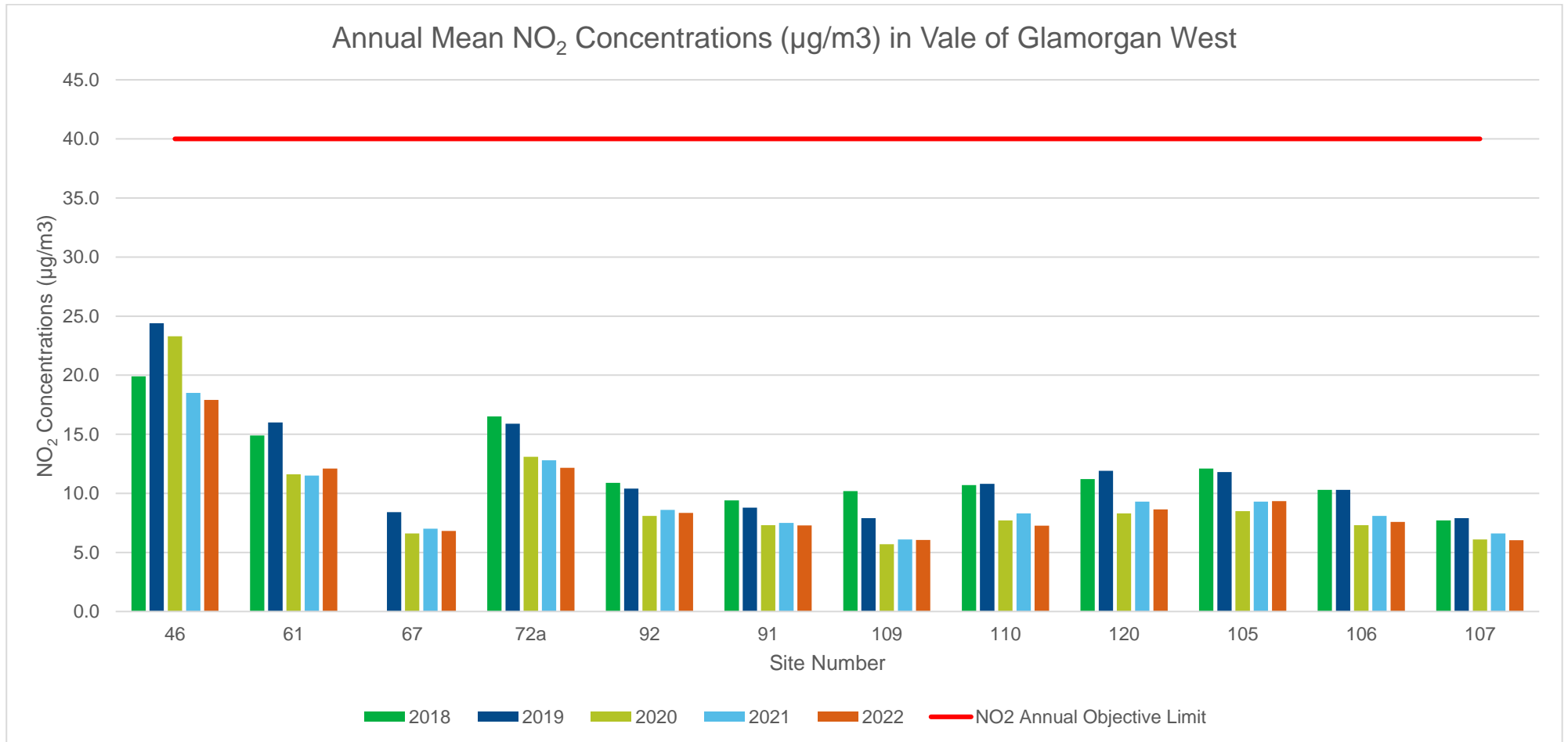


Figure 5 displays compliance with the annual air quality objective for nitrogen dioxide at all locations in Cowbridge, Llantwit Major, and St Brides Major.

Figure 6 – Trends in Annual Mean NO<sub>2</sub> Concentrations in Dinas Powys

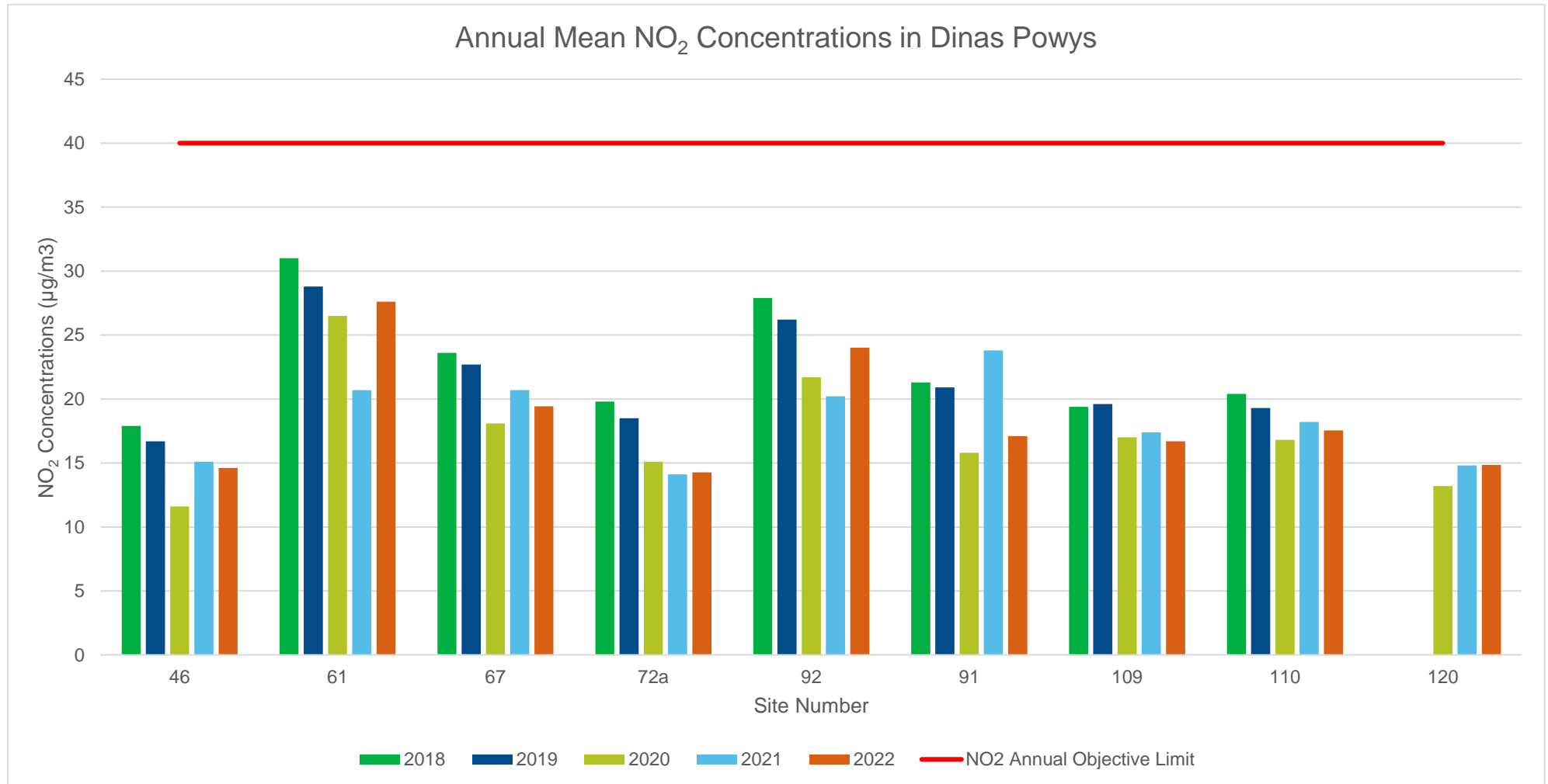


Figure 6 displays compliance with the annual air quality objective for nitrogen dioxide at all locations in Dinas Powys.

Figure 7 – Trends Annual Mean NO<sub>2</sub> Concentrations in Penarth

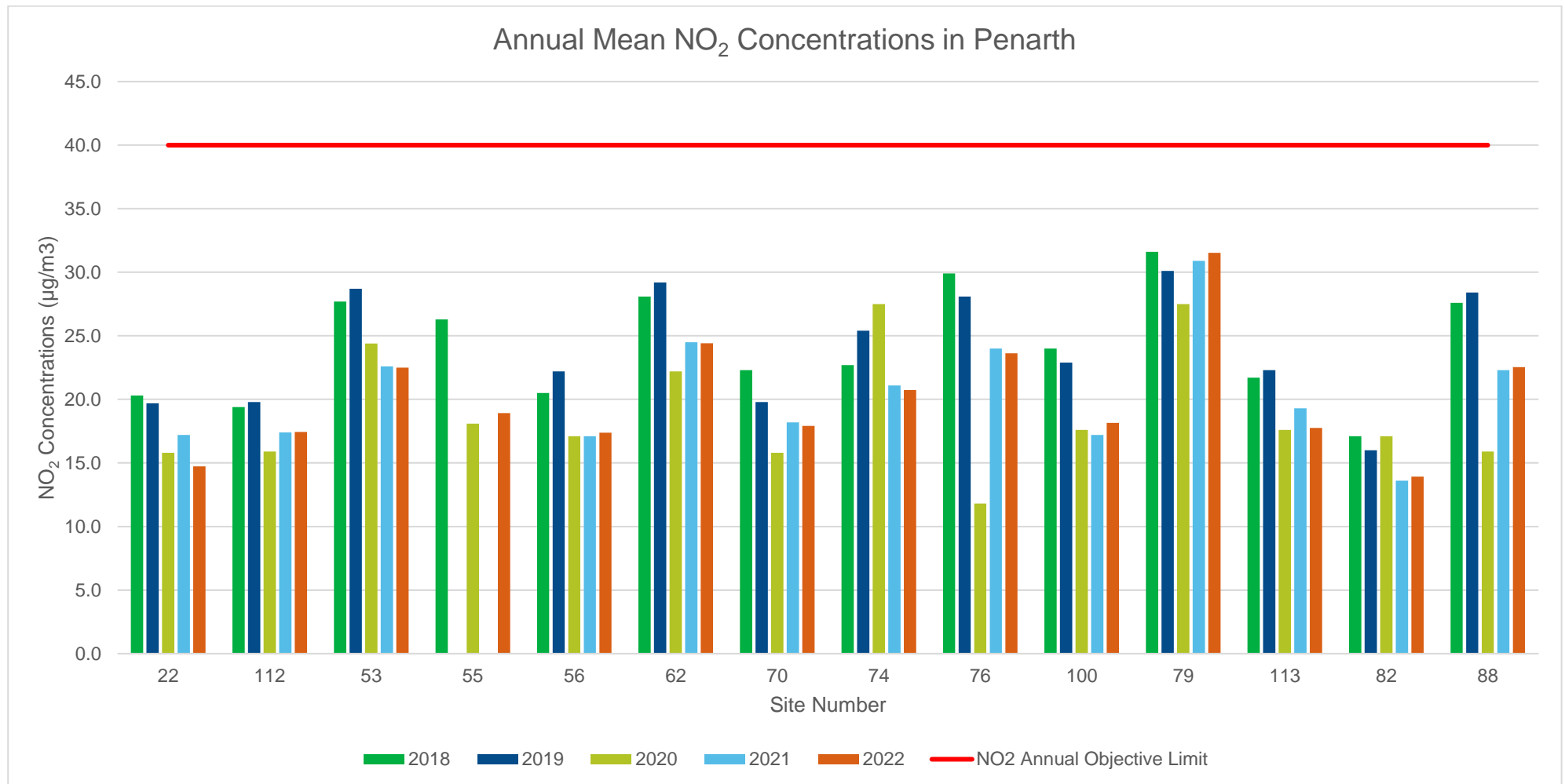


Figure 7 displays compliance with the annual air quality objective for nitrogen dioxide at all locations in Penarth.

Figure 8 - Trends in Annual Mean NO<sub>2</sub> Concentrations in Barry

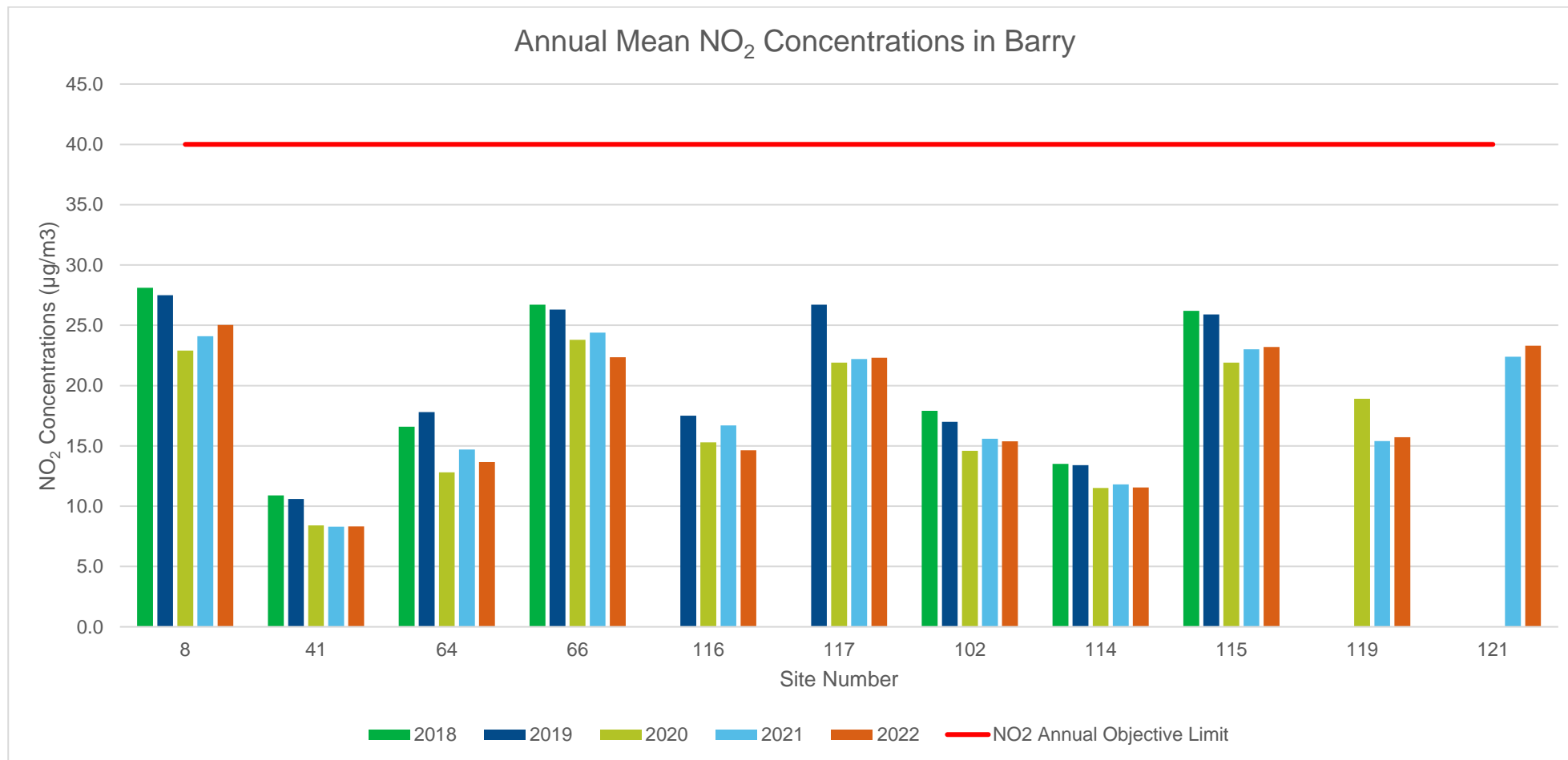


Figure 8 displays compliance with the annual air quality objective for nitrogen dioxide at all locations in Barry.

**Figure 9 - Trends in Annual Mean NO<sub>2</sub> Concentrations in Culverhouse Cross and Bonvilston Sites**

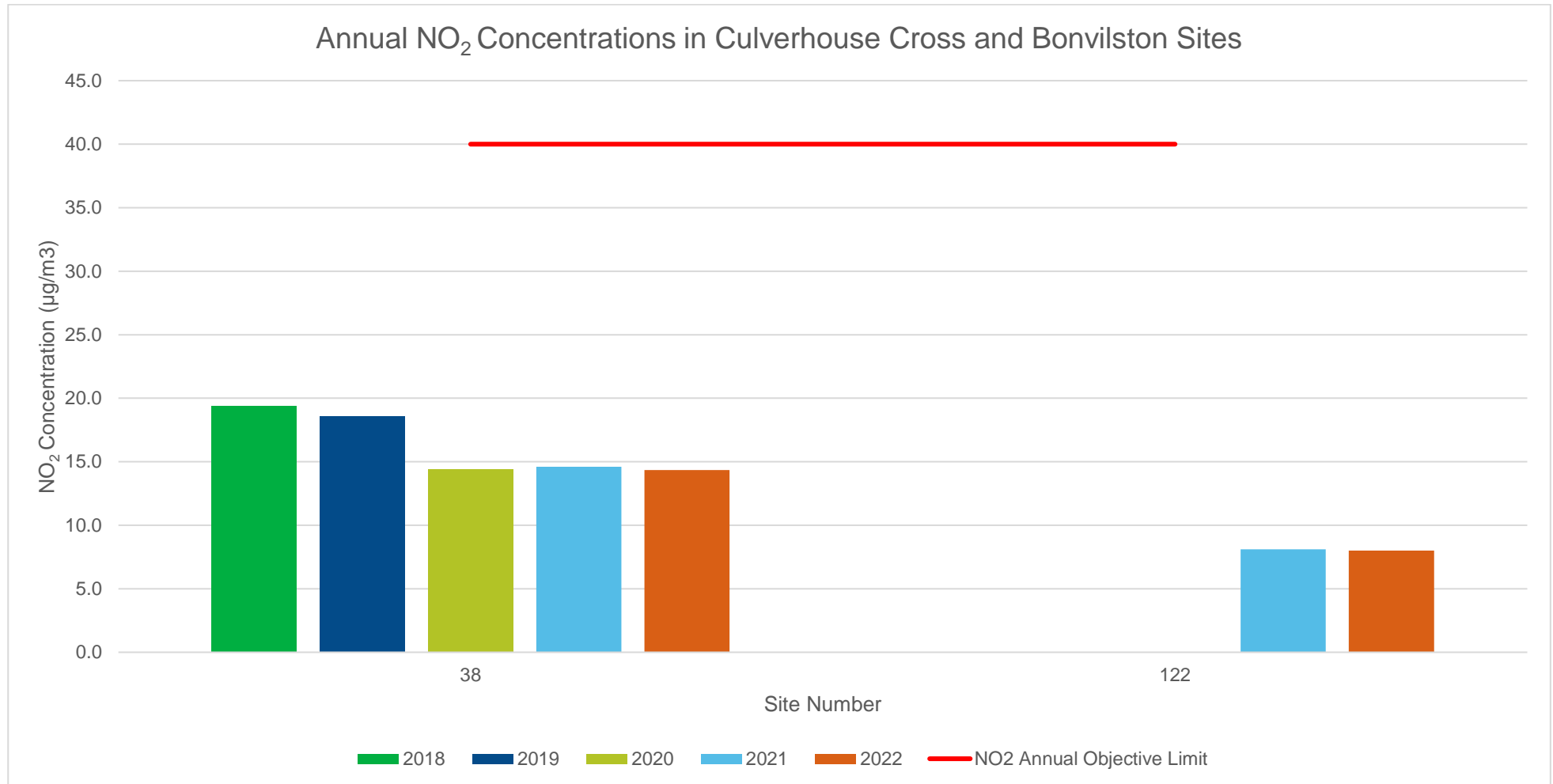


Figure 9 displays compliance with the annual air quality objective for nitrogen dioxide at all locations in Culverhouse Cross and Bonvilston.

**Table 6 - 1-Hour Mean NO<sub>2</sub> Monitoring Results, Number of 1-Hour Means > 200µg/m<sup>3</sup>**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2019	2020	2021	2022
Buttrills Road	Roadside	Automatic	100	57	-	-	0	0
Dockview Road	Roadside	Automatic	0	0	0	0	0	-
St Brides Major	Roadside	Automatic	0	0	-	-	0	-

**Notes:**

Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> not to be exceeded more than 18 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(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%).



**Table 7 - Annual Mean PM<sub>10</sub> Monitoring Results (µg/m<sup>3</sup>)**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2019	2020	2021	2022
Dockview Road	Roadside	Automatic	100	48	11.2	7.3	12.8	6.1
St Brides Major	Roadside	Automatic	100	100	-	-	9	13

**Notes:**

Exceedances of the PM<sub>10</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

**Figure 10 – Trends in Annual Mean PM<sub>10</sub> Concentrations**

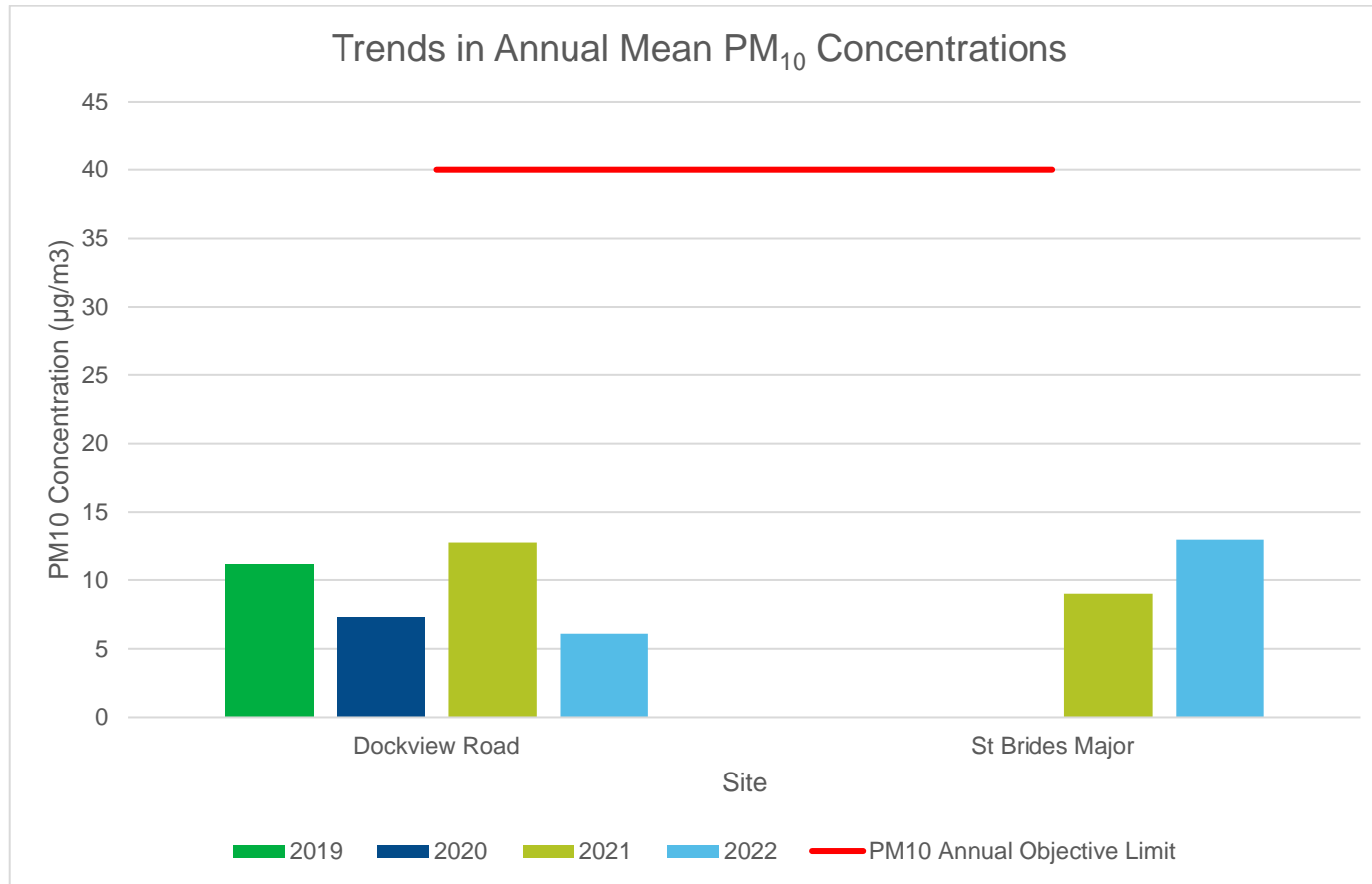


Figure 10 displays trends for particulate matter PM<sub>10</sub> concentrations for the automatic monitors located on Dock View Road Barry, and St Brides Major. The data indicates compliance with annual and short-term air quality objectives for PM<sub>10</sub>.

**Table 8 - 24-Hour Mean PM<sub>10</sub> Monitoring Results, Number of PM<sub>10</sub> 24-Hour Means > 50µg/m<sup>3</sup>**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2019	2020	2021	2022
Buttrills Road	Roadside	Automatic	100	57	0	0	-	-
Dockview Road	Roadside	Automatic	100	48	9	0	0	0
St Brides Major	Roadside	Automatic	100	100	-	-	0	2

**Notes:**

Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4<sup>th</sup> percentile of 24-hour means is provided in brackets.

(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%).

**Table 9 - PM<sub>2.5</sub> Monitoring Results (µg/m<sup>3</sup>)**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2022 (%) <sup>(2)</sup>	2019	2020	2021	2022
Dockview Road	Roadside	Automatic	100	48	6.75	4.4	3.8	4
St Brides Major	Roadside	Automatic	100	100	-	-	5.5	7.1

**Notes:**

All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

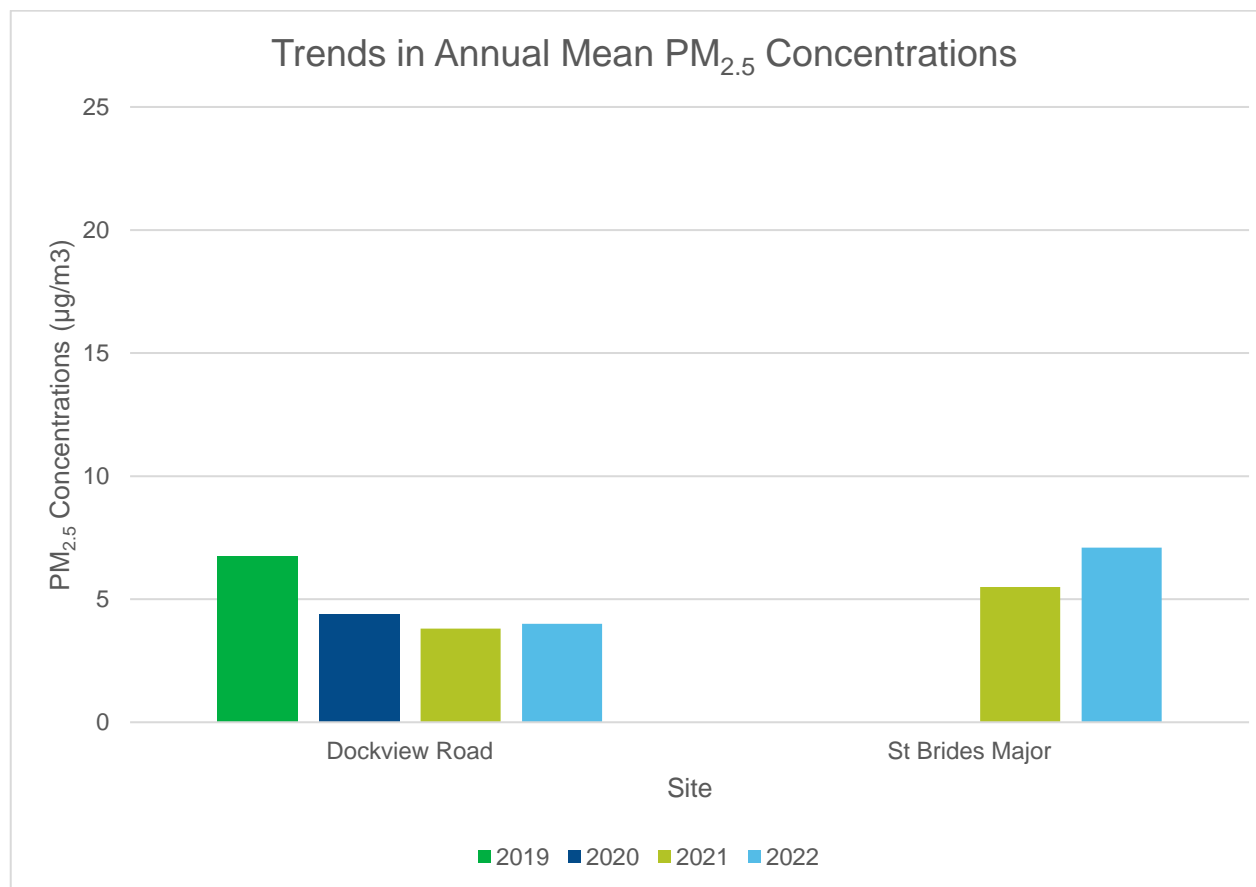
**Figure 11 – Trends in Annual Mean PM<sub>2.5</sub> Concentrations**

Figure 11 displays trends for particulate matter PM<sub>10</sub> concentrations for the automatic monitors located on Dock View Road Barry, and St Brides Major. There is no current air quality objective for PM<sub>2.5</sub> in Wales, although the displayed concentrations demonstrate compliance with the EU limit of 25µg/m<sup>3</sup>. The concentrations are also close to the guideline of 5µg/m<sup>3</sup> set by the World Health Organisation (WHO).

Figure 12 - Dock View Road Indicative Automatic Monitor Particulate Matter Concentrations 2022

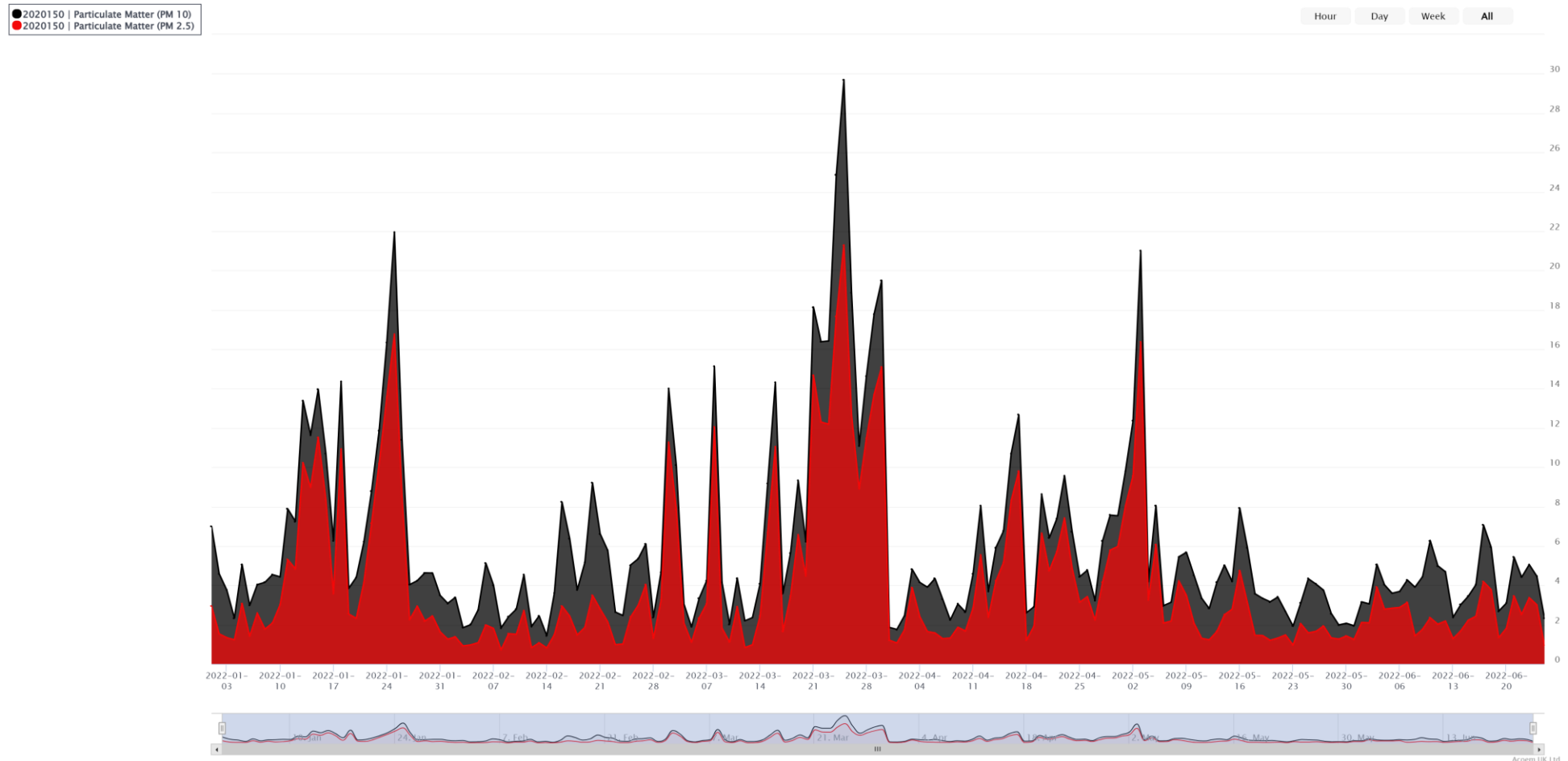


Figure 12 - Dock View Road Indicative Automatic Monitor Particulate Matter Concentrations 2022 displays a graph of particulate matter PM<sub>10</sub> and PM<sub>2.5</sub> for the automatic monitor located on Dock View Road Barry. The data indicates compliance with annual and short-term air quality objectives for PM<sub>10</sub>.

Figure 13 - St Bridges Major Indicative Automatic Monitor Particulate Matter Concentrations 2022

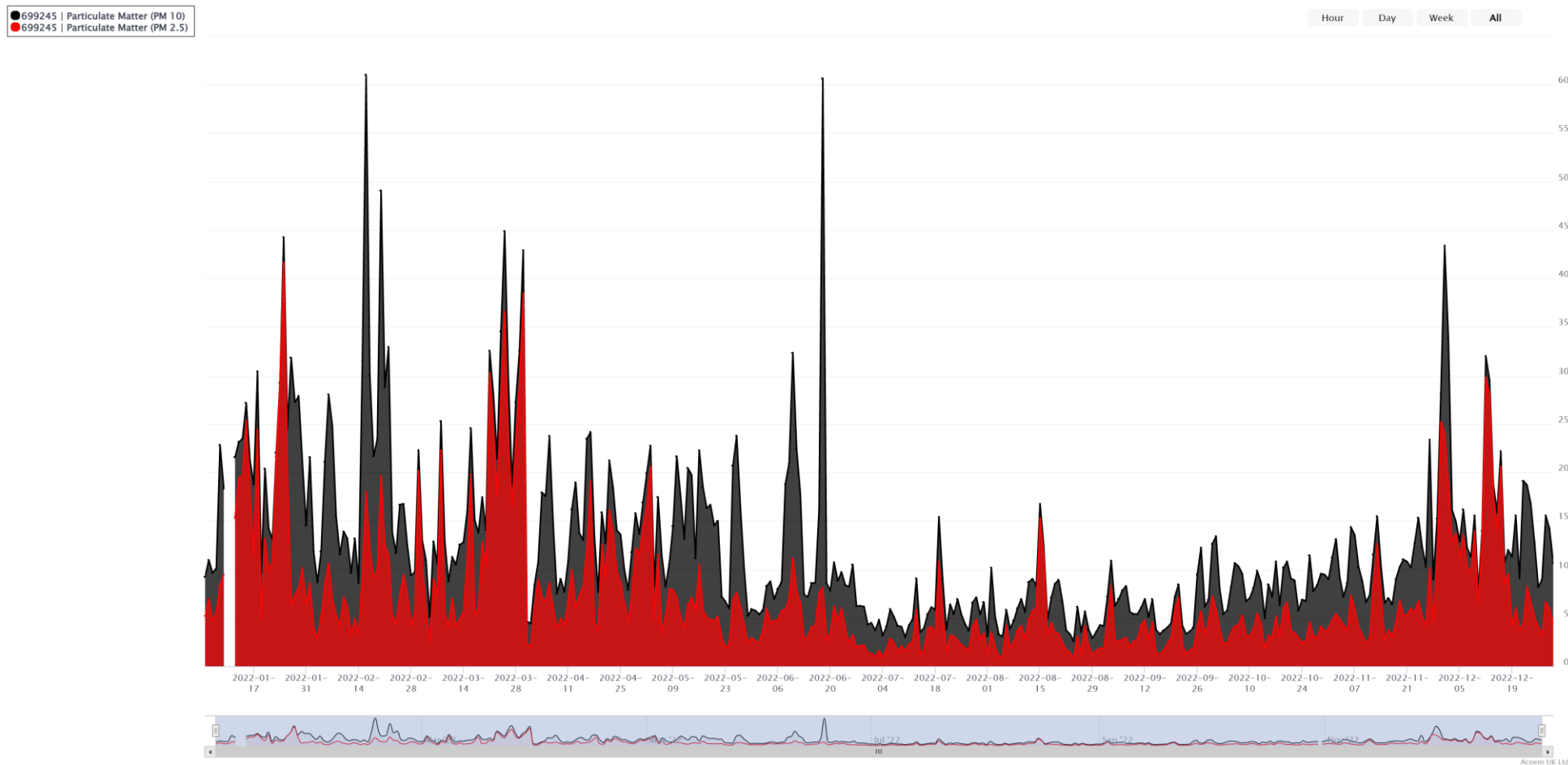


Figure 12 - Dock View Road Indicative Automatic Monitor Particulate Matter Concentrations 2022 displays a graph of particulate matter PM<sub>10</sub> and PM<sub>2.5</sub> for the automatic monitor located in St Brides Major. The data indicates compliance with annual and short-term air quality objectives for PM<sub>10</sub>.



## Comparison of 2022 Monitoring Results with Previous Years and the Air Quality Objectives

### 2.1.3 Nitrogen Dioxide (NO<sub>2</sub>)

Nitrogen dioxide was measured during 2022 at one indicative automated site equipped with an NO<sub>2</sub> monitoring capabilities, as well as by a network of 50 passive diffusion tubes.

To ratify the 2022 diffusion tube dataset, a bias adjustment factor of 0.76 was applied to the annual average readings. The factor was derived from the Defra website which gave the average correction factor from 26 co-location studies across the UK, whereby the analytical laboratory and method used was the same as the VoGC. The national bias correction factor was utilized as it would provide results representative of a worst-case scenario. The bias correction factor of 0.76 was obtained from the following website:

<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

As previously discussed, 2018 saw the introduction of two near real time automated indicative monitoring commissioned by SRS on behalf of the VoGC and installed in the Barry area. In 2021 an additional indicative monitor was located in St Brides Major. The indicative monitor previously located at Holton Road, Barry, was moved to Buttrills Road, Barry. Due to instrument errors, NO<sub>2</sub> data for two indicative automatic sites was unable to be obtained. However, diffusion tubes co-located with these monitors indicate NO<sub>2</sub> concentrations well with the annual air quality objective for NO<sub>2</sub> (annual average 40µg/m<sup>3</sup> & 1-hour average 200µg/m<sup>3</sup> not be exceeded more than 18 times per year).

The nitrogen dioxide diffusion tube data is summarised in Table 5. The full dataset (raw monthly mean values) is included in Appendix A. All data displayed in Table 5 has been bias adjusted in accordance with Box 7.10 of LAQM TG(22).

There were no monitoring sites in 2022 that required annualization.

As outlined by Table 5; the nitrogen dioxide concentrations measured by the passive diffusion tubes show that there were no exceedances of the national air quality objectives for NO<sub>2</sub> (annual average 40µg/m<sup>3</sup> & 1-hour average 200µg/m<sup>3</sup> not be exceeded more than 18 times per year). In accordance with LAQM best practise guidance, there are no monitoring sites in the district with annual average concentrations above 60µg/m<sup>3</sup> in 2022. Therefore, this indicates it is unlikely that the hourly nitrogen dioxide objective was exceeded.

Overall, improvements in NO<sub>2</sub> concentrations are evident at most sites within the Vale of Glamorgan, compared to the pre-pandemic year of 2019.

#### **2.1.4 Particulate Matter (PM<sub>10</sub>)**

In 2022 continuous monitoring of PM<sub>10</sub> was undertaken at two automatic monitoring sites in the Vale.

These indicative near-real time air quality monitors adopt the use of electrochemical sensors / optical particle counters to examine levels of PM<sub>10</sub>.

The results of the monitoring indicate that recorded PM<sub>10</sub> concentrations at all monitored locations are within both the annual mean (40µg/m<sup>3</sup>) and 24-hour mean (>50 µg/m<sup>3</sup> not to be exceeded more than 18 times per year) AQS objectives set for PM<sub>10</sub>.

As previously mentioned, it should be noted that due to the lack of QA procedures, regular instrument calibration and the use non-standard reference methods, the provided indicative automatic data cannot be used for formal assessment of compliance with any air quality objective.

#### **2.1.5 Particulate Matter (PM<sub>2.5</sub>)**

In 2022 continuous monitoring of PM<sub>2.5</sub> was undertaken at two automatic monitoring sites in the Vale.

These indicative near-real time air quality monitors adopt the use of electrochemical sensors / optical particle counters to examine levels of PM<sub>2.5</sub>.

The results of the monitoring indicate that recorded PM<sub>2.5</sub> concentrations at all monitored locations are within the the 20µg/m<sup>3</sup> EU Limit Value. The Dock View Road site also displayed PM<sub>2.5</sub> annual mean concentrations within the WHO Guideline of 5µg/m<sup>3</sup> for its period of operation from January to June 2022

Due to the lack of QA procedures, regular instrument calibration and the use non-standard reference methods, the provided indicative automatic data cannot be used for formal assessment of compliance with any air quality objective.

### **Summary of Compliance with AQS Objectives as of 2022**

The Vale of Glamorgan Council has examined the results from monitoring in the borough. Concentrations are all below the Objectives, therefore no further action is required.

### 3 New Local Developments

The Vale of Glamorgan Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area. SRS on behalf of VoGC review all planning applications regarding air quality in line with local and national planning policy. Technical guidance related to air quality and planning applications is obtained by using IAQM Guidance<sup>7</sup> 'Guidance on land use planning and development control', and 'assessment of dust from demolition and construction.

#### Road Traffic Sources (and Other Transport)

No new road traffic sources have been identified which require consideration in this report.

#### Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

##### Barry Biomass

A review has been undertaken of the Environmental Assessment and associated documentation related to Barry Biomass; Woodham Road submitted as part of the planning appeal CAS-01341-N2Q5B8. The assessment presents the likely effects of the development on local air quality for the operational and construction phase of the development. Dispersion modelling has been used to predict the impact of pollutants on various receptors in the local area.

Shared Regulatory Services on behalf of the Vale of Glamorgan Council carry out nitrogen dioxide (NO<sub>2</sub>) monitoring as part of the Local Air Quality Management (LAQM) program in the area. The closest monitoring locations to the development are on Dock View Road. In addition to the NO<sub>2</sub> diffusion tube monitoring carried out on Dock View Road, an indicative automatic monitor has been located on the roadside since 2018. The automatic monitor is a useful tool in carrying out screening for potential air quality issues that require further investigation. There have been some issues with this monitor displaying abnormal

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<sup>7</sup> <https://iaqm.co.uk/guidance/>

particulate matter (PM) concentrations on some occasions with no associated increase in NO<sub>2</sub>. An assessment undertaken by Natural Resources Wales (NRW) of these episodes, suggests that they are caused by high atmospheric humidity and are not a cause for concern. This data was flagged as invalid due to deliquescence but was not removed from the real time air quality presentation on the Shared Regulatory Services website. Due to this, a decision was made to remove the real time data from the website. This decision was made to prevent invalid concentrations being presented due to instrument error that could potentially cause unnecessary concern to residents. All data is now available on request to Shared Regulatory Services where a report can be issued explaining the indicative automatic data, and any periods of invalid data due to instrument error. There has been no exceedance of any annual or short-term air quality objective in the area, and the closest Air Quality Management AQMA area is in Cardiff. This indicates that the local area, in particular Dock View Road, does not give any cause of concern regarding air quality.

### **Construction phase impacts**

The development has already been built, so a retrospective assessment of particulate matter and dust has already been carried out. A Construction Phase Plan (CPP) and Project Environmental Plan (PEP) was approved by The Vale of Glamorgan Council for the site in 2016 to provide the information required to manage the construction works, dust and control site risks. Following implementation of the measures listed in the Environmental Assessment, the residual effect of emissions of dust and particulate matter during the construction of the development would have been negligible. From a retrospective viewpoint, Shared Regulatory Services agree with this conclusion.

### **Operational Phase Impacts**

Dispersion modelling has been carried out to assess the process contributions (PC) of various pollutants on various human and ecological receptors within the local area due to the operation of the Biomass plant. Predicted environmental concentrations (PEC) are also shown which give a total concentration for the following pollutants.

- Nitrogen Dioxide (NO<sub>2</sub>)
- Particulate Matter (PM<sub>10</sub> & PM<sub>2.5</sub>)

- Carbon Monoxide (CO)
- Sulphur Dioxide (SO<sub>2</sub>)
- Total Organic Compounds (As Benzene)
- Hydrogen Chloride (HCl)
- Hydrogen Fluoride (HF)
- PAH
- Polychlorinated Biphenyls (PCBs)
- Ammonia (NH<sub>3</sub>)
- Trace Metals

The assessment states monitoring of pollutant concentrations within the exhaust from the stack will be undertaken on a regular basis in accordance with the requirements of the Permit granted by NRW. Continuous monitoring of particulate matter, TOCs, HCl, CO, SO<sub>2</sub>, NO<sub>2</sub>, NO, NH<sub>3</sub> and N<sub>2</sub>O will be undertaken. Quarterly sampling of HF, Heavy Metals, Dioxins and Furans, PCBs and PAHs will be undertaken in the first year of operation and then bi-annually in the subsequent years. As part of the Environmental Permit, the site is subject to a number of management plans and monitoring which ensure that operation of the development is undertaken in a sound and safe manner which does not give rise to unacceptable environmental impacts. These include a Dust and Particulate Emission Management Plan, Emergency Plan, Accident Management Plan, Noise Management Plan and Fire Prevention and Mitigation Plan (including monitoring systems). An environmental management system is also in place which accords with international standards (ISO14001). Regular monitoring and reporting to NRW is required for environmental emissions, waste, and a range of other operational aspects to evidence that the Facility is being operated in accordance with the Environmental Permit.

The results of the assessment demonstrate that the likely impact of the operation of the Development on local air quality would be **negligible**. Therefore, no mitigation measures are required. Concentrations pollutants likely to be emitted from the development would be below the relevant air quality standards set for human health at all modelled receptors. A Human Health Risk Assessment has also been undertaken as part of the EIA which confirms that exposure of individuals to pollutants, even in a very worst-case scenario, would not be significant during normal or abnormal operating conditions. NRW were also satisfied that the impact of emissions on local sensitive receptors would not be significant before granting the Environmental Permit. I agree with the findings of the operational assessment that the likely impact of the operation of the development on local air quality would be **negligible**.

## **Conclusion**

In conclusion, using all the information provided by the air quality assessment, Shared Regulatory Services make no objection to the development regarding air quality.

## **Retrospective Planning Application**

In 2023, a retrospective planning application was resubmitted for this development. Details for this application can be found at the following link <https://vagonline.planning-register.co.uk/Planning/Display/2023/00032/FUL#>

## **Other Sources**

Previous reports have confirmed that there are no known areas in The Vale District where coal or solid fuel burning provides a significant level or primary household heating.

Nothing has changed in this regard since the 2022 APR, despite the potential for increasing popularity of solid fuel heating with increased fossil-fuel prices, and there is no need to consider this further at this time.

It should be noted that the Council receives several enquiries each year from residents in respect of national or local requirements where they wish to install log-burners or similar appliances in their homes. There are no smoke control areas in The Vale and hence no legal requirements regarding appliances that may be installed. However, residents are always reminded of the legislation in respect of statutory smoke nuisance and, where they can't be persuaded otherwise for reasons of air quality and health, recommended to seek out an appliance certified for use in a smoke control area.

SRS on behalf of the VoGC can confirm that there are no areas of significant domestic fuel use in the Local Authority area.

## 4 Policies and Strategies Affecting Airborne Pollution

### Local / Regional Air Quality Strategy

The Vale of Glamorgan Council does not currently have an Air Quality Strategy. As a long-term measure, SRS would recommend that the Vale of Glamorgan Council consider developing an Air Quality Strategy with its main objective to improve air quality and protect public health, whilst considering the sustainable development and future growth within the authority.

### Air Quality Planning Policies

#### Local Development Plan (LDP) 2011- 2026

[https://www.valeofglamorgan.gov.uk/en/living/planning\\_and\\_building\\_control/Planning/planning\\_policy/Planning-Policy.aspx](https://www.valeofglamorgan.gov.uk/en/living/planning_and_building_control/Planning/planning_policy/Planning-Policy.aspx)

On the 28th June 2017 the Council adopted the Vale of Glamorgan Local Development Plan 2011-2026. The LDP became operative on its adoption and supersedes the previous adopted Unitary Development Plan (UDP). The LDP will be the basis for decisions on land use planning in the Vale of Glamorgan and will be used by the Council to guide and manage new development proposals.

The Plan sets out the vision, objectives, strategy and policies for managing development in the Vale of Glamorgan and contains a number of local planning policies and makes provision for the use of land for the purposes of housing, employment, retailing, recreation, transport, tourism, minerals, waste, and community uses. It also seeks to identify the infrastructure that will be required to meet the growth anticipated in the Vale of Glamorgan up to 2026 and provides a monitoring framework for assessing the effectiveness of the Plan.

Also highlighted within the LDP document is Policy MD7 (Environmental Protection).

POLICY MD7 -

ENVIRONMENTAL PROTECTION

Development proposals will be required to demonstrate they will not result in an unacceptable impact on people, residential amenity, property and / or the natural environment from either:

1. Pollution of land, surface water, ground water and the air.
2. Land contamination.
3. Hazardous substances.
4. Noise, vibration, odour nuisance and light pollution.
5. Flood risk and consequences.
6. Coastal erosion or land stability.
7. The loss of the best and most versatile agricultural land; or
8. Any other identified risk to public health and safety.

Where impacts are identified the Council will require applicants to demonstrate that appropriate measures can be taken to minimise the impact identified to an acceptable level. Planning conditions may be imposed, or legal obligation entered into, to secure any necessary mitigation and monitoring processes.

Featured as a main objective of the adopted LDP;

Objective 4- To protect and enhance the Vale of Glamorgan's historic, built, and natural environment

The historic, built, and natural environment of the Vale of Glamorgan is highly valued by residents and visitors and includes European, National and local designations which provide local identity and distinctiveness and present opportunities for recreation and tourism. The LDP will ensure that these natural and built environmental assets are protected, conserved and where appropriate enhanced as an important resource for local people and which attract visitors and contributes to the local economy.

## **Local Transport Plans and Strategies**

**The Local Transport Plan (LTP) 2015- 2030.**

<https://www.valeofglamorgan.gov.uk/Documents/Living/Planning/Policy/LTP/Local-Transport-Plan.pdf>



The Vale of Glamorgan authority is part of the Capital Region which comprises of Cardiff and the nine south east unitary authorities. The implementation of this policy was carried out to support Welsh Government's vision in the future development of the Capital Region and commitment to a low carbon future.

“The Capital Region is committed to a low carbon future, which has a transport network and mobility culture that positively contributes to a thriving economy and the health and wellbeing of its citizens and where sustainable travel is the option of choice”

The LTP looks to tackle growing traffic levels (and hence air quality impacts) by providing strategies which focus upon providing efficient and effective transport networks. In order to be successful, the plans need a collaborative approach for the future development of the Capital Region's transport needs, therefore providing improved mobility for both residents and visitors, enhanced accessibility to jobs and services and fundamentally sustainable economic growth.

“This Local Transport Plan (LTP) seeks to identify the sustainable transport measures required to ensure the Vale of Glamorgan Council adheres to current requirements and good practices to allow for a sustainable transport environment for the period 2015 to 2020 as well as looking forward to 2030”

The LTP policy recognises the Council's objective to achieving sustainable travel (alternatives to using cars) and reducing negative impacts on the environment. The policy suggests that through improved transport infrastructure and transport services this can be achieved

## **Active Travel Plans and Strategies**

Active travel means walking and cycling (including the use of mobility scooters) for everyday journeys. This includes journeys to school, to work, to the shops or to access services e.g. health or leisure centres. Active travel does not include walking and cycling for recreational or social reasons.

In September 2014, the Welsh Government introduced the Active Travel (Wales) Act 2013 which makes it a legal requirement for local authorities in Wales to map and plan for suitable routes for active travel within certain settlements, as specified by Welsh Government.

The Council submitted their Integrated Network Maps in November 2017 which set out the Authority's aspirations for improving active travel routes across the County over the next 15 years.

They included routes that were currently used but may not have met the standard of Active Travel routes, or they were routes that did not exist but were identified within other strategic plans, or identified through the consultation process.

Section 4 of the Act requires that the next edition of the INM should be submitted by local authorities three years following the previous edition, or no later than a date specified by the Welsh Ministers. In view of the Covid-19 pandemic, Ministers considered it appropriate to extend the submission of the next round of integrated networks maps and updated existing routes maps to 31 December 2021.

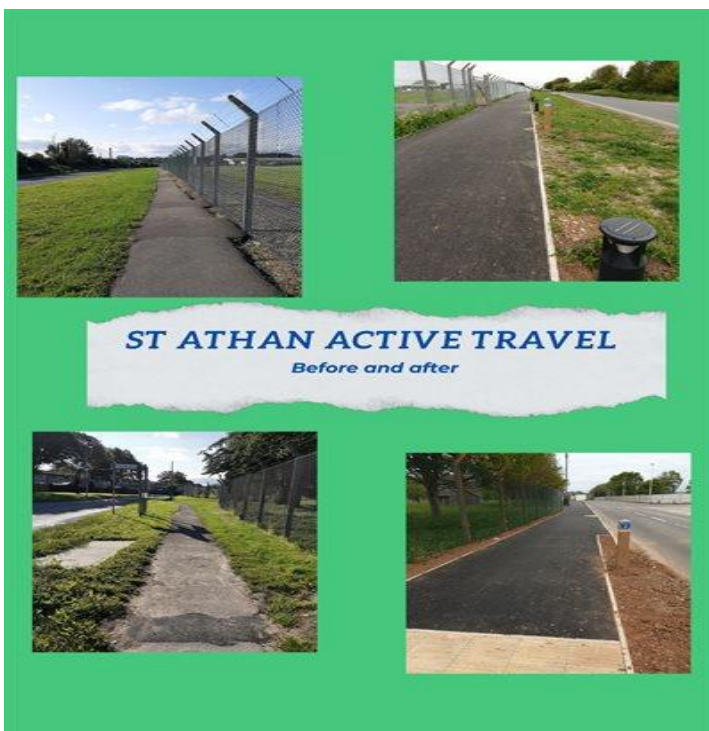
The Vale of Glamorgan Council held extensive consultation with the public throughout 2021, and the new Active Travel Network Map was approved by Welsh Government in August 2022.

<https://www.valeofglamorgan.gov.uk/en/living/transportation/Active-Travel.aspx>

### **St Athan Active Travel route is complete (April 2022)**

Construction of a 1.1km walking, wheeling and cycling route is now complete in St Athan.

**Figure 14 - St Athan Active Travel Route**



### **Cycle track installations in Vale schools (March 2022)**

Eight schools working on their School Active Travel Plans have had cycle track and road safety installations in their playgrounds thanks to the Active Travel team and Prevention Health Funding. Using bikes provided through Welsh Government Active Travel funding, these will help pupils build bike confidence and reinforce kerbcraft skills.

**Figure 15 - Kerbcraft Track**



### **Bike pump and repair stations installed around the Vale (updated October 2022)**

With funding from Public Health Wales, the Council hopes that the scheme will encourage residents and families to dig out their bikes and enjoy a problem-free ride. The new repair stations will offer people a free facility to repair their bike with air pumps and tools. The pumps can also be used on wheelchairs, pushchairs and footballs. The repair station sites have been placed at family-orientated locations:

Alexandra Gardens, Barry

Barry Island car park

Barry Leisure Centre

Colcot Sports centre - removed Sept 22 due to vandalism

Cowbridge Leisure centre

Llantwit Major leisure centre

Llantwit Major beach car park

Murchfield Community Centre

Penarth Leisure Centre

Sully

St Brides Major

Ewenny

Ogmore-by-Sea

Cosmeston Country Park

Wenvoe

Bonvilston

**Figure 16 - Bike Pump and Repair Stations**



## **Local Authorities Well-being Objectives**

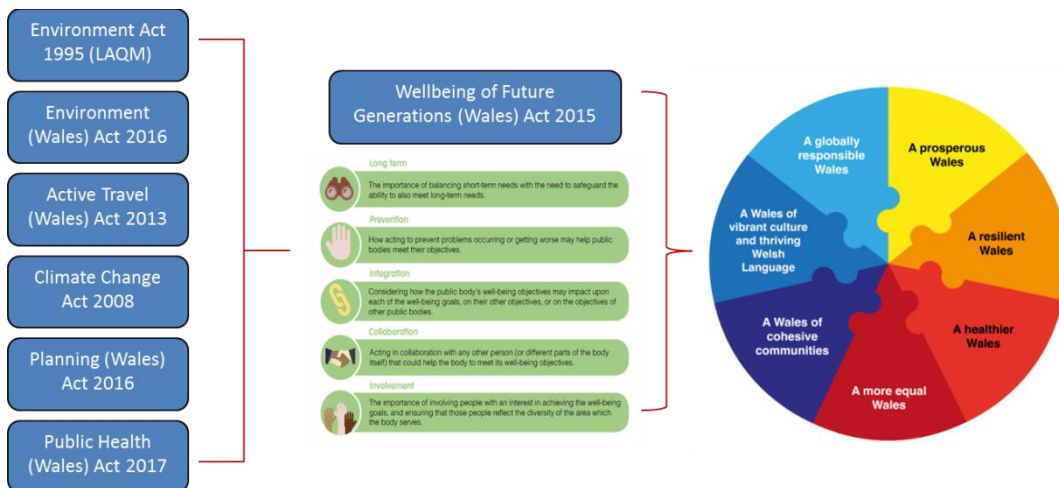
### **Well-being of Future Generations (Wales) Act 2015**

SRS/ VoGC adopts the principles of The Well-being of Future Generations (Wales) Act 2015. The Act is a significant enabler to improve air quality as it calls for sustainable cross-sector action based on the principles of long-term, prevention-focused integration, collaboration and involvement. It intends to improve economic, social, environmental, and cultural well-being in Wales to ensure the needs of the present are met without

compromising the ability of future generations to meet their own needs. The Act places responsibilities on public bodies in Wales to work in new ways (including via Public Services Boards) towards national Well-being goals. Progress is measured against a suite of well-being and Public Health Outcomes Framework indicators; there is one specifically concerned with air pollution.

As Figure 15 illustrates below, the Act is the legislative vehicle for “Health in all Policies in Wales” and provides the underpinning principles for all policy and decision making, including economic development, in Wales. Reducing air pollution, health risks and inequalities can help contribute to most, if not all, of the well-being goals. As such, the Act presents excellent opportunities to change policy and practice to enhance air quality management arrangements across The Vale (and wider).

**Figure 17 – Wellbeing of Future Generations Act**



**Welsh Government, Clean Air Plan for Wales, Healthy Air Healthy Wales**

Welsh Government has published its latest plan which underpins its commitment and long-term ambition to improve air quality in Wales. The plan sets out WG’s policy direction and proposed actions to reduce air pollution to support improvement in public health and the natural environment. Actions are proposed across four thematic themes, examined as People, Environment, Prosperity and Place.

The plan and its proposed actions is available at

<https://gov.wales/sites/default/files/publications/2020-08/clean-air-plan-for-wales-healthy-air-healthy-wales.pdf>

## **The Environment (Air Quality and Soundscapes) (Wales) Bill**

The Environment (Air Quality and Soundscapes) (Wales) Bill<sup>8</sup> was introduced to the Senedd on Monday 20 March 2023, giving the Welsh Government greater ability to tackle air and noise pollution.

The new Bill is part of a package of measures to improve the quality of the air environment in Wales.

It will give powers to Welsh Government to introduce new long-term targets for air quality under a national framework taking account of the latest scientific knowledge including the World Health Organisation Air Quality Guidelines

The Bill will help create low emission zones on Welsh Government trunk roads where needed and will give local authorities more power to tackle vehicle idling

SRS/ VGBC support the aspirations of the plan and welcome the development of more stringent mitigation measures that will enable a cohesive approach to air quality management and protecting public health and the natural environment.

## **Climate Change Strategies**

### **Project Zero**

<https://participate.valeofglamorgan.gov.uk/hub-page/project-zero>



Project Zero is the Vale of Glamorgan Council's response to the climate change emergency. It brings together the wide range of work and opportunities available to tackle

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<sup>8</sup> <https://www.gov.wales/new-powers-tackle-air-and-noise-pollution-will-lead-cleaner-healthier-and-greener-future>

the climate emergency, reduce the Council's carbon emissions to net zero by 2030 and encourage others to make positive changes.

Some of the work the Council is already taking forward as part of Project Zero is detailed below and demonstrates the breadth of activity across our services.

## **Planning**

The Local Development Plan (LDP) provides the local planning policy framework for delivering sustainable development, and specific guidance has also been developed seeking enhancements on Biodiversity, Trees and Development, Travel Plans and Renewable Energy.

The 2022-23 LDP target of granting planning permissions sufficient to meet 10.6% (56.68 GWh) of projected electricity demand through renewable energy sources by 2020 has been met.

Since July 2018 we have secured a replanting ratio of 2:1 for the removal of trees with a preservation orders (TPO) or trees in a conservation area (TCA) in accordance with the Trees, Woodlands, Hedgerows and Development Supplementary Planning Guidance

## **Energy**

The Council purchases 100% of electricity from renewable sources and has granted planning permission to a number of solar farms.

We have undertaken over 100 energy saving projects across council buildings including switching old inefficient lighting to LED lighting and the introduction of better energy controls.

We have begun switching heating from gas to electricity by installing a Ground Source Heat pump at Cadoxton House in Barry and an Air Source Heat pump at BSC2 (the Engine Room) in Barry. These sites have seen significant improvements in energy consumption and there are plans for further installations.

We have installed Solar panels on 23 buildings with a combined capacity of almost 1 Megawatt. All systems are sized appropriately to match demand at the buildings on which they are mounted.

90% of the Council's street lighting has been converted to LED against a target of 95% for 2022-23.

## **Transport**

All relevant planning applications are required to be accompanied by a travel plan to promote sustainable travel choices and prevent unnecessary car use and since March 2019 at least 10% of car parking spaces on non-residential developments are required to have electric vehicle charging points infrastructure.

Active Travel schemes have been delivered to improve opportunities for walking and cycling in a number of areas including Cowbridge, Llantwit Major, Penarth Heights, Lavernock Road/Cosmeston, Sully Road/St Josephs School and South Road/Hayes Road/Sully Moors Road.

An Electric Vehicle charge points installation programme is underway with 36 points installed in public places across the Vale and 80 points on council premises at January 2023.

We are working with our schools to encourage cycling and 6 balance bikes have been provided to every primary school in the Vale. Cycle shelters have been installed at 4 schools and we are working with schools on their Active Travel Plans.

Bike repair stations have been installed in 5 sites across the Vale and Pedestrian improvements made to routes on St Brides Way, Barry, Murch Road, Dinas Powys and Woodland Road, Barry.



## **5 Conclusion and Proposed Actions**

### **Conclusions from New Monitoring Data**

SRS on behalf of the VoGC has examined the results from monitoring undertaking in 2022. There were no exceedances of any pollutant objective.

### **Other Conclusions**

There are no other conclusions to be drawn from the information provided herein.

### **Proposed Actions**

The Specialist Services Team of SRS will work with VoGC representatives from Highways & Transport and Planning Department, and outline measures which have been undertaken, the effectiveness of these measures and future commitments/initiatives that the Council may need to consider to be implemented in the area to ensure compliance is maintained and improved upon.

As a long-term measure, SRS would recommend that the Vale of Glamorgan Council consider developing a Clean Air Strategy with its main objective to improve air quality and protect public health, whilst considering the sustainable development and future growth within the authority.

## References

Air Quality Annual Progress Reports (APRs) <https://www.srs.wales/en/Environmental-Health/Noise-and-Air-Pollution/Air-quality-and-pollution/Air-Quality-and-Pollution.aspx>

Local Air Quality Management Technical Guidance (TG22) <https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>

Vale of Glamorgan Planning Link <http://vog.planning-register.co.uk/plaDetails.aspx>

UK National Air Quality Archive LAQM <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>

Vale of Glamorgan Local Development Plan 2011- 2026  
<http://www.valeofglamorgan.gov.uk/Documents/Living/Planning/Policy/LDP/LDP-Adoption/Adopted-LDP-Written-Statement-June-2017-final-interactive-web-version.pdf>

Vale of Glamorgan The Local Transport Plan (2015- 2030)  
[https://www.valeofglamorgan.gov.uk/en/living/planning\\_and\\_building\\_control/Planning/planning\\_policy/Local-Transport-Plan.aspx](https://www.valeofglamorgan.gov.uk/en/living/planning_and_building_control/Planning/planning_policy/Local-Transport-Plan.aspx)

Vale of Glamorgan Active Travel  
<https://www.valeofglamorgan.gov.uk/en/living/transportation/Active-Travel.aspx>

Clean Air Advisory Panel Report – Impact of the COVID-19 Pandemic on air quality in Wales <https://airquality.gov.wales/reports-seminars/reports>

Air Quality Health Advice <https://airquality.gov.wales/about-air-quality/health-advice>

IAQM Planning Guidance <https://iaqm.co.uk/guidance/>

ONS Survey [Coronavirus and homeworking in the UK labour market - Office for National Statistics \(ons.gov.uk\)](https://ons.gov.uk)

Welsh Government Clean Air Plan <https://gov.wales/sites/default/files/publications/2020-08/clean-air-plan-for-wales-healthy-air-healthy-wales.pdf>

## **Appendices**

Appendix A: Monthly Diffusion Tube Monitoring Results

Appendix B: A Summary of Local Air Quality Management

Appendix C: Air Quality Monitoring Data QA/QC

Appendix D: AQMA Boundary Maps

## Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Table 10 - Full Monthly Diffusion Tube Results for 2022 ( $\mu\text{g}/\text{m}^3$ )

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO <sub>2</sub> Mean Concentrations ( $\mu\text{g}/\text{m}^3$ )												Simple Annual Mean ( $\mu\text{g}/\text{m}^3$ )		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.76)	Distance Corrected to Nearest Exposure
108	299967	174311	35.1	21.1	26.0	20.4	20.3	21.0	20.6	20.1	22.0	22.6	25.4	28.1	23.6	17.9	-
65	299614	174592	24.1	12.5	19.4	12.6	11.0	10.9	12.2	11.8	26.9	14.1	13.5	21.9	15.9	12.1	-
118	299646	174920	16.1	7.1	14.4	9.3	5.7	5.9	5.5	6.6	7.0	6.9	9.0	14.1	9.0	6.8	-
101	298903	174907	27.6	16.6	18.4	12.4	13.9	12.3	13.8	12.7	13.4	13.0	16.1	21.9	16.0	12.2	-
93	297171	168741	20.7	8.3	17.0	11.3	7.3	7.6	8.6	10.1	9.1	8.9	6.7	16.0	11.0	8.3	-
94	297069	168715	18.6	7.4		10.2	6.7	6.5	7.3	8.2	8.7	7.8	7.5	16.5	9.6	7.3	-
96	299045	169126	14.1	5.1	14.8	8.3	4.8	4.2	4.9	6.0	7.7	5.5	6.3	13.9	8.0	6.1	-
103	289530	174896		5.9	16.3	12.5	6.2	6.0	7.6	9.7	11.8	7.8	4.4	16.9	9.6	7.3	-
104	289496	174858	19.1		16.0	12.8	7.3	6.7	9.7	10.9	10.8	8.4	8.5	15.0	11.4	8.7	-

105	289473	174752	22.7	8.5	15.2	13.1	8.4	7.3	8.9		9.0		9.3	20.5	12.3	9.3	-
106	289454	174668	21.5	5.7	15.2	10.7	5.7	5.1	6.7	8.6	9.3	7.7	7.2	16.3	10.0	7.6	-
107	289512	174805	17.6	5.1	11.2	7.9	4.8	3.6	5.1	8.2	6.2	4.6	6.7	14.4	8.0	6.0	-
38	311892	174513	30.8	17.0	21.4	17.4	15.9	15.0	18.5	17.0	18.4	21.7	8.1	25.3	18.9	14.3	-
46	315747	171369	28.6	12.6	24.9	21.4	13.0	13.9	13.7	18.8	18.0	17.4	19.9	28.6	19.2	14.6	-
61	316433	171932	50.0	28.6	39.9	48.8	31.2	30.6	31.0	34.3	36.1	32.2	26.6	46.7	36.3	27.6	-
67	316488	172004	37.2	15.7	34.6	30.9	19.6	20.5	22.8	28.8	25.9	22.7	18.0	30.0	25.6	19.4	-
72a	315841	171527	28.1	15.8	23.8	19.3	14.6	13.5	14.8	15.9		17.2	15.2	28.4	18.8	14.3	-
92	316447	171963	47.2	23.0	36.1	31.4	25.0	24.9	27.9	30.7	30.8	30.9	28.3	43.0	31.6	24.0	-
91	316453	171945	30.1	17.7	31.1	23.1	17.5	17.3	19.2	23.1	22.3	21.2	17.6	29.7	22.5	17.1	-
109	315739	171444	33.5	19.6	24.1	21.8	18.7	17.2	19.2	19.8	19.8	17.6	22.6	29.6	22.0	16.7	-
110	315851	171555	34.2	23.0	24.6	21.8	19.4	17.4	18.6	20.8	18.8	22.0	26.0	30.5	23.1	17.5	-
120	312405	167951	31.5	14.6	25.1	17.5	14.6	14.1	16.6	18.3	17.1	16.4	19.8	28.8	19.5	14.8	-
123	315803	171492	38.6	23.9	30.4	25.8	21.0	20.2	20.7	22.1	25.3	24.1	26.2	36.4	26.2	19.9	-
124	315736	174160				14.5	25.2	8.0	9.2	10.2	10.0	8.2	8.1	18.7	12.5	9.5	-

22	318505	171496		19.6	23.1	16.8		17.0	17.9	19.2	20.2	18.8	21.8		19.4	14.7	-
112	317434	172729	35.0	19.9	28.0	22.4	17.3	16.3	19.1	19.4	21.5	22.2	22.4	32.0	23.0	17.4	-
53	317589	172411	39.8	26.7	34.9	33.0	32.2	23.5	25.1	27.5	28.9	22.5	26.4	34.8	29.6	22.5	-
90	317597	172433	32.4	15.2	33.0	31.9	25.9	18.1		25.5	24.1	21.1	19.7	27.1	24.9	18.9	-
56	316731	172391	35.0	21.7	24.8	21.5	19.8	16.8	27.3	18.9	17.9	20.7	18.7	31.2	22.9	17.4	-
62	317633	172357	42.5	26.3	37.9	32.2	28.3	23.5	26.7	28.9	40.7	33.5	27.6	37.3	32.1	24.4	-
70	316731	172391	36.4	16.1	34.4	27.7	14.4	15.1	19.5	25.4	23.2	19.0	17.4	34.4	23.6	17.9	-
74	317708	172259	42.1	25.2	30.1	26.9	23.4	21.6	24.1	25.3	25.0	24.6	25.9	33.4	27.3	20.7	-
76	317627	172371	42.1	27.1	38.7	30.6	27.5	25.2	26.1	28.2	27.5	29.0	32.0	38.9	31.1	23.6	-
100	317968	172105	36.8	16.5	25.6	19.8	15.4		22.0	29.7	26.0	20.8	18.8	31.3	23.9	18.2	-
79	317549	172572	53.3	26.4	52.4	44.8	36.3	36.3	39.8	50.2	41.2	38.3	30.5	48.2	41.5	31.5	-
113	317999	172067	40.9	18.2	31.7	28.4	18.3	19.0	19.0	16.0	21.1	21.1	18.3	28.5	23.4	17.8	-
82	318061	171944	30.1	12.0	26.2	17.5	12.8	14.0	14.6	14.0	17.7	18.2	16.9	25.7	18.3	13.9	-
55	317668	172312	43.0	26.0	33.0	28.5	29.1	25.3	27.3	28.0	26.9	28.2	24.6	35.9	29.7	22.5	-
8	311797	168503	49.6	33.8	35.7	32.9	28.6	26.6	28.8	27.6	29.5			36.1	32.9	25.0	-

41	315278	168451	22.2	10.2	15.3	10.9	8.2	7.6	8.3	7.5	7.3	7.9	8.5	17.6	11.0	8.3	-
64	311690	168042		16.0	29.7	19.9	14.2	13.7		15.9	16.1	16.9	10.1	27.3	18.0	13.7	-
66	313342	168823	50.5	23.3	32.4	28.9	27.5	15.8	28.9	27.8	27.5	28.0	30.8	31.5	29.4	22.4	-
116	311371	167628	33.0	16.9	22.8	19.2	14.2	14.2	14.8	17.5	16.8	14.1	18.5	29.2	19.3	14.6	-
117	313612	166807	43.2	26.8	31.8	26.3	25.3	24.3	27.4	23.4	26.9	29.3	31.0	36.4	29.3	22.3	-
102	311115	167041	36.6	16.7	26.5	21.6	15.5	14.7	16.5	17.8	18.9	16.6	11.2	30.2	20.2	15.4	-
114	312585	168171	26.7	11.8	21.9	13.6	9.2	9.9	11.3	13.5	15.0	12.9	12.5	24.2	15.2	11.6	-
115	312677	168171	45.2	27.3	32.9	28.2	25.0	26.1	29.0	29.3	29.8	26.9		36.1	30.5	23.2	-
119	315445	170577		18.5	26.5	19.5	16.7	24.7	17.7	19.4	20.3	18.2	17.6	28.3	20.7	15.7	-
121	311270	168363	46.2	30.8	35.1	27.8	27.4	25.3	26.5	26.2	26.7	28.7	29.1	38.3	30.7	23.3	-
122	307283	174138	18.8	7.3	18.2	11.2	7.4	7.5	7.7	8.2	8.4	8.4	9.2	13.3	10.5	8.0	-

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 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 the nearest relevant public exposure

## **Appendix B: A Summary of Local Air Quality Management**

### **Purpose of an Annual Progress Report**

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995, as amended by the Environment Act 2021, and associated government guidance. 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 being achieved. Where exceedances occur, or are likely to occur, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) within 18 months of declaration setting out the measures it intends to put in place in pursuit of the objectives. Action plans must then be reviewed and updated no later than every five years; or if a local authority considers there is a need for further or different measures to be taken in order to achieve air quality standards; or if significant changes to sources occur within your local area.

For Local Authorities in Wales, an Annual Progress Report replaces all other formal reporting requirements and have a very clear purpose of updating the general public on air quality, including what ongoing actions are being taken locally to improve it if necessary.

### **Air Quality Objectives**

The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138), Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298), and are shown in Table B.1.

The table shows the objectives in units of microgrammes per cubic metre  $\mu\text{g}/\text{m}^3$  (milligrammes per cubic metre,  $\text{mg}/\text{m}^3$  for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).



**Table B.1 – Air Quality Objectives Included in Regulations for the Purpose of LAQM in Wales**

<b>Pollutant</b>	<b>Air Quality Objective: Concentration</b>	<b>Air Quality Objective: Measured as</b>	<b>Date to be achieved by</b>
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	40µg/m <sup>3</sup>	Annual mean	31.12.2005
<b>Particulate Matter (PM<sub>10</sub>)</b>	50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
<b>Particulate Matter (PM<sub>10</sub>)</b>	40µg/m <sup>3</sup>	Annual mean	31.12.2010
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	350µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	125µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	266µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
<b>Benzene</b>	16.25µg/m <sup>3</sup>	Running annual mean	31.12.2003
<b>Benzene</b>	5µg/m <sup>3</sup>	Annual mean	31 12 2010
<b>1,3 Butadiene</b>	2.25µg/m <sup>3</sup>	Running annual mean	31.12.2003
<b>Carbon Monoxide</b>	10.0mg/m <sup>3</sup>	Maximum Daily Running 8-Hour mean	31.12.2003
<b>Lead</b>	0.25µg/m <sup>3</sup>	Annual Mean	31.12.2008

# Appendix C: Air Quality Monitoring Data QA/QC

## QA/QC of Diffusion Tube Monitoring

### Diffusion Tube Bias Adjustment Factors

A database of bias adjustment factors determined from Local Authority co-location studies throughout the UK has been collated by the LAQM Helpdesk. The National Diffusion Tube Bias Adjustment Factor Spreadsheet (Version 03/23) was used to obtain an overall adjustment factor of 0.76 from the input data shown in the following screenshot. This overall factor is based on 26 co-location studies where the tube preparation method and analysis laboratory used were the same as those used by VoGC.

Figure 18 - 03/23 Nation Diffusion Tube Bias Adjustment Spreadsheet

National Diffusion Tube Bias Adjustment Factor Spreadsheet				Spreadsheet Version Number: 03/23						
Follow the steps below <b>in the correct order</b> to show the results of <b>relevant</b> co-location studies Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.						This spreadsheet will be updated at the end of June 2023 <a href="#">LAQM Helpdesk Website</a>				
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.				Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.						
Step 1:		Step 2:	Step 3:	Step 4:						
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor <sup>2</sup> shown in blue at the foot of the final column.						
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data.	If you have your own co-location study then see footnote <sup>4</sup> . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953						
Analysed By <sup>1</sup>	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m <sup>3</sup> )	Automatic Monitor Mean Conc. (Cm) (µg/m <sup>3</sup> )	Bias (B)	Tube Precision <sup>3</sup>	Bias Adjustment Factor (A) (Cm/Dm)
SOCOTEC Didcot	50% TEA in acetone	2022						Use	0.76	
				Overall Factor <sup>2</sup> (26 studies)						

### Discussion of Choice of Factor to use

The bias adjustment factor applied to all 2022 data is 0.76. The applied bias adjustment factor has been calculated using the national diffusion tube bias adjustment factor spreadsheet version 03/23.

## QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied and analysed by Socotec UK Ltd Didcot, using the 50% triethanolamine (TEA) in water method. Socotec UK Ltd Didcot participates in the Annual Field Inter-Comparison Exercise and Workplace Analysis Scheme for Proficiency (WASP) inter-comparison scheme for nitrogen dioxide diffusion tube analysis. From April 2014 the

WASP Scheme was combined with the STACKS scheme to form the new AIR scheme, which Socotec UK Ltd Didcot participates in. The AIR scheme is an independent analytical proficiency testing scheme operated by LGC Standards and supported by the Health and Safety Laboratory (HSL).

The laboratory Socotec UK Ltd Didcot is regarded ranked as the highest rank of satisfactory in relation to the WASP intercomparison scheme for spiked nitrogen dioxide diffusion tubes. Information regarding tube precision can be obtained via <http://laqm.defra.gov.uk/diffusion-tubes/precision.html> Information regarding WASP results can be obtained via <http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>

### Diffusion Tube Annualisation

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

**Table C.1 – Bias Adjustment Factor**

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.76
2021	National	03/22	0.78
2020	National	09/20	0.76
2019	National	06/19	0.75

### NO<sub>2</sub> Fall-off with Distance from the Road

No diffusion tube NO<sub>2</sub> monitoring locations within the Vale of Glamorgan required distance correction during 2022.

## QA/QC of Automatic Monitoring

Indicative automatic monitors are co-located at a reference monitoring station located on Park Street, Bridgend. The Park Street monitor is part of the Welsh Automatic Urban pollution Monitoring Network. This co-location exercise is carried out on an annual basis and is used to correct any drift in the scaling for NO and NO<sub>2</sub> sensors.

It should be noted that due to the lack of QA procedures, regular instrument calibration and the use non-standard reference methods, the provided indicative automatic data cannot be used for formal assessment of compliance with any air quality objective.

## Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA 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
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides

PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide