Neath Port Talbot County Borough Council

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: October 2023

Customer:
Neath Port Talbot County Borough Council

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Contact:
Stephen Stratton, 2nd Floor, 18 Blythswood Square, Glasgow, G2 4BG, UK

T: +44 (0) 1235 753 072
E: stephen.stratton@ricardo.com

Author:
Eilidh Morrison

Approved by:
Stephen Stratton

Signed

Date:
26/10/2023

Ref: ED17178111

Ricardo is certified to ISO9001, ISO14001, ISO27001 and ISO45001

Information	Neath Port Talbot County Borough Council Details
Local Authority Officer	Leah Morgan
Department	Planning and Public Protection
Address	Environmental Health, Neath Port Talbot Council, The Quays, Brunel Way, Baglan Energy Park, Neath, SA11 2GG
Telephone	01639 686868
E-mail	environment@npt.gov.uk
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Executive Summary: Air Quality in Our Area

1.1 Air Quality in Neath Port Talbot County Borough Council

The main air quality issues in Neath Port Talbot (NPT) are:

1. Fine particulates (PM_{10}) in Port Talbot.

Emissions of fine particulates, known as PM_{10}, are associated with emissions from the steel works, which is regulated by Natural Resources Wales (NRW). Since the declaration of the Taibach Margam Air Quality Management Area (AQMA) in 2000, annual average PM_{10} concentrations have remained well below regulatory limits. However, the frequency of daily average spikes in pollution concentrations have increased at some sites, although these are still within regulatory limits. Therefore, it is not yet considered to be safe to revoke the air quality management area (AQMA). The Council works with the Welsh Government, Tata and Natural Resources Wales (the regulator) in order to manage air quality issues.

2. Large particulates (nuisance dust) fallout in Port Talbot

Within Port Talbot, nuisance dust is a recurring air quality issue and is also related to activities at the steel works. Although there are no regulatory limits for grit and dust emissions, the concentrations measured at Port Talbot often exceed the guideline "nuisance limit".

3. Polyaromatic hydrocarbons (PAH) in Port Talbot

Polycyclic aromatic hydrocarbons (PAHs) are a class of chemicals that occur naturally in coal, crude oil, and gasoline. Emissions of PAHs in Port Talbot are associated with the coke ovens used in the steel works. More on this can be found in the '*Technical report on UK supplementary modelling assessment under the Air Quality Standards Regulations 2010 for 2020',* available online. The regulator (NRW) is working with Tata to address the issue. Since measurements commenced in 1999, concentrations of PAHs have varied, however concentrations have increased over the last 3 years.

4. Nickel in Pontardawe.

The main source of raised nickel levels in Pontardawe is the Wall Colmonoy works, which is regulated by the Council. The concentrations of Nickel measured in 2022 met regulatory limits however this has not always been the case in previous years.

1.2 Actions to Improve Air Quality

The principal actions in the Taibach Margam AQMA Air Quality Action Plan are described in the NRW dust action plan. These are specific actions agreed between the regulator and Tata to reduce pollution from the steelworks.

In addition to working with Tata and NRW, NPT Council also works with Welsh Government and other organisations to better understand and combat pollution from the works.

The Council is the regulator of the business in Pontardawe which is the principal contributor to nickel levels in the area. The Council works with the operator to ensure that the business is operated using Best Available Techniques (BAT). The aim is to minimise emissions. The Council also works with Welsh Government and other process operators in the region with this aim in mind.

1.3 Local Priorities and Challenges

The Council will continue to work with NRW, Tata and the Welsh Government to understand and minimise particulate emissions from the steelworks.

The Council will continue to focus on regulation of Wall Colmonoy in Pontardawe to maintain measured nickel concentrations below the EU Target.

In both cases above, the main challenge is to understand the precise sources of emissions of which there are potentially several at each location.

1.4 How to Get Involved

The public can engage with NPT Council via their website which contains further local information on NPT's Air Quality Strategy, the Council's strategic policy for achieving cleaner air in partnership with the whole community.

Data from the automatic (continuous) air quality monitors located across the County Borough can be found on the Welsh Air Quality Website.

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1 Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

A summary of the reports produced on air quality by NPT County Borough Council to date are detailed below.

1998 *Annual Progress Report* summarising routine measurements.

1999 *Annual Progress Report* summarising routine measurements.

2000 *Annual Progress Report* summarising routine measurements and Review and Assessment of Air Quality, concluding that it would be necessary to declare an Air Quality Management Area (AQMA) for PM_{10} in Port Talbot. This was due the predicted failure to achieve the Government's Air Quality Objective for PM_{10} by the deadline of 31st December 2004 without intervention.

2001 *Annual Progress Report* summarising routine measurements.

2002 *Annual Progress Report* summarising routine measurements.

2003 *Annual Progress Report* and *Updating and Screening Assessment* produced showing that there was no need to proceed to a detailed assessment in respect of all but two pollutants, NO_2 and PM_{10}. NO_2 measurements at Victoria Gardens, Neath had shown some increases that merited further investigation. PM_{10} measurements at Port Talbot had continued to require further measurement, especially as improvements to a blast furnace might have been expected to abate emissions somewhat.

2004 *Annual Progress Report* and *Updating and Screening Assessment* produced for NO_2 and PM_{10}, showing that it would not be necessary to declare an AQMA in the vicinity of Victoria Gardens. PM_{10} concentrations were found to increase following re-commissioning of blast furnace number 5 at the steelworks. However, the numbers of exceedances were not as numerous as those recorded prior to the re-build of the furnace and the incorporation of cast house fume arrestment.

2005 *Annual Progress Report* summarising routine measurements.

2006 *Annual Progress Report* and *Updating and Screening Assessment* produced showing that it would be necessary to proceed to a Detailed Assessment in respect of NO_2. Several busy roads were identified for which accurate speed information was not

available. Therefore, it would be necessary to deploy diffusion tubes to assess nitrogen dioxide levels at these locations. Measurements of PM_{10} would continue as before.

2007 *Annual Progress Report* and *Updating and Screening Assessment* produced for NO_2, showing that none of the 19 roadside sites identified in the 2006 USA breached the annual average Air Quality Objective. However, two sites were close to the Objective and one site, Water Street, Port Talbot was at risk of exceeding. Diffusion tube monitoring continued at these locations.

2008 *Annual Progress Report* summarising routine measurements.

2009 *Updating and Screening Assessment* produced, identifying the need to proceed to a Detailed Assessment of NO_2 in respect of Water Street, Port Talbot. Further sites were also identified for deployment of NO_2 diffusion tubes. The daily averaged Air Quality Objective for PM_{10} was not exceeded in Port Talbot.

2010 *Annual Progress Report* and *Updating and Screening Assessment* produced, showing that Air Quality Objectives were not breached at Water Street, but identifying the need to proceed to a Detailed Assessment of NO_2 in respect of sites at: Swansea Road, Pontardawe; Victoria Gardens, Neath and Water Street, Port Talbot.

2011 *Annual Progress Report* and *Detailed Assessment* produced, showing that following improved traffic management and reducing volumes of traffic meant that there were no further problems at Water Street, but confirmed raised levels at Swansea Road, Pontardawe and Victoria Gardens, Neath. The Council committed to deploy continuous NO_2 analysers at these locations.

2012 *Updating and Screening Assessment* produced, identifying the need to proceed to a Detailed Assessment of NO_2 at Swansea Road, Pontardawe and Victoria Gardens, Neath. The report also identified the need to proceed to a Detailed Assessment for PM_{10} at respect of Prince Street, Margam.

2013 *Annual Progress Report* produced, identifying a breach of the short-term air quality objective for PM_{10} at Prince Street in Port Talbot using equipment owned by Natural Resources Wales (NRW). A new monitor was to be installed in 2014 to replace the NRW device, which was relocated. Consequently, the report identified the need to proceed to a Detailed Assessment for PM_{10} at respect of Prince Street, Margam. A *Detailed Assessment* of NO_2 was subsequently produced in 2013, showing that neither air quality objective was breached at Victoria Gardens in Neath. However, a property at 1 Victoria Gardens (39.8 µg m^{-3}) was close to exceeding the short-term Air Quality Objective (AQO).

2014 *Annual Progress Report* summarising routine measurements.

2015 *Annual Progress Report* and *Updating and Screening Assessment* produced, identifying the need to proceed to a Detailed Assessment of NO_2 at Swansea Road, Pontardawe and Victoria Gardens, Neath. A *Detailed Assessment* of PM_{10} was subsequently produced in 2015, examining data from 8 sites in Port Talbot, but none were found to breach air quality objectives. Results at Prince Street were more in line with those at Port Talbot Fire Station.

2016 Annual Progress Report and Updating and Screening Assessment produced, identifying the need to proceed to a Detailed Assessment of NO_2 at Victoria Gardens, Neath. A *Detailed Assessment* of NO_2 was subsequently produced in 2016, recommending the deployment of diffusion tubes in triplicate at 1, Victoria Gardens.

2017 *Annual Progress Report* produced, reporting the closure of the continuous NO_2 analyser at Pontardawe, on account of the reduction in pollution levels at the Fire Station site. The NO_2 air quality objective was not exceeded at any location.

2018 *Annual Progress Report* produced, once again reporting a decreasing trend for NO_2 levels at Victoria Gardens and no exceedances of the air quality objectives at any location.

2019 *Annual Progress Report* summarising routine measurements.

2020 *Annual Progress Report* produced, no exceedances of the AQOs were reported at any location apart from for Polyaromatic Hydrocarbons and Nickel. The Polyaromatic Hydrocarbons exceed the Air Quality Objective but not the EU target. Nickel only exceeded the EU Target at 1 location, Tawe Terrace. NO_2 levels at the continuous monitor at Victoria Gardens also continued to fall.

2021 *Annual Progress Report* produced, no exceedances of the AQOs were reported at any location apart from for Polyaromatic Hydrocarbons and Nickel. The Polyaromatic Hydrocarbons exceed the Air Quality Objective but not the EU target. Nickel only exceeded the EU Target at 1 location, Tawe Terrace.

2022 *Annual Progress Report* produced, no exceedances of the AQOs were reported, except for Polyaromatic Hydrocarbons and Nickel. The Polyaromatic Hydrocarbons exceed the Air Quality Objective but not the EU target. Nickel only exceeded the EU Target at 1 location, Tawe Terrace.

1.2 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 (Please see Appendix A)). 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.

A summary of the AQMA declared by NPT Council can be found in Table 1-1. The table presents a description of the AQMA that is currently declared in response to exceedances of the PM_{10} 24-hour mean objective. The AQMA boundary can be seen in Appendix D.

Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available on the Defra website.

Table 1-1 – Declared Air Quality Management Areas

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Town	Description	Action Plan
AQMA Taibach/ Margam	Particulate Matter PM_{10} 24-hour mean	There has been a gradual decrease in PM_{10} exceedance days since the declaration of the AQMA	Neath Port Talbot	An area covering the majority of land and properties between the Corus Steel Works and the M4 Motorway.	Air Quality Action Plan for the Taibach Margam Air Quality Management Area – 2012

AQMA boundary maps within NPT Council can be viewed on the Defra website and are included in Appendix D.

Due to ongoing compliance with the Air Quality Objectives within the AQMA, during 2022 NPT considered whether it should revoke the declaration. It was decided that the AQMA should not be revoked at this time. It is considered important that the AQMA remains in place for at least a short period longer for the following reasons:

1. To allow for a period of post Covid air quality monitoring, to establish any impact that Covid had on the pollution levels and to see if long term changes in working practices has an impact on the AQMA.
2. A period of monitoring to allow investigation into the impact that the reduced M4 speed limit has had on the AQMA.

3. Completion of the Vortex Air Quality Monitoring Pilot Study that aims to more effectively target interventions, identify particular pollution hotspots and sources that were previously hidden, and gain a better understanding of the impact of particular policies; crucial to designing effective strategies for managing air pollution. Further information is available on our website.
4. Considerations of any new requirements imposed by the Clean Air Bill which is scheduled for introduction during the second year of this Senedd term[1].
5. Noted increases in days exceeding the daily PM_{10} concentration limit at PT2 Margam monitoring site in 2021 and 2022, with 2021 in particular increasing to within 10% of the AQO for daily mean PM_{10}.

1.3 Implementation of Action Plans

NPT has taken forward a number of measures during 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 1-2. More detail on these measures can be found in the Air Quality Action Plan relating to any designated AQMAs.

Air Quality Action Plans are continuously reviewed and updated whenever deemed necessary, but no less frequently than once every five years. Such updates are completed in close consultation with local communities.

NPT intends to publish an updated AQAP for 2023 to 2028. The AQAP works closely alongside the Short Term Action Plan (STAP) which is also under review and likely to have a significant influence on the measures that NPT adopt in their new AQAP.

[1] https://www.gov.wales/written-statement-publication-white-paper-clean-air-wales-bill-summary-responses

Table 1-2 – Progress on Measures to Improve Air Quality

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
A1	Multi-agency interaction	Cooperation between various organisations to investigate PM_{10} exceedances	Welsh Government	2000	2001-present	See previous Progress reports	Impossible to quantify	Various investigations, most recently the King's College monitoring report	UWE report in preparation for 2019	Not known	Impossible to quantify
A2	Dust reduction programme at Tata site	Reduce particulate emissions via NRW regulation	NRW	2000	2001-present	Implementation of various improvement schemes	Impossible to quantify	Various improvements. See previous Progress reports.	Further improvements to programme and arrangements for dealing with complaints	None. The dust reduction programme will continue for the foreseeable future	Impossible to quantify
A3	Planning policies	Resist developments on air quality grounds where appropriate	NPT	2000	2001-present	None	Impossible to quantify	UDP now in force	UDP continued	UDP complete	Impossible to quantify
A4	Tree planting	Trees may help to reduce airborne particulates	Tata, NRW, NPT	N/A	Ongoing	Number of trees and shrubs planted	Impossible to quantify	Tree planting in Port Talbot	Pilot project completed	Not known	Impossible to quantify

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
A5	Transport infrastructure (PDR)	Provide alternative route for traffic and slightly reduce pollution	NPT	2010	Completed 2013	None	Impossible to quantify	PDR complete	PDR complete	PDR complete	Impossible to quantify
A6	Train haulage emissions	Investigate cases of visible mineral emissions from trains	NPT	N/A	Ongoing	Avoidance of visible emissions	Impossible to quantify	No problems in recent years	No problems reported	Ongoing	Impossible to quantify
A7	NPT regulated activities	Regulate Civil & Marine slag cement to minimise PM_{10} emissions	NPT	N/A	Ongoing	Compliance with permit	Impossible to quantify	Emissions comply with permit	Emissions comply with permit	Ongoing	Impossible to quantify
A8	Travel plans	Minimise traffic and emissions by use of public transport etc.	NPT	N/A	Ongoing	Travel plan implemented	Impossible to quantify	Part implemented but not complete	None	Not known	Impossible to quantify
A9	School travel plans	Reduce the impact of the school journey in the AQMA	NPT	N/A	Ongoing	Number of plans in place	Impossible to quantify	62 plans in place	1 new plan	Ongoing	Impossible to quantify

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
A10	Domestic bonfires	Minimise through education and recycling	NPT	N/A	Ongoing	Provision of green waste recycling	Impossible to quantify	Quantities vary from year to year depending on weather etc	Responded to 180 domestic smoke and bonfire complaints between Jan and Dec 2021.42,870 tonnes of recycling - combination of reuse, recycling and composting in 2021.	Ongoing	Impossible to quantify
A11	Industrial fires	Minimise large industrial fires by identifying risky sites and taking remedial action	NPT, NRW	N/A	Ongoing	Avoidance of industrial fires in Port Talbot	Impossible to quantify	No problems in recent years	28 business/ industrial smoke complaints received	Ongoing	Impossible to quantify
A12	Hill fires	Prevent hill fires in vicinity of Port Talbot	MAWWFIRE	N/A	Ongoing	Minimise hill fires through education	Impossible to quantify	Community Fire Safety Team targets schools and farmers	Fire and Rescue responded to 23 hill fires in and around the Port Talbot area in 2021.This is 14 fewer than the year before.	Ongoing	Impossible to quantify

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
A13	Street sweeping	Can be carried out as required to remove particulates from the highway	NPT	N/A	Ongoing as required	The cleanliness of the street scene	Impossible to quantify	Sweeping has been carried out at Tata's request on several occasions	Sweeping carried out on PDR at Tata's request	Ongoing	Impossible to quantify
A14	Air Alerts	Provide email alert system notifying NRW, WG, Tata etc. to intervene where pollution levels are raised	NPT	N/A	Ongoing	System operates as expected	Impossible to quantify	System has been operational for some years	151 users currently subscribed	Ongoing	Impossible to quantify

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

This section sets out the monitoring undertaken within 2022 by Neath Port Talbot Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

2.1 Summary of Monitoring Undertaken in 2022

2.1.1 Automatic Monitoring Sites

NPT Council undertook automatic (continuous) monitoring at five sites during 2022. Table 2-1 presents the details of the sites. National monitoring results are available on the Welsh Air Quality Website.

NPT has a comprehensive monitoring network that it has operated for many years, providing good air quality data for the area and particularly around Port Talbot's Steelworks and the AQMA.

Monitoring at Prince Street, Little Warren and Dyffryn School were upgraded from FDMS to BAM (Beta Attenuation Monitoring) monitors to allow sampling for PM_{10} and $PM_{2.5}$. The FDMS monitor at Prince Street ran until the 21st of February, the FDMS monitor at Little Warren ran for a short period in January and the FDMS at Dyffryn School was not used in 2022. The new BAM monitors at all three sites came online on the 20th May 2022.

Twll yn y Wal (TYW) developed a fault at the same time as a number of other monitors. When the sites were reviewed it was concluded that TYW was lower priority than others for replacement because it had not shown any exceedances for a number of years and as such was not upgraded along with Prince Street, Little Warren and Dyffryn School. However, a decision on the long-term fate of TYW has not yet been fully decided and will continue to be reviewed particularly in light of the upcoming changes in legislation.

Maps showing the location of the monitoring sites are provided in Figure 2-1. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

2.1.2 Non-Automatic Monitoring Sites

NPT undertook non- automatic (passive) monitoring of NO_2 at 26 sites during 2022. Table 2-2 presents the details of the sites.

Maps showing the location of the monitoring sites are provided in Figure 2-2. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Table 2-1 – Details of Automatic Monitoring Sites

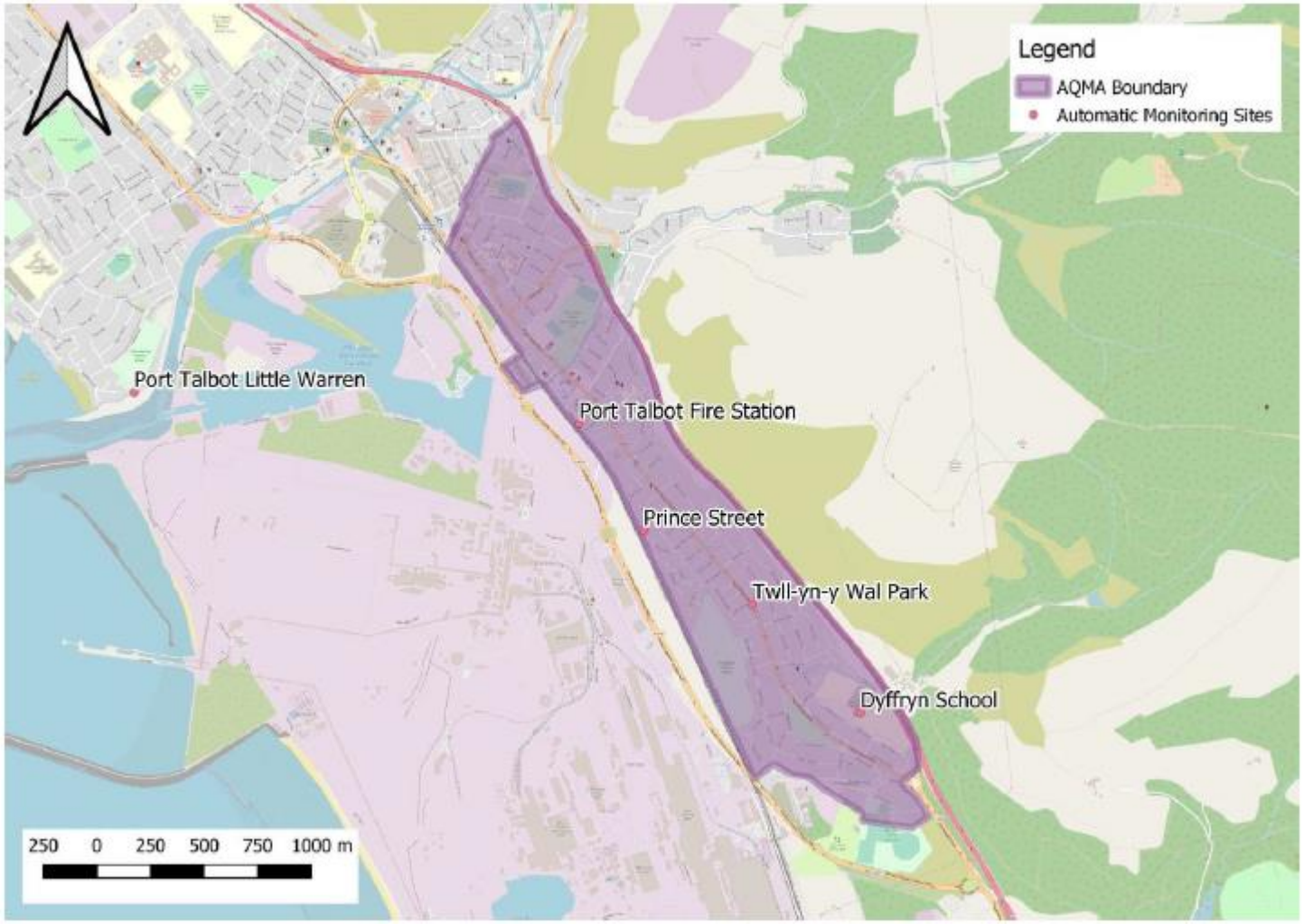
Site ID	Site Name	Site Type	Associated with (Named) AQMA?	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	Monitoring Technique	Inlet Height (m)	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
PT2	Port Talbot Margam (Fire Station) AURN	Industrial	Y (Taibach Margam)	277388	188733	PM_{10}, $PM_{2.5}$, SO_2, CO, O3, NO_2	BAM, UV fluorescence, IR absorption, UV absorption, chemiluminescence	2.5	16	8	4
DS1	Dyffryn School	Industrial	Y (Taibach Margam)	278700	187387	PM_{10}, $PM_{2.5}$	BAM	1.8	45	4	45
TW1*	Twll-yn-y Wal Park	Industrial	Y (Taibach Margam)	278196	187891	PM_{10}	FDMS	1.8	14	2	4
LW1	Talbot Little Warren	Industrial	N	275313	188879	PM_{10}, $PM_{2.5}$	BAM	2.5	35	7	53
PS2	Prince Street	Industrial	Y (Taibach Margam)	277689	188235	PM_{10}, $PM_{2.5}$	BAM	1.8	45	6	57
VG2	Victoria Gardens	Roadside	N	275471	197183	NO_2	Chemiluminescence	1.2	18	19	2

Notes:

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

*This site stopped monitoring in March 2021 and the council has not decided the fate of this monitor.

Figure 2-1 – Maps of Automatic Monitoring Sites



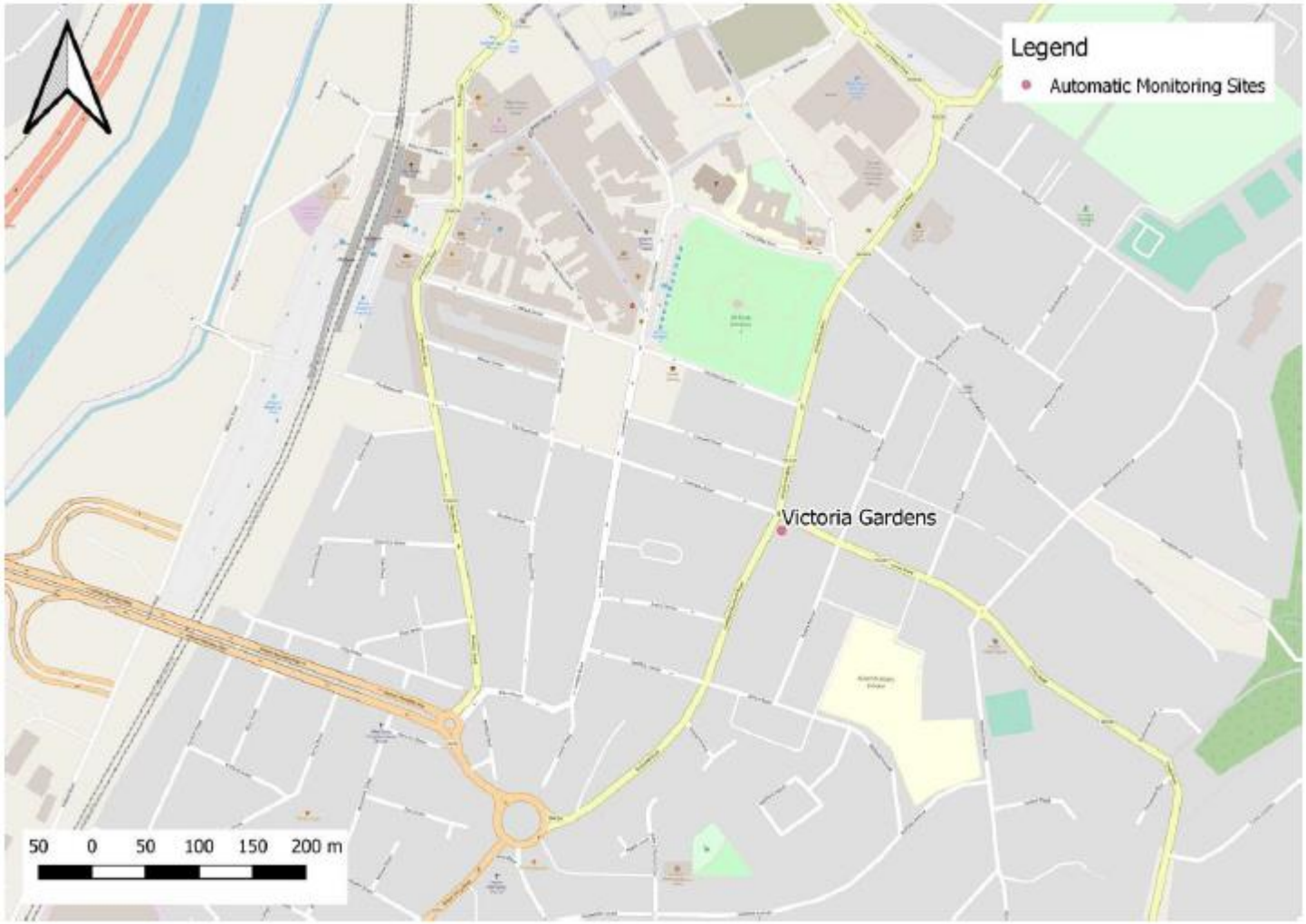

Legend
Automatic Monitoring Sites
Victoria Gardens
50 0 50 100 150 200 m

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

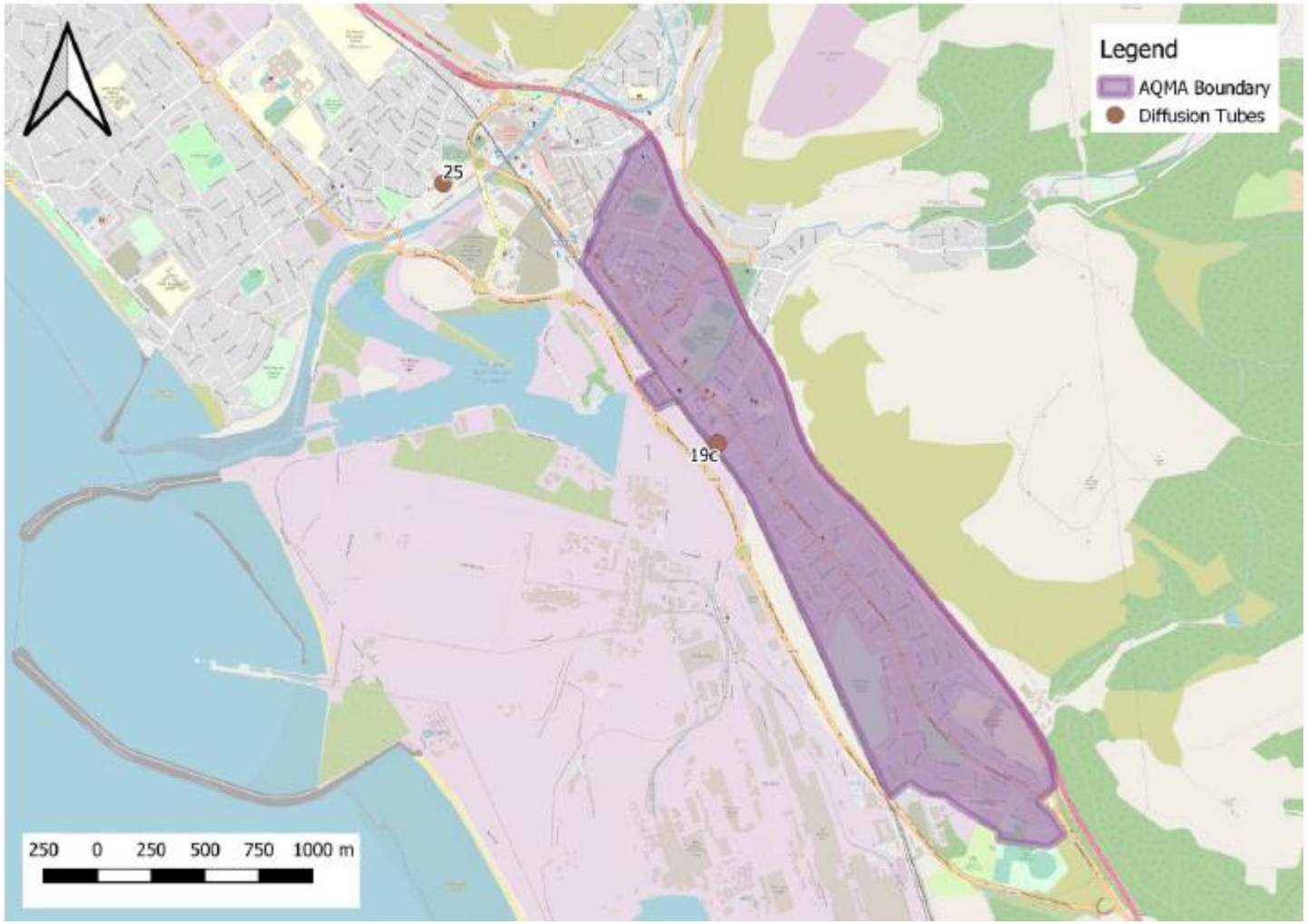
Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
1a, 1b, 1c	1 VG (Tube A), (Tube B), (Tube C)	Roadside	No	275463	197217	2	No	0	1	1
4	8 VG	Roadside	No	275494	197272	1.5	No	2	4	4
5	Eastland Rd. Neath (28 Eastland Rd)	Roadside	No	275438	197164	1.5	No	0	4	4
7a, 7b, 7c	Mobys (Tube A), (Tube B), (Tube C)	Roadside	No	274312	194601	2	No	2	2	2
8	Neath Rd. Briton Ferry (Tube 185)	Roadside	No	274307	194580	2	No	0	2	2
9	Neath Rd. Briton Ferry (Tube 179)	Roadside	No	274305	194563	2	No	0	2	2
10	Neath Rd. Briton Ferry (Tube 187)	Roadside	No	274308	194584	2	No	0	2	2
11	Neath Rd. Briton Ferry (Tube 183)	Roadside	No	274310	194589	2	No	0	2	2
12	Eastland Rd. Neath (34 Eastland Rd)	Roadside	No	275427	197139	1.5	No	0	4	4
13	Eastland Rd. Neath (40 Eastland Rd)	Roadside	No	275415	197110	1.5	No	0	4	4
14	Eastland Rd. Neath (32 Eastland Rd)	Roadside	No	275431	197149	1.5	No	0	4	4
15	Eastland Rd. Neath (30 Eastland Rd)	Roadside	No	275434	197157	1.5	No	0	4	4
16	5 VG	Roadside	No	275464	197230	1.5	No	0	3	3
17	1 Greenway Rd. Neath	Roadside	No	275455	197211	2	No	0	2	2
18a, 18b, 18c	Pontardawe PO (Tube A), (Tube B), (Tube C)	Roadside	No	272034	203954	2	No	0	2	2

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
19a, 19b, 19c	Port Talbot Fire Station (Tube A), (Tube B), (Tube C)	Industrial	Yes (Taibach/ Margam)	277406	188719	2.5	Yes	16	8	4
20a, 20b, 20c	3 VG (Tube A), (Tube B), (Tube C)	Roadside	No	275463	197223	1.5	No	0	3	3
21	50 Greenway Rd. Neath	Roadside	No	275452	197195	2	No	0	2	2
22	54 Windsor Rd. Neath	Roadside	No	275146	197248	2	No	0	2	2
23	4 VG	Roadside	No	275482	197227	1.5	No	0	3	3
24a, 24b, 24c	Stockhams Corner. Neath (Tube A), (Tube B), (Tube C)	Roadside	No	275200	196905	2	No	0	3	3
25	Water St. Port Talbot	Roadside	No	276131	189926	2	No	0	2	2
26	Swansea Rd. Pontardawe (10 Swansea Rd)	Roadside	No	272019	203924	2	No	0	2	2
27	Swansea Rd. Pontardawe (11A Swansea Rd)	Roadside	No	272016	203941	2	No	0	2	2
28	Swansea Rd. Pontardawe (7 Swansea Rd)	Roadside	No	272026	203961	2	No	0	2	2
34a, 34b, 34c	Cimla Rd Analyser. Neath (Tube A), (Tube B), (Tube C)	Roadside	No	275475	197186	1.4	Yes	20	2	2

Notes:

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

Figure 2-2 – Maps of Non-Automatic Monitoring Sites


Legend
AQMA Boundary
Diffusion Tubes
25
250 0 250 500 750 1000 m


Legend
Diffusion Tubes
Manset Street
Vernon Street
Grandison Street
Neath Road
7a
11
10
8
9
50
0
50
100
150
200 m


Legend
Diffusion Tubes
28
18c
27
26
50
0
50
100
150
200 m

2.2 2022 Air Quality Monitoring Results

Table 2-3 – Annual Mean NO_2 Monitoring Results (µg m^{-3})

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
PT2	Industrial	Automatic	97.6	97.6	15.0	15.0	12.0	13.0	12.0
VG2	Roadside	Automatic	81.2	81.2	34.0	32.0	27.0	26.0	27.0
1a, 1b, 1c	Roadside	Diffusion Tube	89.1	89.1	32.5	34.0	29.8	32.6	25.7
4	Roadside	Diffusion Tube	90.4	90.4	22.7	23.5	20.1	22	20.1
5	Roadside	Diffusion Tube	63.7	63.7	25.7	27.2	23.9	26.8	20.6
7a, 7b, 7c	Roadside	Diffusion Tube	98.6	98.6	24.5	26.3	22.3	23.6	18.1
8	Roadside	Diffusion Tube	83.1	83.1	24.9	23.9	21.2	23.7	18.9
9	Roadside	Diffusion Tube	90.7	90.7	23.5	25.1	21.6	22.7	21.0
10	Roadside	Diffusion Tube	98.6	98.6	24.6	26.1	22.7	21.6	18.9
11	Roadside	Diffusion Tube	98.6	98.6	23.8	26.1	22.6	25.4	18.5
12	Roadside	Diffusion Tube	90.7	90.7	24.9	26.7	22.2	24.1	19.7
13	Roadside	Diffusion Tube	87.4	87.4	22.2	23.6	20.5	24.4	20.1
14	Roadside	Diffusion Tube	98.6	98.6	25.9	26.6	23.0	25.5	21.7
15	Roadside	Diffusion Tube	90.7	90.7	25.9	27.1	23.7	26.5	20.2
16	Roadside	Diffusion Tube	73.0	73.0	29.2	30.2	25.6	26.6	24.3
17	Roadside	Diffusion Tube	87.4	87.4	29.3	31.3	26.0	29.5	23.8
18a, 18b, 18c	Roadside	Diffusion Tube	65.6	65.6	32.6	36.8	30.3	32.2	24.0
19a, 19b, 19c	Industrial	Diffusion Tube	98.6	98.6	13.7	15.7	13.4	15.2	11.8
20a, 20b, 20c	Roadside	Diffusion Tube	89.1	89.1	28.6	29.8	25.9	27.4	22.6
21	Roadside	Diffusion Tube	56.3	56.3	32.8	33.7	32.5	34.8	25.8
22	Roadside	Diffusion Tube	98.6	98.6	21.1	21.3	17.6	21.3	16.1
23	Roadside	Diffusion Tube	90.7	90.7	26.1	26.2	22.2	23.3	19.2
24a, 24b, 24c	Roadside	Diffusion Tube	98.6	98.6	25.4	28.0	24.8	26.0	21.3
25	Roadside	Diffusion Tube	90.4	90.4	24.1	27.7	21.5	26.6	21.2
26	Roadside	Diffusion Tube	75.1	75.1	29.9	33.0	27.6	28.0	23.5
27	Roadside	Diffusion Tube	82.5	82.5	34.4	37.0	30.4	29.1	25.8
28	Roadside	Diffusion Tube	67.2	67.2	24.2	24.4	22.7	17.2	18.2
34a, 34b, 34c	Roadside	Diffusion Tube	91.0	91.0	36.7	36.6	30.0	34.0	26.3

Notes:

Exceedances of the NO_2 annual mean objective of 40 µg m^{-3} are shown in **bold**.

NO_2 annual means exceeding 60 µg m^{-3}, indicating a potential exceedance of the NO_2 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 2-3 – Trends in Annual Mean NO_2 Concentrations

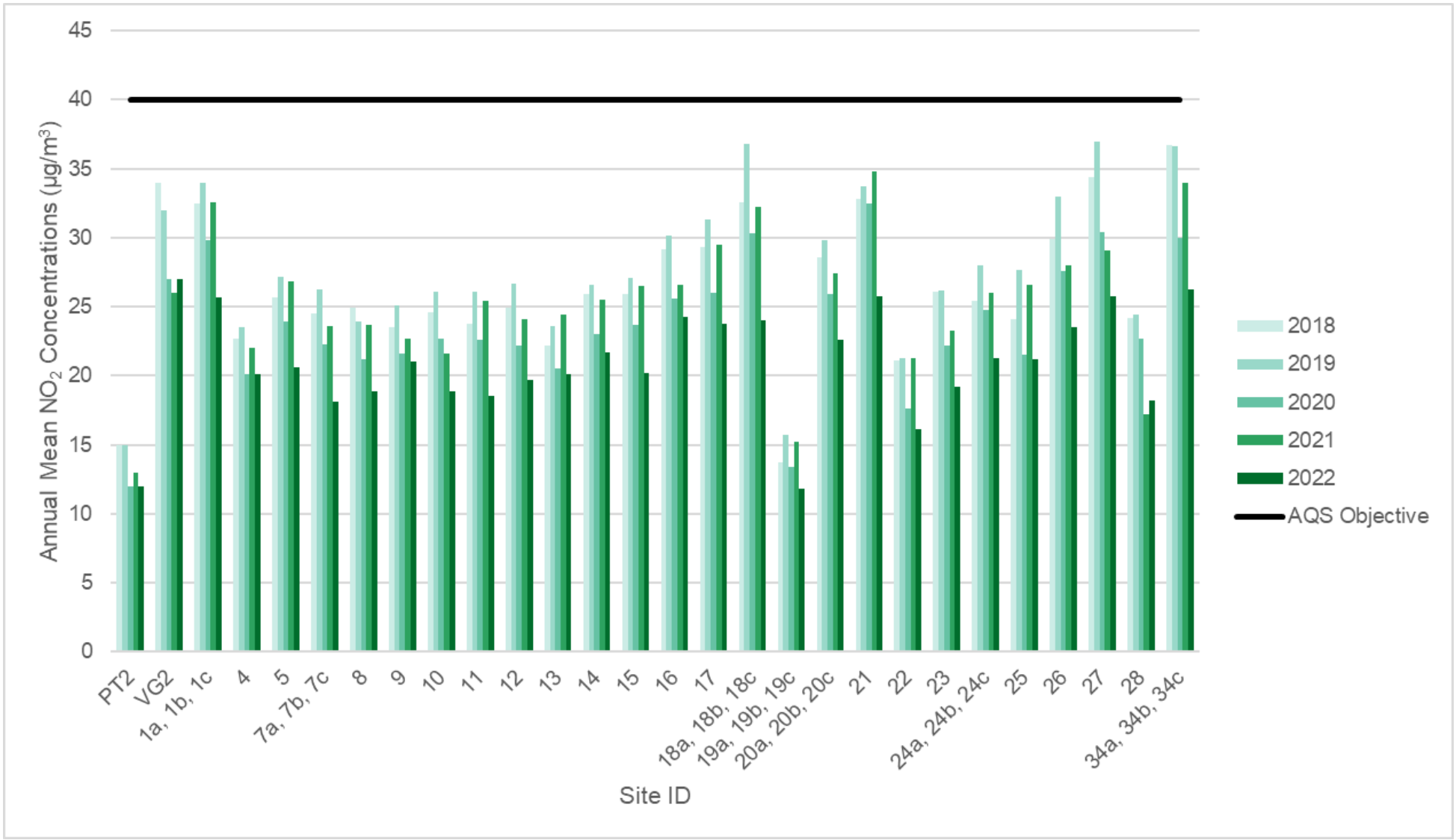


Table 2-4 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200 µg m^{-3}

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
PT2	Industrial	Automatic	97.6	97.6	0	0	0	0	0
VG2	Roadside	Automatic	81.2	81.2	0	0	0	0	0 (90)

Notes:

Exceedances of the NO_2 1-hour mean objective (200 µg m^{-3} 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 2-5 – Annual Mean PM_{10} Monitoring Results (µg m^{-3})

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
PT2	Industrial	94.10	94.10	23	21	21	25	26
DS1	Industrial	59.70	59.70	-	22	23	25	17
TW1*	Industrial	-	-	21	21	20	20	-
LW1	Industrial	62.80	62.80	21	20	21	18	19
PS2	Industrial	74.60	74.60	23	20	24	20	27

Notes:

Exceedances of the PM_{10} annual mean objective of 40µgm^{-3} 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%).

* This site stopped monitoring in March 2021 and the council has not decided the fate of this monitor.

Figure 2-4 – Trends in Annual Mean PM_{10} Concentrations

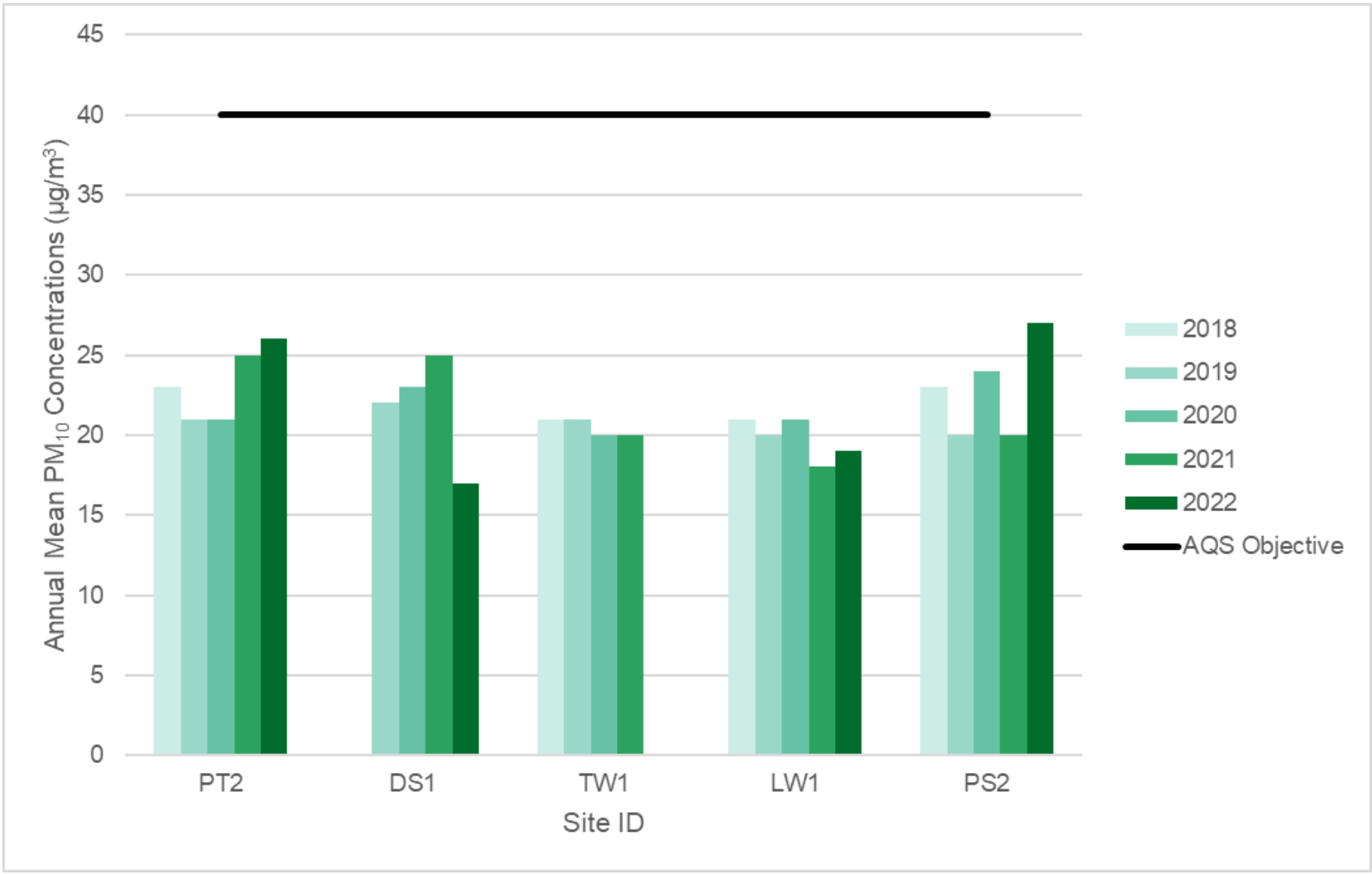


Table 2-6 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50 µg m^{-3}

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
PT2	Industrial	94.1	94.1	11	12	11	33	23
DS1	Industrial	59.7	59.7	-	2	0	0	2 (30)
TW1*	Industrial	-	-	9	10	7	0	-
LW1	Industrial	62.8	62.8	9	9	15	7	6 (33)
PS2	Industrial	74.6	74.6	12	8	16	3	20 (47)

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50 µg m^{-3} not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th 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%).

* This site stopped monitoring in March 2021 and the council has not decided the fate of this monitor.

Figure 2-5 – Trend in Number of PM_{10} 24-hour Mean Concentrations >50 µg m^{-3}

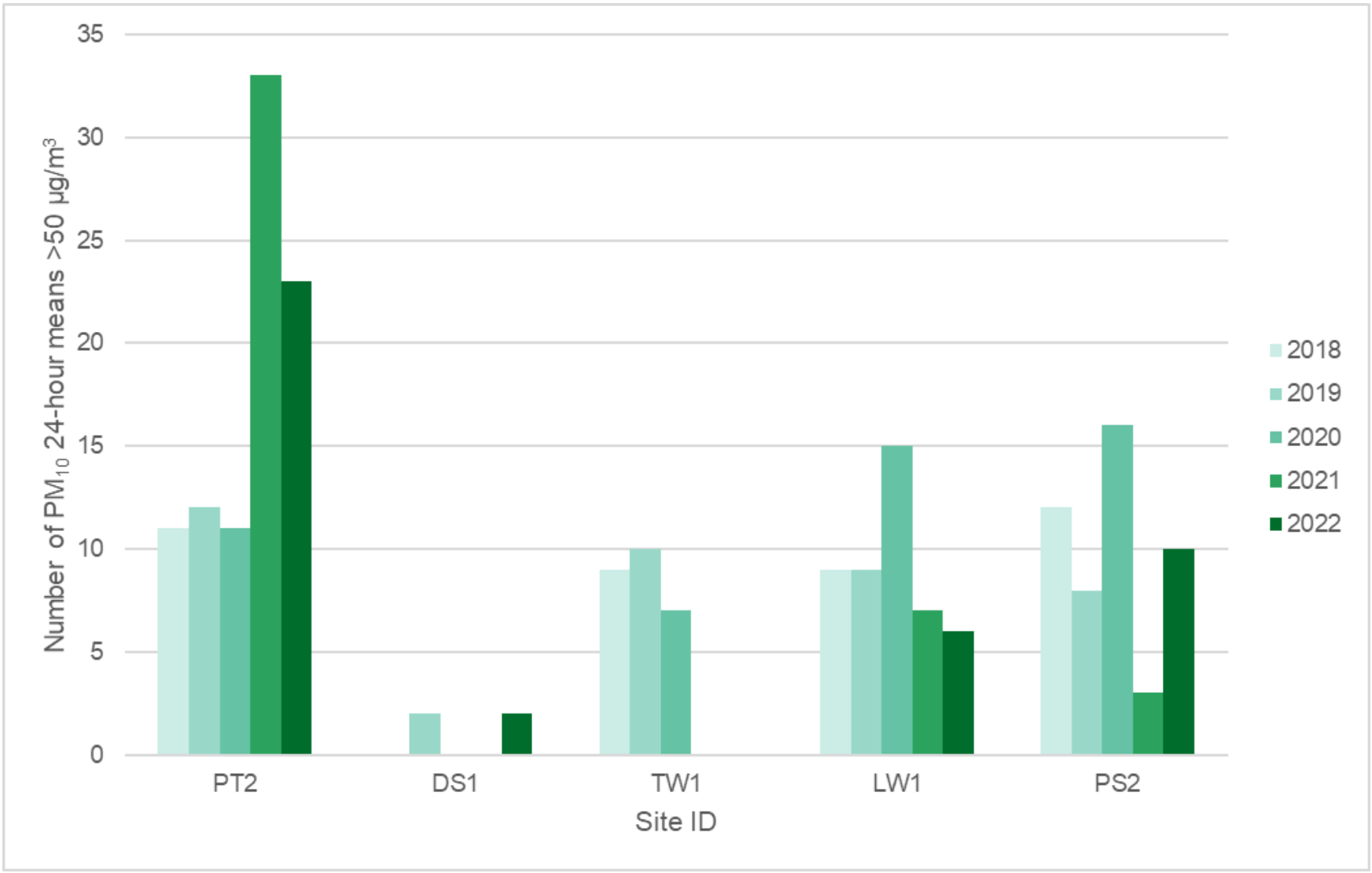


Table 2-7 – $PM_{2.5}$ Monitoring Results (µg m^{-3})

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
PT2	Industrial	95.7	95.7	10	11	11	9	8
DS1	Industrial	59.7	59.7	-	-	-	-	6
TW1*	Industrial	-	-	-	-	-	-	-
LW1	Industrial	58.5	58.5	-	-	-	-	7
PS2	Industrial	72.7	72.7	10	9	9	9	10

Notes:

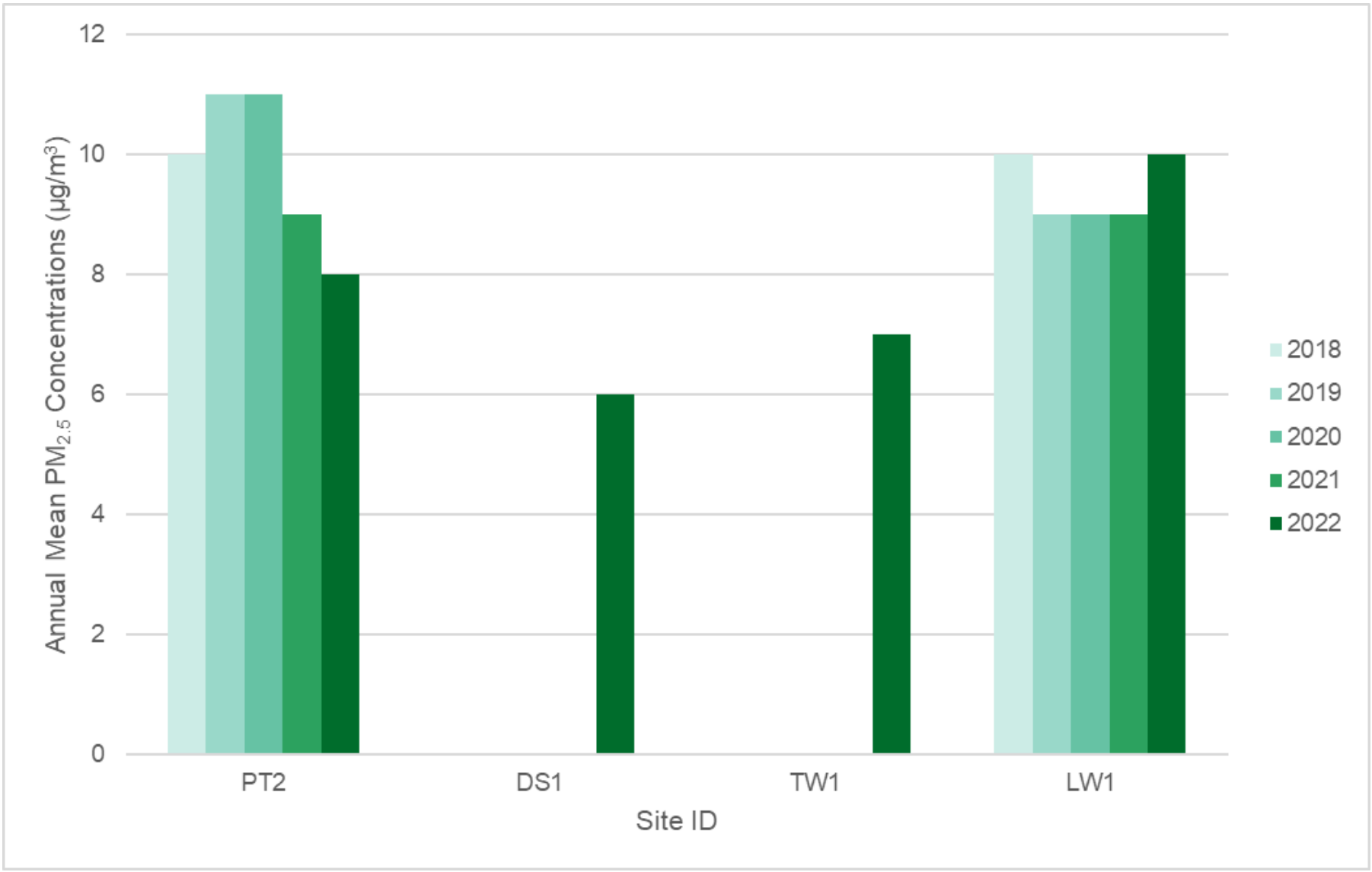
All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

* This site stopped monitoring in March 2021 and the council has not decided the fate of this monitor.

Figure 2-6 – Trends in Annual Mean $PM_{2.5}$ Concentrations



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

The trend analysis presented in this section has been carried out using Openair: a free, open-source software package of tools for analysis of air pollution data. Openair was initially funded by the Natural Environment Research Council (NERC), with additional funds from Defra[2]. The Openair project is now maintained by Dr David Carslaw, of Ricardo Energy & Environment/ University of York and Dr Karl Ropkins of the University of Leeds.

For long-term trend analysis in this section, the Openair "TheilSen" analysis tool was used. This uses the Theil-Sen statistical method to determine trends in pollutant concentrations over several years. The trend analysis is based on monthly mean pollutant concentrations. Openair includes an option to "de-seasonalise" the data (i.e. statistically modify the plotted data to remove the influence of seasonal cycles, thus providing a clearer indication of the overall trend over the relevant time). The "de-seasonalise" option has been used in all the Theil-Sen trend graphs presented here. When the de-seasonalise option is used, Openair fills in any gaps in the data using a linear interpolation method.

In these plots the trend line is shown by a solid red line, with 95% confidence intervals for the trend shown by dotted red lines. The trend is given at the top of the plot in green, with confidence intervals shown in square brackets. The trend is given as units (i.e. µg m^{-3}) per year, over the period shown. This may be followed by a number of stars, with * indicating that the trend is statistically significant at the 0.05 level (low significance), ** indicating significance at the 0.01 level (significant) and *** indicating significance at the 0.001 level (highly significant). The symbol + indicates that the trend is significant at the 0.1 level.

2.3.1 Nitrogen Dioxide (NO_2)

There were no exceedances of the annual mean AQS objective for NO_2 (40 µg m^{-3}) at any site, whether measurements were conducted using diffusion tubes or continuous analysers.

In 2022, the maximum annual mean NO_2 concentration at any site was at DT34 (26.3 µg m^{-3}), a decrease from the maximum concentration measured in 2021 at DT21

[2] Carslaw DC and Ropkins K (2012). "Openair — An R package for air quality data analysis." Environmental Modelling & Software, 27–28(0), pp. 52–61. ISSN 1364-8152, doi: 10.1016/j.envsoft.2011.09.008.

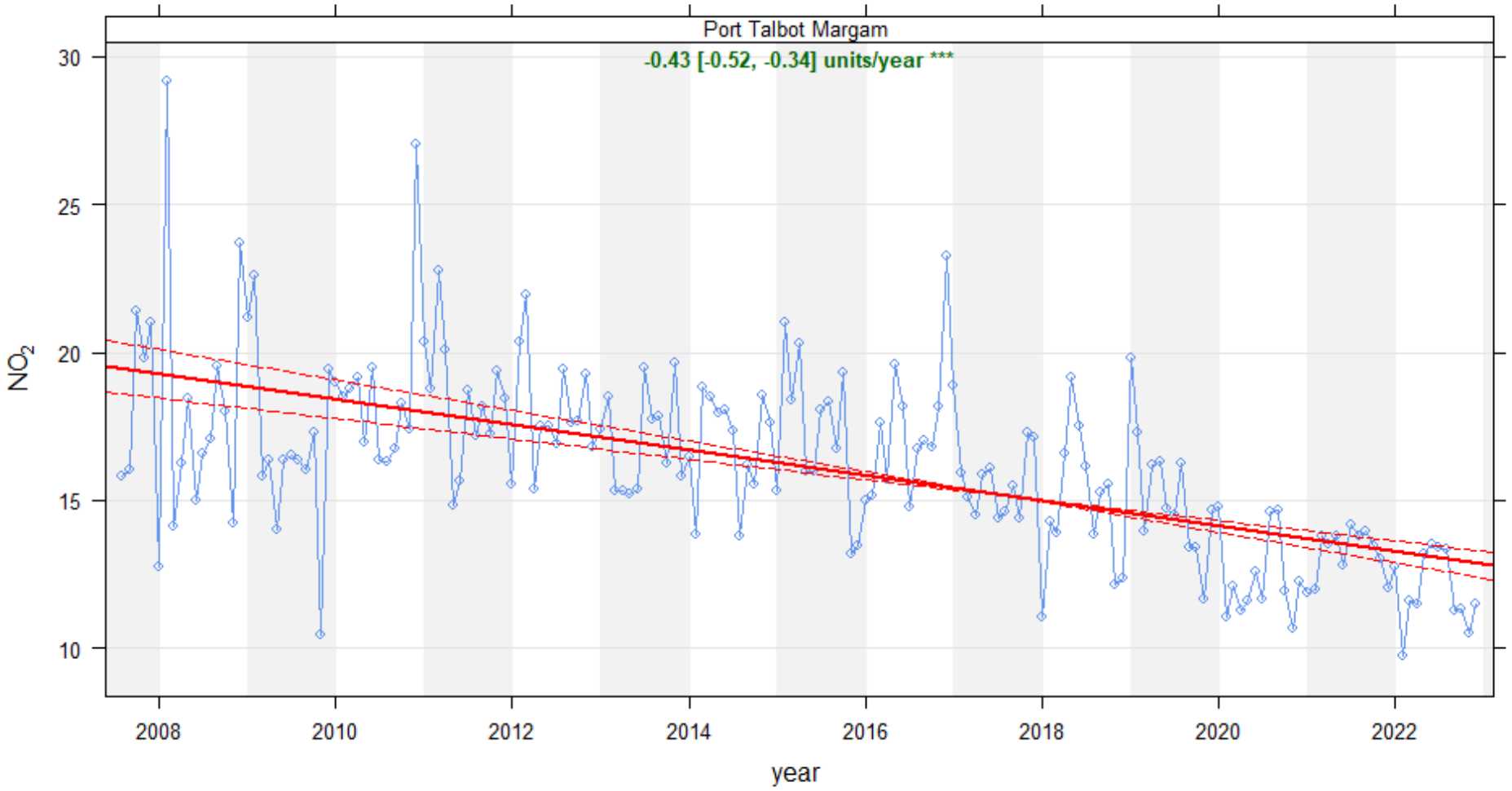
(34.8 µg m^{-3}). Annual mean NO_2 concentrations at all sites decreased over the last 5 years, except for a slight increase between 2020 and 2021. It is thought that a greater than expected decrease in concentrations in 2020 is due to the COVID-19 lockdown and restrictions and the subsequent increase in 2021 is due to easing of these restrictions. Concentrations fell by around 5% between 2021 and 2022.

There have been no exceedances of the 1-hour NO_2 AQS objective (200 µg m^{-3}) measured at the automatic monitoring locations. All automatic monitoring sites had sufficient data capture therefore annualisation was not required.

Diffusion tube data has been subject to bias adjustment and the calculation methodology is included in Appendix C. A local bias adjustment of 0.66 was used. The full dataset is included as Appendix A. Annualisation was necessary for four sites (DT5, DT18a, DT21 and DT28).

The Automatic Urban and Rural Network (AURN) continuous analyser in Port Talbot Margam (Fire Station) has been running since 2007, after being relocated from Groeswen Hospital. The deseasonalised trend in NO_2 concentrations measured at this site from 2007 to 2022 is shown in Figure 2-7. There is a highly significant downward trend in NO_2 concentrations at the site. Between 2013 and 2017 the NO_2 concentrations remain level and a consistent decrease in concentrations is particularly noticeable from 2017 onwards.

Figure 2-7 – Deseasonalised Trend in NO_2 Concentrations at Port Talbot Margam 2007-2022



2.3.2 Particulate Matter (PM_{10})

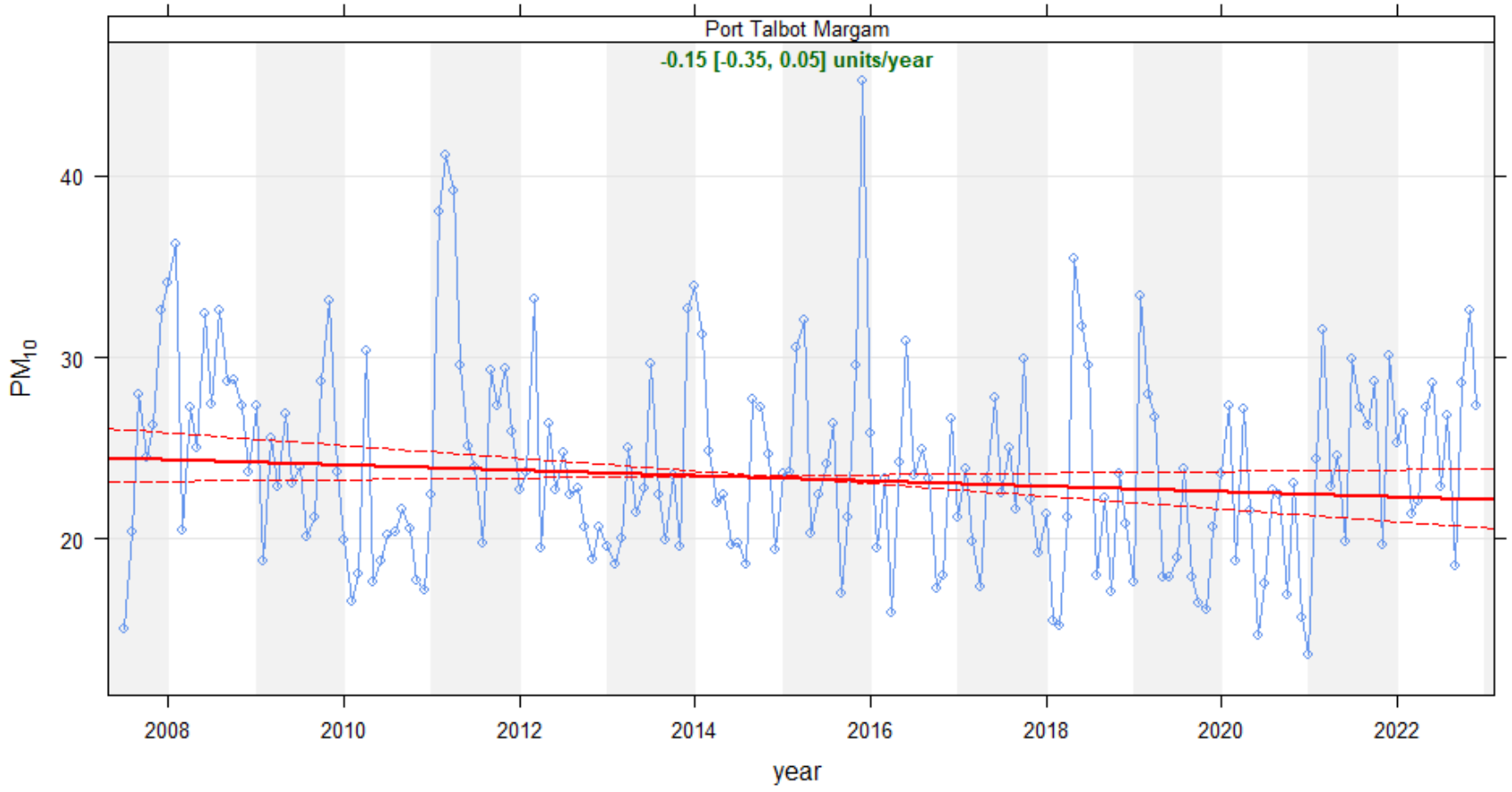
There were no exceedances of the annual mean AQS objective for PM_{10} (40 µg m^{-3}). Annual mean PM_{10} concentrations have remained similar over the past five years at three sites and increased at the Prince Street site from 20 µg m^{-3} in 2021 to 27 µg m^{-3} in 2022.

Within the Taibach Margam AQMA, declared for PM_{10}, PM_{10} 24-hour mean concentrations exceeding 50 µg m^{-3} were measured by continuous monitors. At the Margam (Fire Station) site, exceedances decreased from 33 to 23, however remained higher than the 11 to 12 in the previous three years. Exceedances increased at the other two sites within the AQMA: two exceedances were measured at Dyffryn School, an increase from zero in 2020 and 2021; and 20 were recorded at Prince Street, an increase from three the previous year.

Data capture rates at 3 sites were 75% or less due to faulty equipment which has now been upgraded.

The deseasonalised trend in PM_{10} concentrations from 2007 to 2022 at the AURN continuous analyser in Port Talbot Margam (Fire Station) is shown in Figure 2-8. There is a downward trend in PM_{10} concentrations at the site however this is not statistically significant. Concentrations of PM_{10} have jumped up since the end of 2020.

Figure 2-8 – Deseasonalised Trend in PM_{10} Concentrations at Port Talbot Margam 2007-2022



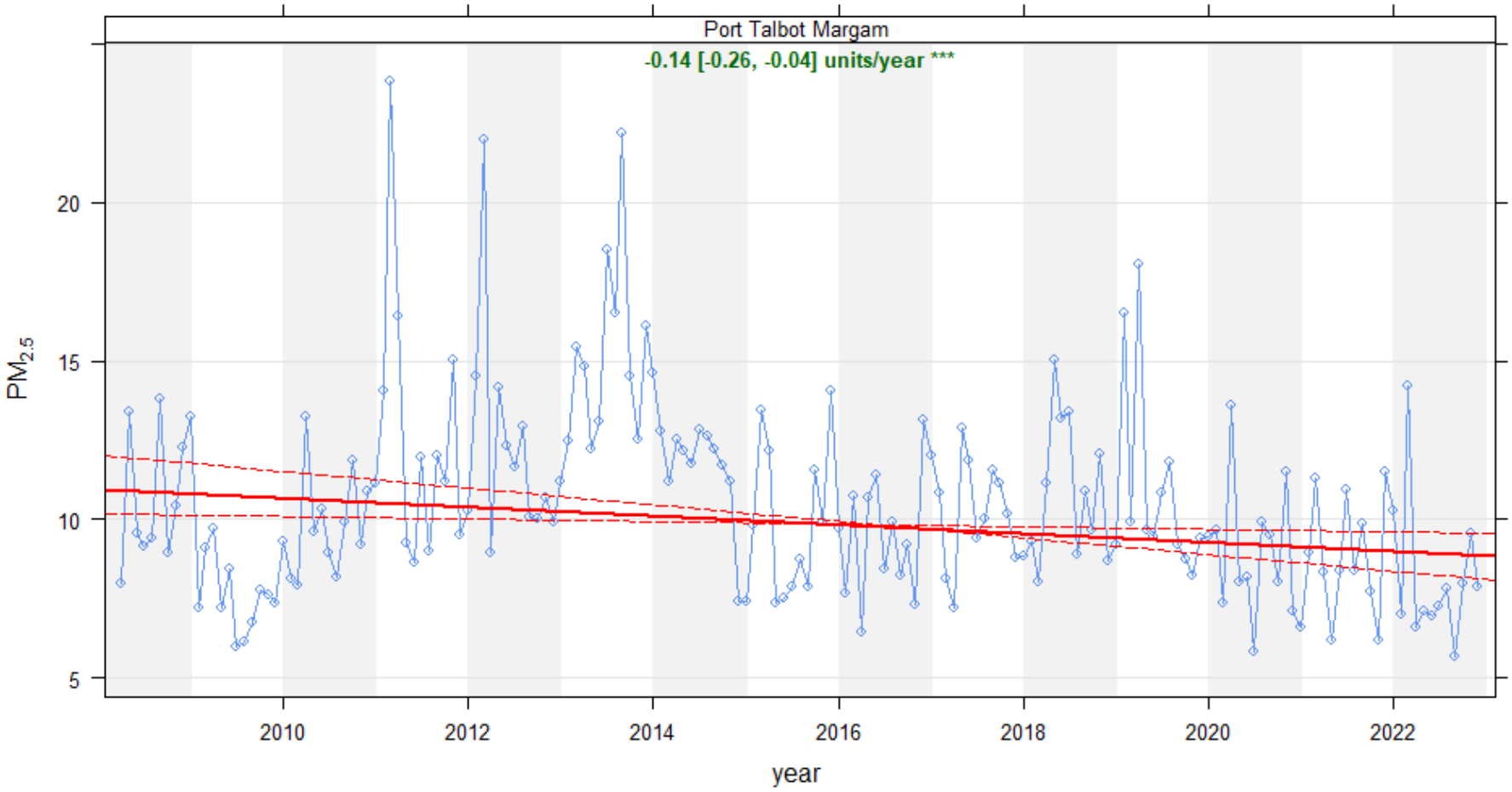
2.3.3 Particulate Matter ($PM_{2.5}$)

At the end of May 2022 additional $PM_{2.5}$ monitoring was brought online at Dyffryn School and Talbot Little Warren.

For annual mean $PM_{2.5}$ concentration, the EU Target value of 25 µg m^{-3} was not exceeded at any of the sites. The WHO Guideline value of 5 µg m^{-3} was exceeded at all of the sites, although the WHO Interim Target 4 of 10 µg m^{-3} was not exceeded. There is no LAQM air quality objective for $PM_{2.5}$, rather that Welsh local authorities are encouraged to work towards reducing concentrations. Annual mean concentrations continue to remain relatively low at between 6 to 10 µg m^{-3} across the four sites.

The deseasonalised trend in $PM_{2.5}$ concentrations from 2008 to 2022 at the AURN continuous analyser in Port Talbot Margam (Fire Station) is shown in Figure 2-9. There is a highly significant downward trend in $PM_{2.5}$ concentrations at the site.

Figure 2-9 – Deseasonalised Trend in $PM_{2.5}$ Concentrations at Port Talbot Margam 2008-2022



2.3.4 Sulphur Dioxide (SO_2)

During 2022 there were no exceedances of the 15-minute average of 266 µg m^{-3} (up to 35 are allowed annually) for SO_2 concentrations as measured at Port Talbot Fire Station, where the annual data capture rate was 97.7% (Table 2-8). Neither were there any exceedances of the 350 µg m^{-3} (maximum 120 µg m^{-3}) 1-hour mean or the 125 µg m^{-3} daily mean (maximum 40 µg m^{-3}). Measurements are carried out using a Thermo 48i analyser under the QA/QC arrangements of the AURN.

Table 2-8 – SO_2 Monitoring Results (µg m^{-3})

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	Number of: c 15-minute Means > 266 µg m^{-3}	Number of: c 1-hour Means > 350 µg m^{-3}	Number of: c 24-hour Means > 125 µg m^{-3}
PT2	Urban Industrial	Y	97.7	97.7	0	0	0

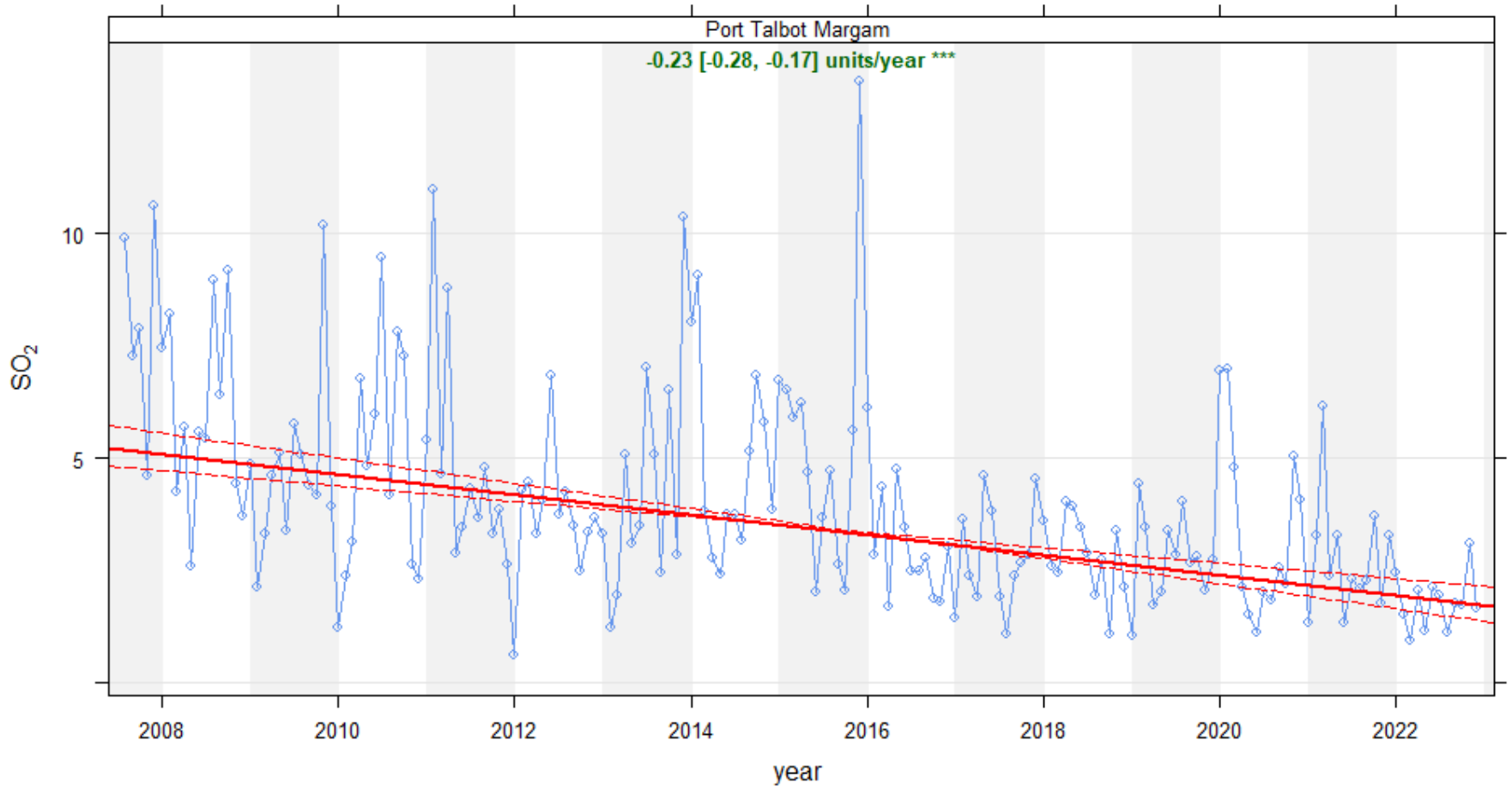
Notes: In bold, exceedance of the relevant AQS objective (15-min mean = 35 allowed/year; 1hour mean = 24 allowed/year; 24-hour mean = 3 allowed/year)

(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 six months the maximum data capture for the full calendar year would be 50%)

The deseasonalised trend in SO_2 concentrations from 2007 to 2022 at the AURN continuous analyser in Port Talbot Margam (Fire Station) is shown in Figure 2-10. There is a highly significant downward trend in SO_2 concentrations at the site.

Figure 2-10 – Deseasonalised Trend in SO_2 Concentrations at Port Talbot Margam 2007-2022



2.3.5 Carbon Monoxide (CO)

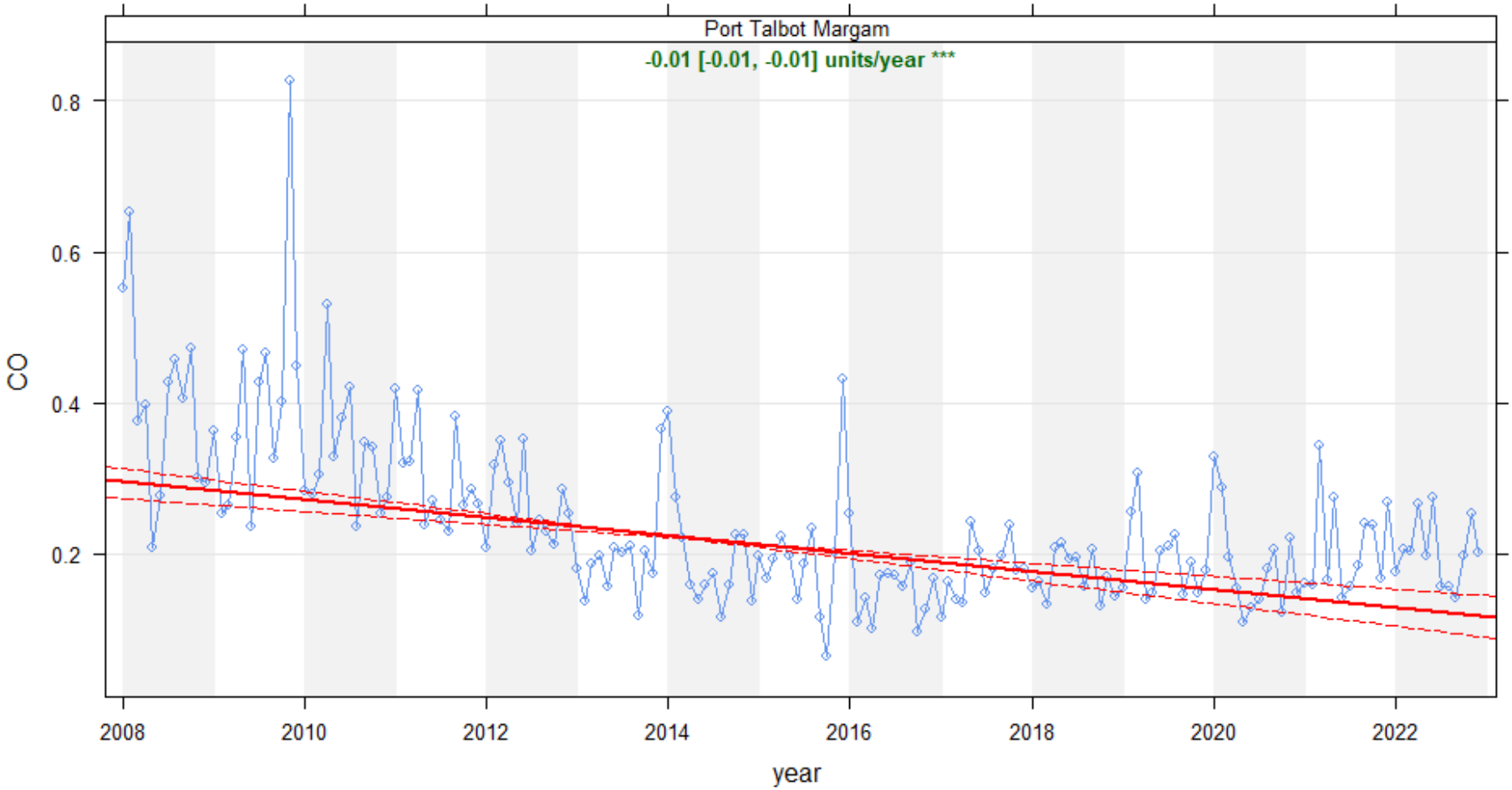
There were no exceedances of the 8-hour maximum daily running average of 10 mg m^{-3} during 2022 (Table 2-9). Measurements are carried out using a Thermo 48i analyser under the QA/QC arrangements of the AURN.

Table 2-9 – CO Monitoring Results (mg m^{-3})

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	Number of Exceedances of 8 hour mean > 10 mg m^{-3}
PT2	Urban Industrial	Y	92.4	92.4	0

The deseasonalised trend in CO concentrations from 2008 to 2022 at the AURN continuous analyser in Port Talbot Margam (Fire Station) is shown in Figure 2-10. There is a highly significant downward trend in CO concentrations at the site. The CO concentrations begin to level off from 2013 onwards.

Figure 2-11 – Deseasonalised Trend in CO Concentrations at Port Talbot Margam 2008-2022



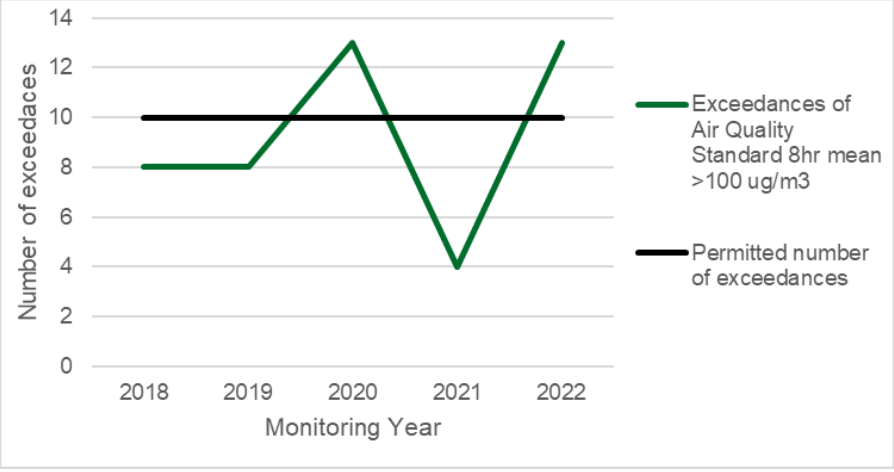
2.3.6 Ozone (O_3)

Ozone (O_3) is a highly reactive chemical which, when present in the lower atmosphere at high concentrations, can irritate the eyes and air passages, causing breathing difficulties.

O_3 is a so-called secondary pollutant as it is produced indirectly by the reaction between hydrocarbons, NO_2 and sunlight. O_3 tends to be lower in urban areas because high levels of NO are produced by vehicles, and this helps to break down O_3 to oxygen and NO_2. The highest concentrations of O_3 therefore tend to occur in rural areas and during the summer months. The O_3 forming reactions are complex and have a time lag associated with them which can mean that O_3 levels are greatest downwind of the location where the pollution is produced. It is recognised that low level O_3 formation is an international problem and that exceedances of the National Air Quality Standard would still occur, even if all sources of hydrocarbons were eliminated in this country.

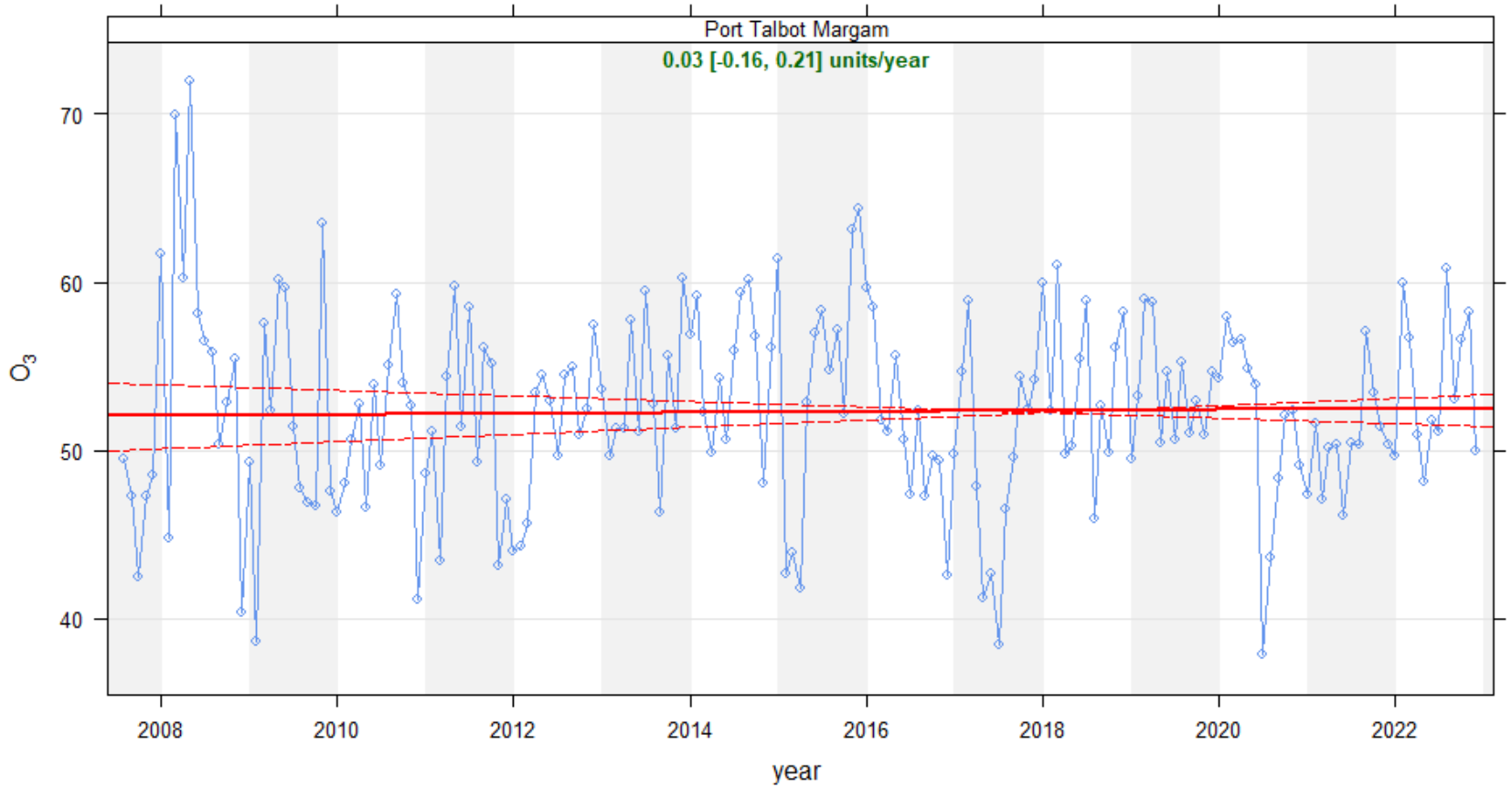
The Air Quality Standards objective for O_3 is 100 µg m^{-3}, measured as a rolling 8-hour average, which is not to be exceeded more than 10 times a year. The Port Talbot Margam Fire Station site measured concentrations greater than 100 µg m^{-3} on 13 occasions during 2022 (data capture was 97.1%), exceeding the permitted number. In 2020 the number of exceedances were also greater than the permitted number (Figure 2-12).

Figure 2-12 - Number of Exceedances of the Ozone AQS



The deseasonalised trend in O_3 concentrations from 2007 to 2022 at the AURN continuous analyser in Port Talbot Margam (Fire Station) is shown in Figure 2-13. There is a stable level of O_3 concentrations at the site.

Figure 2-13 - Deseasonalised Trend in O_3 Concentrations at Port Talbot Margam 2007-2022



2.3.7 Polycyclic aromatic hydrocarbons (PAHs)

Polycyclic aromatic hydrocarbons (PAHs) are a group of persistent organic compounds, some of which are toxic and/or possible or proven human carcinogens; they are produced through industrial and incomplete combustion of carbon containing fuels.

Air quality standards have been set in UK and EU legislation and are based upon measurements of benzo[a]pyrene which is also known as B[a]P.

The UK Air Quality Objective for PAHs is based on the recommendations of the Expert Panel on Air Quality Standards (EPAQS). It specifies an annual air quality standard of 0.25 ng m^{-3} benzo[a]pyrene to be achieved by 2012.

The EU Air Quality Daughter Directive (2005/107/EC) specifies a target value of 1 ng m^{-3} for the annual mean concentration of benzo[a]pyrene to be achieved by 2012.

Monitoring of benzo[a]pyrene first commenced at Groeswen Hospital in 1999 using an Anderson sampler. This equipment was replaced by a Digitel sampler in the last quarter of 2007. Monitoring has taken place at Port Talbot Margam (Fire Station) since 2007, after being relocated from Groeswen Hospital.

The UK standard of 0.25 ng m^{-3} benzo[a]pyrene was exceeded in 2022. Results from the past 24 years are displayed in Figure 2-14.

Although the monitored B[a]P concentration at Port Talbot frequently exceeds the Air Quality Objective of 0.25 ng m^{-3}, it has never exceeded the EU target value of 1 ng m^{-3}.

In addition to monitored air quality data, modelling techniques are used to predict pollution levels in the wider area beyond the monitoring sites. NPT have recently been made aware by Welsh Government that modelling exercises undertaken by Environment Agency suggests that the target value at Port Talbot is at risk of being exceeded in future years.

A report by Ricardo in 2022 identified sites on the monitoring network where there were compliance problems with the UK Air Quality Objective (https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2203150935_2020_PCM_technical_report.pdf). Compliance issues were identified at Port Talbot due to the steel works (likely associated with coke production). Exceedances of the objectives were modelled in 7 km^2 of the South Wales zone and 3 km^2 of the Swansea Urban Area. These were associated with industrial emissions from the coke oven at the steel plant at Port Talbot.

Figure 2-14 - Benzo[a]pyrene Annual Averages 1991-2022

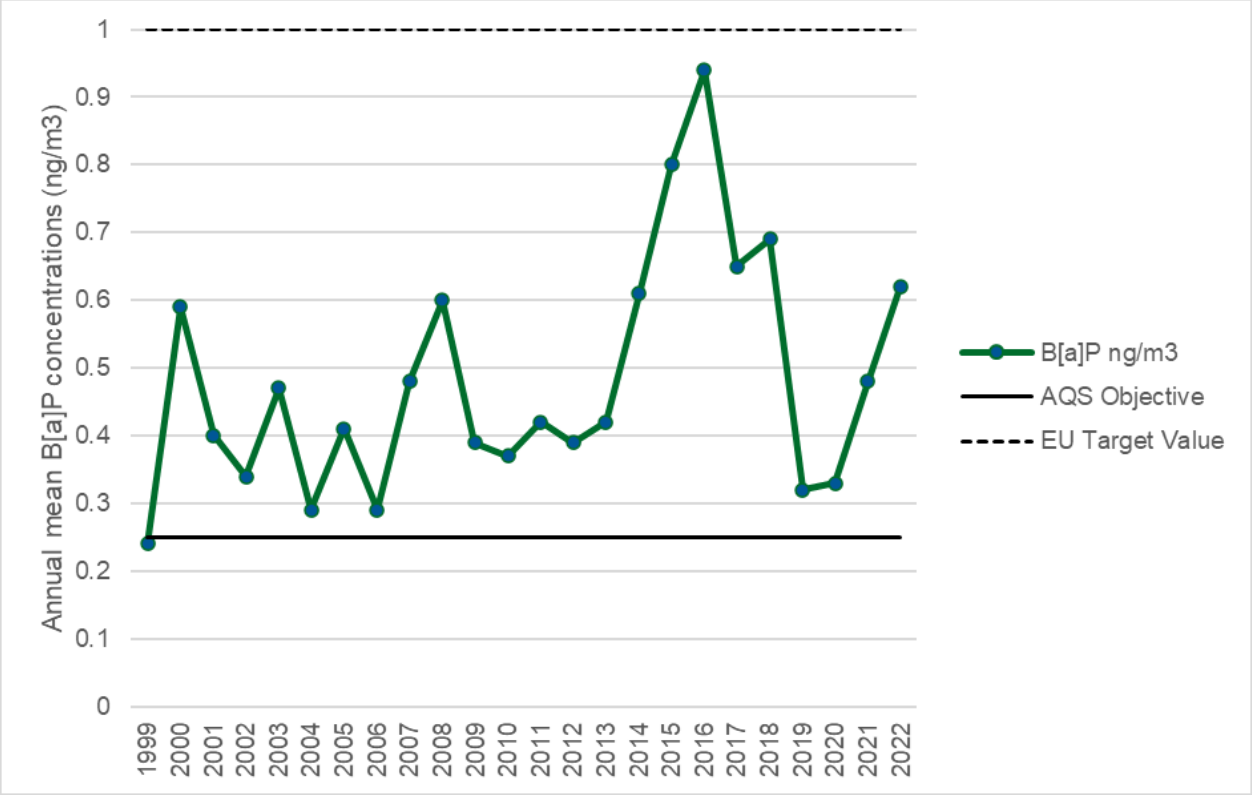


Figure 2-15 shows the modelled annual mean B(a)P concentration at a 100 m x 100 m spatial resolution in the vicinity of the coke ovens at Port Talbot. The complex terrain surrounding Port Talbot is shown in Figure 2-16. This influences the dispersion of emissions from the coke ovens in this location and is included in the modelling.

To fully understand the situation and complete a further modelling study, an additional monitoring station was required at another location in Port Talbot. The Environment Agency deployed a new PAH monitor at Margam Youth Centre at the end of 2022, results will be reported in next year's APR.

Figure 2-14 - Benzo[a]pyrene Annual Averages 1991-2022

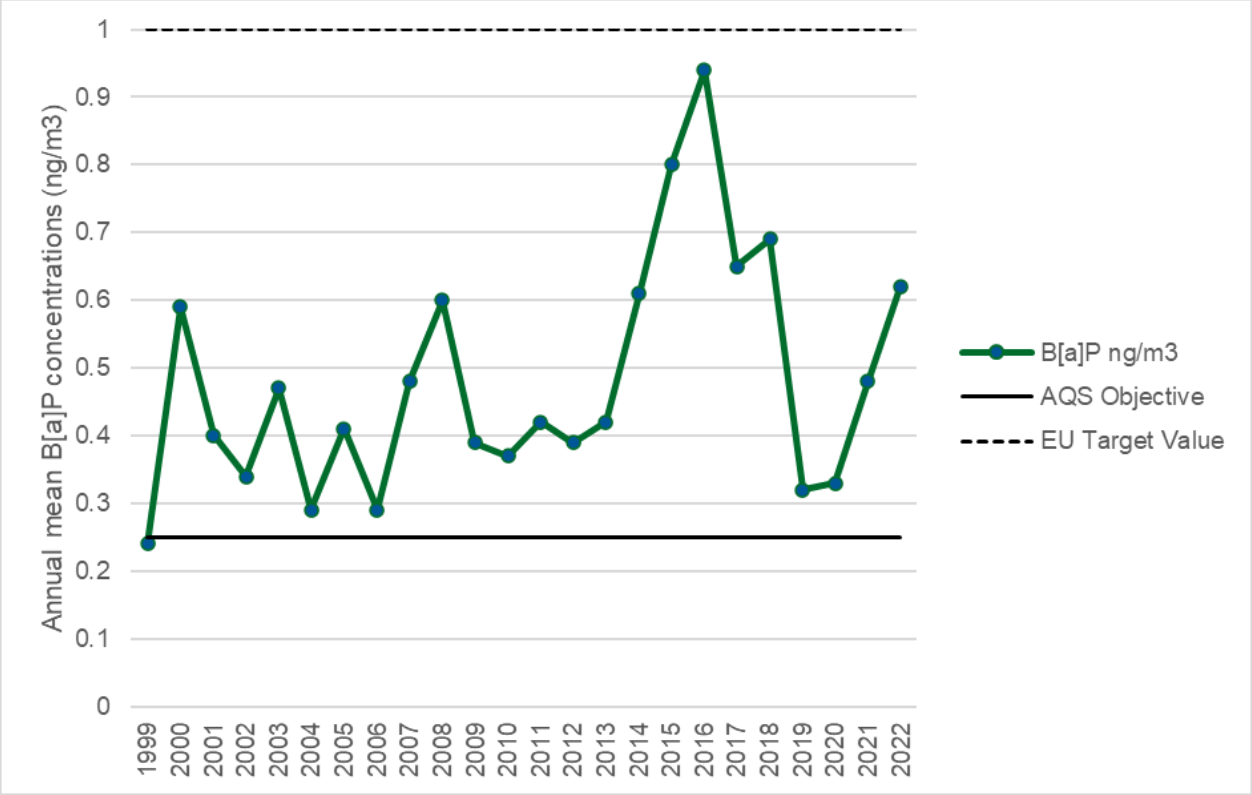


Figure 2-15 - Modelled Total Annual Mean B[a]P Concentrations in the Vicinity of the Coke Ovens at the Port Talbot Steelworks in 2020

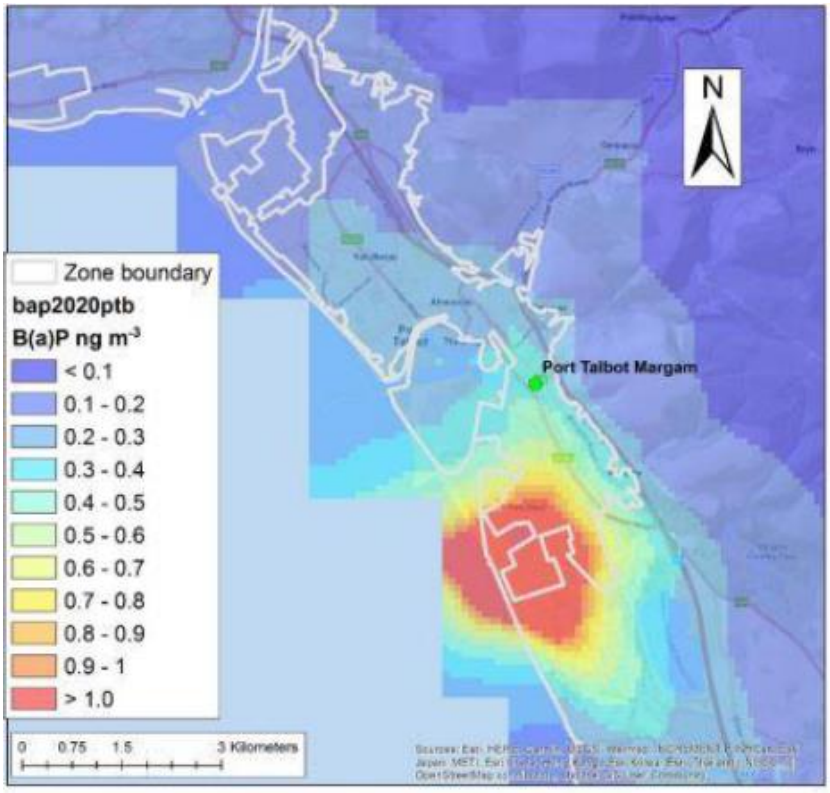


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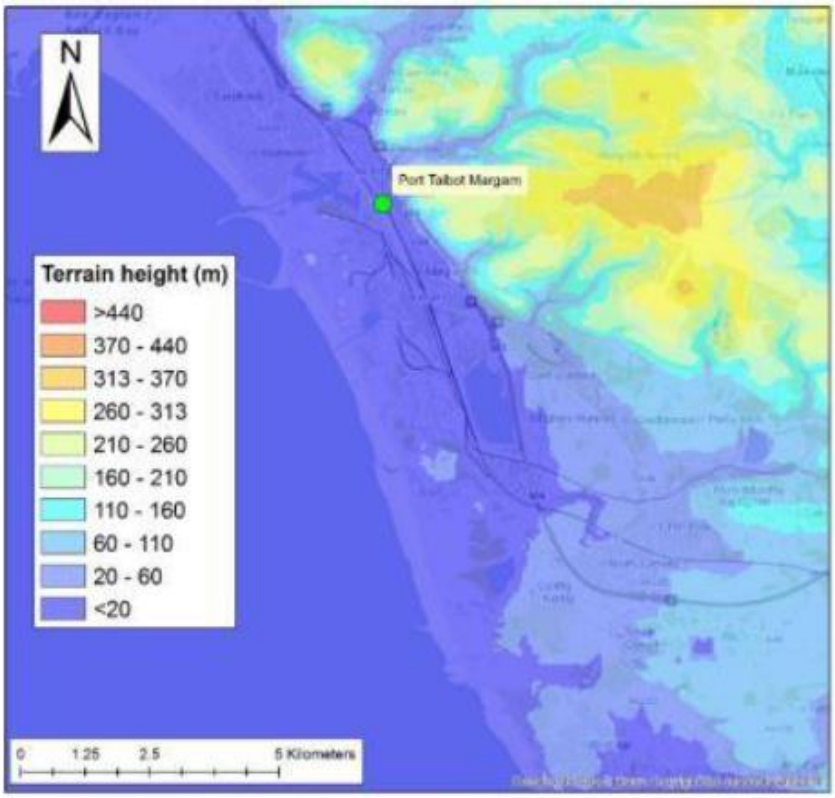
Figure 2-16 - Terrain Heights in the Vicinity of Port Talbot



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2.3.8 Metals

Monitoring of 13 airborne metals has been carried out in the Pontardawe area since 1972. The objectives are to establish whether local industry has any significant impact upon airborne metal concentrations in the area.

Monitoring is currently in operation at the following sites:

- Port Talbot Margam Fire Station
    - Metals have been measured at this site since February 2008 as part of the UK Heavy Metals Network.
- Pontardawe Brecon Road
    - Monitoring commenced here in August 2011. The site is approximately 500 m northeast of the Wall Colmonoy works. This site is within the residential location nearest the area predicted to have the highest modelled nickel downwind concentrations. Wall Colmonoy is a manufacturer of metal alloys and is subject to an Environmental Permit issued by NPT. Approximately 500 tonnes of nickel are used at this permitted site each year to manufacture a variety of products.
- Pontardawe Leisure Centre
    - This site is approximately 4 km downwind of the Nickel works at Clydach and approximately 1 km upwind of the Wall Colmonoy works.
- Pontardawe Tawe Terrace
    - Monitoring has been ongoing at this site, approximately 270 m from Wall Colmonoy's Part B permitted site in Pontardawe since September 2009.
- Neath Milland Road
    - Measurements at this site commenced in December 2014. It lies between the Sandvik Osprey plant and the nearest receptors in King Street.

Monitoring is carried out in respect of the following metals:

- Arsenic (As)
- Cadmium (Cd)
- Cobalt (Co)
- Chromium (Cr)
- Copper (Cu)
- Iron (Fe)
- Mercury (Hg)

- Manganese (Mn)
- Nickel (Ni)
- Lead (Pb)
- Selenium (Se)
- Vanadium (V)
- Zinc (Zn)

2.3.8.1 Target values

In 2004 the European Union published the "4th Daughter Directive" which set annual mean target levels of arsenic, cadmium and nickel (2004/107/EC), to be achieved by 31st December 2012:

- Arsenic: 6 ng m^{-3}
- Cadmium: 5 ng m^{-3}
- Nickel: 20 ng m^{-3}

Monitoring using a method compliant with the Directive (Partisol 2025 sampler) commenced during 2006. During 2021 and 2022, all the ambient air samplers across the network were replaced with Digitel DPA-14 samplers.

The annual mean concentrations of monitored metals for 2022 are summarised in Table 2-10.

Table 2-10 - Annual Mean Concentrations of Heavy Metals at Five Monitoring Sites in 2022 (ng m^{-3})

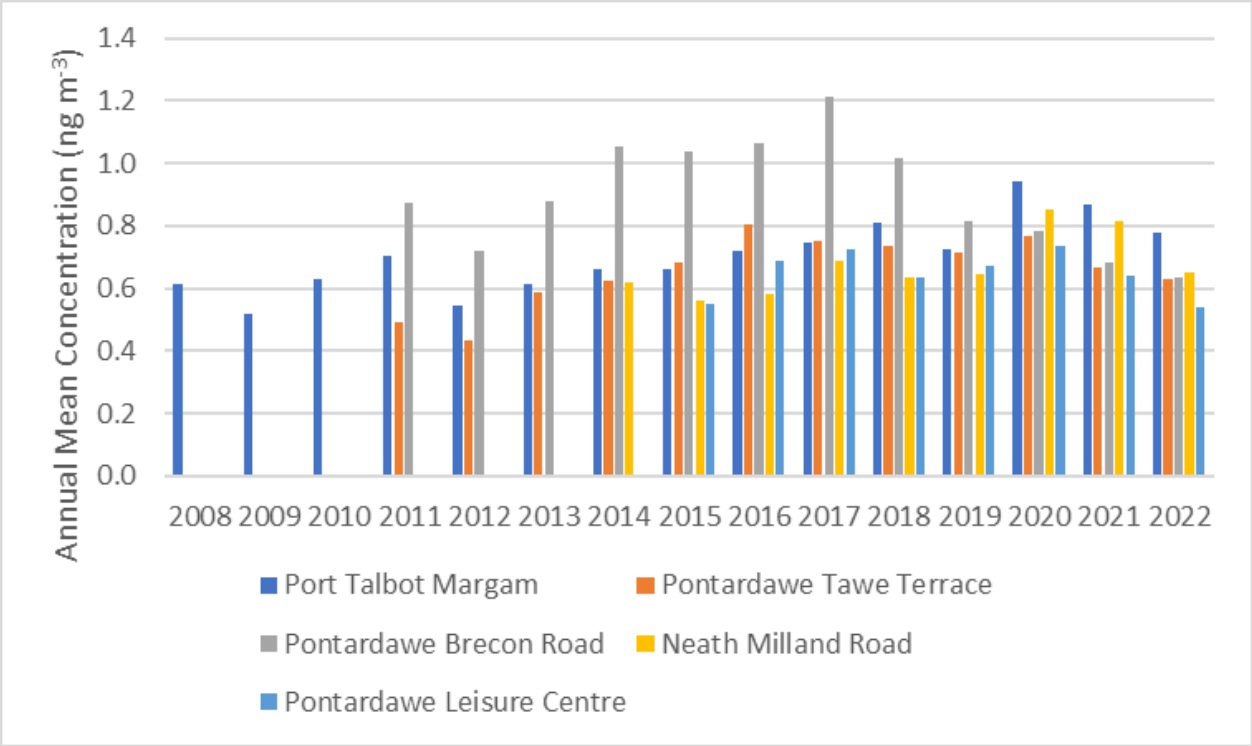
Heavy Metal	Port Talbot Fire Station	Pontardawe Brecon Road	Pontardawe Leisure Centre	Pontardawe Tawe Terrace	Neath Milland Road
As	0.78	0.64	0.54	0.63	0.65
Cd	0.64	0.26	0.21	0.30	0.76
Co	0.41	0.18	0.32	0.82	0.28
Cr	4.62	1.65	2.27	4.21	7.69
Cu	351.86	4.15	3.62	4.39	27.24
Fe	2683.55	211.30	164.79	231.27	356.63
Hg*	-	-	-	-	-
Mn	35.13	3.93	4.34	6.55	4.34
Ni	1.83	3.29	7.95	16.88	1.25
Pb	7.54	5.80	5.04	6.52	8.28
Se	1.09	0.52	0.6	0.57	0.46
V	7.78	0.54	0.56	0.59	0.49
Zn	45.29	11.70	12.62	12.56	17.5

2.3.8.2 Arsenic

The annual average concentration of arsenic for 2022 was between 0.5 and 0.8 ng m^{-3}, well below the EU target level. The maximum weekly concentration observed was 1.7 ng m^{-3}, which is 28% of the Target Value and below the Lower Assessment Threshold value of 2.4 ng m^{-3}.

Historic data for five long-term monitoring sites over the period 2008 to 2022 is presented in Figure 2-17. Concentrations measured at all sites have decreased since 2020. The highest annual mean concentrations were measured at the Pontardawe Brecon Road site until around 2019. Since 2020, higher annual mean concentrations have been measured at the Port Talbot Margam site.

Figure 2-17 – Trend in Annual Mean Concentrations of Arsenic 2008 - 2022



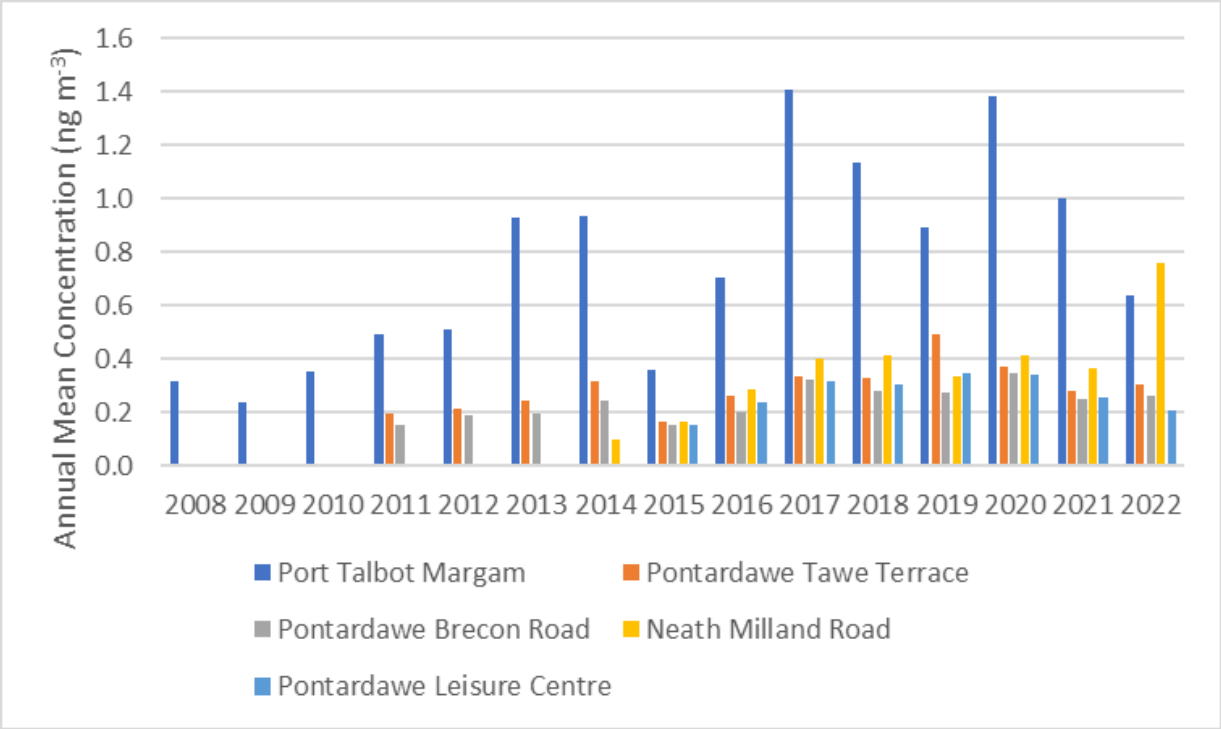
2.3.8.3 Cadmium

The annual average concentration was 0.3 ng m^{-3}. This is below the EU Directive's target of 2 ng m^{-3} and represents 5.7% of the Target Value (5.2 ng m^{-3}). The maximum weekly concentration observed was 0.8 ng m^{-3} (15 % of the Target Value).

Figure 2-18 presents historic data for five long-term monitoring sites over the period 2008 to 2022. Annual mean concentrations of cadmium in the last six years have been higher than previously at the Port Talbot Margam site, however these have decreased since

2020. Concentrations have remained roughly the same at the other sites over the last five years except for Neath Milland Road, which doubled between 2021 and 2022.

Figure 2-18 – Trend in Annual Mean Concentrations of Cadmium 2008 - 2022



2.3.8.4 Nickel

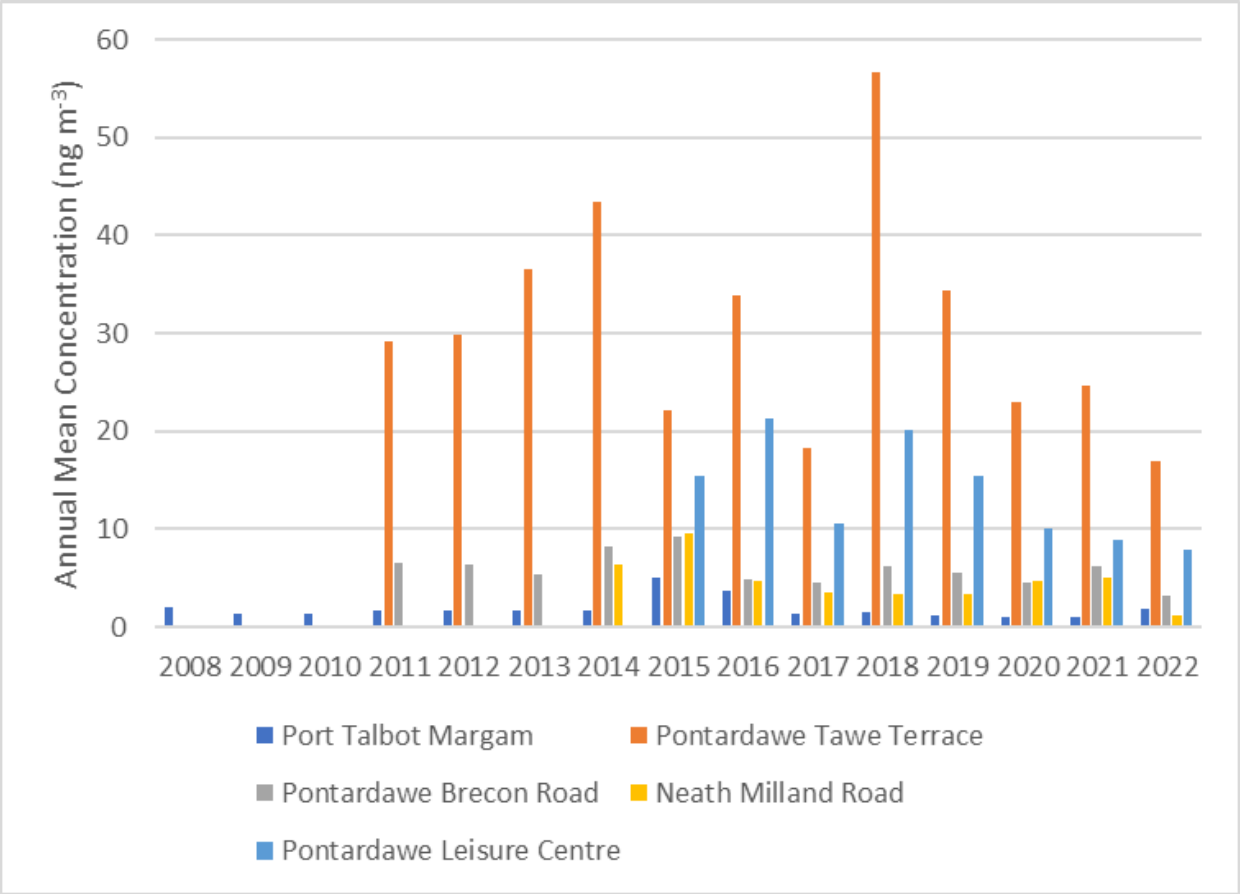
The annual average concentration was 9.4 ng m^{-3}, below the EU Directive's Lower Assessment Threshold value of 10 ng m^{-3}. There were two weekly concentrations above 20 ng m^{-3} recorded. The maximum weekly concentration observed was 75 ng m^{-3} (375 % of the Target Value).

The average concentration of nickel in 2022 was 18.6 ng m^{-3} which is 93% of the Target value. This is a decrease from 2021 (24.4 ng m^{-3}).

The Council as regulator of Wall Colmonoy, continues to place the emphasis on maintenance checks to bring ambient nickel levels in compliance with the Target.

Figure 2-19 presents historic data for five long-term monitoring sites over the period 2008 to 2022. The highest concentrations are measured at the Pontardawe Tawe Terrace site, as expected. Annual mean concentrations of nickel at this site have decreased since 2018. The next highest concentrations have been measured at the Port Talbot Margam site and these have also decreased since 2018.

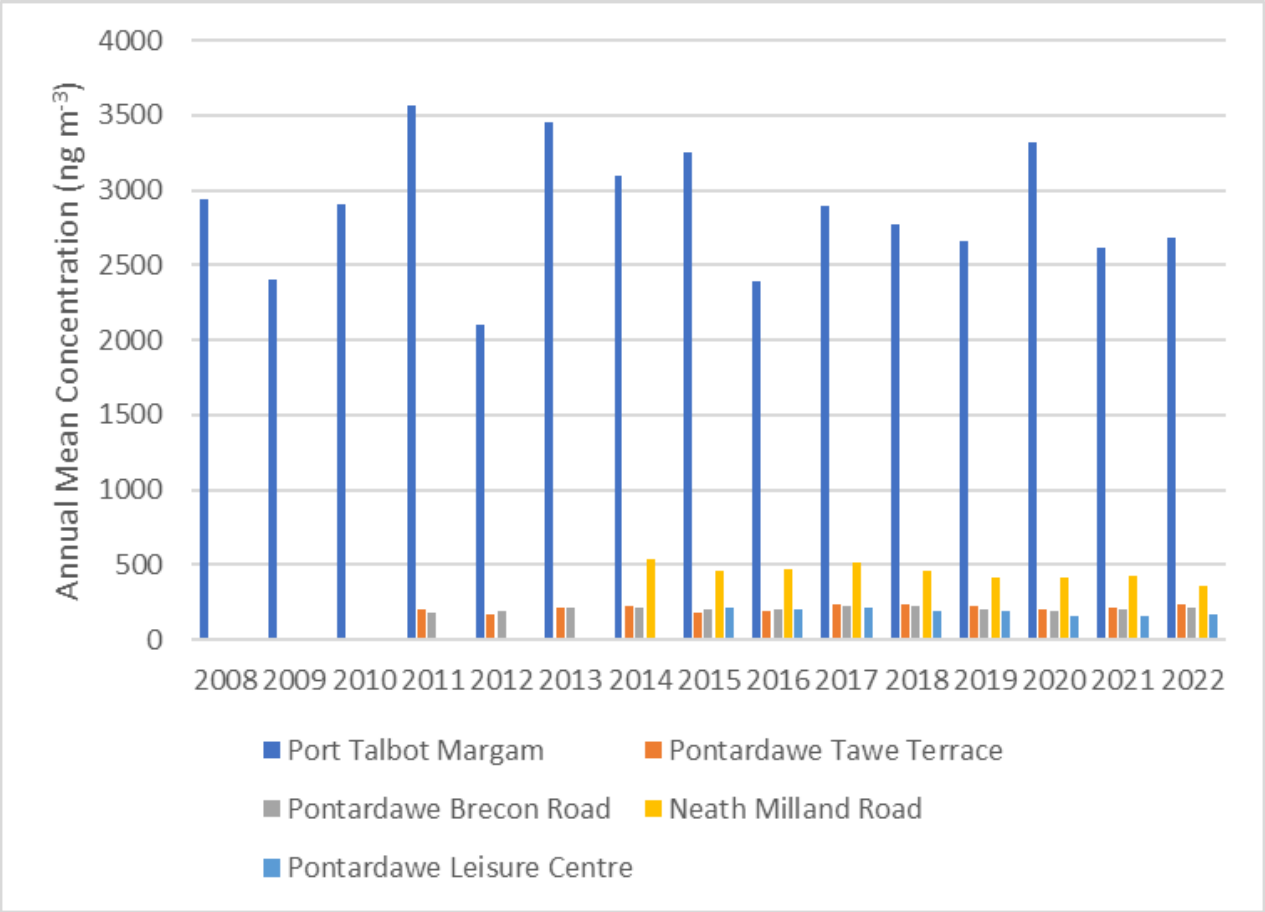
Figure 2-19 – Trend in Annual Mean Concentrations of Nickel 2008 - 2022



2.3.8.5 Iron

Figure 2-20 presents historic data for five long-term monitoring sites over the period 2008 to 2022. Annual mean concentrations of iron dropped in 2021 and have remained roughly the same in 2022. There are no target values set for levels of iron. The highest concentrations are consistently measured at the Port Talbot Margam site.

Figure 2-20 – Trend in Annual Mean Concentrations of Iron 2008 - 2022

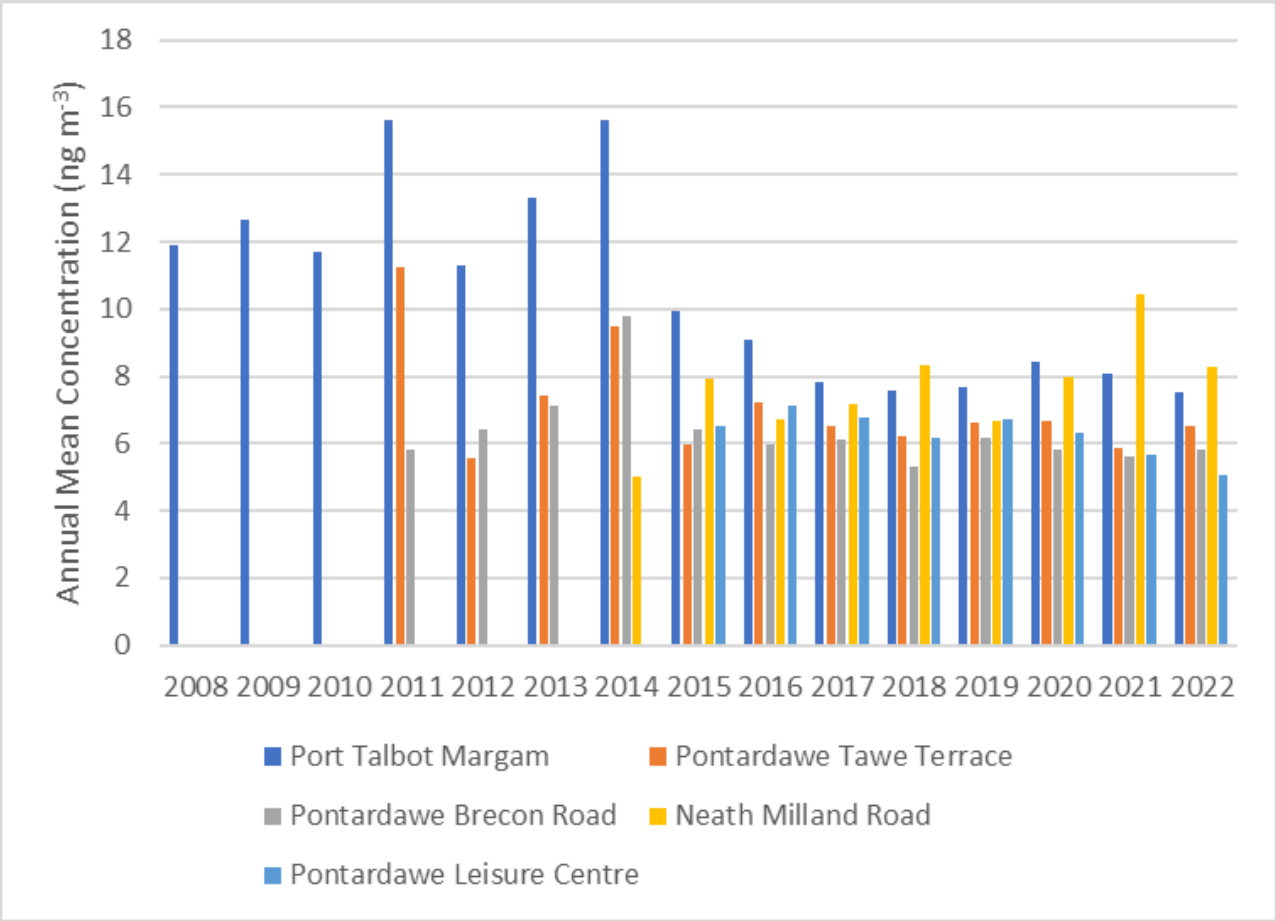


2.3.8.6 Lead

In 2022 the annual average concentration of lead was between 5.7 ng m^{-3} and 8.3 ng m^{-3}, well within the Air Quality Objective of 0.25 µg m^{-3} (250 ng m^{-3}) (to be achieved by 31st December 2008). The analysis and reporting are contracted to the National Physical Laboratory.

Historic lead data for five long-term monitoring sites over the period 2008 to 2022 is presented in Figure 2-21. It shows that average concentrations have decreased below 10 ng m^{-3} since 2015. Over the past six years, concentrations have remained roughly the same at approximately 8 ng m^{-3}. The highest annual mean concentrations are consistently measured at the Neath Milland Road and Port Talbot Margam site.

Figure 2-21 – Trend in Annual Mean Concentrations of Lead 2008 - 2022



2.3.9 Grit and Dust

Deposit gauges have been used to collect atmospheric fallout from several locations. During 2022, sampling of this kind took place at six sites in the County Borough (locations shown in Figure 2-26):

- Prince Street, Margam, Port Talbot – measuring dust from Steelworks
- Little Warren, Port Talbot – measuring dust from Steelworks (this was relocated December 2021 due to continued vandalism)
- Dyffryn Upper School, Bertha Road, Port Talbot – measuring dust from Steelworks
- Port Talbot Fire Station – measuring dust from Steelworks
- Wembley Avenue, Onllwyn – measuring opencast mine
- Tairwaith Community Hall – measuring opencast mine

Figure 2-22 details the annual average and maximum deposition, alongside a comparison with the "nuisance limit" (200 mg m^{-2} day^{-1}), which is recognised by the IAQM Guidance as relevant for this method of monitoring. However, it should be noted that this "limit" is not statutory and is relevant to construction guidance. Public perception of what constitutes a

nuisance might suggest that a lower “limit” would be appropriate. The Minerals Technical Advice note from Welsh Government suggests a limit of 80 mg m^{-2} day^{-1} for coal working, this has also been presented for comparison purposes (Table 2-11).

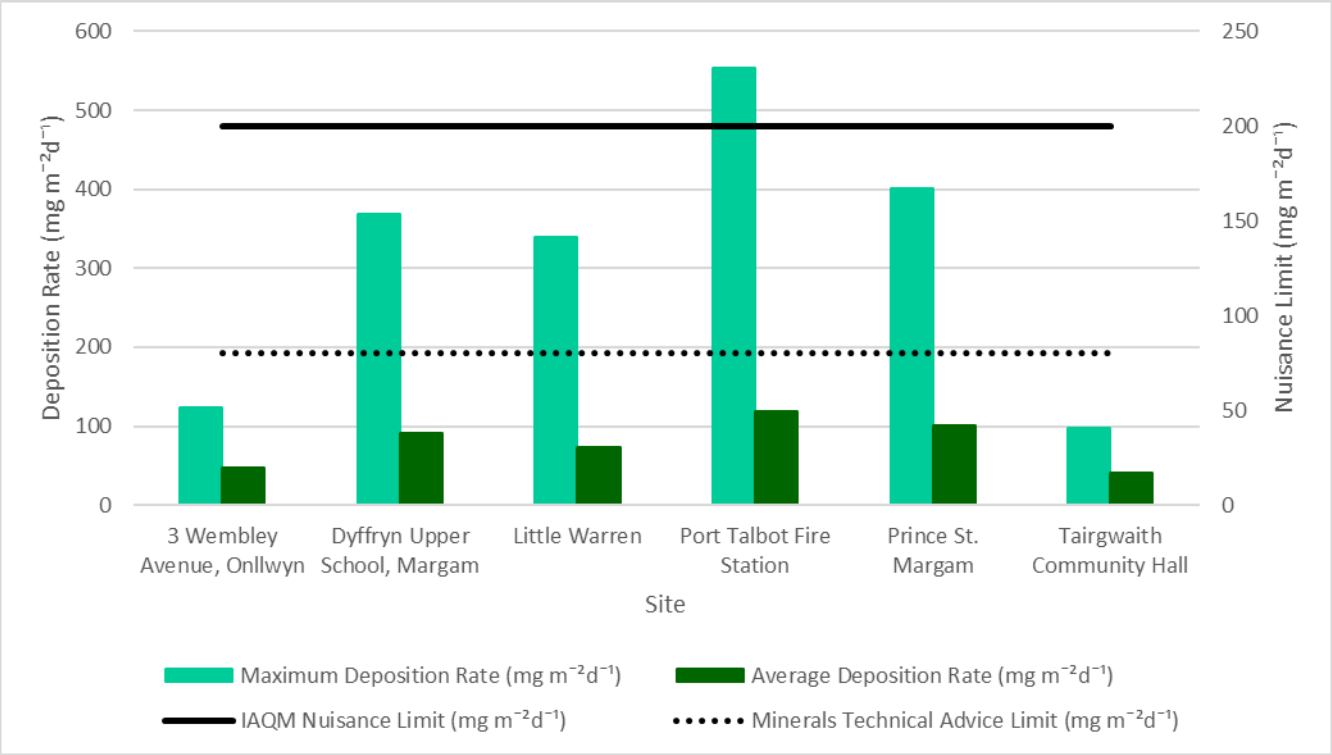
Table 2-11 – Nuisance Dust Fallout Categories used by NPT

Fallout rate mg/m^2/day	Category
< 40	Low
40 to 79	Moderate
80 to 159	High
> 159	Very high

During 2022 the higher IAQM nuisance limit was exceeded for the maximum deposition rate at one site (Port Talbot Fire Station). The average deposition rates for all sites were below this suggested nuisance limit.

The Minerals Technical Advice Limit was exceeded at four out of six sites (Dyffryn Upper School, Little Warren, Port Talbot Fire Station and Prince St Margam) for the maximum deposition rate. It is worth noting that this limit is associated with coal works, and there is no statutory limit for dust.

Figure 2-22 – Summary of Dust Deposition Results Compared with Recommended Limit Values



The maximum dust deposition rate data for the past three years is shown in Figure 2-23. The highest maximum rates are consistently measured at the Port Talbot Fire Station site.

As in previous years, the Port Talbot sites at the Fire Station and Prince Street remain the highest in terms of average deposition rate (Figure 2-24).

Figure 2-23 – Maximum Dust Deposition Rate Results for 2020 to 2022 Compared with Recommended Limit Values

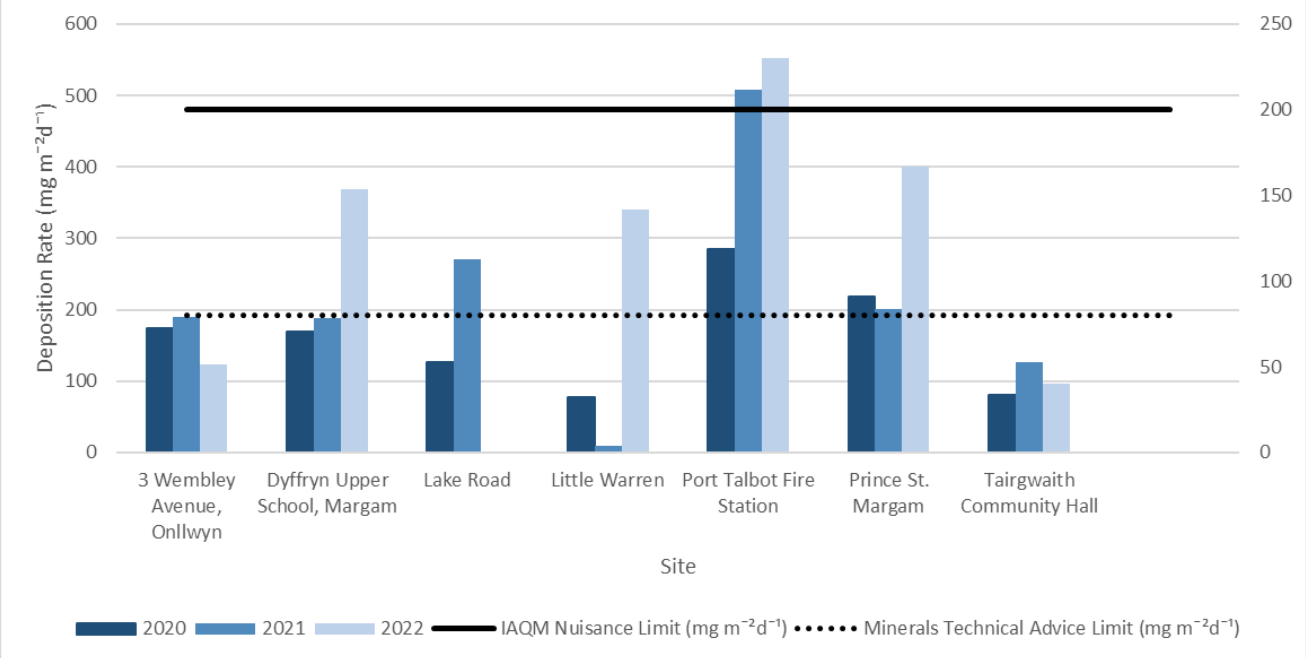
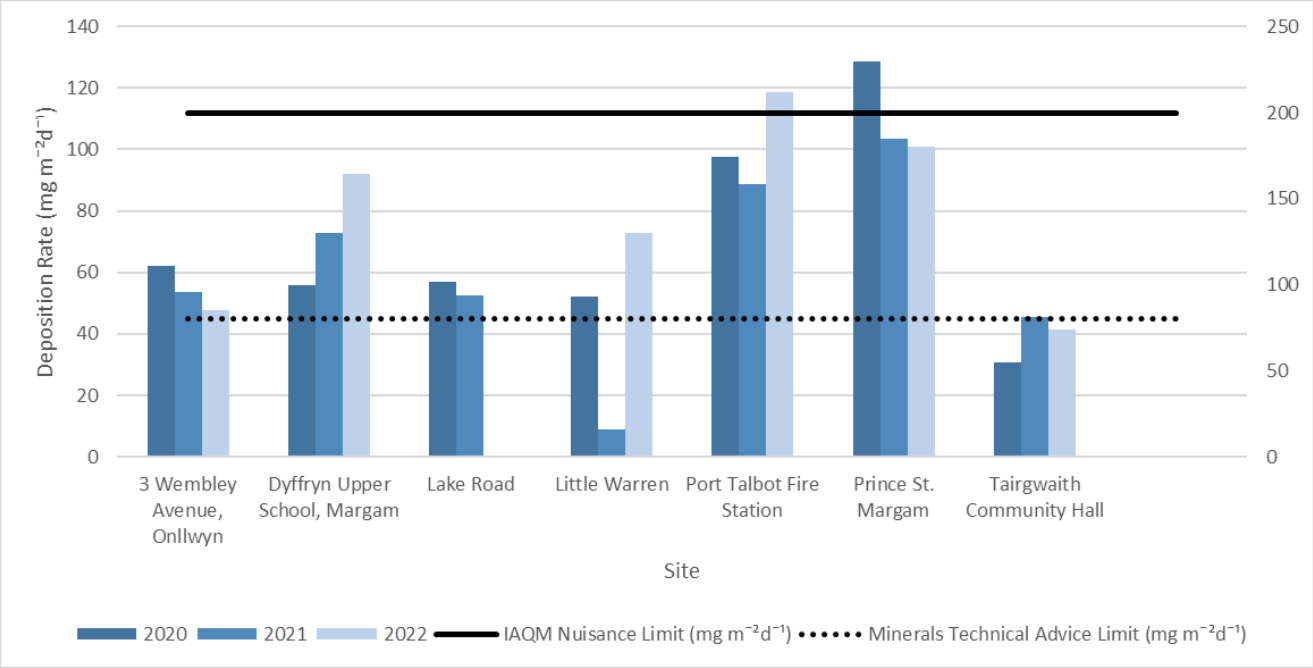


Figure 2-24 – Average Dust Deposition Rate Results for 2020 to 2022 Compared with Recommended Limit Values



A summary of the average components of the grit and dust monitored in 2022, as tested using Scanning Electron Microscopy (SEM) / Energy Dispersive X-ray Spectroscopy (EDS), are presented in Figure 2-25. Results for carbonised coal and fly ash sphere are no longer included as these have been consistently reported as zero.

Unburnt coal / carbonaceous matter constitutes the largest proportion of the dust deposited at all sites, averaging between 45 and 62%. The percentage of ‘general dirt’ is also high (20 to 25%) at all sites. The remainder is made up by silicon-rich, calcium-rich and iron-rich particles. The highest percentage of silicon-rich and calcium-rich particles are found at Port Talbot Fire Station. Dyffryn Upper School, Margam has the highest percentage of iron-rich particles (16%).

Figure 2-25 – Components of Monitored Grit and Dust 2022

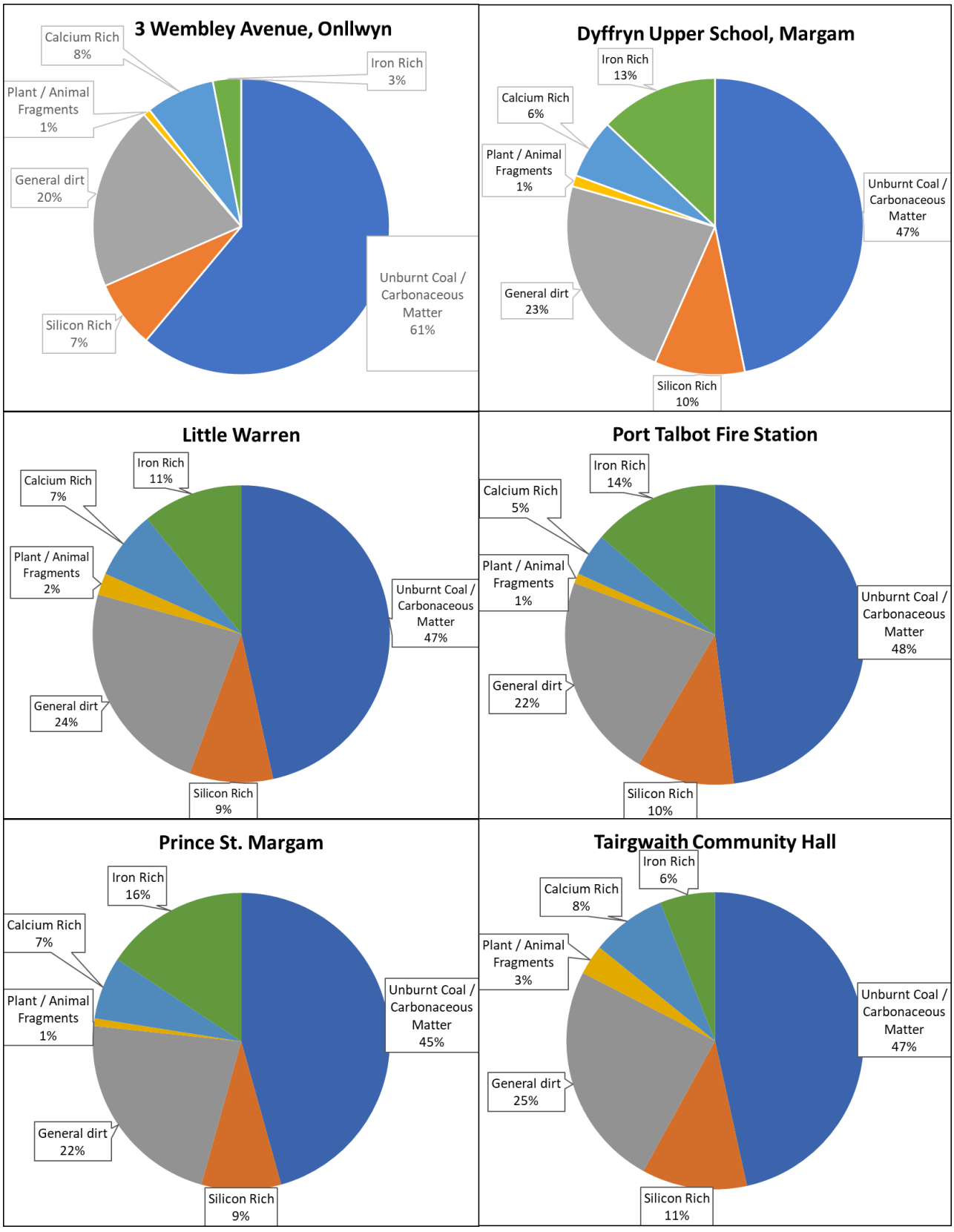
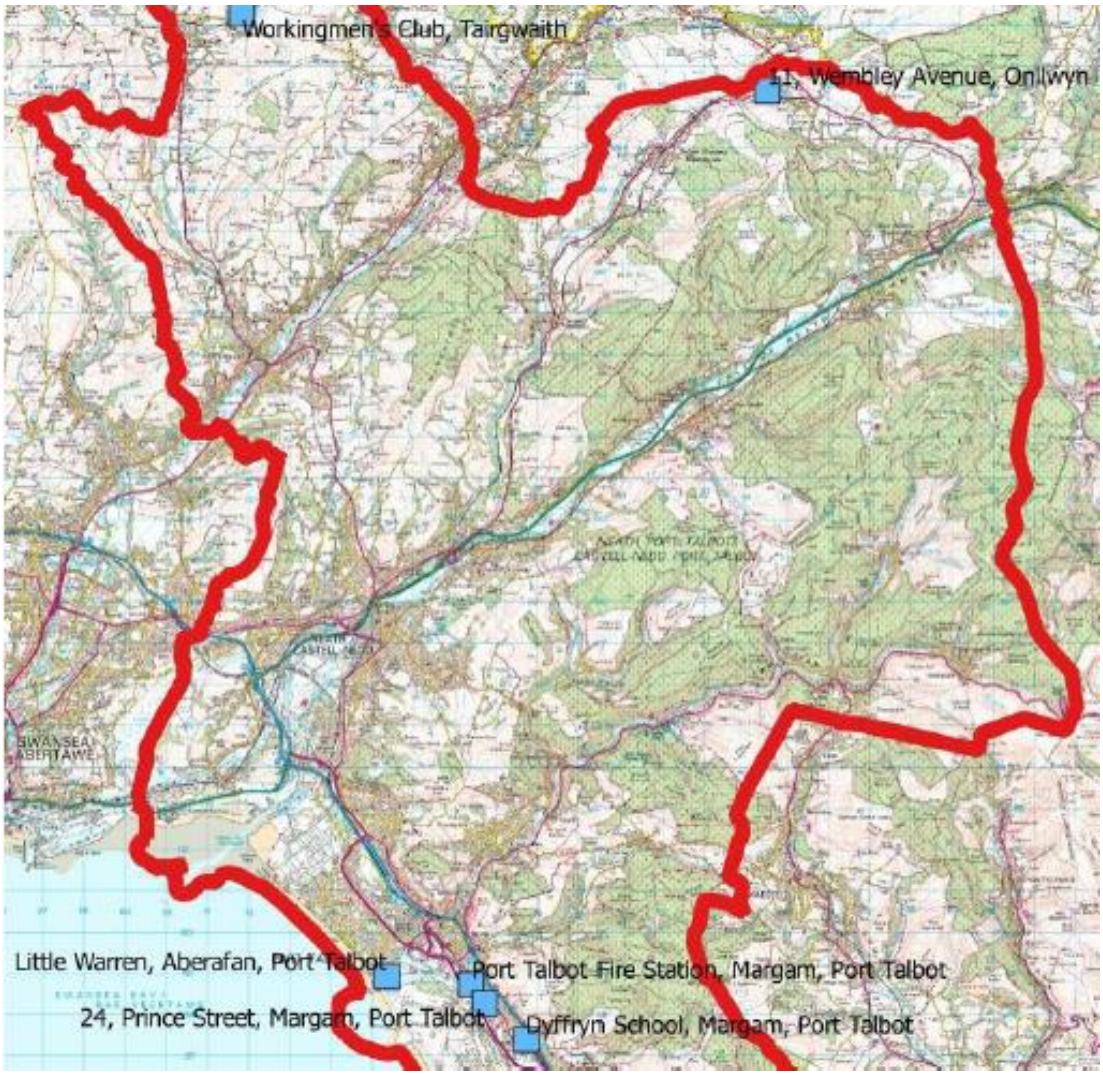


Figure 2-26 – Location of Deposit Gauges



2.4 Summary of Compliance with AQS Objectives as of 2022

NPT has examined the results from monitoring in the borough. Concentrations are all below the objectives, therefore no further action is required.

Annual mean measured concentrations of PM_{10} within the Taibach Margam AQMA have remained roughly the same over the last five years and are well below the AQS objective. Exceedances of the 24-hour PM_{10} objective are still occurring regularly at the three measurement sites within the Taibach Margam AQMA. NPT will consider revoking the AQMA if a steady decline in the number of exceedances is observed in future years.

Nickel exceeded the objective at Pontardawe Leisure Centre (in 2 consecutive weeks with a maximum of 74 ng m^{-3}) and Pontardawe Tawe Terrace (with an average 24.7 ng m^{-3}). NPT contacted the Welsh Government to make them aware of exceedances.

3 New Local Developments

3.1 Road Traffic Sources (and Other Transport)

There have been no changes to road traffic sources during 2022 that meet the associated criteria for further consideration.

3.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

There have been no new industrial sources during 2021 that meet the associated criteria for further consideration.

There have been no new fugitive or uncontrolled particulate matter sources during 2021 that meet the associated criteria for further consideration.

There have been no new commercial sources during 2021 that meet the associated criteria for further consideration.

3.3 Other Sources

There were no PM_{10} exceedance days measured at any of the four monitoring sites around 5th November 2022. Subsequently, it has been interpreted that there was no evidence of adverse air quality arising from fireworks displays. Neither was there any indication to suggest that bonfires, domestic wood burning, or other localised pollution incidents gave rise to a significant pollution incident.

NPT confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

NPT confirms that all the following have been considered:

- Road traffic sources
- Other transport sources
- Industrial sources
- Commercial and domestic sources
- New developments with fugitive or uncontrolled sources.

3.4 Planning Applications

A planning application was approved at the start of 2023 for Land West of Junction 38 of the M4 (Reference - P2021/1255) after more information was requested due to potential impacts on the M4 Junction. It is a full planning application of the development of a metal processing facility totalling 28,500 m^2 of floorspace comprising a powder processing plant (17,377 m^2), warehouse and store (5,428 m^2) office building (1,442 m^2), amenity building (776 m^2), laboratory (200 m^2), services building (470 m^2), substation (107 m^2), phase 2 (2,700 m^2), CCTV, storage tanks and plant, parking, servicing and roads and associated works. Further information can be found on the planning portal.

3.5 Planned Proactive Monitoring

3.5.1 Vortex

NPT are currently undertaking a pilot study to test the concept of localised air pollution monitoring. It forms part of the Swansea Bay City Deal project called 'Supporting Innovation and Low Carbon Growth', led by NPT Council. It is delivered as part of the council's Decarbonisation and Renewable Energy (DARE) Strategy.

The aim of the pilot study is to achieve a better understanding of air quality on a local level by using digital technology. Sensors are located in; Margam; Taibach; Aberavon; Sandfields and Baglan Energy Park. The area will act as a test bed for the technology and will provide real time data on how air quality varies between different neighbourhoods.

NPT are collaborating with a local company Vortex IoT who have developed this innovative technology. Vortex IoT provide the sensors, wireless network and maintenance support. It is the first project of this kind in Wales.

The project is hoped to help the council more effectively target interventions, identify any pollution hotspots and pollution sources that were previously hidden and help it improve air quality and health outcomes.

The results of the study will be released on completion of the pilot project which is due to run for 3 years.

3.5.2 Short Term Operating Reserve (STOR) at Afan Way

In May 2021 concerns were raised about the local Air Quality near the Short-Term Operating Reserve (STOR) at Afan Way. Although the air quality modelling data for the facility suggested it would not give rise to any breach of Air Quality objectives, there was an ask for Environmental Health to undertake local air quality monitoring for Nitrogen Dioxide (NO_2) and Carbon Monoxide (CO). NPT has commenced a 12-month study using real time data from 3 of the Vortex sensors and a number of diffusion tubes located at various locations circulating the STOR and at nearby residential receptors. Unfortunately, there was not a low-cost option for monitoring CO and therefore the decision was made to focus on NO_2. Interim results are presented in Table 3-1, showing the raw data for June to December 2022, a mean for the seven months of data collected, and the bias adjusted mean for this period. The Local Bias adjustment factor of 0.66 has been used (see calculation methodology in Appendix C). The full results of this localised monitoring project will be reported in the 2024 APR.

Table 3-1 – Interim STOR Diffusion Tube Monitoring Results for 2022

Diffusion Tube ID	Site Name	NO_2 Monthly Concentration Data (µg m^{-3})							Interim Mean (µg m^{-3})	
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.66)
Neath/22A/NB7S1	3 Harvey Cres	7.6	9.2	10.5	13.4	12.3	19.6	18.1	13.0	8.6
Neath/22A/NB7S2	32 Harvey Cres	7.6		11.1	16.7	11.2	17.7	19	13.9	9.2
Neath/22A/NB7S3	Lamp post near Harvey Cres	7.7	7.8	10.8	14.7	11.8	19.5	19.2	13.1	8.6
Neath/22A/NB7S4	2 Victoria Rd	19.6				23.7	31.4	31.7	26.6	17.6
Neath/22A/NB7S5	Jubilee Hse	18.1	24			21.1	32.6	30	25.2	16.6
Neath/22A/NB7S6	Station Tce / Lady Lane St	12.1	13.2	14.7	15.1		22.5	24.3	17.0	11.2
Neath/22A/NB7S7	Afan Way Crossing	29.6	30.5	28.9	0	27	39.6	31.5	26.7	17.6
Neath/22A/NB7S8	Rd Afan Way	31.8	27	25.9	26.6	14.1	38.3	33.7	28.2	18.6
Neath/22A/NB7S9	Cycle Path to Afan Way (1 Glenaton St)	15.1			17.9		28.2	25.7	21.7	14.3
Neath/22A/NB7S10	30 Heshaw St	17	15.3		14.8		26.4	22.3	19.2	12.6
Neath/22A/NB7S11	Roundabout Afan Way	8	14.2	15.9	19.2	16.9	27	28.9	18.6	12.3
Neath/22A/NB7S12										
Neath/22A/NB7S13	8 Ysguthan Rd		17.4	19	21.5	22.3			20.1	13.2
Neath/22A/NB7S14	81 Newbridge Rd		12.1	11.4	14.8	13.5	18.8	18.3	14.8	9.8
Neath/22A/NB7S15	181 Victoria Rd		13.7	17.5		14.9	23.9	19.3	17.9	11.8
Neath/22A/NB7S16	20 Crescent Rd		14	15.4	13.3	19.1	26.9	22.7	18.6	12.3
Neath/22A/NB7S17	11 Dyffryn Rd		14.2	13.6	12.1	20.2	26		17.2	11.4
Neath/22A/NB7S18	18 Talbot Rd		16.3	16.3	19.7	21.5		28	20.4	13.4
Neath/22A/NB7S19	75 Talbot Rd		23.7	23.7	22.4	22.4		32.5	24.9	16.5
Neath/22A/NB7S20	Village Rd Roundabout		14.4	15.1	15.7	16.4	23.8	0	14.2	9.4
Neath/22A/NB7S21	Baglan Way. Roadside		16.4	17.9	17.2	17.7	25.5	23.8	19.8	13.0
Neath/22A/NB7S22	25 Endeavour Close		8.5	9.9	11.9	11	18.8	16.7	12.8	8.4

4 Policies and Strategies Affecting Airborne Pollution

The Council's air quality strategy (AirWise) was first drawn up in 2000 and was subsequently revised in 2006 and 2013.

Progress being taken towards implementation of the strategy is contained within strategy document.

4.1 Local / Regional Air Quality Strategy

NPT adopted the Local Development Plan (LDP) on 27th January 2016. The extract below captures all relevant policies in respect of air quality / pollution, namely:

- Strategic Policy SP16 – Environmental Protection;
- Policy EN8 – Pollution and Land Stability; and
- Policy EN9 – Developments in the Central Port Talbot Area.

Subsequently in October 2016, NPT adopted a number of Supplementary Planning Guidance (SPG) documents to support the LDP, which set out more detailed topic or site-specific guidance on the way in which the policies of the LDP will be applied in particular circumstances or areas. Supplementing the three LDP policies referred to above, the 'Pollution' SPG provides detailed information about pollution issues in NPT and sets out the relevant matters that will need to be taken into consideration when developments are being planned. While only policies in the LDP have special status in the determination of planning applications, the SPG will be taken into account as a material consideration in the decision-making process.

NPT are in the process of creating a new LDP and one part of the consultation has now closed but there is more ongoing. More information is available at: https://www.npt.gov.uk/29462.

4.2 Local Transport Plans and Strategies

The Regional Transport Plan is the result of joint working between the four local authorities (Carmarthenshire, Neath Port Talbot, Swansea and Pembrokeshire) in southwest Wales. It replaces the individual local transport plans previously adopted by the four councils. As well as acting as a bidding document for major transport schemes it will shape transport policy in the region for the period 2016 -2021 and beyond. Details can be found on the Council's website.

4.3 Active Travel Plans and Strategies

NPT's Active Travel information can be found on their website. This includes the existing route map (ERM) and the Integrated Network Map (INM).

4.4 Local Authorities Well-being Objectives

The Environmental Health team address the wider determinants of health, which is the basis of the Act, and as such deals with a number of issues either directly or indirectly that contribute to the goals set out in the Well-being of Future Generations Act. For example: accumulations of rubbish and pest control; air quality strategy, monitoring and regulation; commercial and industrial pollution control; contaminated land strategy and regulation; dampness in housing; derelict houses and unsightly land; domestic air pollution control (garden fires/bonfires); health and safety regulation in Local Authority enforced businesses; health and safety regulation in houses in multiple occupation (HMOs); housing health and safety rating system in private rented accommodation; illegal eviction and harassment; industrial and commercial noise; neighbour nuisance and antisocial behaviour; planning consultations; public health protection and health promotion (sunbeds, tattooing etc); smoking ban and smoke free legislation; water quality.

4.5 Green Infrastructure Plans and Strategies

NPT is taking a more strategic approach to the management, enhancement and creation of Green Infrastructure, for the benefit of people and wildlife. Funding was secured from Welsh Government from the GI Capital Fund in 2018 to develop GI opportunity and demand maps, and deliver a demonstration project, whilst funding for further implementation was secured as part of the ENRaW (Enabling Natural Resources and Well-being) WG fund for 2019/20. As part of this grant, over 6000 saplings were planted and 160 large standards were planted throughout the county borough, in schools and urban locations, including the Port Talbot area.

An update is being awaited on further funding that has been sought from a second ENRaW application, for the period from April 2020 until March 2023. This funding bid was successful with funding received in September 2021 after significant delays. This provided the opportunity to further deliver GI intervention in Neath Port Talbot.

4.6 Climate Change Strategies

NPT has endorsed a Decarbonisation and Renewable Energy Strategy, a draft version of which is available via their website.

5 Conclusion and Proposed Actions

5.1 Conclusions from New Monitoring Data

During 2022, the annual mean NO_2 concentrations at all monitoring sites complied with the AQS objective. Annual mean NO_2 concentrations at all sites decreased over the last five years, except for a slight increase between 2020 and 2021. It is thought that a greater than expected decrease in concentrations in 2020 is due to the COVID-19 lockdown and restrictions and the subsequent increase in 2021 is due to easing of these restrictions. Concentrations fell by around 5% between 2021 and 2022.

There were no exceedances of the annual mean AQS objective for PM_{10} (40 µg m^{-3}). Annual mean PM_{10} concentrations have remained similar over the past five years at three sites and increased slightly at the Prince Street in 2022.

Within the Taibach Margam AQMA, declared for PM_{10}, PM_{10} 24-hour mean concentrations exceeding 50 µg m^{-3} were measured by continuous monitors. At the Margam (Fire Station) site, exceedances decreased from 33 to 23, however remained higher than the 11 to 12 in the previous three years. Exceedances increased at the other two sites within the AQMA: two exceedances were measured at Dyffryn School, an increase from zero in 2020 and 2021; and 20 were recorded at Prince Street, an increase from three the previous year.

5.2 Conclusions relating to New Local Developments

Ongoing implementation and development of local strategies will continue to assist in reducing pollution concentrations and emissions. The Council also continues to request air quality assessments for new planning applications where relevant, to ensure that there is no significant degradation of air quality or that no new sensitive receptors are being introduced into areas of existing poor air quality.

5.3 Other Conclusions

Fine particulates of less than 2.5 microns in size ($PM_{2.5}$) were present in very low concentrations during 2022 and complied with the EU Target value (25 µg m^{-3}) and the WHO Interim Target 4 (10 µg m^{-3}). There is a highly significant downward trend in $PM_{2.5}$ concentrations at one long-term measurement site over the last 14 years.

Ozone is not covered by Local Air Quality Management because trans-boundary pollution can have a significant effect upon local results. The Air Quality Standards objective for O_3

is 100 µg m^{-3}, measured as a rolling 8-hour average, which is not to be exceeded more than 10 times a year. The Port Talbot Margam Fire Station site measured concentrations greater than 100 µg m^{-3} on 13 occasions during 2022, exceeding the permitted number. In 2020 and 2022, the number of exceedances were greater than the permitted number. There is a stable trend in ozone concentrations at one long-term measurement site over the last 14 years.

The concentration of polyaromatic hydrocarbons at Port Talbot continues to exceed the Air Quality Objective of 0.25 ng m^{-3} but it has never exceeded the EU target value of 1 ng m^{-3}. Concentrations increased from around 0.4 ng m^{-3} to 0.6 ng m^{-3} between 2021 and 2022.

Arsenic, Lead and Cadmium easily comply with the EU Target. Nickel concentrations comply with the EU Target however monitoring at Pontardawe Leisure Centre recorded two weekly concentrations above 20 ng m^{-3}. The maximum weekly concentration observed was 75 ng m-3 (375 % of the Target Value). The Council will continue with enhanced regulation of Wall Colmonoy with the emphasis being on maintenance procedures.

5.4 Proposed Actions

1. NPT will continue to actively monitor pollutant concentrations, reviewing the monitoring network where necessary.
2. NPT will participate in the current Short Term Action Plan and participate in relevant meetings as detailed in the plan.
3. NPT will not be revoking the AQMA in the short term and will be assessing the impact of the points detailed in section 1.2.
4. NPT intends to publish a review of the AQAP in 2023 to better reflect the current status of the AQMA.
5. NPT will contribute to the review of the Short-Term Action Plan.
6. NPT will liaise closely with Wall Colmonoy to prevent exceedances of the nickel target.
7. NPT will review new planning applications with particular attention to any likely to have an impact on the AQMA.
8. NPT will continue with its 3-year Vortex Air Quality Pilot Study.

References

- Decarbonisation and Renewable Energy Strategy (DARE)
- Joint Transport Plan for Southwest Wales 2016 – 2021
- Local Air Quality Management in Wales. Policy Guidance June 2017
- Mid and West Wales Air Quality: A Guide for Developers (2012)
- Neath Port Talbot Air Quality Action Plan 2012
- Neath Port Talbot Borough Council's Annual Progress Report 2022
- Neath Port Talbot CBC Local Development Plan (2011-2026)
- Neath Port Talbot's Local Air Quality Strategy, "Air Wise - clean air for everyone"
- Part IV of the Environment Act 1995 as amended by the Environment Act 2021, Local Air Quality Management, Technical Guidance LAQM.TG(22)
- Supplementary Planning Guidance
- Welsh Air Quality Forum data downloads
- World Health Organization. (2021). WHO global air quality guidelines: particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. World Health Organization. https://apps.who.int/iris/handle/10665/345329 License: CC BY-NC-SA 3.0 IGO

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 A.1 – Full Monthly Diffusion Tube Results for 2022 (µg m^{-3})

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Time Weighted Annual Mean (µg m^{-3})	
														Bias Adjusted (0.66) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
1a	44.9	45.1	34.6	37.9	37.5	35.5	36.8	40.8	33.4	38.2	46.6		39	25.7	
1b	56.5	45.8	36.1	37.8	39.2	37.2	36.6	42	30.1	36.2	42.2				
1c	53.7	43.6	38.5	37.5	35.9	33.8	36.2	42.7	33.2	39.1	46.3				
4	28	36.3	34.7	27.4	24.7	21	22.3	26.6		46.5	32.3	33.9	30.5	20.1	
5	48.5	35.8	27.9	29.5	28.5	26.2	27.3	29.6					31.1	20.6	
7a	29	26.4	26	28.3	27.5	25.8	24.4	28.7	23.4	26.7	36.5	27.6	27.5	18.1	
7b	42.3	33	31.4	27	26.2	25.3	27.5	28	24.5	30	36.8	30.6			
7c	43.2	30.3	31.3	27.9	24.7	24.3	27	29.2	17.5	29.5	35.8	35.4			
8	44.6			28.3	26.3	24.3	25.3	28	21.4	26.9	34.1	32.2	28.7	18.9	
9	43.4	34.8	31.5	28.8	25.8	24.5	22.1	28.2	21.6	57.7		33.4	32	21	
10	43.5	33.3	31.7	27.6	25.5	24.4	24.5	29.2	23.7	24.6	35.2	27.2	28.7	18.9	
11	39.4	32.2	28.5	25.6	24.4	23.9	24.6	26.6	22.3	29.9	35	29	28.2	18.5	
12	47.8		29.7	28.8	27	25	25.8	29.1	25.9	27	35.3	32.2	29.9	19.7	
13	44.3	27.5	26.1	57.4		21.1	24.1	27.5	24.6	23.1	33.3	31.5	30.6	20.1	
14	41.7	34.7	27.6	60.6	31.5	25.6	27.5	29.1	25.7	28.4	34.4	33.5	33.1	21.7	
15	47.6		29.7	27.2	27.4	25.4	27.7	31.1	26.9	25.8	37.9	35.7	30.7	20.2	
16	47.1	37.9	28.8	31.1	34.4	31.1	28.9	64.1		33.5			36.9	24.3	
17	50.8	41.4	40.5	33		28.4	26.4	36.5	31.7	26.5	43.4	42.9	36.2	23.8	
18a	42.6			38.7	39	38.3	32.1	35.4			42.7	33.3	37.6	24	
18b	48.6	42.1	41.1	35.9	38.1	33.6	31	34		39	47.2	97			
18c	47.7		40.3	36.9	39.9	33	33	37.6			44.4	34.7			
19a	26.4	20.3	16.1	13.4	13.6	14.2	12.8	13.5	12.8	21.1	29.9	22.1	17.9	11.8	
19b	24.7	20	14.6	11.9	12.8	13.6	12.1	12.7	11.5	18.4	30.6	24.6			
19c	26.2	21.3	25.4	14	14.7	14.1	12.3	12.5	11.7	20.1	25.8	22.7			
20a	45.4	39.2	31.7	30.4	33.7	30.5	31.5	34.9	28.3	33.9	41.2		34.4	22.6	

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Time Weighted Annual Mean (µg m^{-3})	
														Bias Adjusted (0.66) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
20b	43.7	32.6	32.5	33.1	35.5	32.5	31.7	34.6	29.9	31.5	39.1	38.2			
20c	43.2	37.5	28.1	31.7	33.1	32.5	31.7	35.9	29.4	32.7	38.1	34.3			
21	45.9	47.1	36.8	38.8	36.1	36	36.6						39.3	25.8	
22	39.1	29.5	24	22.8	20.6	18.2	19	21	19.7	23.3	27.8	31.2	24.4	16.1	
23	39.1		35.9	29.6	26	21	24.5	30.1	26.4	25.1	33.1	34	29.2	19.2	
24a	47	36.2	27.4	32.2	29	27.1	29.5	31.3	27.6	30.9	38.5	35.5			
24b	48.5	37.6	29.4	72.9		28.1	28.8	29.1	24.3	29.9	38	36.3	32.4	21.3	
24c	46.6	36.2	29.6	30.7		28.3	27.7	32.2	26.8	30.5	34.5	33.8			
25	47.3	31.4	38.4	30	28.8	26.2	24.3	29.1		31	33.5	37.4	32.2	21.2	
26	43.5	41.4	36.8	30.4	34.4	32.5				34.3	32.8	37	35.7	23.5	
27	55.7	46.2	35.5	36.7	38.2	35	37.2	37.2		35.5		39.5	39.3	25.8	
28	36.7		25.5	24.7	21.1	19.3				35.1	42.8	38.3	30.2	18.2	
34a	51.1	43.9		40.4	41.9	35.6	35.1	41.5	28.8	43.8	46.9	33.2			
34b	52.8	45.8	44.6	40.1	41.6	33.2	37	42.7	34	44.4	49.1	46	40	26.3	
34c	80.7	44.6	41.6	38.8	42.6	35.3	37.1	43.1	34.7	42.2	46.8	46.9			

Notes:

Exceedances of the NO_2 annual mean objective of 40 µgm^{-3} are shown in **bold**.

NO_2 annual means exceeding 60µgm^{-3}, indicating a potential exceedance of the NO_2 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

5.5 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 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 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 public on air quality, including what ongoing actions are being taken locally to improve it if necessary.

5.6 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 µg m^{-3} (milligrams per cubic metre, mg 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

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as	Date to be achieved by
Nitrogen Dioxide (NO_2)	200 µg m^{-3} not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen Dioxide (NO_2)	40 µg m^{-3}	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50 µg m^{-3}, not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
Particulate Matter (PM_{10})	40 µm^{-3}	Annual mean	31.12.2010
Sulphur dioxide (SO_2)	350 µg m^{-3}, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide (SO_2)	125 µg m^{-3}, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO_2)	266 µg m^{-3}, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	16.25 µg m^{-3}	Running annual mean	31.12.2003
Benzene	5 µg m^{-3}	Annual mean	31 12 2010
1,3 Butadiene	2.25µg m^{-3}	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg m^{-3}	Maximum Daily Running 8-Hour mean	31.12.2003
Lead	0.25 µg m^{-3}	Annual Mean	31.12.2008

Appendix C: Air Quality Monitoring Data QA/QC

5.7 QA/QC of Diffusion Tube Monitoring

NO_2 diffusion tubes are sourced from the Environmental Scientifics Group Socotec and are prepared using the 50% Acetone TEA in Acetone Method.

Defra has provided a spreadsheet to facilitate the calculation of local bias adjustment factors. The National Bias Adjustment Factor Spreadsheet can be found on the LAQM Support Website.

Diffusion Tube Annualisation

Annualisation was necessary for four sites (DT5, DT18a, DT21 and DT28) during 2022 due to data capture of less than 75%. Data from four background sites (Narberth, Leominster, Aston Hill and Honiton) were used to conduct the annualisation (Table C.1).

Table C.1 – Annualisation Summary (concentrations presented in µg m^{-3})

Site ID	Annualisation Factor Narberth	Annualisation Factor Leominster	Annualisation Factor Aston Hill	Annualisation Factor Honiton	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
5	0.9391	1.0632	1.0037	1.0152	1.0053	31.1	31.3
18a	0.9564	0.9651	1.0122	0.9391	0.9682	37.6	36.4
21	0.9114	1.0622	1.0188	1.0008	0.9983	39.3	39.2
28	0.8836	0.8991	0.9409	0.9462	0.9174	30.2	27.7

Diffusion Tube Bias Adjustment Factors

NPT have applied a local bias adjustment factor of 0.66 to the 2022 monitoring data (the average of two local studies - Table C.2). The national bias adjustment factor of 0.76 was not used as the local bias adjustment had good overall precision and good overall data capture.

Table C.2 – Local Bias Adjustment Calculations

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2
Periods used to calculate bias	11	11
Bias Factor A	0.67 (0.62 - 0.73)	0.65 (0.58 - 0.72)
Bias Factor B	49% (37% - 60%)	55% (39% - 71%)
Diffusion Tube Mean (µg m^{-3})	17.8	40.8

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2
Mean CV (Precision)	5.3%	4.8%
Automatic Mean (µg m^{-3})	12.0	26.3
Data Capture	96%	99%
Adjusted Tube Mean (µg m^{-3})	12 (11 - 13)	27 (24 - 29)

Notes: An average local bias adjustment factor of 0.66 has been used to bias adjust the 2022 diffusion tube results.

A summary of bias adjustment factors used by NPT over the past five years is presented in Table C.3.

Table C.3 – Bias Adjustment Factors Applied in the Last 5 Years

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	Local	-	0.66
2021	National	06/22	0.78
2020	National	06/21	0.76
2019	National	09/20	0.75
2018	Local	-	0.71

NO_2 Fall-off with Distance from the Road

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

5.8 QA/QC of Automatic Monitoring

The AURN site is subject to the quality control procedures of the network. NPT Council staff act as Local Site Operator, carrying out calibrations on an approximately fortnightly basis. There are regular site audits and validation, and ratification are carried out by AURN staff prior to dissemination of the data via UK Air. All equipment is covered by service and maintenance contracts with suppliers. These contracts provide for 6-monthly servicing and emergency callouts.

Monitoring stations are covered by a QA/QC contract with Ricardo which provides for two site audits per year and QA/QC of the data which is polled by Ricardo and disseminated on the Welsh Air Quality Forum website. Data is subject to a similar QA/QC standard as the AURN.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The Smart Heated BAM PM_{10} data are corrected by dividing by 1.035 for gravimetric equivalence. The $PM_{2.5}$ Smart Heated BAM data do not require any correction for equivalence.

Automatic Monitoring Annualisation

Annualisation was required at three automatic monitoring sites, Dyffryn School (DS1, 56-60% data capture), Talbot Little Warren (LW1, 58-63% data capture) and Prince Street (PS2, 71-74% data capture). The nearest long-term, continuous monitoring sites identified were Cardiff (Urban Background, approx. 30 miles away), Narberth (Rural Background, approx. 50 miles away) and Newport (Urban Background, approx. 40 miles away). These form part of the national network. The data capture for each of these sites is greater than 85%. Annualisation data is presented in Table C.4 and Table C.5.

Table C.4 – PM_{10} Automatic Station Annualisation Summary (concentrations in µg m^{-3})

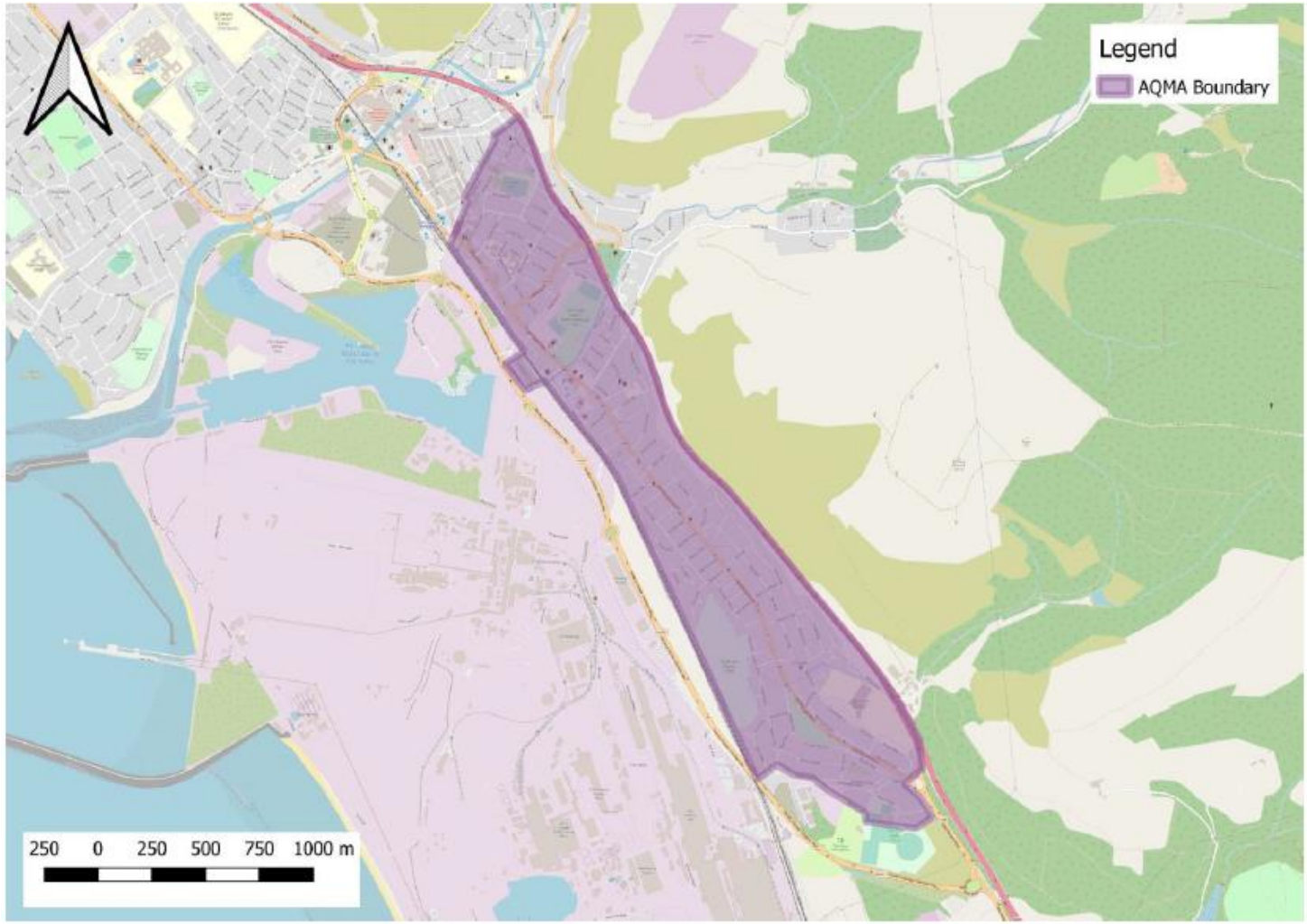
Site ID	Annualisation Factor - Cardiff	Annualisation Factor – Narberth	Annualisation Factor – Newport	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
DS1	1.05	1.17	1.10	1.11	17.00	18.83
LW1	1.04	1.14	1.09	1.09	19.00	20.73
PS2	1.04	1.11	1.06	1.07	27.00	28.94

Table C.5 – $PM_{2.5}$ Automatic Station Annualisation Summary (concentrations in µg m^{-3})

Site ID	Annualisation Factor - Cardiff	Annualisation Factor – Narberth	Annualisation Factor – Newport	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
DS1	1.06	1.25	1.20	1.17	6.00	7.04
LW1	1.06	1.22	1.17	1.15	7.00	8.04
PS2	1.06	1.16	1.10	1.11	10.00	11.07

Appendix D: AQMA Boundary Maps

Figure D.1 – Taibach/Margam AQMA Boundary



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)
BAM	Beta Attenuation Monitoring
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_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide