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2023 Annual Progress Report

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Cyngor **Abertawe**
Swansea Council



Swansea 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

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Executive Summary: Air Quality in Our Area

Air Quality in Swansea Council

This report contains the latest air quality monitoring results within the City and County of Swansea. The conclusions reached are that the objectives for benzene, lead and sulphur dioxide will be met and that there is no requirement to proceed further with these pollutants.

During 2022, all passive monitoring locations were compliant with the NO₂ AQS objective of 40 µg/m³; 183 sites reported a decrease in comparison to 2021, with 7 sites reporting increases. There was only one site that reported a concentration within 10% of the annual mean NO₂ AQS objective of 40 µg/m³ within Swansea, this was at site 459, situated in Graig Trewyddfa. This site continues to report the highest concentrations within the monitoring network. 459 (37.7 µg/m³) is not at a location of relevant exposure, and once fall-off with distance calculations have been carried out to predict the concentration at the nearest relevant receptor, the estimated concentration is 20.5 µg/m³.

Swansea Council currently have one declared AQMA (Swansea AQMA 2010). Details of the AQMA can be found on the UKAir website and the Welsh Government Website. The AQMA has been declared due to exceedances of the NO₂ annual mean AQS objective. All AQMA boundaries are either close to, or have busy roads within them, recognising the influence vehicle emissions have upon local air quality. 2022 was the first year of full compliance across all parts of Swansea's AQMA. To ensure that continual compliance is achieved, the Council do not intend to revoke this AQMA at this moment in time. If concentrations continue to remain stable, then the Council may carry out the revocation process.

No diffusion tube monitoring sites reported an annual mean NO₂ concentration greater than 60µg/m³, therefore in accordance with LAQM.TG(22) it is not believed that there have been any exceedances of the 1-hour NO₂ AQS objective in these areas. Additionally, the automatic monitoring stations located in Swansea all reported no concentrations above the 1-hour NO₂ AQS objective of 200 µg/m³.

All automatic monitoring stations reports PM₁₀ and PM_{2.5} compliance with both the annual and 24-hour AQS objectives continuing to be maintained. Ozone is monitored at four sites within Swansea. Compliance with the 8-hour mean UK objective (not set in regulation) has been observed during 2022 at all sites.

Actions to Improve Air Quality

Swansea Council takes an active role within the Welsh Air Quality Forum <https://airquality.gov.wales/> and is taking part in collaborative discussions with Swansea University to work together towards carrying out research into areas of 'public health interest' for all parties.

Collaborative works have led to Swansea Council being involved in a research project looking at the digital environment in the City Centre; focusing on the collection of Air Quality, Noise and Parking data.

Local Priorities and Challenges

Swansea Council will continue to undertake monitoring at the fixed locations for pollutants reported upon in this report. The assessment of locations for NO₂ diffusion tube monitoring will continue to be carried out, sites returning low concentrations will be closed down in order to allow new sites to be created to enable Swansea Council to enhance their quantitative data.

Swansea Council is reviewing their action plan to consider the impact of the Coronavirus Pandemic and ongoing compliance. Swansea Council will continue to work towards achieving Welsh Governments aims to maintain compliance and further reduce public health exposure.

How to Get Involved

Swansea Council publishes its real-time monitoring data on their website <https://swansea.airqualitydata.com/> and data can be downloaded from this site; a review of this site is scheduled.

Also, Swansea Council's data can be viewed and downloaded via the Welsh Air Quality Forum website <https://airquality.gov.wales/>.

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1 Actions to Improve Air Quality

Previous Work in Relation to Air Quality

The local authority review and assessment process is multi-staged. This Authority carried out its first stage review in 1999. The conclusion reached was to progress to a second and third stage review for Benzene, Particulate Matter (PM₁₀), Sulphur Dioxide (SO₂) and Nitrogen Dioxide (NO₂).

In between these stages the authority had to deal with and resolve a burning, disused coal spoil tip at the former Brynlliw Colliery site. This absorbed most resources available between 1999 and 2000.

Section 83(1) of the Environment Act 1995 requires the Authority to designate Air Quality Management Areas (AQMAs) in areas where it is likely that the standards for any of the identified pollutants would be exceeded. As a result of the detailed work carried out in the authorities' third stage review and assessment it was found that areas of the Hafod were likely to fail the NO₂ annual mean objective of 40µg/m³ by the compliance date of 31st December 2005.

On the 12th September 2001 the Authority declared The Hafod Air Quality Management Area (NO₂), cited as the City & County of Swansea (Hafod Air Quality Management Area (NO₂)) Order 2001. The Order came into force on the 14th September 2001. Appendix D contains a map indicating the AQMA area.

The Stage 4 review required under Section 84(1) of the Environment Act 1995 confirmed the earlier findings and that the declaration of the Hafod AQMA was justified as several locations were projected to fail the nitrogen dioxide (NO₂) annual mean objective in 2005.

Section 84 of the Environment Act 1995 requires the formulation of a written plan in pursuit of the achievement of air quality standards and objectives within the designated AQMA and has become known as the "Action Plan". The City and County of Swansea have undertaken a considerable amount of feasibility and infrastructure work in formulating its Action Plan taking a few years to produce the completed Action Plan in December 2004.

In 2004, the authority commenced works on the second round of review and assessment. In accordance with the policy and technical guidance documents, the second round of review and assessment was carried out in two stages;

- An Updating and Screening Assessment (USA) - intended to identify aspects that have changed since the first round of review and assessment (from 1999 in Swansea's case) and identify those that require further assessment; namely
- A Detailed Assessment of those pollutants that have been identified as requiring further work and investigation

Swansea Council currently has one active AQAP (The City and County of Swansea (Hafod Air Quality Management Area (NO₂))Order 2001). This is currently outdated and Swansea council are currently in the process of updating the AQAP.

A summary of the reports produced on air quality by Swansea Council to date are accessible on the Swansea government website (<https://swansea.gov.uk/laqmreports?lang=en>), via previous Annual Progress Reports (APRs), which summarise previous year air quality reports.

Annual Progress Report 2022 Summary

During 2022, the monitoring network within Swansea reported an overall decrease in NO₂ concentrations, with 183 non-automatic sites reporting a decrease in comparison to 2021. All sections of the Swansea AQMA continued to report compliance. Swansea Council will continue to use their monitoring network to oversee concentrations, and will look to revoke their AQMA next year if compliance continues.

Air Quality Management Areas

Air Quality Management Areas (AQMA) 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 AQMA declared by Swansea Council can be found in Table 1.1. Further information related to declared or revoked AQMA, including maps of AQMA boundaries are available online on the UKAir [website](#).

Table 1.1 – Declared Air Quality Management Areas

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	City / Town	Description	Action Plan
Swansea AQMA 2010	NO ₂ Annual Mean	The 2022 monitoring results indicates Decreased annual mean NO ₂ concentrations across all sites from 2021. All sections of the AQMA reported compliance..	Hafod Sketty Fforestfach	Elevated annual mean NO ₂ concentrations at residential properties alongside main arterial routes, which located within Hafod, Sketty and Fforestfach area.	https://www.swansea.gov.uk/media/4052/Air-Quality-Action-Plan/pdf/Air_Quality_Action_Plan.pdf?m=1635522507237

AQMA boundary maps within Swansea Council can be viewed on the LAQM [website](#) and are included in Appendix D.

Implementation of Action Plans

Swansea Council 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.

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
1	Nowcaster Model	Pollution reduction by prediction and behaviour change	Swansea Council	2004	2017	-	e.g. 27% Reduction in Road NOx required Neath Road	Model Complete	Due to resource restriction and the pandemic no further works have been able to be carried out.	Unknown – funding dependant	Effects of Nowcaster Model to be verified with traffic flow data and NO ₂ Concentrations
3	Nowcaster Model Output Progression	Pollution reduction by prediction and behaviour change	Swansea Council	2017	2018/19	-	CHERISH-DE application accepted Awaiting next stage	Pilot study carried out – Data analysis carried out by Swansea University.	Collaborative working with Swansea University Psychology Department to look at behavioural change approach with messages.	March 2020	-
4	Collaborative Research Studies	Pollution reduction by prediction and behaviour change	Swansea University	2018	-	-	-	Ongoing work stream – has not begun to date as funding applications have been unsuccessful.	Application bids for funding with collaborative partners to undertake work looking at behavioural change at congested areas.	-	-

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
5	Morfa Distributor Road	Infrastructure change	Swansea Council	-	August 2017	-	Road Complete	-	Effects on Traffic Flow to be assessed alongside NO ₂ concentration.	04/08/2017	Pollutant Concentration reduced and AADT decreased
6	Green infrastructure	Exposure reduction, enhancing greenery	Swansea Council	-	2018-2020	-	-	Green Screen installed at the junction of Fabian Way and Port Tennant Road.	Effects on Traffic Flow to be assessed alongside NO ₂ concentration.	04/08/2017	-
7	UK Prevention Research Partnership Bid	Collaborative Working	School of Management Bay Campus Swansea University Fabian Bay, Swansea	2017	2018	-	Expression of interest to apply submitted.	Unsuccessful	-	-	-
8	LDP Policy RP	Policy	Swansea Council	-	2018	-	Creation of specific Air Pollution Policy within the LDP.	Adopted	-	-	-
9	Highway Infrastructure Works	Infrastructure	Swansea Council	2018	-	-	-	Ongoing involvement when schemes required.	-	-	-
10	Council Vehicle Fleet	Reduced Emission	Swansea Council	-	-	-	-	Ongoing	Increase in electric vehicles and newer diesel vehicles within the council fleet.	-	-

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
11	Welsh Government LAQM Support Grant	Green Infrastructure	Swansea Council	2021	2022	-	-	Grant application submitted to Welsh Government and awaiting outcome.	Grant application approved for two projects at Primary Schools in Swansea. Monitoring equipment installed and green screens purchased; installations works planned for end 2023.	April 2024	-
12	Welsh Government LAQM Support Grant	Engine idling and behaviour change	Swansea Council	2021	2022	-	-	Grant application submitted to Welsh Government and awaiting outcome.	Engine idling study carried out in July 2022. Report has been submitted to Welsh Government and will be included within the APR reporting structure once submission to peer reviewed publication has been made.	May 2023	

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
13	Welsh Government LAQM Support Grant	monitoring network and bus transport	Swansea Council	2021	2022	-	-	Grant application submitted to Welsh Government and awaiting outcome.	Network has been installed and data collection commenced.	April 2024	-
14	Welsh Government LAQM Support Grant	Engine idling and behaviour change	Swansea Council	2022	2023	-	-	Grant application submitted to Welsh Government. Project ongoing for analysis comp.	Engine idling study carried out in February/March 2023. Will be reported upon in the next APR.	December 2023	-

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

Summary of Monitoring Undertaken in 2022

2.1.1 Automatic Monitoring Sites

Swansea Council undertook automatic (continuous) monitoring at 12 sites during 2022. Table 2.1 presents the details of the sites. National monitoring results are available at <https://uk-air.defra.gov.uk/data/>, <https://airquality.gov.wales/maps-data/measurements/downloadsubmit-data> and <http://swansea.airqualitydata.com/>.

CM6 (Fforestfach Cross) and CM9 (Westway Quadrant Bus Station) both had communications issues through 2022, and were switched off for the entire year.

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-Automating Monitoring Sites

Swansea Council undertook non-automatic (passive) monitoring of NO₂ at 191 sites during 2022, a new site was commissioned in 2022. Table 2.2 presents the details of the sites.

Maps showing the location of the monitoring sites are provided in Figure 2.2 – Figure 2.10. 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)
CM1	Swansea Roadside AURN	Roadside	Swansea AQMA 2010	265299	194470	NO ₂ , PM ₁₀ , PM _{2.5}	Chemiluminescence and BAM1020	2.0	16.5	22	4.5
CM2	Morrison Groundhog	Roadside	Swansea AQMA 2010	267210	197674	NO ₂ , PM ₁₀ , PM _{2.5} and Ozone	Chemiluminescence, UV Absorption and BAM1020	2.0	22	27	5.0
CM3	Swansea Cwm Level Park	Urban Background	Swansea AQMA 2010	265912	195890	NO ₂ and Ozone	Chemiluminescence, UV Absorption	1.5	-	-	78
CM4	Swansea Hafod DOAS	Roadside	Swansea AQMA 2010	Transmitter 265927 Receiver 265991	Transmitter 194453 Receiver 194706	NO ₂ , Ozone and Benzene	Differential Optical Absorption Spectrometry	4.0	0	1.5	1.5
CM5	Swansea St Thomas DOAS	Roadside	No	266199	193657	NO ₂ , SO ₂ , Ozone and Benzene	Differential Optical Absorption Spectrometry	4.0	7.5	0.2	7.3
CM6	Fforestfach Cross	Roadside	Swansea AQMA 2010	263236	195489	PM ₁₀	EBam	3.0	22	25	3
CM7	Uplands Crescent	Roadside	-	264078	192888	PM ₁₀	EBam	3.0	13	14	1
CM8	Sketty Cross	Roadside	Swansea AQMA 2010	262681	192871	PM ₁₀	EBam	3.0	15	16	1
CM9	Westway Quadrant Bus Station	Roadside	No	265256	192731	PM ₁₀	EBam	3.0	13	15	2
CM11	Swansea Station Court High Street	Roadside	Swansea AQMA 2010	265705	193686	NO ₂	Chemiluminescence	1.5	3	5	2
CM12	Morfa Road	Roadside	Swansea AQMA 2010	265905	193733	NO ₂	Chemiluminescence	1.5	0	6	6
CM13	Junction Port Tennant	Roadside	No	266670	193179	PM _{2.5} and NO ₂	Chemiluminescence and BAM1020	1.5	9	12	3

Notes:

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

Figure 2.1 – Map(s) of Automatic Monitoring Sites

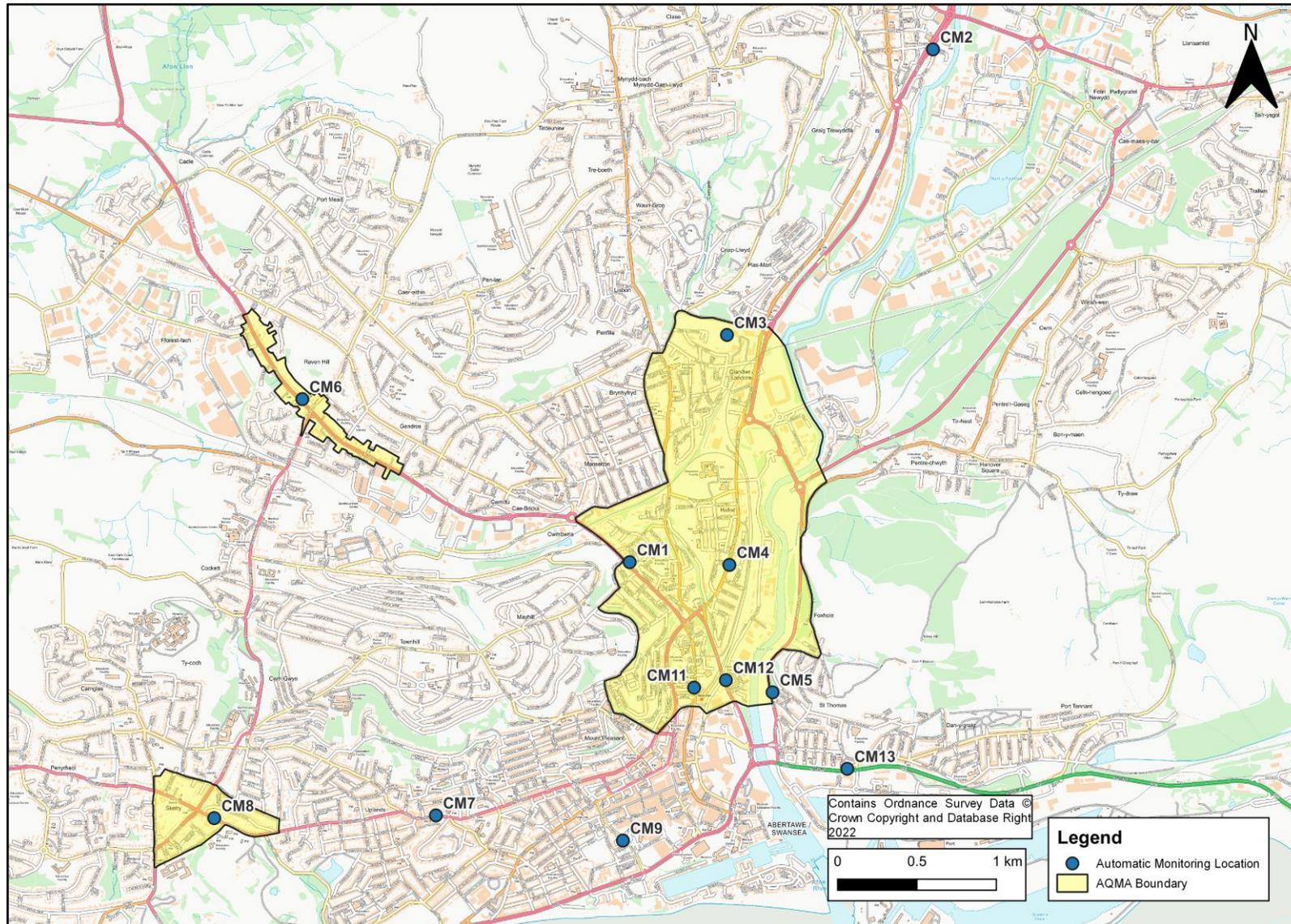


Table 2.2 – Details of Non-Automatic Monitoring Sites

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)
5	Gower Road	Roadside	Y	262548	192943	3.0	No	-	-	-
6	Vivian Road	Roadside	Y	262612	192995	3.0	No	-	-	-
7	Gower Road	Roadside	Y	262691	192852	3.0	No	-	-	-
8	Carmarthen Road	Roadside	Y	262990	195820	3.0	No	4.5	-	2.5
10	Carmarthen Road	Roadside	Y	263219	195513	3.0	No	-	-	-
11	Ravenhill Road	Roadside	Y	263344	195474	3.0	No	-	-	-
12	Carmarthen Road	Roadside	Y	263680	195103	3.0	No	-	-	-
16	Oystermouth Road	Roadside	N	265339	192534	3.0	No	-	-	-
18	Cwm Level Road	Roadside	Y	265526	195807	3.0	No	-	-	-
19	Dyfatty Street	Roadside	Y	265597	194061	3.0	No	-	-	-
20	Carmarthen Road	Roadside	Y	265594	194175	3.0	No	-	-	-
22	Pentretreharne Road	Roadside	Y	265682	195374	3.0	No	-	-	-
26	Neath Road	Roadside	Y	265876	194318	3.0	No	-	-	-
27	Neath Road	Roadside	Y	265922	194428	3.0	No	-	-	-
29	Neath Road	Roadside	Y	265973	195222	3.0	No	-	-	-
32	Pentreguinea Road	Roadside	N	266209	193867	3.0	No	-	-	-
33	Pentreguinea Road	Roadside	N	266236	193488	3.0	No	-	-	-
35	Delhi Street	Roadside	N	266314	193298	3.0	No	-	-	-
36	Delhi Street	Roadside	N	266455	193300	3.0	No	-	-	-

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)
40	Pentrepoeth Road	Roadside	N	266951	198278	3.0	No	-	-	-
41	Woodfield Road	Roadside	N	266953	198085	3.0	No	-	-	-
43	Clase Road	Roadside	N	267093	198063	3.0	No	-	-	-
44	Ian's Walk	Roadside	N	267639	199543	3.0	No	-	-	-
45	Glyncollen Drive	Roadside	N	267661	199451	3.0	No	-	-	-
48	Bevans Row	Roadside	N	268011	193101	3.0	No	-	-	-
50	Nantyffin Road	Roadside	N	268530	197419	3.0	No	-	-	-
54	Peniel Green Road	Roadside	N	268693	197416	3.0	No	-	-	-
55	Peniel Green Road	Roadside	N	268789	197420	3.0	No	-	-	-
56	Ynysallan Road	Roadside	N	269306	198661	3.0	No	166.0	-	2.0
58	Uplands Crescent	Roadside	N	264000	192800	3.0	No	8.0	-	4.0
59	Hafod Post Office	Roadside	Y	265918	194463	3.0	No	-	-	-
61	St Helens Road	Roadside	N	264959	192878	3.0	No		-	
63	De La Beche Road	Roadside	Y	262675	192775	3.0	No	6.0	-	2.0
64	Gower Road	Roadside	Y	262719	192840	3.0	No	1.0	-	5.5
65	Gower Road	Roadside	Y	262735	192855	3.0	No	-	-	-
66	Sketty Road	Roadside	Y	262802	192829	3.0	No	-	-	-
67	Newcut Road	Roadside	Y	265901	193677	3.0	No	5.0	-	2.0
68	Orchard Street	Roadside	N	265573	193432	3.0	No	-	-	-
70	Copper Quarter	Roadside	N	266649	195435	3.0	No	7.0	-	2.0

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)
75	Uplands Crescent	Roadside	N	264072	192869	2.0	No	-	-	-
84	Gower Road	Roadside	Y	262714	192839	2.0	No	-	-	-
85	Gower Road	Roadside	Y	262702	192847	2.0	No	-	-	-
86	Gower Road	Roadside	Y	262704	192865	2.0	No	-	-	-
87	De La Beche Road	Roadside	Y	262697	192798	2.0	No	-	-	-
88	Gower Road	Roadside	Y	262605	192916	2.0	No	-	-	-
89	Vivian Road	Roadside	Y	262587	192956	2.0	No	-	-	-
90	Vivian Road	Roadside	Y	262631	192996	2.0	No	-	-	-
91	Gower Road	Roadside	Y	262534	192950	2.0	No	-	-	-
94	Ravenhill Road	Roadside	N	263444	195572	2.0	No	-	-	-
95	Carmarthen Road	Roadside	N	262815	196090	2.0	No	-	-	-
96	Carmarthen Road	Roadside	N	262922	195590	2.0	No	-	-	-
97	Carmarthen Road	Roadside	Y	262946	195902	2.0	No	-	-	-
98	Carmarthen Road	Roadside	Y	263142	195548	2.0	No	-	-	-
99	Carmarthen Road	Roadside	Y	263387	195332	2.0	No	-	-	-
104	Nantyffin Road	Roadside	N	268538	197389	2.0	No	-	-	-
110	Cefn Glas	Roadside	N	267369	199521	2.0	No	-	-	-
115	Mansel Street	Roadside	N	265031	193097	2.0	No	-	-	-
116	Mansel Street	Roadside	N	265192	193138	2.0	No	-	-	-
117	De La Beche Road	Roadside	N	265288	193211	2.0	No	-	-	-
118	Alexandra Road	Roadside	N	265483	193385	2.0	No	-	-	-

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)
119	Pleasant Street	Roadside	N	265522	193390	2.0	No	-	-	-
121	High Street	Roadside	Y	265697	193679	2.0	No	-	-	-
122	High Street	Kerbside	N	265694	193505	3.0	No	-	-	-
123	High Street	Roadside	N	265655	193423	2.0	No	-	-	-
124	High Street	Kerbside	N	265651	193253	2.0	No	-	-	-
125	High Street	Kerbside	N	265642	193148	3.0	No	3.0	-	1.0
126	The Kingsway	Roadside	N	265475	193144	2.5	No	-	-	-
128	The Kingsway	Roadside	N	265297	193085	2.0	No	-	-	-
129	Christina Street	Roadside	N	265153	193098	2.0	No	-	-	-
131	Dilwyn Street	Roadside	N	265137	192846	2.0	No	-	-	-
132	Westway	Roadside	N	265229	192753	3.0	No	-	-	-
134	Dilwyn Street	Roadside	N	265113	192903	2.0	No	-	-	-
180	Loughor Road	Roadside	N	259064	197781	3.0	No	-	-	-
182	Loughor Road	Roadside	N	259050	197790	3.0	No	-	-	-
197	Alexandra Road	Roadside	N	258797	198701	3.0	No	-	-	-
198	Alexandra Road	Roadside	N	258811	198701	3.0	No	-	-	-
206	Newton Road	Roadside	N	261565	188211	3.0	No	-	-	-
207	Newton Road	Roadside	N	261561	188222	3.0	No	-	-	-
208	Newton Road	Roadside	N	261541	188215	3.0	No	-	-	-
209	Newton Road	Roadside	N	261534	188198	3.0	No	-	-	-
210	Newton Road	Roadside	N	261516	188207	3.0	No	-	-	-
211	Newton Road	Roadside	N	261501	188188	3.0	No	-	-	-
212	Newton Road	Roadside	N	261486	188200	3.0	No	-	-	-
213	Newton Road	Roadside	N	261490	188186	3.0	No	-	-	-
240	Neath Road	Roadside	N	266169	195995	3.0	No	-	-	-
242	High Street	Roadside	N	265655	193423	3.0	No	-	-	-
243	Courtney Street	Roadside	N	265474	194949	3.0	No	-	-	-

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)
244	Courtney Street	Roadside	Y	265466	194930	3.0	No	-	-	-
247	Courtney Street	Roadside	Y	265394	194899	3.0	No	-	-	-
249	Courtney Street	Roadside	Y	265326	194871	3.0	No	-	-	-
256	Mansel Terrace	Roadside	-	264995	194777	3.0	No	-	-	-
275	Pentremawr Road	Roadside	Y	265658	194856	3.0	No	3.0	-	1.0
276	Pentremawr Road	Roadside	Y	265610	194871	2.0	No	-	-	-
277	Pentremawr Road	Roadside	Y	265596	194875	2.0	No	-	-	-
278	Pentremawr Road	Roadside	Y	265573	194882	2.0	No	-	-	-
279	Llangyfelach Road	Roadside	Y	265555	194926	2.0	No	-	-	-
280	Llangyfelach Road	Roadside	Y	265537	194980	2.0	No	2.0	-	1.0
281	Llangyfelach Road	Roadside	Y	265542	194872	2.5	No	3.0	-	1.0
282	Llangyfelach Road	Roadside	Y	265540	194840	2.5	No	3.0	-	1.0
284	Llangyfelach Road	Roadside	N	265452	195899	2.0	No	-	-	-
285	Martin Street	Roadside	N	266955	197415	2.0	No	-	-	-
286	Martin Street	Roadside	N	266938	197377	2.0	No	-	-	-
287	High Street	Roadside	Y	265715	193902	2.0	No	-	-	-
288	High Street	Roadside	Y	265698	193878	2.0	No	-	-	-
289	High Street	Roadside	Y	265702	193842	2.0	No	-	-	-
291	Wern Terrace	Roadside	N	267952	193121	2.0	No	-	-	-

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)
295	High Street Gorseinon	Roadside	N	258998	198698	3.0	No	1.5	-	1.0
296	High Street Gorseinon	Roadside	N	259054	198679	2.0	No	-	-	-
323	Port Tennant Road	Roadside	N	266765	193224	2.0	No	-	-	-
331	High Street	Roadside	N	265741	193545	2.0	No	-	-	-
334	High Street	Kerbside	N	265688	193483	2.0	No	-	-	-
335	High Street	Kerbside	N	265682	193461	2.0	No	-	-	-
336	High Street	Roadside	N	265664	193395	2.0	No	-	-	-
337	High Street	Roadside	N	265637	193335	2.0	No	3.5	-	1.0
338	High Street	Kerbside	N	265651	193331	2.0	No	-	-	-
339	High Street	Kerbside	N	265652	193313	2.0	No	-	-	-
340	High Street	Kerbside	N	265632	193292	2.0	No	5.0	-	3.0
341	High Street	Kerbside	N	265635	193224	2.0	No	3.0	-	1.5
342	Castle Street	Kerbside	N	265655	193197	2.0	No	3.5	-	1.0
343	Castle Street	Kerbside	N	265640	193173	2.0	No	-	-	-
346	Castle Street	Kerbside	N	265681	193096	2.0	No	-	-	-
347	Orchard Street	Roadside	Y	265562	193518	2.0	No	-	-	-
348	Orchard Street	Roadside	Y	265572	193549	2.0	No	-	-	-
349	Orchard Street	Roadside	Y	265578	193576	2.0	No	-	-	-
350	Orchard Street	Roadside	Y	265577	193606	2.0	No	-	-	-
356	Grove Place	Roadside	N	265471	193359	2.0	No	-	-	-
362	Westway	Kerbside	N	265271	192774	2.0	No	-	-	-
363	Westway	Kerbside	N	265287	192797	2.0	No	-	-	-
364	Westway	Kerbside	N	265301	192814	2.0	No	-	-	-
373	Mill Street	Kerbside	N	258859	196513	2.0	No	-	-	-
375	Mill Street	Roadside	N	258798	196371	2.0	No	-	-	-
376	Mill Street	Roadside	N	258765	196368	2.0	No	-	-	-
377	Sterry Road	Roadside	N	258763	196317	2.0	No	-	-	-
385	Pentrepoeth Road	Roadside	N	267001	198231	2.0	No	-	-	-

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)
386	Copper Quarter	Roadside	N	266698	195334	3.0	No	3.5	-	1.5
388	Bevans Row	Roadside	N	267964	193076	2.0	No	-	-	-
390	Wern Terrace	Roadside	N	267974	193132	2.0	No	-	-	-
391	High Street	Roadside	N	259467	198509	2.0	No	-	-	-
394	De La Beche Road	Roadside	Y	262445	192645	2.0	No	-	-	-
396	De La Beche Road	Roadside	Y	262370	192609	2.0	No	-	-	-
398	Mynydd Garllwyn Road	Roadside	N	265584	197442	2.0	No	149.0	-	1.5
399	Mynydd Garllwyn Road	Roadside	N	265224	197412	2.0	No	9.0	-	1.5
401	Llangyfelach Road	Kerbside	N	265243	197312	2.0	No	4.5	-	1.5
403	Dillwyn Street	Roadside	N	265115	192895	5.0	No	-	-	-
404	Pontardualis Road	Roadside	N	261713	199051	2.0	No	17.0	-	-
406	Morfa Terrace	Roadside	Y	265973	195222	2.0	No	-	-	-
407	Llangyfelach Road	Roadside	Y	265539	195664	2.0	No	-	-	-
408	Port Tennant Road	Roadside	N	266655	193177	2.0	No	2.0	-	1.5
412	Victoria Road	Kerbside	N	258957	196766	2.0	No	-	-	-
413	Victoria Road	Roadside	N	258950	196721	2.0	No	-	-	-
415	Danycoed	Kerbside	N	270242	197671	2.0	No	16.5	-	0.5
416	Birchgrove road	Kerbside	N	270487	197805	2.0	No	7.0	-	0.5
417	Birchgrove road	Kerbside	N	270485	197705	2.0	No	5.0	-	-
418	Birchgrove road	Kerbside	N	270449	197600	2.0	No	19.0	-	-

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)
419	Birchgrove road	Kerbside	N	270475	197714	2.0	No	5.5	-	-
422	Victoria Road	Kerbside	N	260149	195425	2.0	No	3.0	-	0.5
423	Victoria Road	Kerbside	N	260136	195411	2.0	No	20.0	-	2.0
424	Cwm Road	Kerbside	Y	265536	194752	2.0	No	23.0	-	1.0
425	Llangyfelach Road	Kerbside	Y	265509	194748	2.5	No	4.0	-	1.0
426	New Cut Road	Kerbside	N	265960	193609	2.5	No	6.0	-	3.0
427	Swansea Road	Kerbside	N	261994	197782	2.5	No	33.5	-	3.0
428	Gorseinon Road	Kerbside	N	261518	198929	2.5	No	13.5	-	3.0
429	Sterry Road	Roadside	N	258827	196293	2.5	No		-	
430	Mynydd Newydd Road	Kerbside	N	263930	196601	2.5	No	26.0	-	0.5
431	Mynydd Newydd Road	Kerbside	N	264029	196852	2.5	No	12.5	-	0.5
432	Llangyfelach Road	Kerbside	N	265345	195645	2.5	No	10.5	-	2.5
433	Llangyfelach Road	Roadside	N	265543	195621	2.5	No	-	-	-
434	Llangyfelach Road	Kerbside	N	265530	195679	2.5	No	-	-	-
435	Gors Avenue	Kerbside	N	263104	194457	2.5	No	5.0	-	1.0
436	Gors Avenue	Kerbside	N	263005	194476	2.5	No	7.5	-	0.5
437	Bevans Row	Kerbside	N	267986	193103	2.5	No	14.5	-	2.0
438	Brunel Way	Roadside	N	266541	195495	2.5	No	-	-	-
439	Glanmor Road	Roadside	N	262949	193293	2.5	No	-	-	-
440	Glanmor Road	Roadside	N	262905	193293	2.5	No	-	-	-
441	Broadway Road	Roadside	N	262903	193379	2.5	No	12.5	-	2.5
442	Townhill Road	Roadside	N	263004	193454	2.5	No	30.0	-	11.5

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)
444	Cockett Road	Roadside	N	262991	193759	2.5	No	19.0	-	1.0
445	Vivian Road	Roadside	N	262879	193408	2.5	No	41.0	-	2.5
446	Vivian Road	Roadside	N	262838	193374	2.5	No	19.5	-	4.5
447	Tycoch Road	Roadside	N	262709	193311	2.5	No	11.5	-	2.0
448	Vivian Road	Roadside	N	262788	1932813	2.5	No	10.5	-	4.0
449	Vivian Road	Roadside	N	262761	193228	2.5	No	9.5	-	4.0
450	Oytermouth School	Roadside	N	262812	193293	2.5	No	8.0	-	1.0
451	Oytermouth School	Roadside	N	261220	188184	2.5	No	10.0	-	1.5
452	Castle Road	Roadside	N	261163	188175	2.5	No	17.1	-	4.8
453	Llangyfelach Road	Roadside	N	261221	188298	2.5	No	5.0	-	0.5
454	Llangyfelach Road	Roadside	N	265548	195679	2.5	No	4.5	-	0.5
455	Llangyfelach Road	Roadside	N	265516	195729	2.5	No	4.5	-	1.0
458	Cockett Road	Roadside	N	262941	193459	2.5	No	22.5	-	2.5
459	Neath Road	Kerbside	N	267019	197407	2.5	No	-	-	-
460	Ystrad Road	Kerbside	N	262084	196454	2.5	No	-	-	-

Notes:

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

Figure 2.2 – Spatial Map of Non-Automatic Monitoring Sites

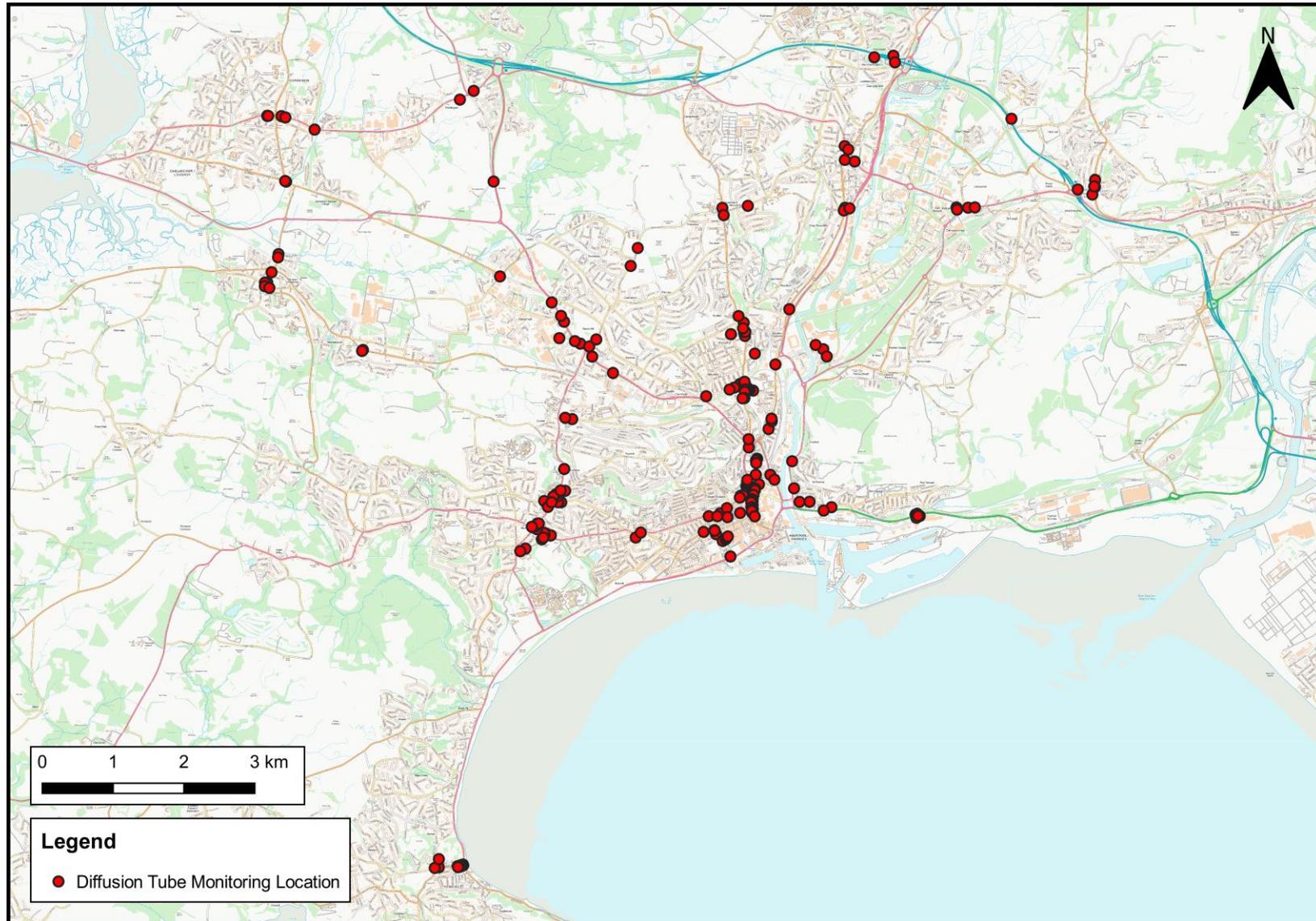


Figure 2.3 – Map of Non-Automatic Monitoring Sites (Gorseinon and Gowerton)

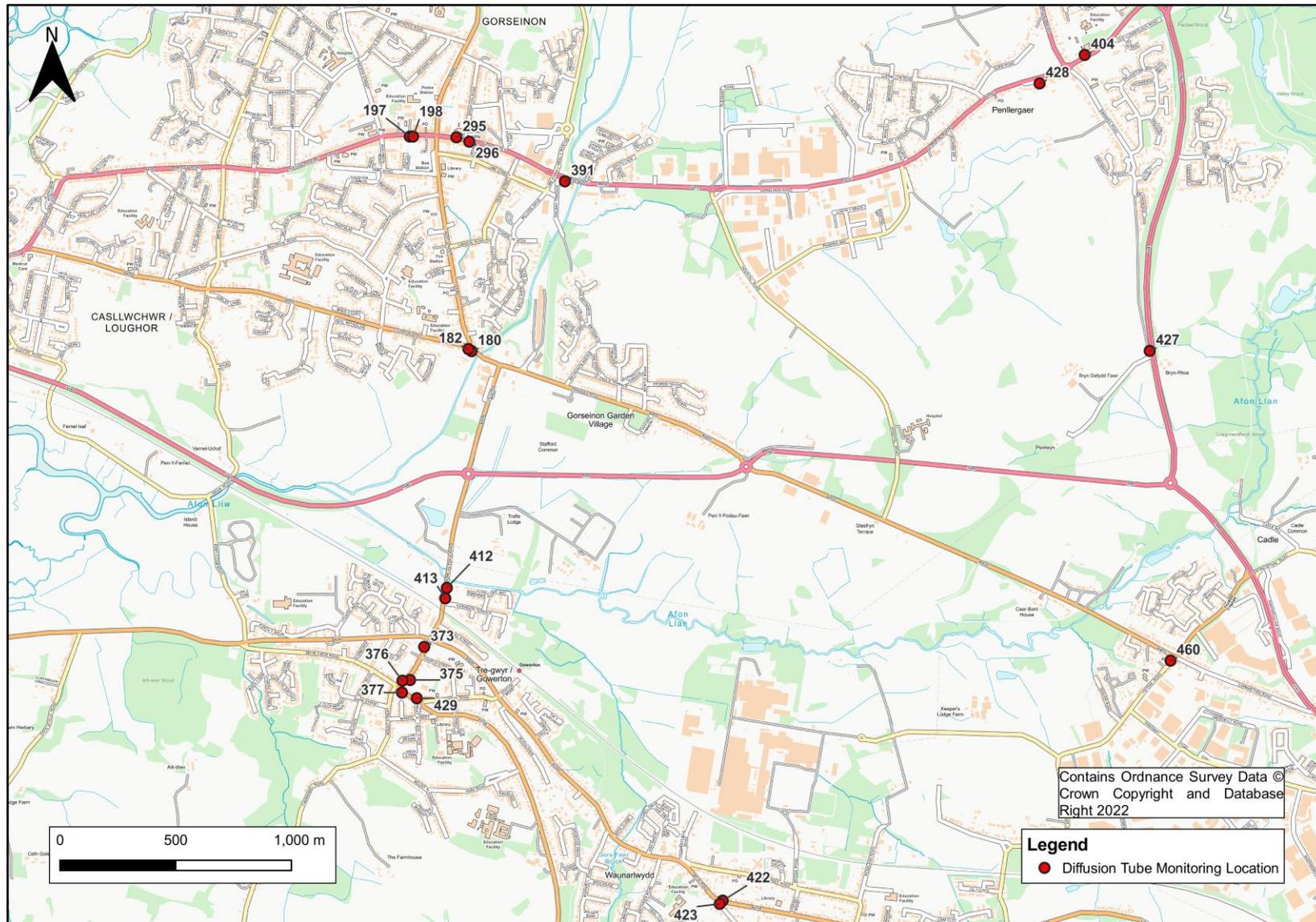


Figure 2.4 – Map of Non-Automatic Monitoring Sites (Fforestfach)

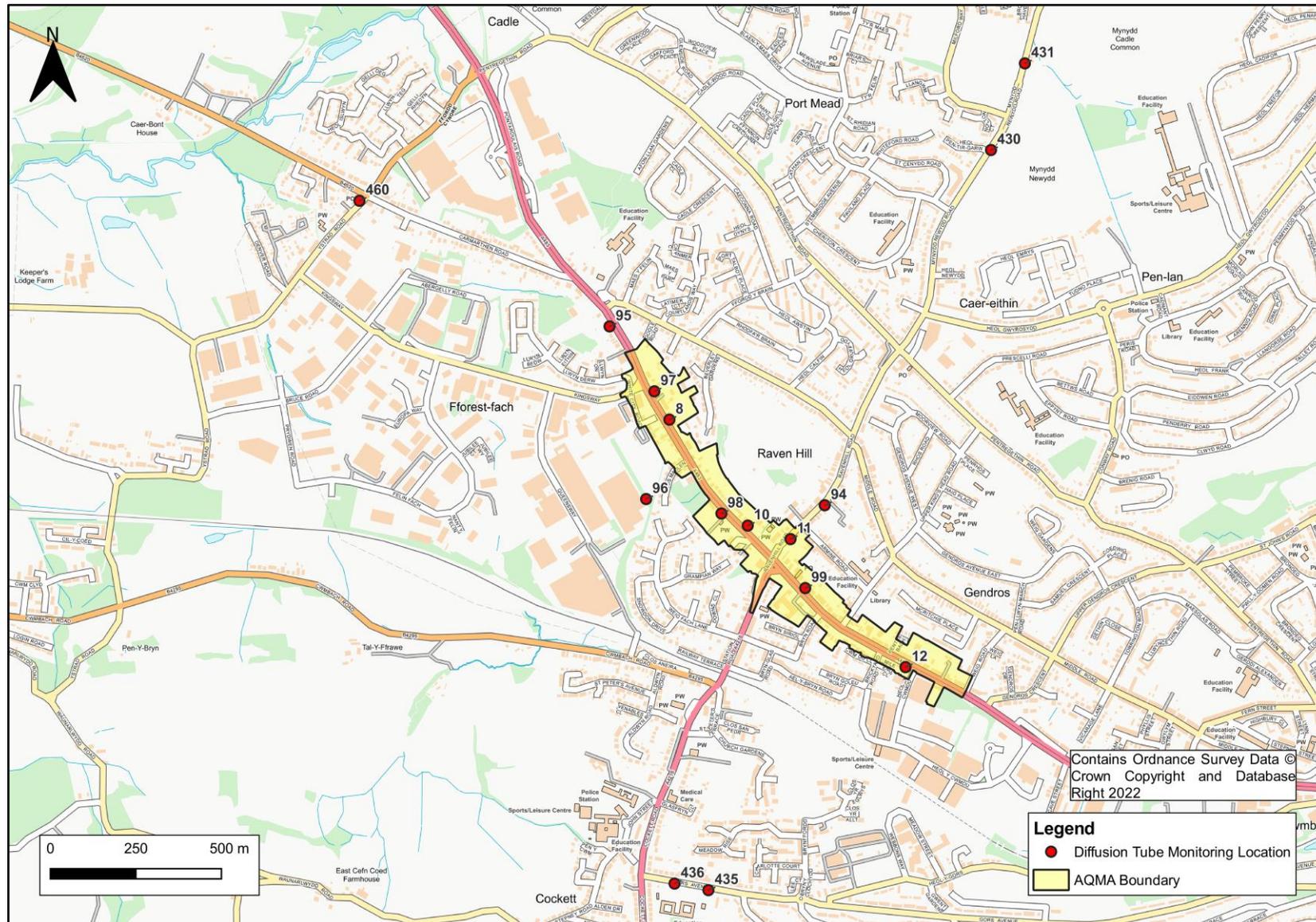


Figure 2.5 – Map of Non-Automatic Monitoring Sites (Hafod and Landore)

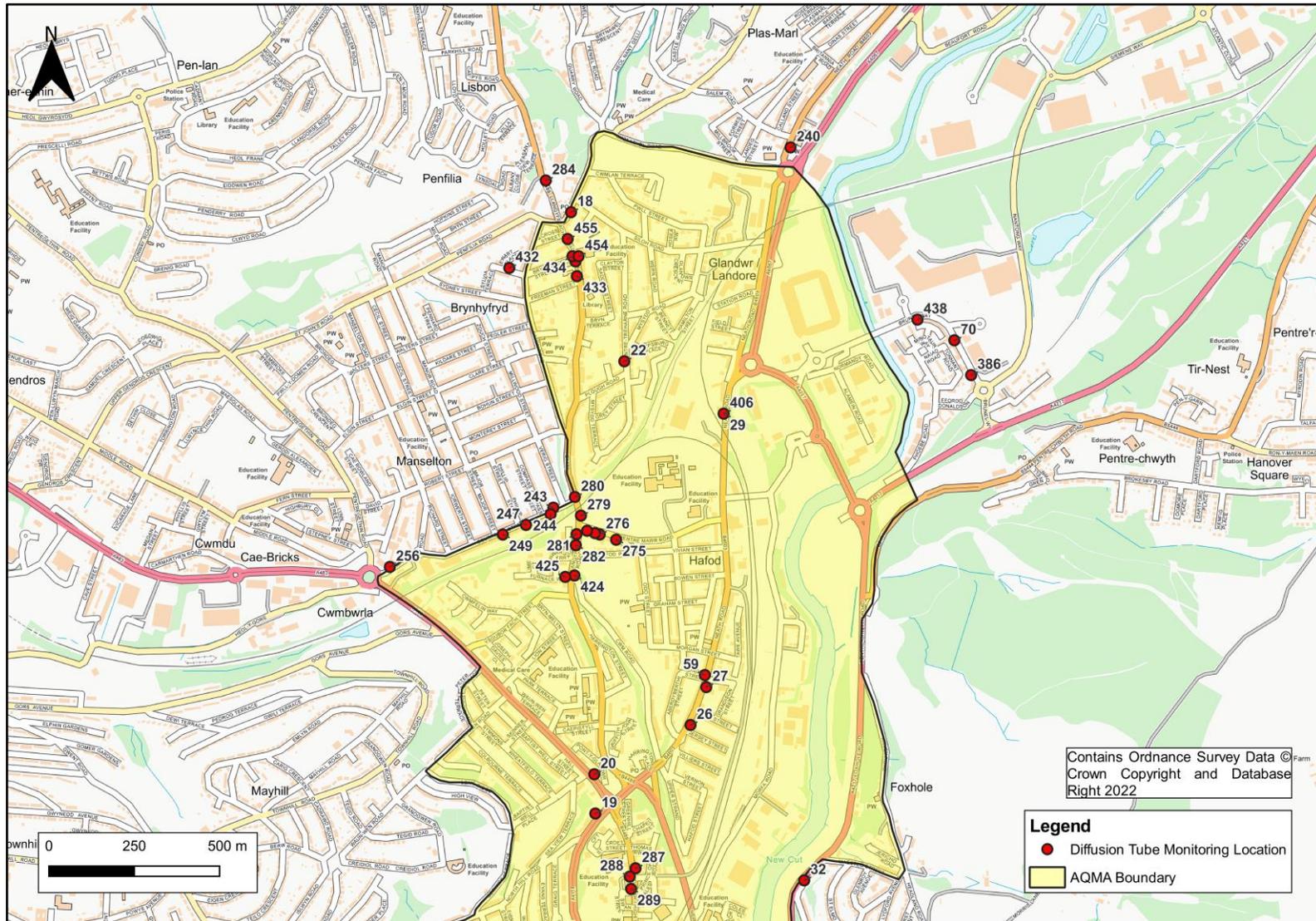


Figure 2.6 – Map of Non-Automatic Monitoring Sites (St Thomas and City Centre)



Figure 2.7 – Map of Non-Automatic Monitoring Sites (Uplands and City Centre West)

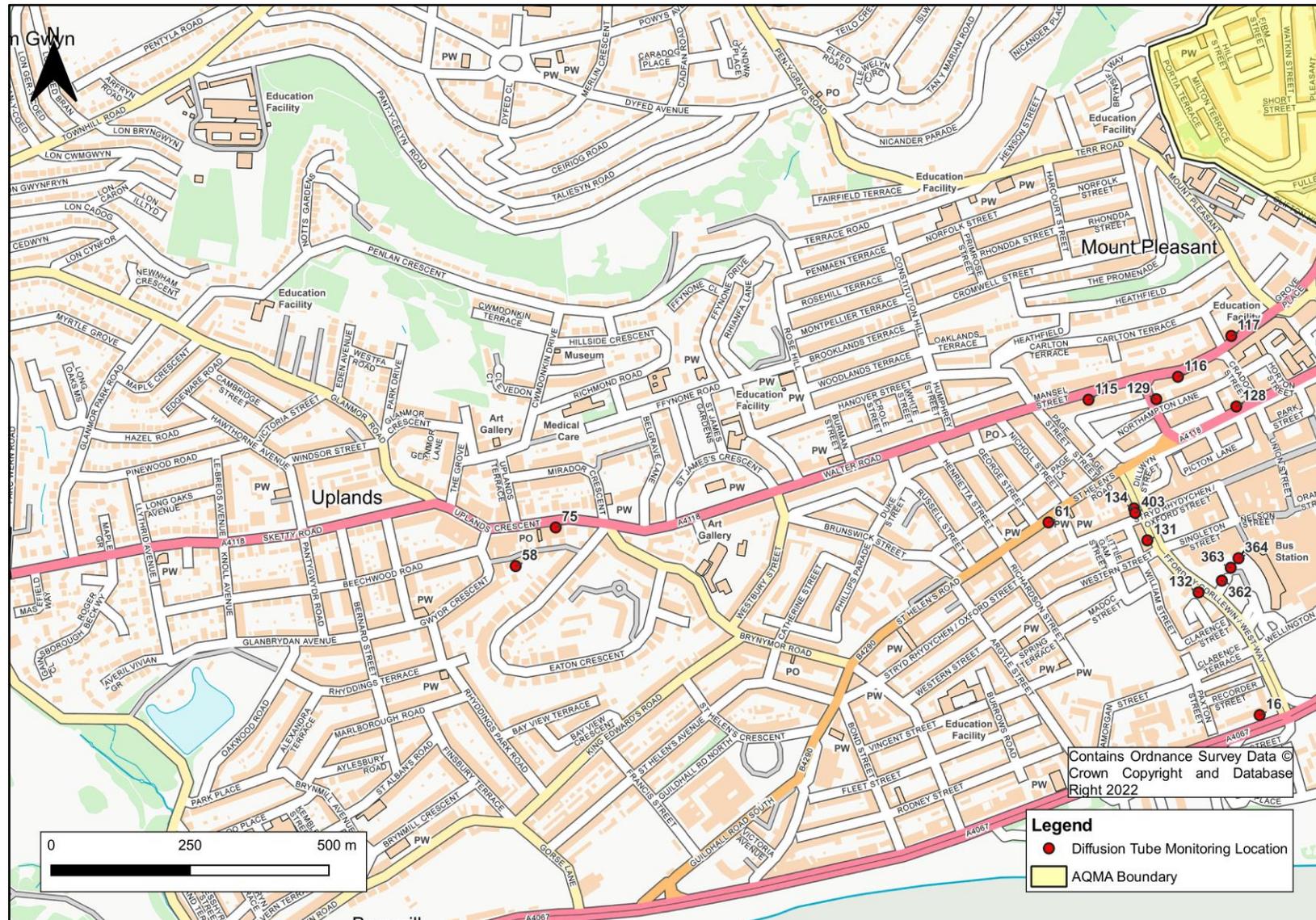


Figure 2.8 – Map of Non-Automatic Monitoring Sites (Sketty)

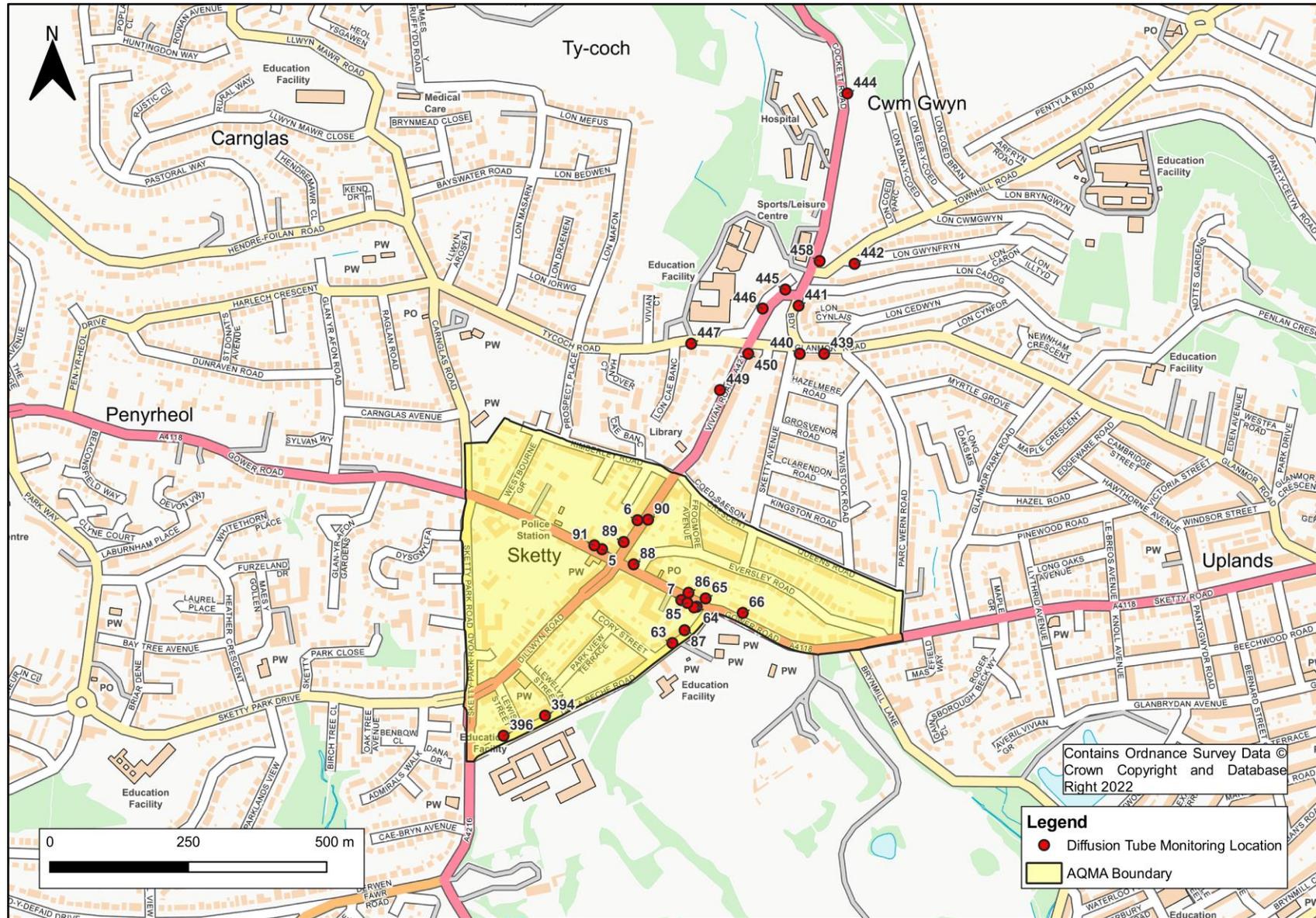


Figure 2.9 – Map of Non-Automatic Monitoring Sites (The Mumbles)

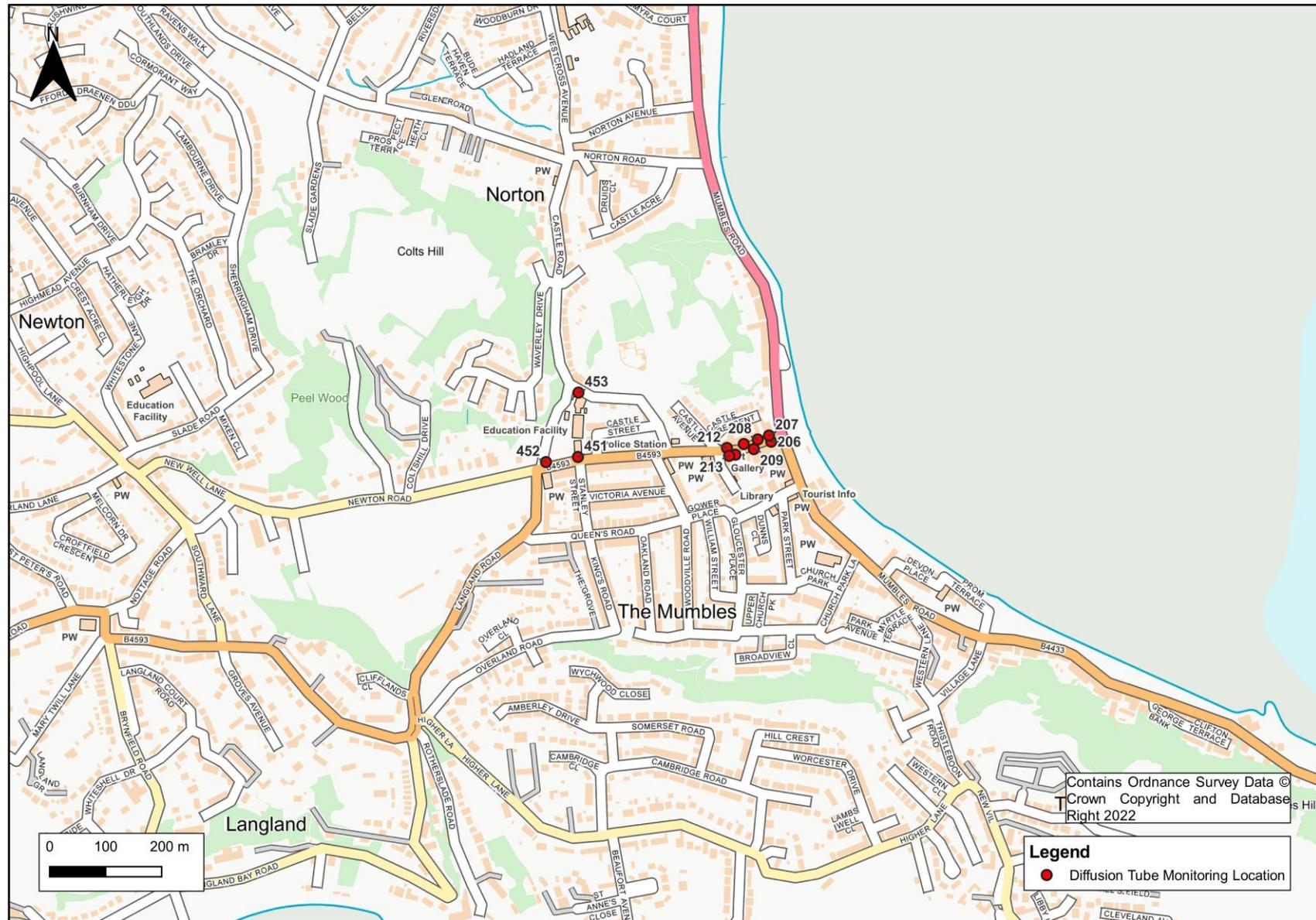
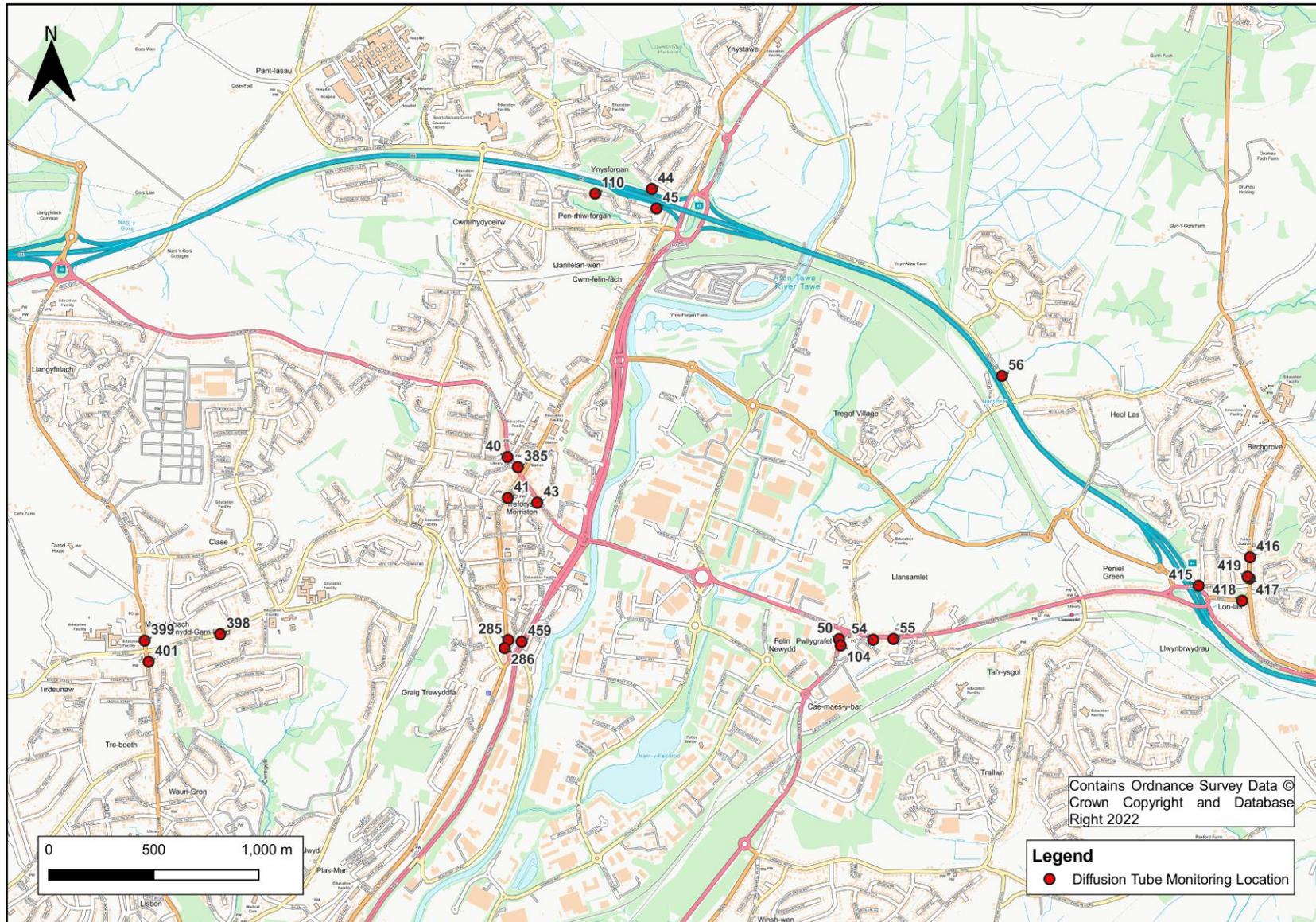


Figure 2.10 – Map of Non-Automatic Monitoring Sites (North Swansea)



2022 Air Quality Monitoring Results

Table 2.3 – Annual Mean NO₂ Monitoring Results (µg/m³)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
CM1	Roadside	Automatic	93.2	93.2	18.7 (23.50) ³	24.1	17.6	19.2	19.3
CM2	Roadside	Automatic	94.4	94.4	18.1 (23.50) ³	23.5	11.4	21.3	20.6
CM3	Urban Background	Automatic	99.2	99.2	14.5	13.1	10.5	11.3	12.8
CM4	Roadside	Automatic	41.5	41.5	37.3	34.8	28.8	31.4	36.2
CM5	Roadside	Automatic	82.2	82.2	30.3	34.6	25.6	35.0	28.4
CM11	Roadside	Automatic	58.6	58.6	39 (45.87) ³	44.5	31.2	35.3	34.6
CM12	Roadside	Automatic	87.8	87.8	26.2	27.0	21.7	26.2	26.5
CM13	Roadside	Automatic	80.8	80.8	27 (34.50) ³	28.5	10.8	23.8	20.7
5	Roadside	Passive	92.3	92.3	25.5	24.3	16.2	20.4	19.6
6	Roadside	Passive	92.3	92.3	21.4	20.6	14.8	18.8	16.6
7	Roadside	Passive	92.3	92.3	34.2	33.8	24.2	29.5	26.2
8	Roadside	Passive	100	100	33.6	37.1	26.7	33.2	28.7
10	Roadside	Passive	100	100	19.8	18.5	13.6	18.7	14.8
11	Roadside	Passive	92.3	92.3	28.4	27.8	20.4	24.7	24.5
12	Roadside	Passive	67.0	67.0	33.2	33.8	24.3	30.5	27.1
16	Roadside	Passive	92.3	92.3	23.6	23.3	16.5	22.1	19.8
18	Roadside	Passive	100	100	36.1	36.6	28.5	32.7	29.1
19	Roadside	Passive	82.7	82.7	36.7	35.2	24.5	29.1	29.0
20	Roadside	Passive	100	100	29.3	28.4	20.6	25.9	25.2
22	Roadside	Passive	100	100	24.8	22.4	17.8	21.3	19.8
26	Roadside	Passive	100	100	27.7	28.1	21.7	27.4	25.4
27	Roadside	Passive	92.3	92.3	28.9	28.9	21.8	27.0	24.1
29	Roadside	Passive	92.6	92.6	24.3	25.4	18.6	22.5	19.4
32	Roadside	Passive	83.0	83.0	26.1	26.9	19.8	22.8	22.6
33	Roadside	Passive	100	100	25.3	25.1	19.8	23.7	21.1

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
35	Roadside	Passive	65.4	65.4	27.0	27.4	20.6	25.0	23.1
36	Roadside	Passive	84.6	84.6	22.8	22.6	18.0	21.2	18.8
40	Roadside	Passive	67.6	67.6	20.4	19.9	14.3	17.7	15.6
41	Roadside	Passive	82.7	82.7	28.1	27.4	22.8	26.1	22.6
43	Roadside	Passive	90.1	90.1	27.7	26.4	20.9	25.2	22.7
44	Roadside	Passive	100	100	21.0	21.7	15.5	18.5	16.4
45	Roadside	Passive	92.3	92.3	22.9	23	18.2	21.4	18.4
48	Roadside	Passive	77.2	77.2	18.2	16.9	12.3	15.2	13.9
50	Roadside	Passive	84.6	84.6	28.7	26.3	21.4	24.6	22.1
54	Roadside	Passive	73.1	73.1	26.3	24.5	19.7	23.6	20.7
55	Roadside	Passive	92.3	92.3	26.4	24.6	19.5	25.2	20.5
56	Roadside	Passive	100	100	27.5	27.7	23.1	24.0	22.0
58	Roadside	Passive	100	100	24.6	30.0	20.2	25.4	22.7
59	Roadside	Passive	100	100	35.0	36.2	27.6	34.6	31.5
61	Roadside	Passive	92.3	92.3	26.0	27.5	20.5	25.3	23.4
63	Roadside	Passive	92.3	92.3	15.8	18.0	11.9	15.0	13.5
64	Roadside	Passive	74.7	74.7	31.1	32.1	19.2	24.7	25.7
65	Roadside	Passive	92.3	92.3	20.6	19.2	13.8	16.2	15.2
66	Roadside	Passive	92.3	92.3	20.5	20.6	16.5	19.4	17.9
67	Roadside	Passive	100	100	34.1	38.5	26.5	31.0	29.2
68	Roadside	Passive	92.3	92.3	25.1	26.5	18.8	23.8	22.6
70	Roadside	Passive	84.6	84.6	18.1	22.8	16.9	19.5	17.1
75	Roadside	Passive	92.3	92.3	28.0	27.2	21.2	23.2	22.4
84	Roadside	Passive	92.3	92.3	24.7	24.5	18.1	21.0	18.5
85	Roadside	Passive	82.7	82.7	26.1	24.6	18.9	21.1	20.5
86	Roadside	Passive	77.2	77.2	19.1	19.6	14.0	17.7	16.6
87	Roadside	Passive	92.3	92.3	14.3	14.4	9.3	12.1	10.6
88	Roadside	Passive	84.9	84.9	23.0	24.2	16.2	19.8	19.5
89	Roadside	Passive	82.7	82.7	17.0	16.8	12.5	16.1	12.3
90	Roadside	Passive	100	100	23.6	23.1	16.2	19.4	19.3
91	Roadside	Passive	100	100	25.2	21.3	15.0	18.8	18.1
94	Roadside	Passive	92.6	92.6	21.0	21.2	15.8	19.0	18.1
95	Roadside	Passive	92.3	92.3	18.5	17.9	13.5	17.8	15.8
96	Roadside	Passive	82.7	82.7	20.3	19.1	15.7	18.0	16.9
97	Roadside	Passive	84.6	84.6	26.0	24.7	19.5	22.0	20.8
98	Roadside	Passive	92.3	92.3	27.3	26.7	19.1	22.8	20.2

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
99	Roadside	Passive	100	100	23.8	23.1	16.1	19.7	17.4
104	Roadside	Passive	100	100	22.0	20.6	17.4	19.9	18.2
110	Roadside	Passive	100	100	19.7	18.7	14.2	17.1	15.5
115	Roadside	Passive	75.0	75.0	29.0	27.5	18.1	23.4	22.6
116	Roadside	Passive	92.3	92.3	32.0	28.9	21.6	29.5	25.6
117	Roadside	Passive	92.3	92.3	30.5	29.1	21.2	25.9	23.5
118	Roadside	Passive	90.4	90.4	25.8	24.2	16.1	18.7	15.8
121	Roadside	Passive	92.3	92.3	38.3	39.9	26.0	31.4	30.5
122	Roadside	Passive	69.2	69.2	29.0	28.5	19.7	24.0	21.8
123	Roadside	Passive	92.3	92.3	36.6	34.1	23.6	30.6	29.4
124	Roadside	Passive	92.3	92.3	33.1	33.3	21.0	27.4	26.2
125	Roadside	Passive	92.3	92.3	32.3	37.0	24.5	30.4	26.4
126	Roadside	Passive	92.3	92.3	26.1	28.8	20.1	24.4	24.7
128	Roadside	Passive	84.6	84.6	29.3	23.2	16.3	19.6	19.5
129	Roadside	Passive	92.3	92.3	29.7	27.8	19.2	23.4	21.6
131	Roadside	Passive	92.3	92.3	30.7	29.7	22.1	29.4	25.9
132	Roadside	Passive	75.0	75.0	25.8	24.5	17.8	23.3	22.9
134	Roadside	Passive	74.7	74.7	31.6	32.7	22.6	29.9	26.5
180	Roadside	Passive	100	100	24.7	23.8	17.5	22.2	19.3
182	Roadside	Passive	100	100	20.9	21.8	16.6	18.3	18.2
197	Roadside	Passive	90.4	90.4	26.6	25.9	18.4	22.7	19.5
198	Roadside	Passive	100	100	26.5	27.2	19.9	21.8	18.6
206	Roadside	Passive	100	100	30.4	30.0	22.4	26.3	24.0
207	Roadside	Passive	100	100	27.0	26.5	19.4	23.1	20.8
208	Roadside	Passive	92.3	92.3	28.6	26.0	19.3	23.9	19.6
209	Roadside	Passive	100	100	29.3	27.3	18.8	24.7	21.8
210	Roadside	Passive	100	100	25.8	25.8	16.4	21.8	19.1
211	Roadside	Passive	100	100	25.6	23.5	17.4	22.0	19.7
212	Roadside	Passive	92.3	92.3	19.4	17.7	12.8	15.8	14.7
213	Roadside	Passive	100	100	25.6	24.7	16.5	18.1	17.7
240	Roadside	Passive	92.3	92.3	25.4	24.3	18.6	22.9	21.2
242	Roadside	Passive	100	100	33.2	32.5	21.4	30.1	28.3
243	Roadside	Passive	100	100	28.6	27.9	22.0	26.5	24.3
244	Roadside	Passive	92.6	92.6	35.8	33.3	27.7	32.3	29.1
247	Roadside	Passive	65.1	65.1	26.0	24.0	19.6	20.9	20.2
249	Roadside	Passive	100	100	25.0	23.3	18.8	21.9	19.2

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
256	Roadside	Passive	80.5	80.5	31.7	31.0	23.8	27.2	26.7
275	Roadside	Passive	100	100	17.6	19.6	14.8	19.2	15.9
276	Roadside	Passive	100	100	25.7	24.2	19.4	24.2	21.3
277	Roadside	Passive	100	100	27.6	26.0	20.3	24.2	22.1
278	Roadside	Passive	92.3	92.3	27.9	25.0	20.2	23.7	21.7
279	Roadside	Passive	100	100	37.5	34.0	22.6	31.1	29.4
280	Roadside	Passive	92.3	92.3	31.6	31.1	24.1	27.8	27.9
281	Roadside	Passive	100	100	27.6	32.1	23.2	29.6	26.6
282	Roadside	Passive	84.6	84.6	25.9	32.8	25.9	29.4	26.0
284	Roadside	Passive	100	100	25.0	22.5	19.2	22.3	20.9
285	Roadside	Passive	84.6	84.6	26.5	26.2	20.2	23.5	22.3
286	Roadside	Passive	90.4	90.4	26.6	24.3	19.4	22.0	21.2
287	Roadside	Passive	92.6	92.6	24.0	23.7	17.4	24.2	21.4
288	Roadside	Passive	84.6	84.6	26.8	27.2	18.6	23.5	21.5
289	Roadside	Passive	100	100	26.9	27.3	20.2	26.4	21.9
291	Roadside	Passive	90.1	90.1	32.3	33.2	23.3	28.0	24.2
295	Roadside	Passive	90.1	90.1	23.7	27.1	19.5	22.9	20.7
296	Roadside	Passive	63.2	63.2	28.2	27.6	19.5	26.4	23.3
323	Roadside	Passive	100	100	26.4	27.3	19.1	23.9	22.1
331	Roadside	Passive	84.9	84.9	32.5	30.0	21.2	27.1	25.1
334	Roadside	Passive	76.9	76.9	27.2	27.2	18.2	23.1	18.9
335	Roadside	Passive	76.9	76.9	25.4	24.8	17.5	23.2	19.9
336	Roadside	Passive	67.6	67.6	30.0	28.4	21.3	24.1	24.9
337	Roadside	Passive	84.6	84.6	29.1	35.6	25.9	26.4	30.5
338	Roadside	Passive	77.2	77.2	29.9	28.7	20.9	25.4	23.4
339	Roadside	Passive	76.9	76.9	33.1	32.7	23.4	28.1	25.7
340	Roadside	Passive	84.9	84.9	41.3	39.6	26.3	32.5	30.8
341	Roadside	Passive	67.3	67.3	31.0	34.8	25.1	31.2	28.2
342	Roadside	Passive	84.6	84.6	28.7	34.4	22.4	29.0	26.3
343	Roadside	Passive	59.6	59.6	26.1	26.0	18.2	24.0	21.8
346	Roadside	Passive	77.2	77.2	29.8	28.8	17.8	23.5	21.2
347	Roadside	Passive	92.3	92.3	25.7	24.1	17.8	23.4	20.4
348	Roadside	Passive	100	100	28.0	27.0	19.8	25.8	22.3
349	Roadside	Passive	100	100	26.8	25.8	19.4	26.6	24.1
350	Roadside	Passive	84.6	84.6	31.1	28.8	23.4	30.9	29.5
356	Roadside	Passive	84.6	84.6	27.5	24.5	17.3	20.8	18.8

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
362	Roadside	Passive	67.3	67.3	34.3	31.4	19.8	28.8	26.3
363	Roadside	Passive	69.5	69.5	27.0	26.5	15.0	23.7	20.2
364	Roadside	Passive	69.5	69.5	32.7	30.0	19.3	27.2	25.4
373	Roadside	Passive	100	100	27.3	25.2	18.4	23.6	20.6
375	Roadside	Passive	100	100	14.4	13.4	11.2	12.6	13.1
376	Roadside	Passive	100	100	24.8	23.6	18.8	23.6	17.9
377	Roadside	Passive	92.6	92.6	28.2	26.8	20.9	24.5	21.6
385	Roadside	Passive	92.3	92.3	20.6	21.0	16.1	19.4	16.3
386	Roadside	Passive	92.3	92.3	22.3	24.8	17.5	22.3	19.7
388	Roadside	Passive	100	100	16.0	16.2	11.1	13.0	11.4
390	Roadside	Passive	100	100	29.7	27.4	20.7	24.3	22.0
391	Roadside	Passive	100	100	22.4	24.2	18.6	21.8	20.7
394	Roadside	Passive	100	100	14.0	14.4	9.9	11.3	10.8
396	Roadside	Passive	72.8	72.8	16.2	17.0	11.5	13.3	12.3
398	Roadside	Passive	92.6	92.6	10.6	16	13.3	13.9	12.5
399	Roadside	Passive	90.1	90.1	19.1	26.6	18.4	22.8	19.9
401	Roadside	Passive	82.4	82.4	21.5	23.9	18.7	21.1	20.4
403	Roadside	Passive	84.9	84.9	29.6	30.0	19.8	26.5	25.2
404	Roadside	Passive	92.3	92.3	19.6	25.7	18.2	23.6	21.3
406	Roadside	Passive	92.3	92.3	30.9	29.1	26.4	29.3	27.9
407	Roadside	Passive	100	100	19.4	18.3	14.5	18.1	15.1
408	Roadside	Passive	90.1	90.1	30.7	32.2	22.1	27.4	24.1
412	Roadside	Passive	100	100	21.5	21.1	17.1	20.7	18.5
413	Roadside	Passive	100	100	24.3	23.8	17.9	23.8	16.7
415	Roadside	Passive	92.3	92.3	29.6	25.9	21.1	23.3	21.5
416	Roadside	Passive	100	100	20.3	18.2	14.9	16.2	14.2
417	Roadside	Passive	100	100	24.5	22.7	16.8	18.3	15.7
418	Roadside	Passive	92.3	92.3	24.6	21.0	16.9	20.2	15.2
419	Roadside	Passive	92.3	92.3	24.4	22.9	17.9	21.4	17.0
422	Roadside	Passive	100	100	18.1	16.9	12.3	14.7	12.3
423	Roadside	Passive	92.3	92.3	13.6	11.6	9.4	11.4	9.0
424	Roadside	Passive	76.9	76.9	23.3	20.5	16.3	18.5	16.1
425	Roadside	Passive	92.3	92.3	24.1	25.9	18.7	21.7	19.5
426	Roadside	Passive	92.3	92.3	-	33.1	26.0	29.8	23.8
427	Roadside	Passive	92.6	92.6	-	37.2	30.0	35.4	32.6
428	Roadside	Passive	84.9	84.9	-	12.7	9.7	12.5	10.5

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
429	Roadside	Passive	82.7	82.7	-	18.3	13.4	17.7	16.3
430	Roadside	Passive	100	100	-	12.1	10.0	10.8	10.2
431	Roadside	Passive	92.3	92.3	-	14.0	10.6	10.7	10.1
432	Roadside	Passive	100	100	-	17.6	13.7	15.8	13.8
433	Roadside	Passive	30.8	30.8	-	18.9	14.4	16.0	16.1
434	Roadside	Passive	100	100	-	23.4	18.0	22.0	19.3
435	Roadside	Passive	92.3	92.3	-	18.4	12.0	15.1	14.4
436	Roadside	Passive	92.6	92.6	-	17.8	14.4	16.5	15.8
437	Roadside	Passive	100	100	-	27.0	18.4	22.2	19.4
438	Roadside	Passive	100	100	-	21.3	15.8	18.7	16.5
439	Roadside	Passive	82.4	82.4	-	20.0	13.7	15.9	14.0
440	Roadside	Passive	50.0	50.0	-	19.7	13.3	16.8	13.4
441	Roadside	Passive	82.4	82.4	-	28.4	18.3	19.0	17.6
442	Roadside	Passive	84.9	84.9	-	22.7	16.9	17.6	16.7
444	Roadside	Passive	100	100	-	25.5	24.2	22.7	20.4
445	Roadside	Passive	100	100	-	35.9	23.5	24.8	22.6
446	Roadside	Passive	100	100	-	32.9	13.7	24.3	22.9
447	Roadside	Passive	100	100	-	19.9	16.8	13.5	12.7
448	Roadside	Passive	92.3	92.3	-	24.7	15.9	21.7	20.2
449	Roadside	Passive	74.7	74.7	-	22.9	18.6	26.1	19.4
450	Roadside	Passive	92.3	92.3	-	24.5	14.1	23.0	20.9
451	Roadside	Passive	100	100	-	-	10.4	16.2	15.3
452	Roadside	Passive	92.3	92.3	-	-	6.4	13.8	12.5
453	Roadside	Passive	92.3	92.3	-	-	16.3	7.2	6.5
454	Roadside	Passive	100	100	-	-	18.1	19.0	16.3
455	Roadside	Passive	90.1	90.1	-	-	16.2	23.2	19.6
458	Roadside	Passive	100	100	-	-	33.4	23.3	20.6
459	Roadside	Passive	92.3	92.3	-	-	11.7	39.3	37.7
460	Roadside	Passive	92.6	92.6	-	-	20.1	17.2	16.2
461	Roadside	Passive	100	100	-	-	-	-	9.1

Notes:

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

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

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%).
- (3) Concentrations that have been distance corrected.

Figure 2.11 – Trends in Annual Mean NO₂ Concentrations at Automatic Monitoring Sites

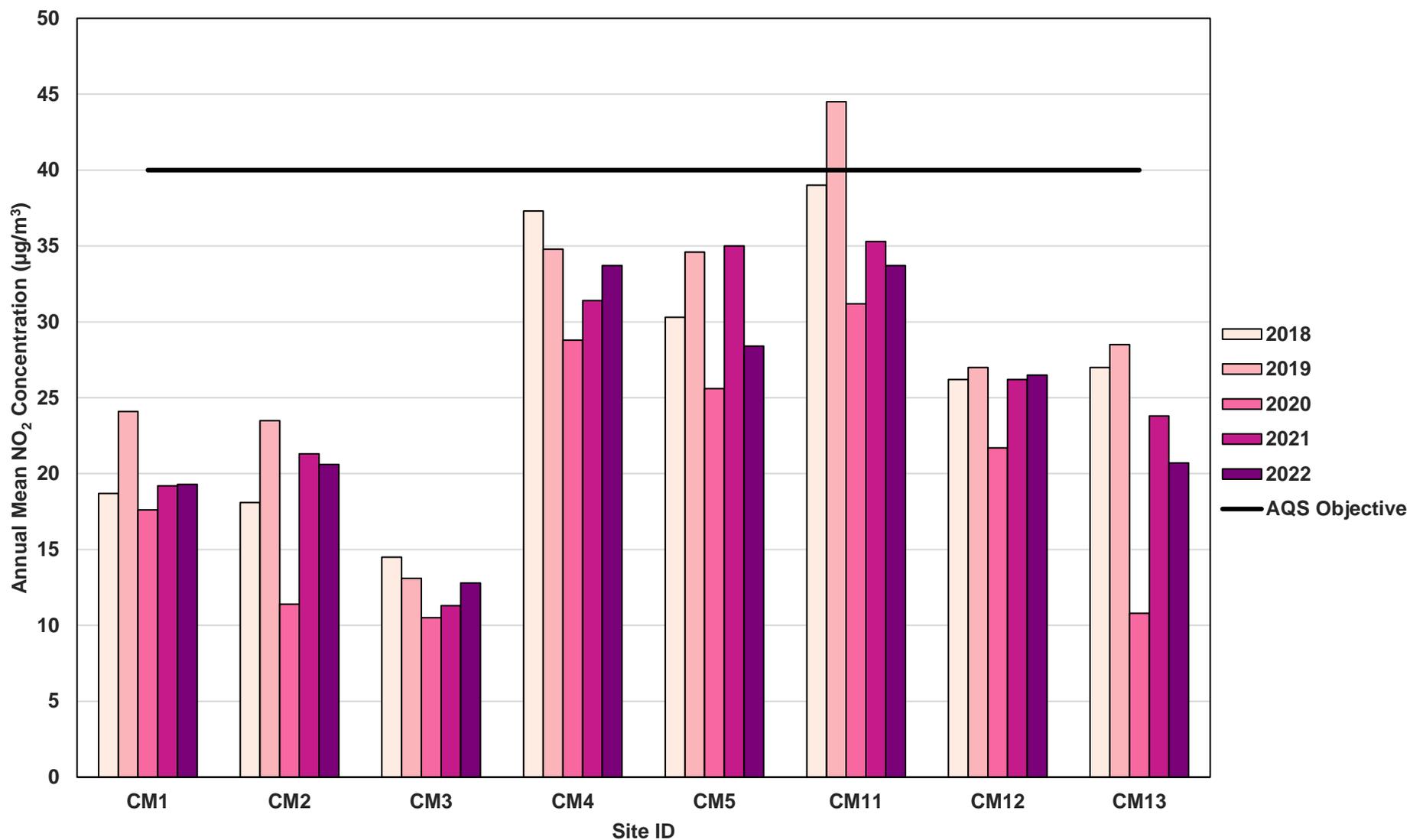


Figure 2.12 – Trends in Annual Mean NO₂ concentrations in Hafod and Landore

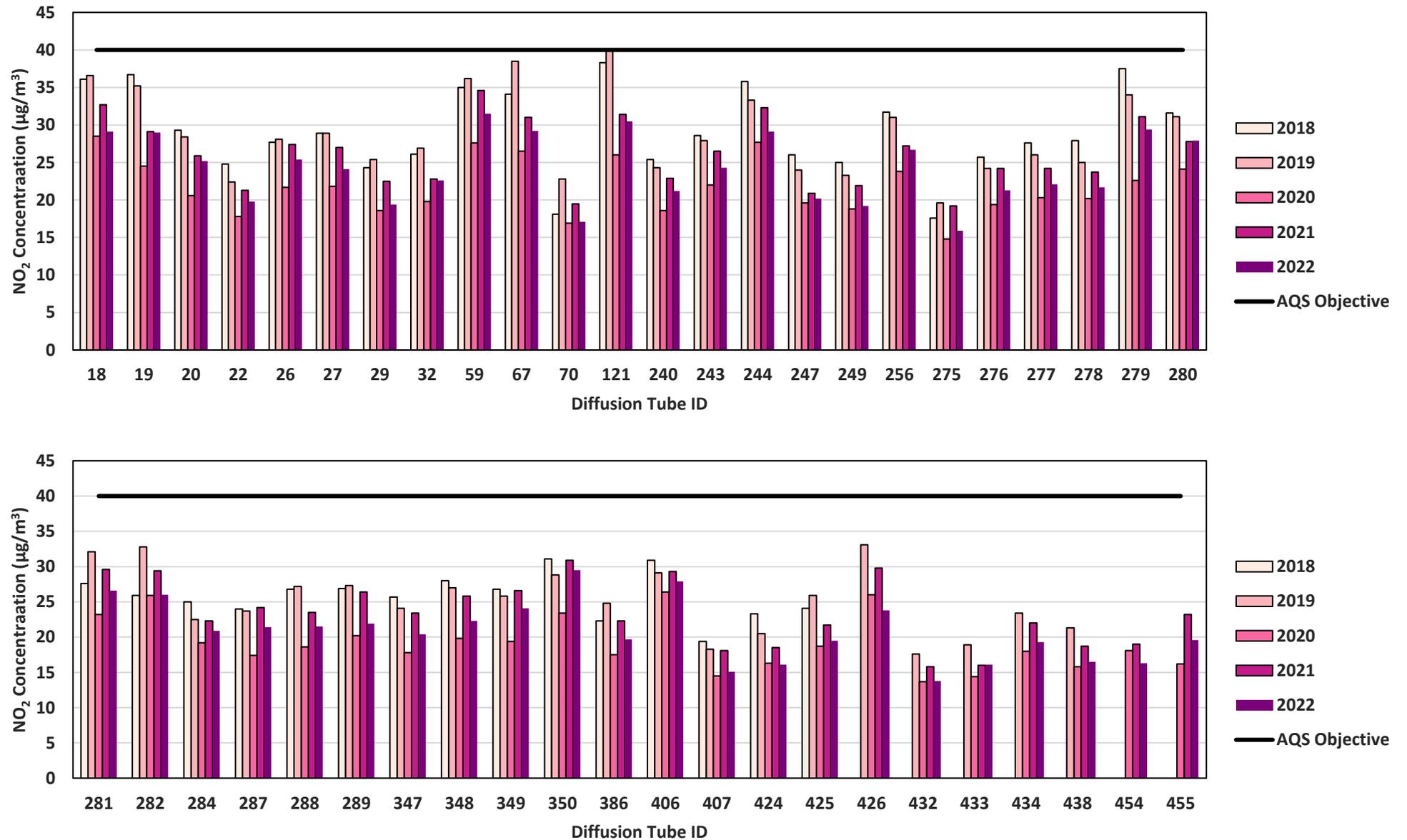


Figure 2.13 – Trends in Annual Mean NO₂ concentrations in Fforestfach

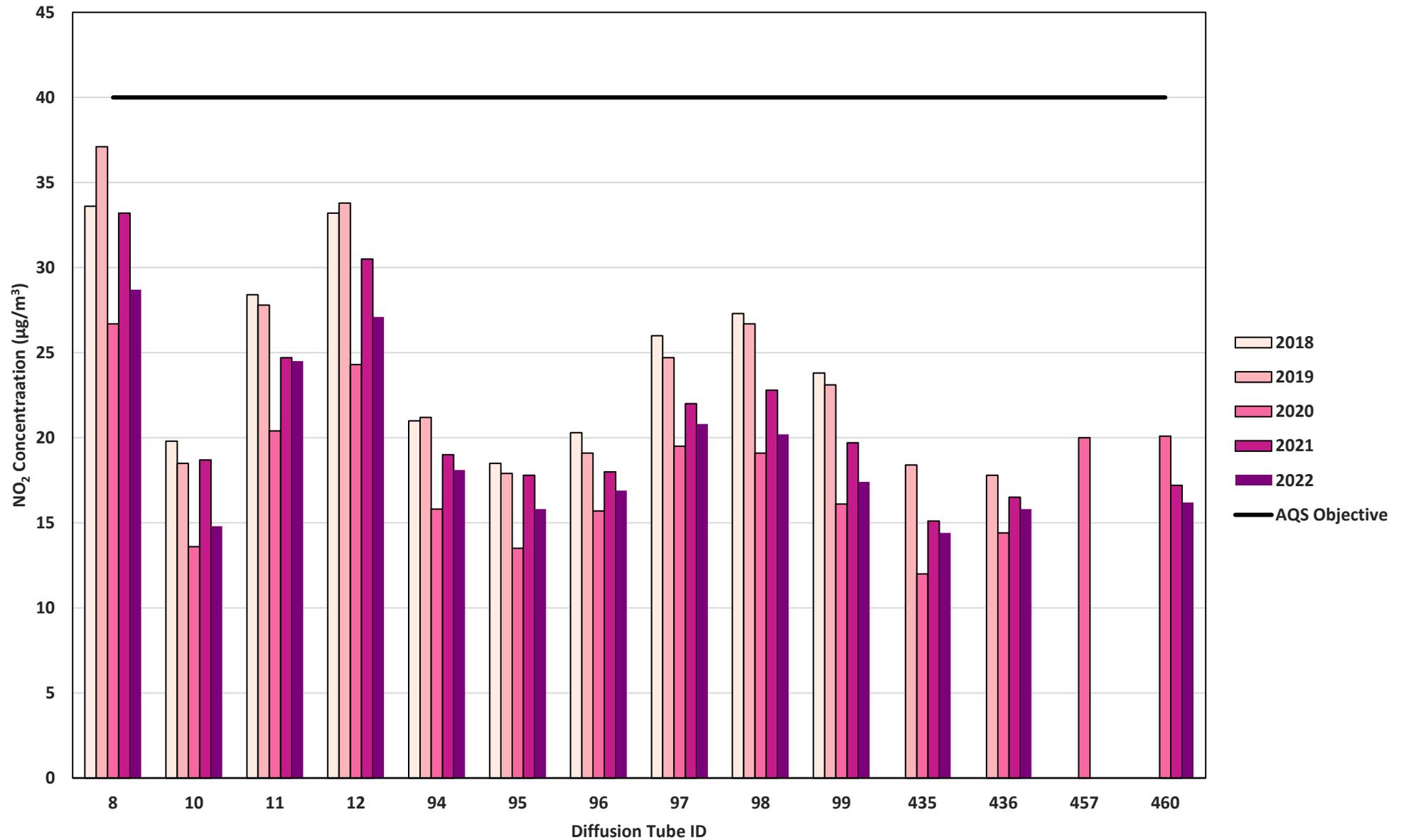


Figure 2.14 – Trends in Annual Mean NO₂ concentrations in Sketty

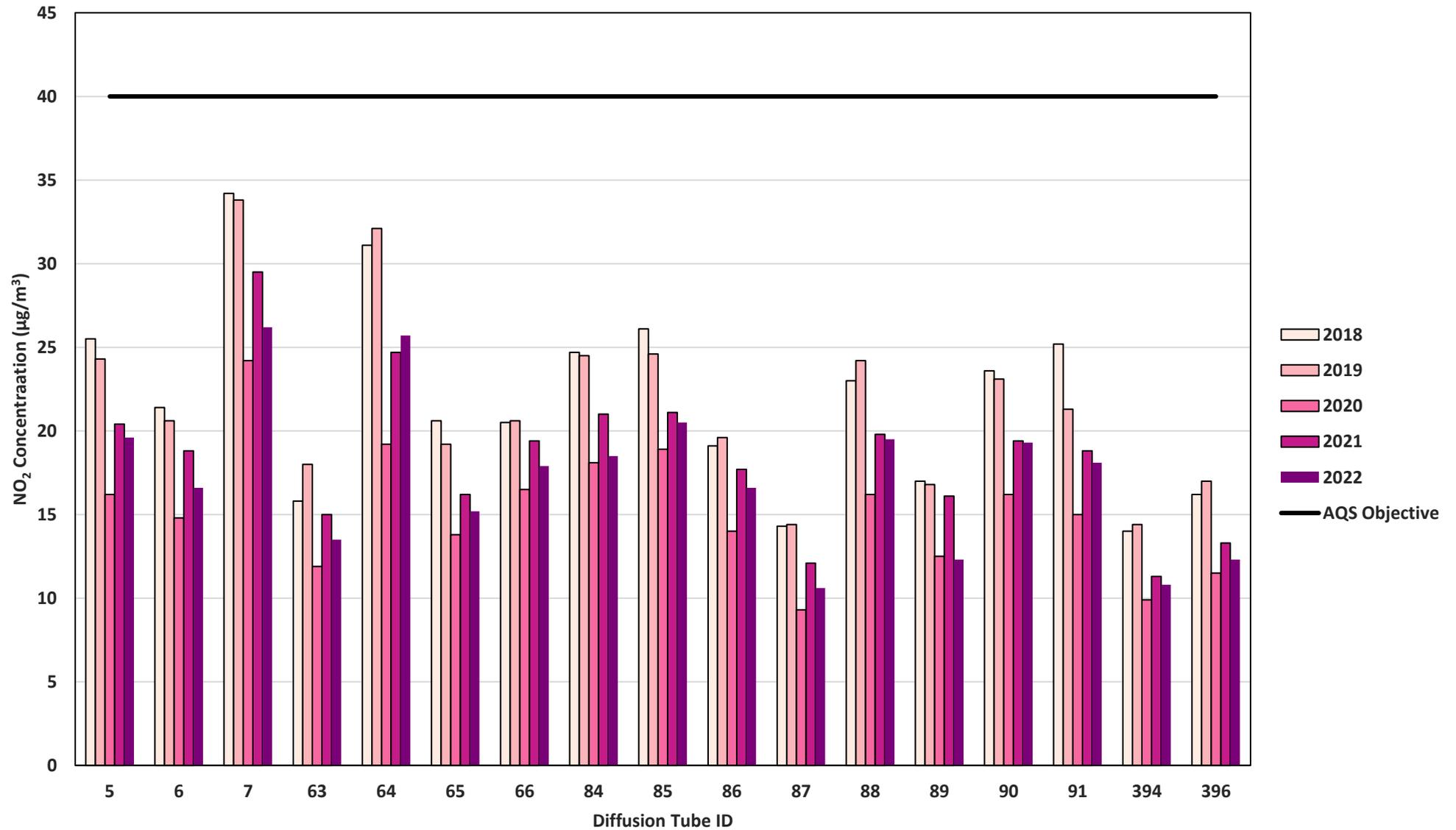


Figure 2.15 – Trends in Annual Mean NO₂ concentrations in St Thomas

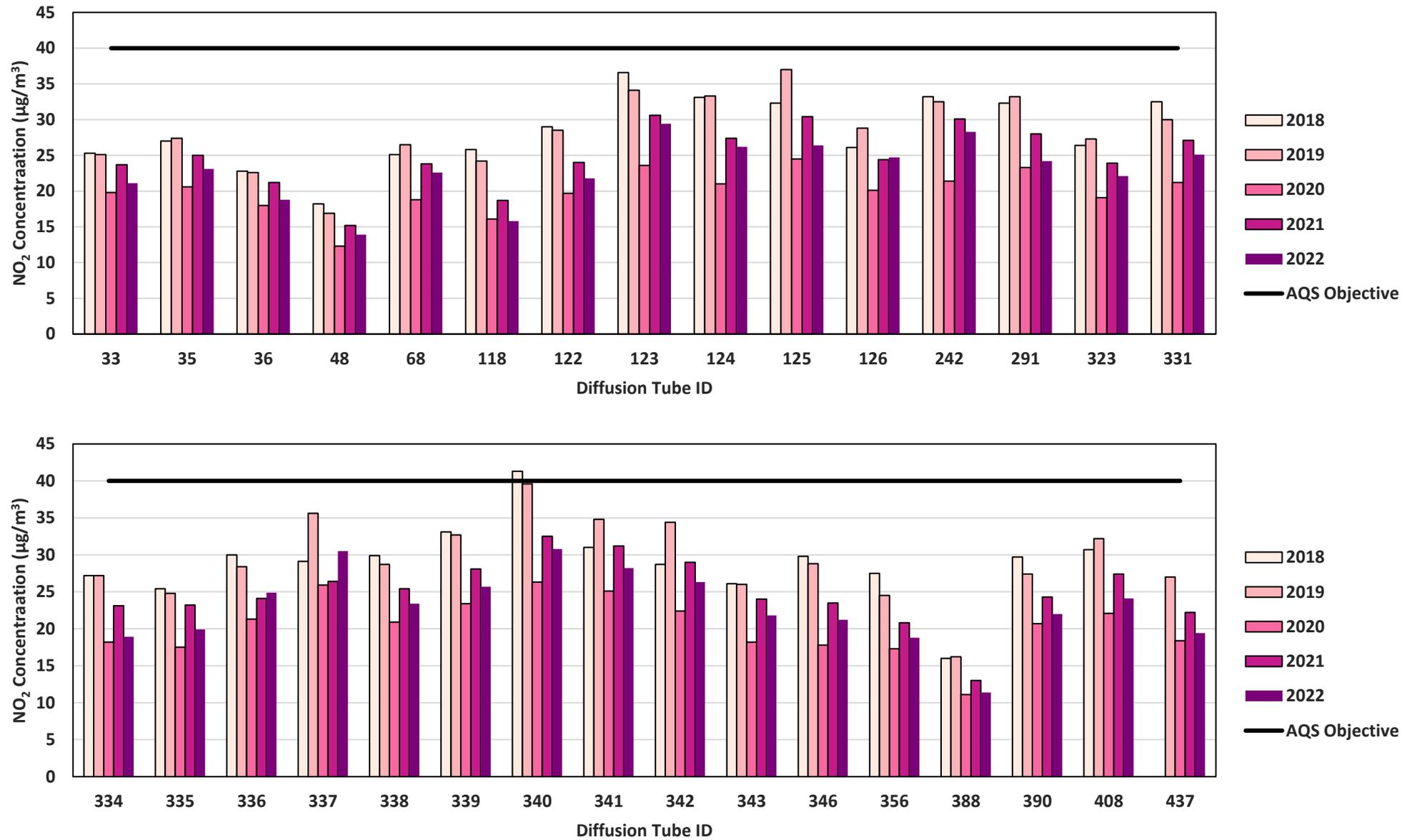


Figure 2.16 – Trends in Annual Mean NO₂ concentrations in Uplands and City Centre West

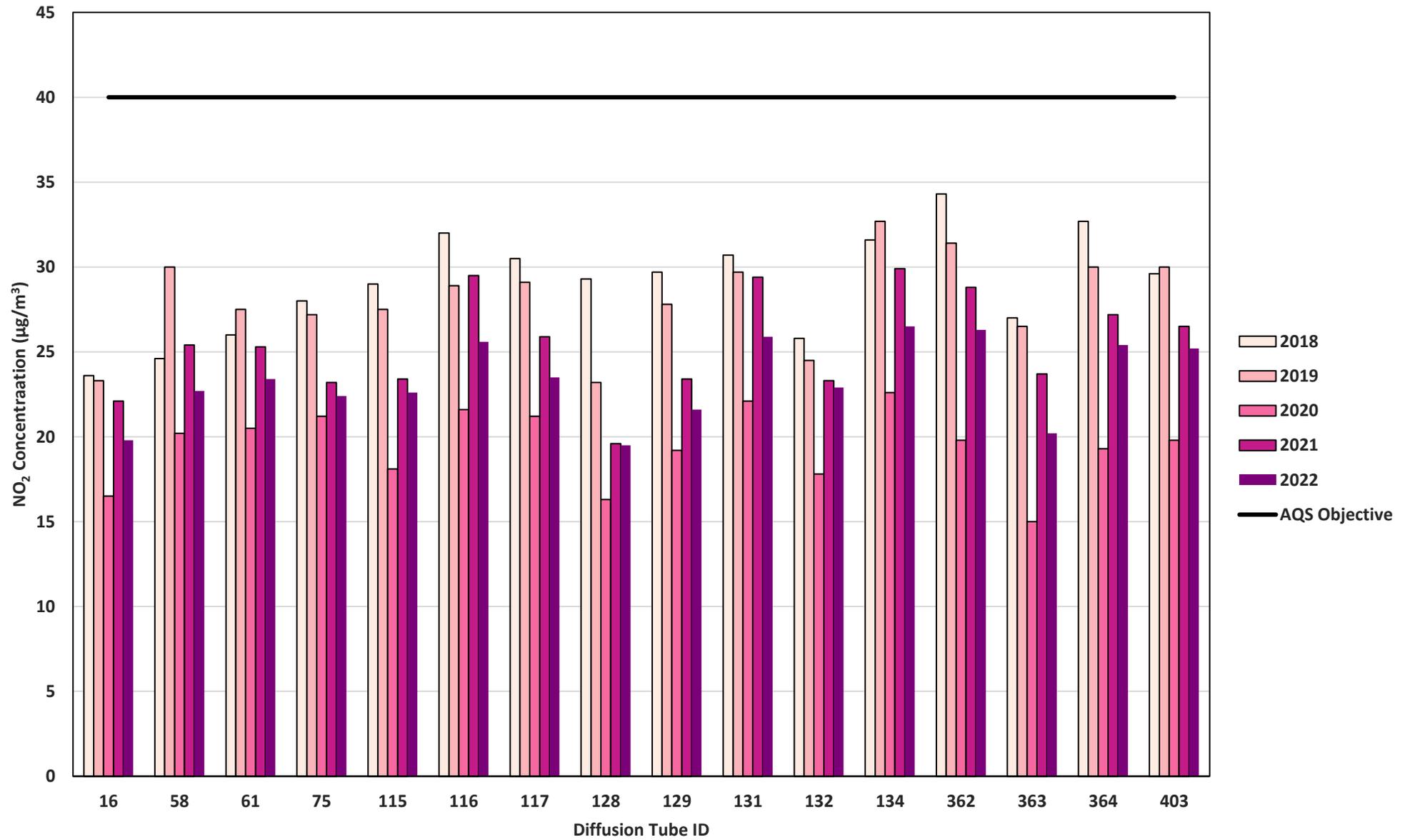


Figure 2.17 – Trends in Annual Mean NO₂ concentrations in North Swansea

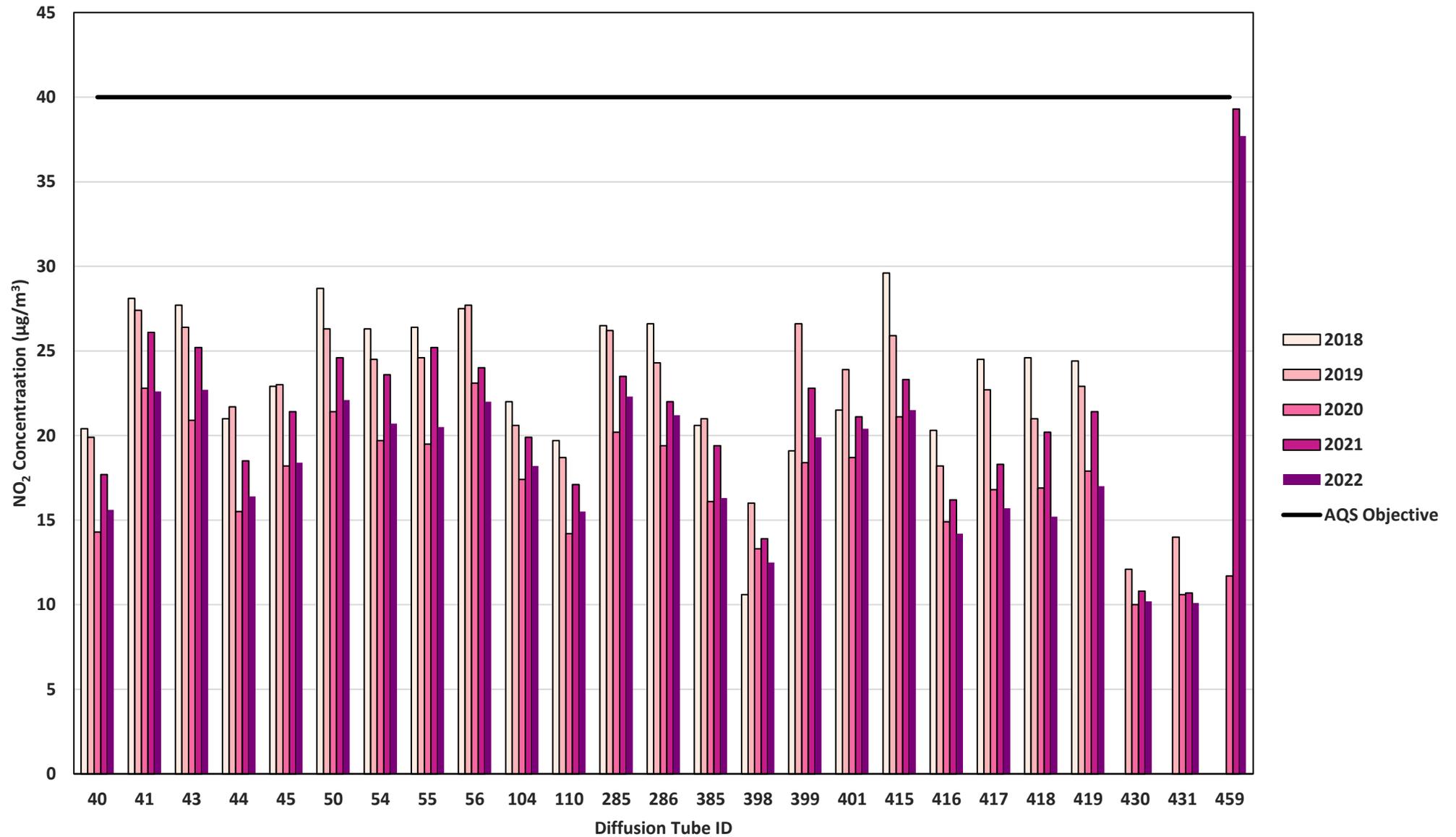


Figure 2.18 – Trends in Annual Mean NO₂ concentrations in Gorseinon and Gowerton

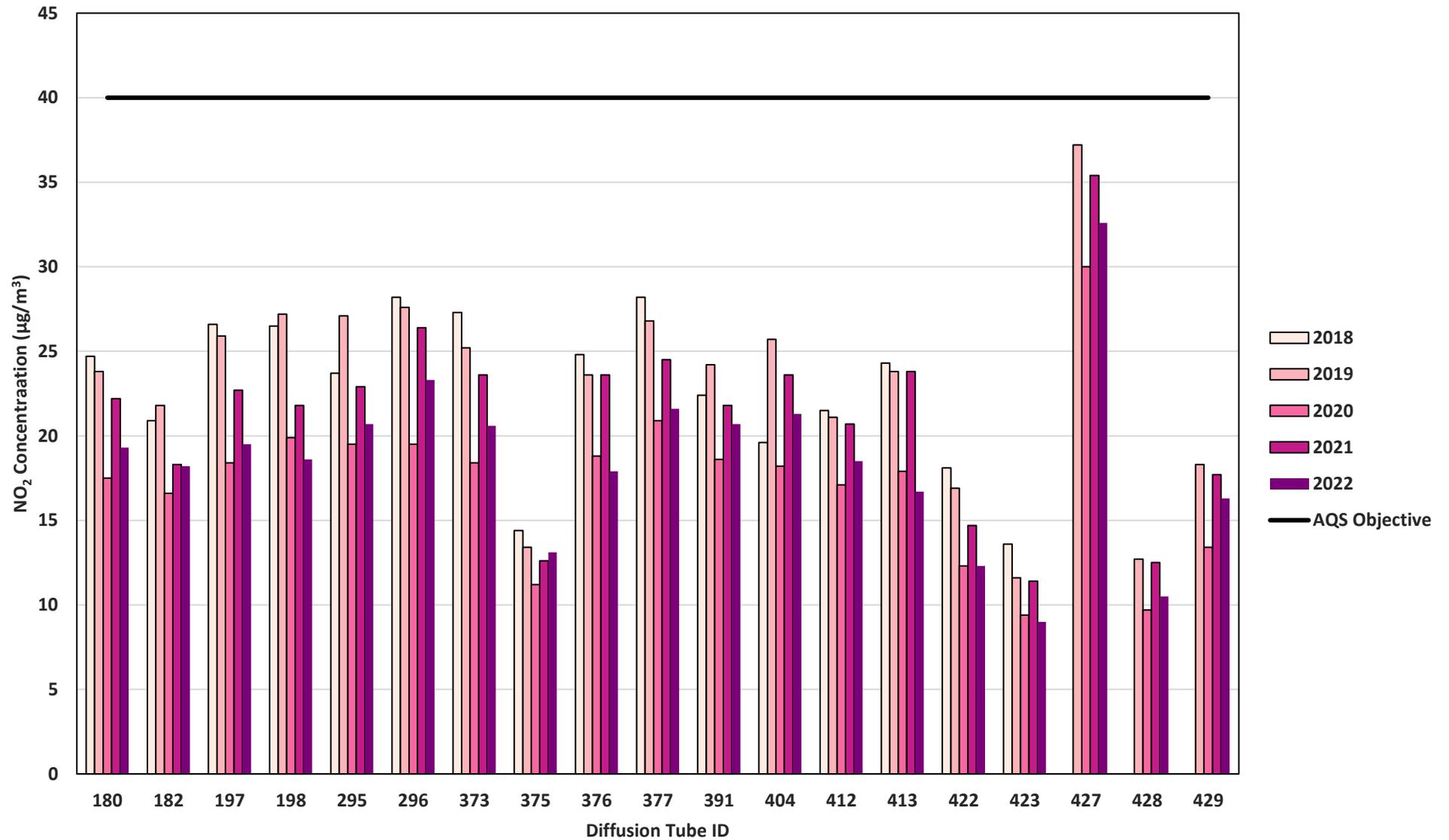


Figure 2.19 – Trends in Annual Mean NO₂ concentrations in The Mumbles

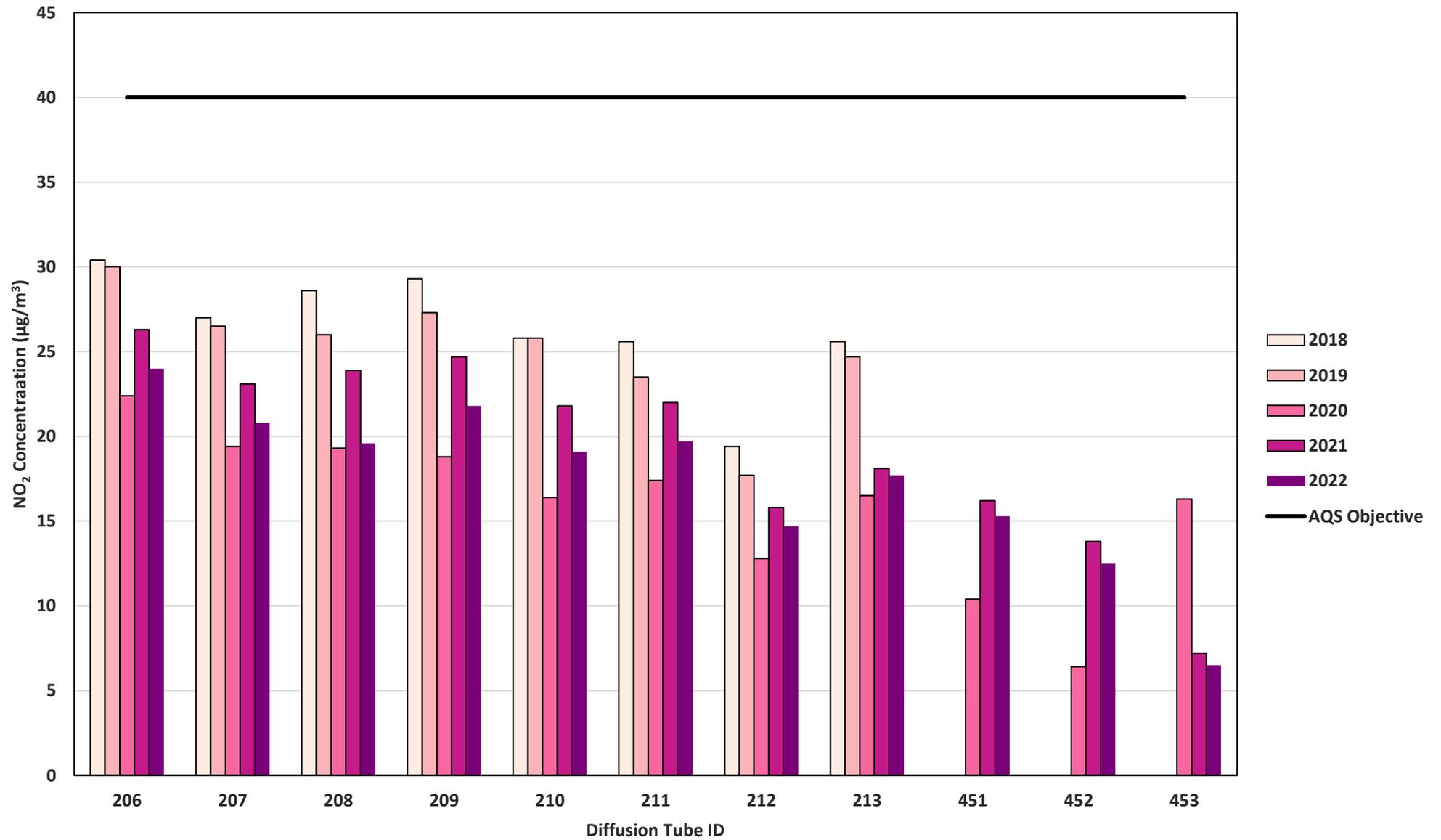


Figure 2.20 – Trends in Annual Mean NO₂ concentrations at New Diffusion Tube Sites

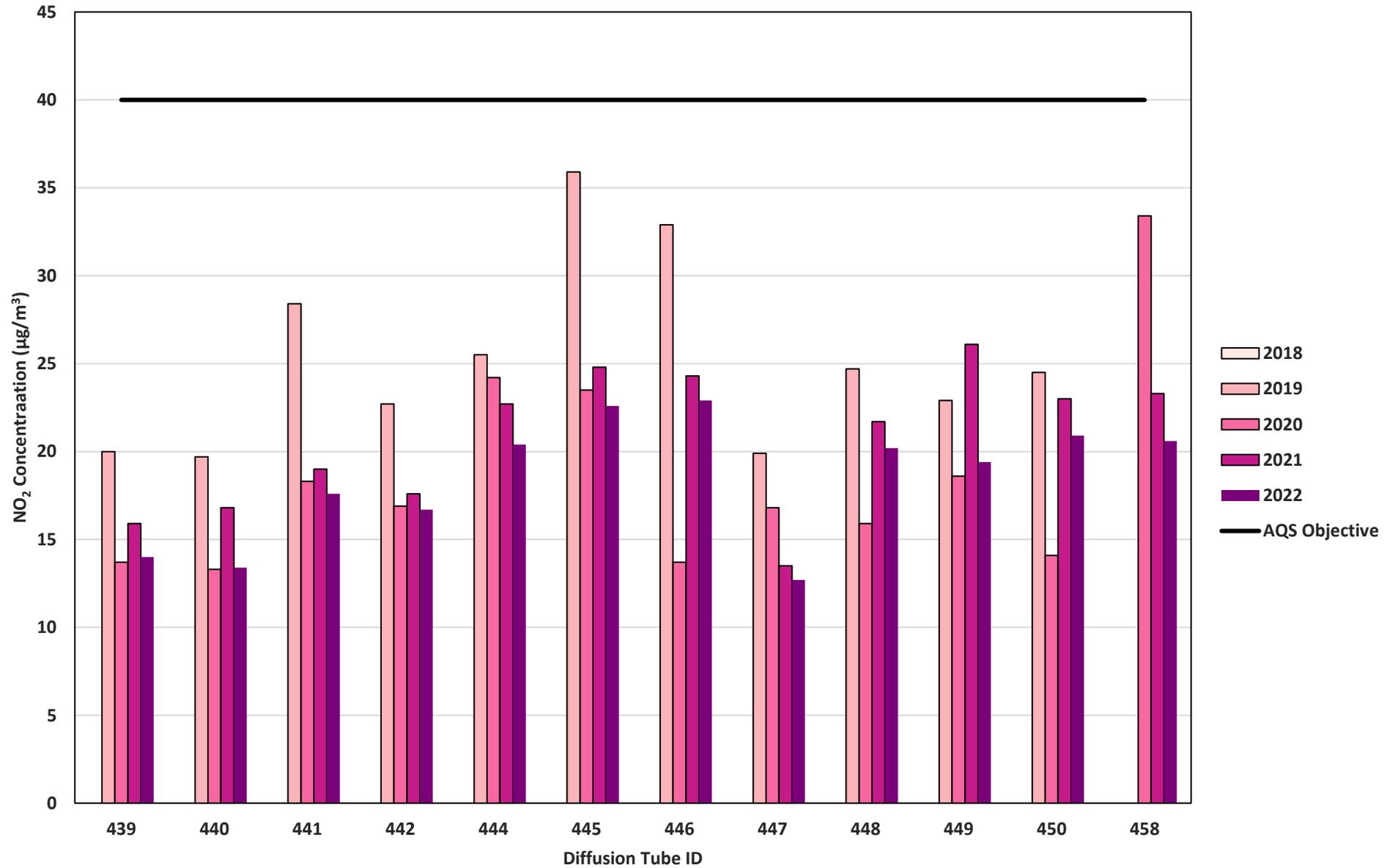
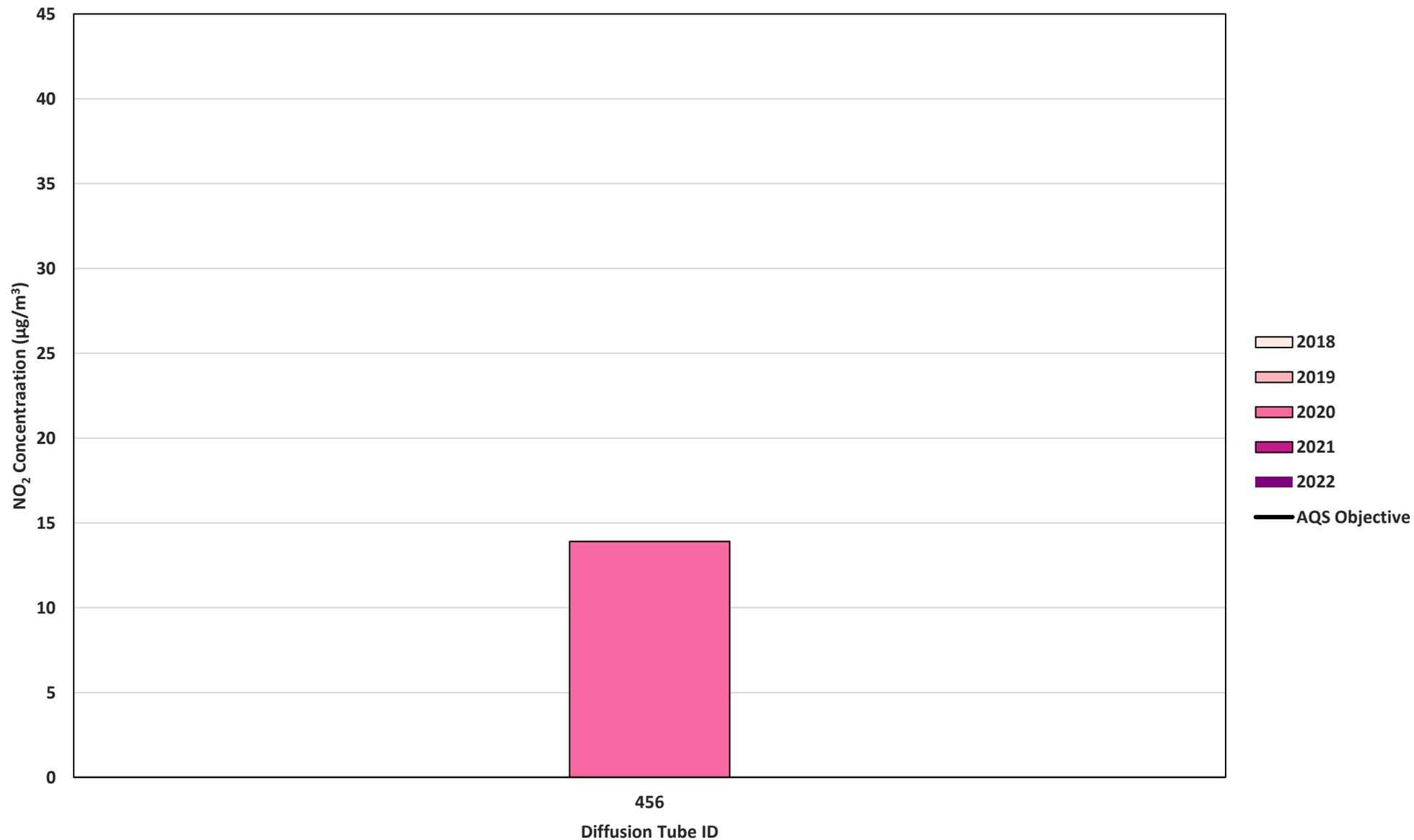


Figure 2.21 – Trends in Annual Mean NO2 concentrations in Blackpill



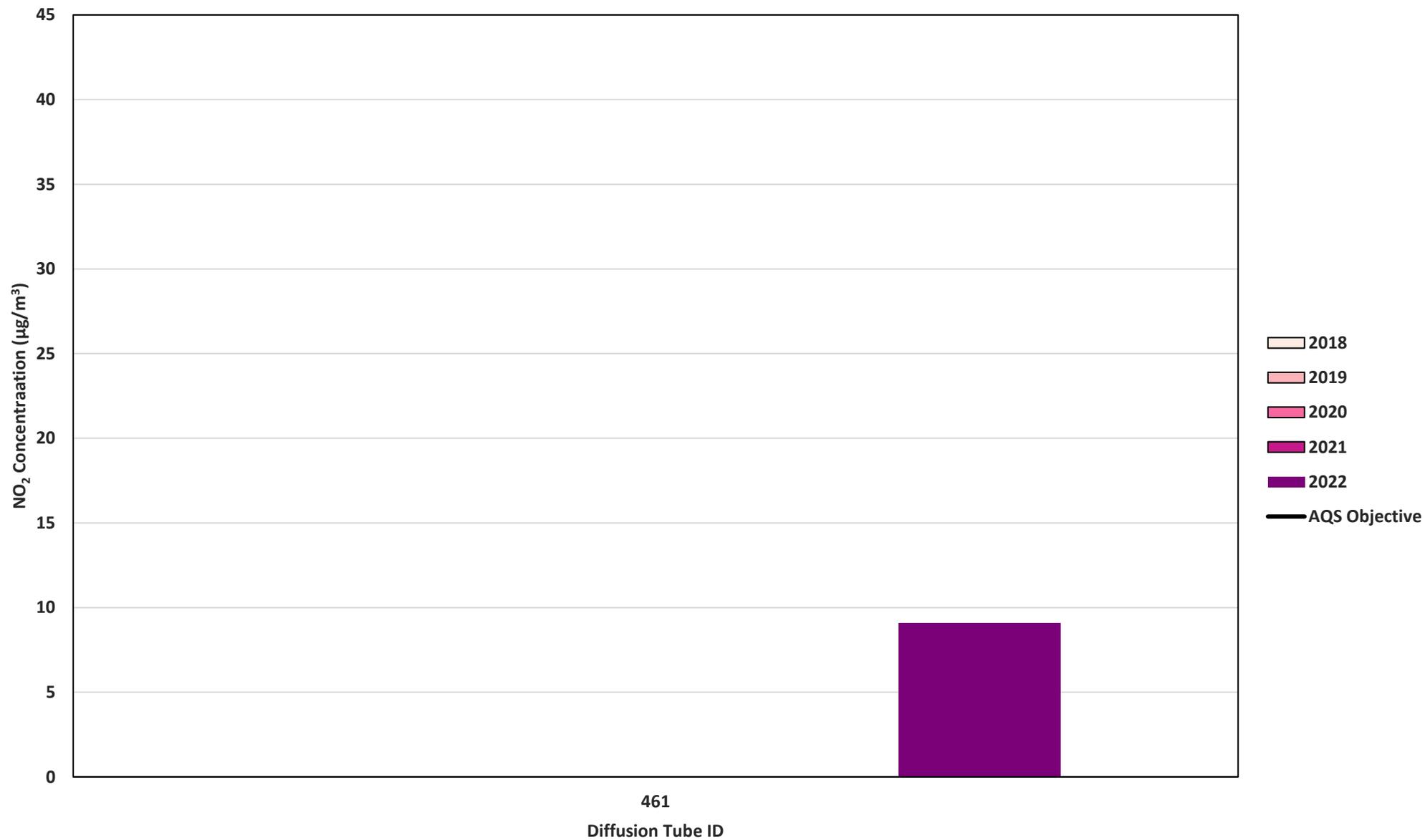


Table 2.4 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
CM1	Roadside	Automatic	93.2	93.2	0	0	0	0	0
CM2	Roadside	Automatic	94.4	94.4	0	0	3	0	0
CM3	Urban Background	Automatic	99.2	99.2	0	0	1	0	0
CM4	Roadside	Automatic	41.5	41.5	1 (34.60)	0	0	0	0 (152)
CM5	Roadside	Automatic	82.2	82.2	0	0	0	0 (97)	0 (123)
CM11	Roadside	Automatic	58.6	58.6	0 (35.69)	0 (100)	0	0	0 (113)
CM12	Roadside	Automatic	87.8	87.8	0	0	1	0 (109)	0
CM13	Roadside	Automatic	80.8	80.8	0	1	0	0	0 (78)

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ 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 PM₁₀ Monitoring Results (µg/m³)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
CM1	Roadside	91.0	91.0	19.7	18.4	18.3	18.1	18.4
CM6	Roadside	-	-	9.9	17.4	17.7	15.8	-
CM7	Roadside	91.3	91.3	12.5	15.1	15.6	15.3	13.0
CM8	Roadside	52.1	52.1	14.7	18.6	15.9	14.5	14.9
CM9	Roadside	-	-	11.4	16.0	18.3	14.5	-

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

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

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

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

Figure 2.1 – Trends in Annual Mean PM₁₀ Concentrations

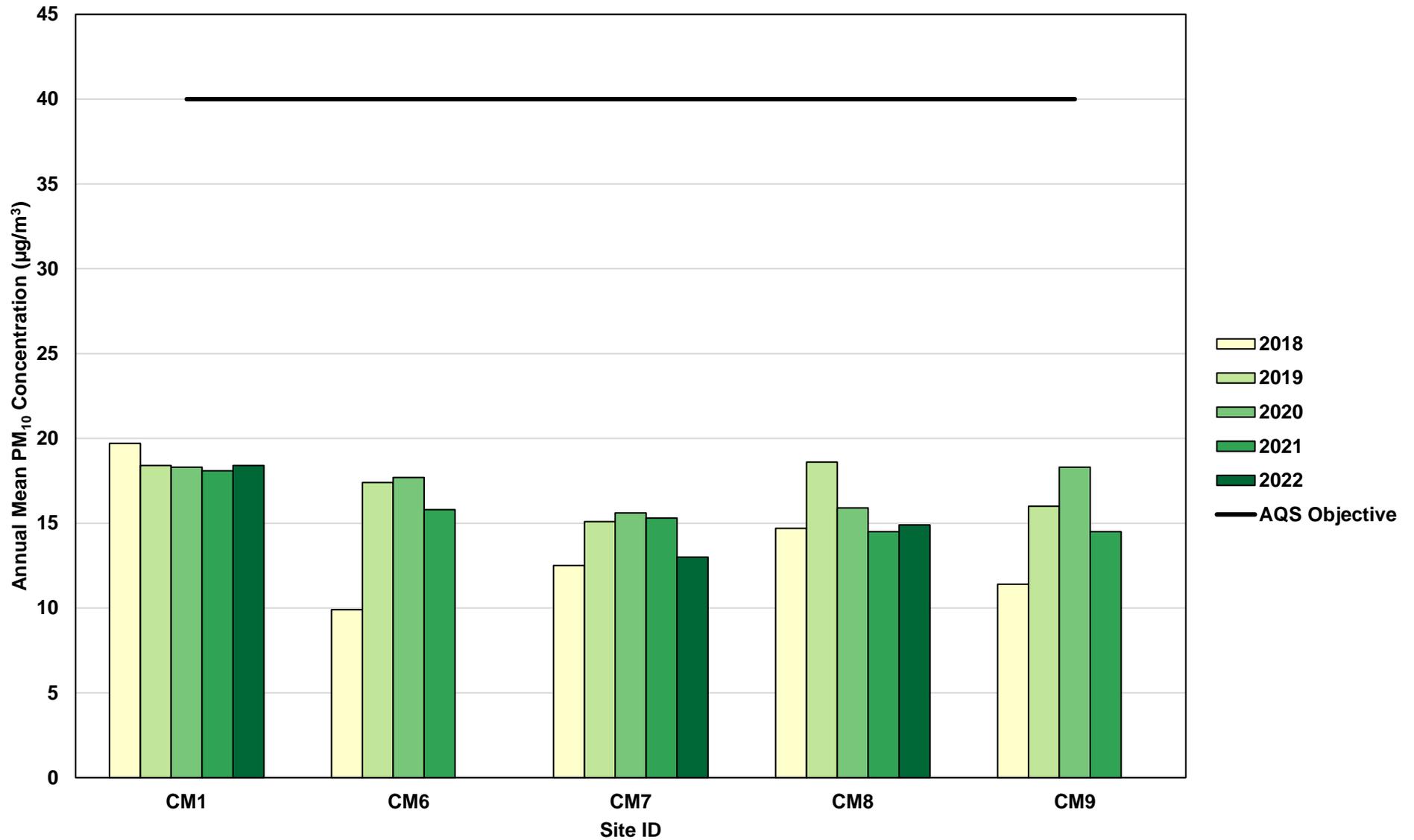


Table 2.6 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
CM1	Roadside	91.0	91.0	0	2	1	4	2
CM6	Roadside	-	-	0 (15.03)	0	1	1 (23.2)	-
CM7	Roadside	91.3	91.3	0 (18.55)	0	0 (25.0)	1	0
CM8	Roadside	52.1	52.1	0 (22.63)	3	0 (22.4)	1	1 (37.1)
CM9	Roadside	-	-	0 (17.83)	0 (22.8)	0	1 (21.1)	-

Notes:

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ 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%).

Figure 2.2 – Trends in Number of 24-Hour Mean PM₁₀ Results > 50µg/m³

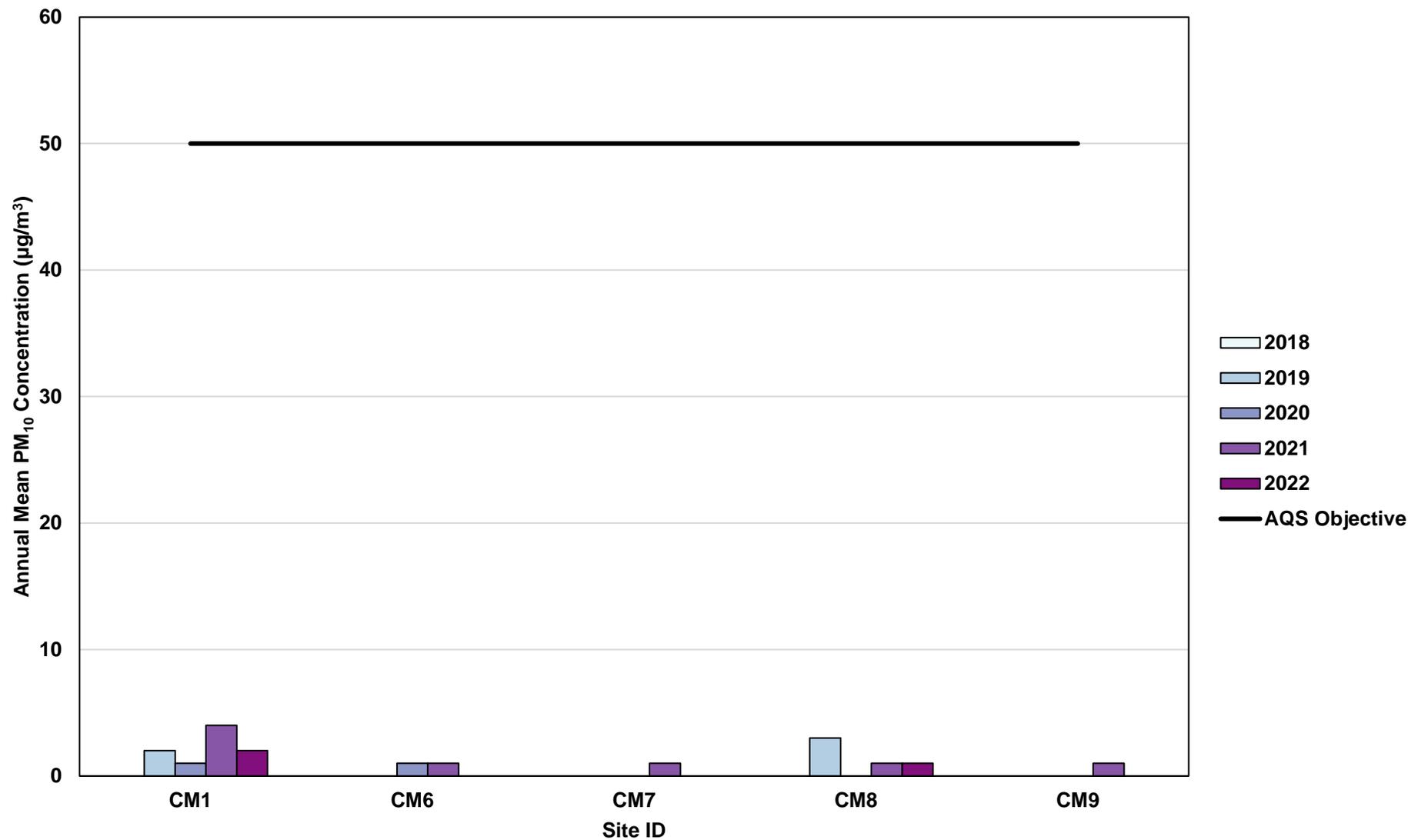


Table 2.7 – PM_{2.5} Monitoring Results (µg/m³)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
CM1	Roadside	83.1	83.1	12.9	9.9	7.9	9.1	9.9
CM2	Roadside	91.8	91.8	10.9	9.3	11.4	11.8	9.4
CM13	Roadside	91.0	91.0	7.3	9.5	10.8	11.0	11.3

Notes:

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

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

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

Figure 2.3 – Trends in Annual Mean PM_{2.5} Concentrations

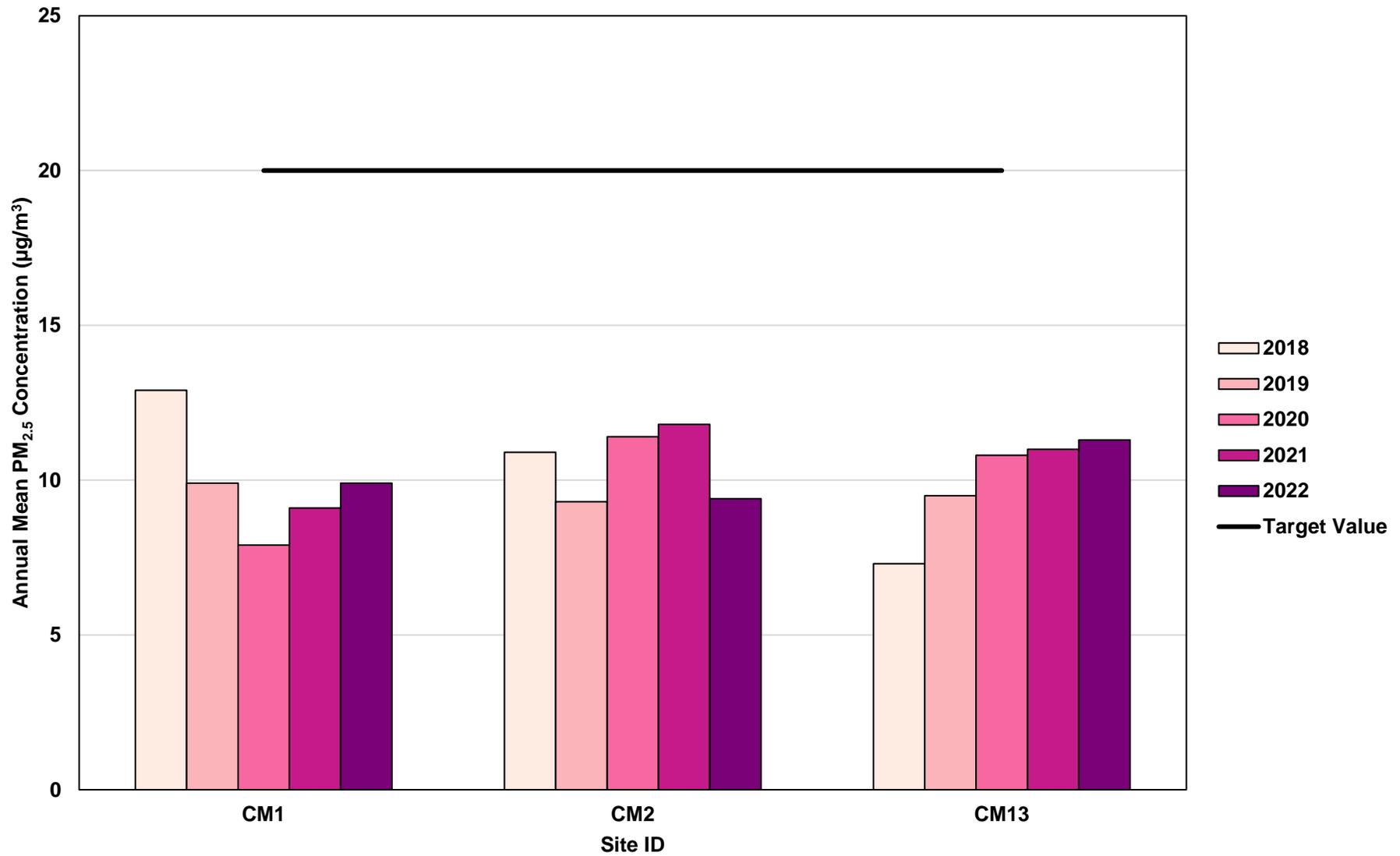


Table 2.8 – Automatic Ozone Monitoring Results, Number of 8-Hour Means > 100µg/m³

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
CM2	Roadside	93.1	93.1	-	7	13	1	16
CM3	Urban Background	95.9	95.9	-	2	3	2	11
CM4	Roadside	41.5	41.5	-	1	1	0	0
CM5	Roadside	82.1	82.1	-	49	14	0	4

Notes:

(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 2.9 – Automatic Sulphur Dioxide Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	1-hour Means > 350µg/m ³	24-hour Means > 125µg/m ³
CM5	Roadside	82.3	82.3	0	0

Notes:

(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%).

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

2.1.3 Nitrogen Dioxide (NO₂)

The automatic monitoring stations located in Swansea continues to report compliance with the annual mean NO₂ AQS objective.

During 2022 there were no exceedances of the NO₂ AQS objective, with the majority of passive monitoring sites recording concentrations well below the objective. From 2021 to 2022, 183 sites reported decreases in NO₂. The maximum NO₂ annual mean concentration in 2022 was 37.7µg/m³, reported at Site ID: 459 which is located along the A4067 in Graig Trewyddfa.

All sections of the Swansea AQMA continue to report compliance with the NO₂ AQS objective, with AQMA sections within Sketty and Fforestfach reporting five years of compliance and Hafod reporting three years of full compliance. Swansea will be looking to initiate the revocation process of Swansea AQMA.

There are no passive monitoring sites where the NO₂ annual mean is greater than 60 µg/m³, therefore in accordance with Defra LAQM.TG(22) there are no sites likely to be at risk of exceeding the 1-hour mean AQS objective.

One site reported a concentration within 10% of the NO₂ AQS objective, fall-off with distance correction calculations was carried out in accordance to LAQM.TG(22). After distance correction calculations, Site ID: 459 reported a concentration of 20.5 µg/m³, which is below 10% of the AQS for NO₂. 14 monitoring sites had a data capture between 25 and 75% and therefore, annualisation was carried out in accordance with LAQM.TG(22) and can be seen in Table C.2.

2.1.4 Particulate Matter (PM₁₀)

During 2022, all automatic monitoring sites recorded PM₁₀ concentrations well below the 40 µg/m³ PM₁₀ AQS objective. There are minor increases and reductions at all monitors since 2021, with an average decrease of 4%. Overall, the annual mean concentration remains relatively stable and consistent over the last five years.

There were no 24-hour mean concentrations in excess of 50µg/m³ in 2022, therefore compliance to the 24-hour AQS objective.

Data capture at one automatic monitoring station (CM7) in 2022 had a data capture between 25% and 75%, annualisation was carried out in accordance with LAQM.TG(22), as shown in Table C.4

Both CM6 and CM9 did not report any data in 2022 due to communications issues.

2.1.5 Particulate Matter (PM_{2.5})

During 2022 all automatic monitoring sites recorded PM_{2.5} concentrations well below the PM_{2.5} AQS target. Out of the three monitoring sites, two recorded minor increases and one reporting a minor decrease. Overall, the annual mean concentrations remains relatively stable and consistent over the last five years. There is no LAQM air quality objective for PM_{2.5}, however concentrations continue to remain low and consistent.

2.1.6 Other Pollutants Monitored (Sulphur Dioxide (SO₂) and Ozone (O₃))

The St Thomas automatic monitor recorded no exceedances of the SO₂ AQS objectives in 2022.

The maximum number of 8-hour mean O₃ concentrations greater than 100 µg/m³ reported at the Morrision Groundhog automatic monitoring location in 2022 was 16. There is no LAQM air quality objective for O₃, however this does exceed the UK National air quality objective of 100 µg/m³ not to be exceeded more than 10 times a year.

Summary of Compliance with AQS Objectives as of 2022

Swansea Council has examined the results from monitoring in the Swansea district. Concentrations across the monitoring networking showed full compliance with the AQS objective. There was only one site within 10% of the NO₂ AQS objective at Site ID: 459 with concentration 37.7 µg/m³; once fall with distance calculations have been carried out, the

NO₂ concentration reduces to 20.5 µg/m³. The remaining sites displayed concentrations well below the NO₂ AQS objective.

3 New Local Developments

Road Traffic Sources (and Other Transport)

No new road traffic sources were present in 2022.

Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

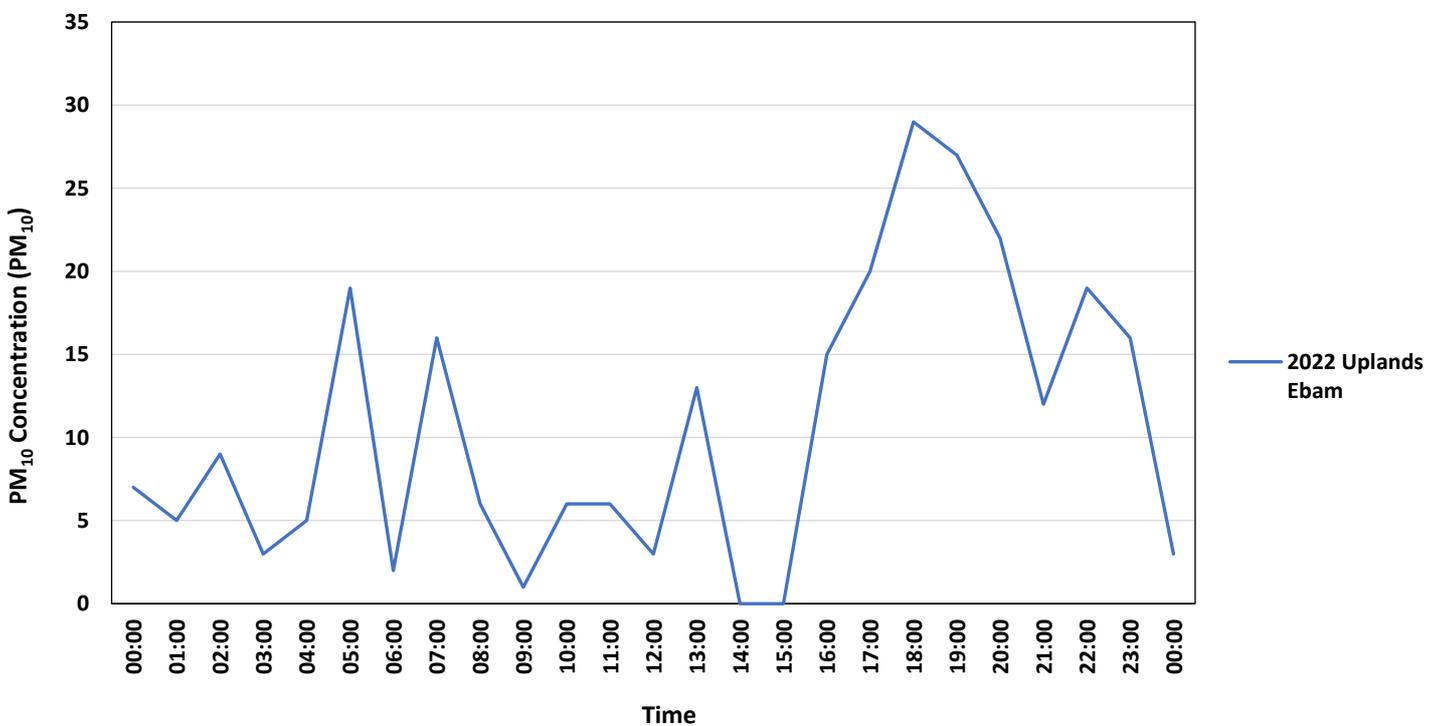
No new Industrial / Fugitive or Uncontrolled Sources / Commercial Sources in 2022.

Other Sources

During bonfire night, particulate monitors in Swansea often record elevated concentrations as a result of Firework displays in the city.

Figure 3.1 – Diurnal PM₁₀ Concentration on the 5th November 2022 shows the peaks recorded in 2022 on bonfire night (5th November 2022).

Figure 3.1 – Diurnal PM₁₀ Concentration on the 5th November 2022



4 Policies and Strategies Affecting Airborne Pollution

Local / Regional Air Quality Strategy

Not applicable

Air Quality Planning Policies

The Swansea Local Development Plan (LDP) was adopted on the 28th February 2019. Under the provisions of the Planning (Wales) Act, the LDP forms the statutory development plan for Swansea Council. It will be used as the primary material consideration to inform decisions on planning applications and development proposals.

<https://www.swansea.gov.uk/ldp>

Within the LDP are the following policies regarding Air, Noise and Light Pollution:

RP 1: Safeguarding Public Health and Natural Resources

Development will not be permitted that would result in significant risk to life; human health and wellbeing; property; controlled waters; or the natural and historic environment, particularly in respect of:

- i. Air, noise or light pollution;
- ii. Flood risk;
- iii. The quality or quantity of water resources;
- iv. Land contamination;
- v. Land instability or subsidence;
- vi. Sustainable development of mineral resources; and
- vii. Sustainable waste management.

Development will not be permitted if judged to have a significant adverse effect on the integrity of any European Designated Sites, either alone or in combination with other plans or projects

RP 2: Noise Pollution

Where development could lead to exposure to a source of noise pollution it must be demonstrated that appropriate mitigation measures will be implemented, and incorporated into the design of the development to minimise the effects on existing and future occupants. Noise sensitive developments will not be permitted unless effective and appropriate mitigation is carried out to prevent exposure to existing noise generating uses. Development will not be permitted if it would cause, or result in, a significant increase in levels of environmental noise in an identified Noise Action Planning Priority Area, or would have unacceptable impacts on an identified Quiet Area or the characteristics of tranquillity that led to the designation of a Quiet Area.

RP 3: Air and Light Pollution

Where development could lead to exposure to a source of air or light pollution it must be demonstrated that appropriate mitigation measures will be implemented, and incorporated into the design of the development to minimise the effects on existing and future occupants.

Local Transport Plans and Strategies

LAQM.TG(22) paragraphs 4.30 – 4.31 indicates guidance on the inclusion within Progress Reports to those measures within the Local Transport Plan (LTP) that specifically relate to bringing about air quality improvements. Within Wales, the LTP had been replaced with the Regional Transport Plan (RTP). The South West Wales Integrated Transport Consortium (SWWITC) was one of the four transport consortia in Wales which were required to produce a Regional Transport Plan. The SWWITC consortia region relevant to the City & County of Swansea included a partnership with the neighbouring authorities of Neath Port Talbot County Borough Council, Carmarthenshire County Council and Pembrokeshire County Council. Unfortunately, the Welsh Assembly withdrew funding for the consortia from the end of the 2013/14 financial year. All staff had been redeployed following the withdrawal of funding. However, the Welsh Assembly Government reverted back to Local Transport Plans for 2015 - 2020. The new Local Transport Plan was adopted in January 2015. Details of the adopted plan can be found at <http://www.swansea.gov.uk/localtransportplan>

Active Travel Plans and Strategies

The Active Travel (Wales) Act (2013) places a legal duty upon local authorities in Wales to map, plan for and promote active travel journeys.

The Active Travel (Wales) Act is a landmark piece of Welsh legislation brought forward in 2013 which aims to make it easier for people to walk and cycle in Wales, specifically to promote walking and cycling as viable modes of transport for everyday journeys such as to the shops, work or college.

The Existing Route Map and Integrated Network Map will be reviewed and updated periodically in conformity to the requirements of the Act.

The Council also prepares annual reports which are submitted to the Welsh Government to monitor the costs and use of Active Travel within the City & County of Swansea. These reports can also be found in the downloads section

<https://www.swansea.gov.uk/activetravelact>.

Local Authorities Well-being Objectives

The Corporate Plan describes the council's vision for Swansea, our 6 key council priorities (well-being objectives and improvement objectives) and our organisation values and principles that will underpin the delivery of our priorities and overall strategy.

The Corporate Plan has been refreshed for 2022/23. There will be a further review of the Council's Corporate Plan for the next five years 2022/27 following the appointment of a new Chief Executive and local government elections in May 2022.

A summary of the Council's well-being statement was updated and incorporated into the refreshed Corporate Plan 2018/22.

Our priorities for 2022/23 that are set out within our Corporate Plan can be viewed via the following link <https://www.swansea.gov.uk/corporateplan2022-23>

Green Infrastructure Plans and Strategies

Swansea Central Area: Regenerating our City for Wellbeing and Wildlife

The green infrastructure strategy, published jointly by Swansea Council and Natural Resources Wales, is designed to bring more nature into the Swansea Central Area.

Green Infrastructure - commonly referred to as GI - is the term used to describe all the green space, soil, vegetation and water that provide the ecosystem services that make places

more liveable. This includes, for example, streets trees, green roofs and walls, natural play spaces, wildlife / nature gardens, pollinator corridors, landscaping, drainage and air quality management solutions.

The vision is for a city with high quality multifunctional green infrastructure, which delivers resilience, prosperity, nature, health, wellbeing and happiness to the citizens and visitors of Swansea.

The 5 Principles of Green Infrastructure to be applied to achieve this vision:

1. **Multifunctional** – making sure that all GI in the city centre provides as many benefits as possible. For example, it may reduce pollution and/or flooding, offer shelter and/or food for native animals (birds, insects and/or small mammals), provide shade during hot summer days, and create attractive pleasant and/or calming spaces for people to meet, relax and play.
2. **Adapted for climate change** – absorbing water to reduce flooding, providing summer cooling and accommodating wildlife. GI also helps mitigate climate change by capturing and locking up carbon.
3. **Healthy** – helping our physical and mental health by absorbing pollution, providing clean air, clean water, food and space to exercise, socialise and play and space to have contact with nature.
4. **Biodiverse** – supporting a wide variety of native species providing shelter and food and creating green corridors across the city centre linking to existing strategic wildlife corridors.
5. **Smart and Sustainable** – providing solutions, techniques and technologies that are low maintenance and reduce pollution and waste and maximise the use of recycled or sustainably sourced materials.

Success will be measured via a number of performance indicators which will work towards targets to double (from 13% to 26%) GI by 2030 and to increase tree canopy cover to 20-25% by 2044.

The strategy is designed to support the Local Development Plan and the application of the Statutory SuDS Standard 2019. It also delivers the council's duties under the Well-being of Future Generations (Wales) Act 2015 and Environment (Wales) Act 2016 through the Council's Well-being Objective: Maintaining and enhancing Swansea's natural resources and biodiversity and, the Swansea Public Service Board's Working with Nature Objective.

<https://www.swansea.gov.uk/climateactiongreeninfrastructure>

Climate Change Strategies

Climate Change and Nature Strategy 2022 - 2030

Introduction

Climate change is the long-term alteration of temperature and typical weather patterns largely caused by human activity, like burning fossil fuels, like natural gas, oil, and coal. Burning these materials releases what are known as greenhouse gases into the atmosphere. Human health and well-being is vulnerable to such change. This shift is expected to cause fluctuating weather- heat and fire, drought and flood, an increase in waterborne diseases, poor air quality, threats to wildlife and loss of food sources.

The image below shows how the temperatures across Wales are already increasing year on year, setting a clear trend towards a hotter climate which will bring significant consequences.

We all have a responsibility to act now. A public sector target of 2030, ahead of the Welsh Government's target of 2050 for the whole of Wales, will give us our best chance of keeping global warming below 1.5°C.

This is the tipping point at which the climate impacts we're already experiencing will go from bad to potentially catastrophic. We'll see natural systems cross danger points, triggering lasting changes such as extreme storms, heatwaves, mass loss of natural habitats and species.

It is also recognised that our wellbeing and that of future generations are dependent upon the state of the natural environment. Our natural environment in Wales is under considerable pressure from over exploitation, habitat loss, pollution, climate change as well as invasive non-native species.

So, what are Swansea Council doing about it?

Legislation, Regulation and Policy

There is a range of well publicised legislation and policy helping to drive this change:

Globally

The international Paris Accord 2015 which seeks to keep global temperature increases well below 2 degrees.

The IPCC (Intergovernmental Panel on Climate Change) - In their Climate Change 2021 report, conclude that:

- there is still time to limit the worst effects of climate change
- stabilising the climate will require the globe to reach net-zero CO₂ emissions by 2050
- human activities have already caused around 1.1°C warming
- the planet's climate is warming faster than anything experienced
- every part of our planet is already seeing multiple and increasing changes in their climate systems
- global warming is very likely to reach 1.5°C by 2040
- climate change is intensifying the water cycle affecting rainfall patterns
- coastal areas will see continued sea-level rise throughout the 21st century
- further warming will amplify impacts on frozen regions
- the ocean is warming and acidifying.

Nationally

In 2019 the UK Government amended the Climate Change Act 2008 by increasing the target for reducing greenhouse gas emissions in the UK to at least 100% lower than 1990 levels by 2050. This is otherwise known as the Net Zero target.

The Welsh Government Well-being of Future Generations Act 2015 which requires accountability for the impacts of long term decision making.

The Environment (Wales) Act 2016 supports finding ways to secure healthy, resilient and productive ecosystems for the future whilst still meeting the challenges of creating jobs, housing and infrastructure.

Welsh Government has set out its legal commitment to achieve net zero emissions by 2050, but is pushing to "get there sooner". It recognises that climate change will impact us all, but the stark reality remains our most vulnerable communities will be hit the hardest. Welsh Government recognises that transition towards a Net Zero Wales must be fair and just, in order to achieve a green and clean future with good quality jobs and leaves no communities behind.

Swansea will strive to align with the Net Zero Wales Carbon Budget 2 (2021-2025), embracing the Team Wales approach.

The Welsh Government in recent years has developed a forward-looking legislative framework to encourage environmental improvements, including for the preparation of

Nature Recovery Plans at national and local level. These plans which, are currently under preparation and continual review, are aimed at addressing the underlying causes of biodiversity loss by putting nature at the heart of decision-making and increasing the resilience of our natural systems (ecosystems). The Welsh Government became one of the first parliaments in the world to declare a Nature Emergency in June 2021.

Regionally

As part of the regional agenda the 4 local authorities - Carmarthenshire, Pembrokeshire, Neath Port Talbot and Swansea have progressed a new regional energy strategy. Further work is also progressing as part of the new CJC work programme.

Locally

Following the Notice of Motion on Climate Change Emergency presented to Council on 27th June 2019, the Authority reaffirms its commitment to:

- Call upon the UK and Welsh governments to provide us with the necessary powers and resources to ensure Swansea Council becomes net zero by 2030.
- Publicise climate emergency and promote a greater awareness of the truth of climate change amongst the local population aiming for a county wide target of net zero by 2050
- Work with relevant experts in research and development to:
- Review our current strategies and action plans for addressing climate change.
- Identify any further policy changes or actions which we could undertake, within the scope of our powers and resources, to meet the challenge of climate emergency.
- Seek the help of local partners such as Swansea University and other research bodies to, within one year, produce a report to share with the community, explaining work already underway and achievements already made, as well as targets for the future.
- Update on further work undertaken by the Council in this area on an annual basis through the Council Annual Review of Performance Report section on corporate objective - Maintaining and enhancing Swansea's natural resources and biodiversity.
- The Council undertook a citizen's survey in March 2021, with excellent response, but the key message taken on board is 'Go Faster, Go Further'.

Climate change survey 2021 - results

- 967 people were surveyed and 93% were concerned about climate change
- A Twitter check of 396 people found 66% were concerned about climate change

Nature Recovery

Swansea Council declared a Nature Emergency in November 2021. A Swansea Nature Recovery Action Plan is currently being prepared in collaboration with the Swansea Nature Partnership, a core ambition of which will be to reverse the current decline of nature within the City and County of Swansea and to increase the resilience of ecosystems. The aim is for Swansea to be nature positive by 2030, i.e., that current decline in nature is beginning to reverse. By 2050 the hope is that nature is thriving in Swansea, that nature is in recovery, valued, restored, sustainably managed, and wisely used.

The Vision

Swansea Council's commitment to addressing climate change is broken down into clearly defined work streams alongside its commitment to nature recovery. Nature recovery proposals will be set out in a separate action plan that sits alongside this strategy

The council will lead by example and be the focal point for response to climate and nature action across the whole city and county.

The council business will strive for net zero carbon by 2030, establishing monitoring processes for emissions and developing a robust action plan in order to achieve the target.

Working with partners, the council will call on the whole City and County of Swansea, its major employers, its citizens, community groups and businesses to contribute to achieving net zero carbon by 2050. There will be a need for collective leadership and a shared ambition.

Governance

To enable the Council to continue to make progress one of the key actions from the NoM was to review the current policy framework and how this could contribute to the achievement of net zero carbon and climate emergency response.

Therefore, it has been necessary to review over 100 Council policies that contribute to this agenda and distil these down to 8 key themes as outlined below:

- Energy strategy
- Green infrastructure strategy
- Biodiversity plan
- Local development plan
- Procurement strategy
- Sustainable transport strategy

- Waste strategy
- Housing strategy

These policies overlap to firstly feed into the core short term target of net zero carbon for the council emissions by 2030, and the longer term goal of achieving a similar aim for the whole of the city by 2050. These policies are then intrinsically wrapped up in the overarching requirements of the Corporate Plan, Strategic Equality Plan and Wellbeing of Future Generations Act (Wales) 2015.

Climate Change and Nature Recovery Governance

Cabinet

Climate Change Corporate Development Committee

Climate Change and Nature Recovery Steering Group (Cabinet Members, Director, lead officers)

Climate Change and Nature Recovery Programme Board (Director, Heads of Service, key officers)

Then feeding through the structure above:

- 2030 Net Zero Carbon Action - Welsh Government emissions reporting, renewables
- Nature Recovery Action - Biodiversity Section 6, local nature partnership, nature recovery, green infrastructure strategies, food strategy, air, water and soil quality
- 2050 Net Zero Carbon Internal Action - All Programme Board Members
- 2050 Net Zero Carbon External Action - Environmental Partners, Climate Change and Nature Action Charter Signatories
- Climate Change and Nature Recovery Communications Group - One Planet Accreditation, staff, training, spreading the word to external stakeholders, develop a community of council champions, Education
- Sustainable Transport Strategy - LEV, active travel, street lighting, grey fleet, commuting etc.
- Procurement Strategy - Procurement Social Value Recording Tool, Socially Responsible and Sustainable Procurement Policy, Procurement Strategy
- Waste Strategy
- Regional Energy
- Regional Transport
- Regional Planning - local development plan

- The governance structure represents a golden thread not only through the organisation, but externally with partners.

The journey so far

Swansea Council have achieved a great deal over several years to mitigate the impacts of Climate Change such as:

- Swansea Council procures its energy using Crown Commercial Services Framework Agreements, via the National Procurement Service (NPS), for its energy supplies. All electricity procured via the NPS framework is from 100% renewable energy sources; 41% sourced from Wales (Apr 20 - Mar 21); Gas - Total Gas and Power (TGP) procured as new gas supplier (from Apr 21), registered interest in purchasing 'Green Gas'- dependant on viability and cost impact.
- Refit Low Carbon Programme - Swansea Council is participating in the Welsh Government supported Re:fit Low Carbon Programme to implement energy efficiency saving opportunities in non-domestic buildings. A £1.3 million interest free loan has been secured from Welsh Government Wales Funding Programme (Salix) to deliver a Re:fit Cymru (Energy Efficiency) Phase 1 project comprising over 18 buildings which is projected to save an estimated 400 tCO₂e every year. Quantifying the energy savings delivered by the Energy Conservation Measures (ECMs) will be validated using the Measurement and Verification (M and V) process.
- Carbon Reduction Retrofit (phase 2): Working towards developing a business case to implement Energy Conservation Measures for Education Services - Schools.
- Swansea Council with the support of Welsh Government Energy Services are progressing towards the development of a 3MW Ground Mounted Solar PV farm located on a capped waste land filled area. It is predicted over the asset lifespan (35 years) that 101,302,731 kWh of renewable energy will be generated equating 28,454 t/CO₂. Part of this capital expenditure cost could be recovered as it would create revenue for the Authority, in the form of either Power Purchase Agreements (PPA) or private wire connection. There is the potential opportunity of extending the Solar PV site in future years as current additional waste land is capped.
- Public Sector Hub: Cabinet are considering moving from the Civic Centre to a new public sector hub in the heart of the city centre as part of Swansea Bay Central Phase 2, the £1bn project to revitalise the St David's area of the city centre. This is an opportunity for the Authority to show its commitment towards meeting its net zero

carbon aspirations by 2030 incorporating renewable technologies into the design specifications.

- Progressing work towards a world-leading Swansea Bay Tidal Lagoon, estimated electricity generation of 504,854 MWh, equating to carbon emission savings of 94,913 mT CO₂e.

Swansea Council Net Zero Carbon by 2030

Swansea Council is monitoring its emissions and reporting annually to Welsh Government.

It is taking all possible action to achieve net zero as demonstrated in the action plan:

- Buildings and Energy
- Decarbonise our public estate by reviewing our asset management strategy.
- Reduce the energy consumed across the council's buildings and estate.
- Encourage employee behaviour change through training and process improvement
- Decarbonise street lighting with more LED's
- Ensure all new buildings are constructed to the highest possible sustainability standards.

Fleet and Mobile Equipment

- Transition the Council's fleet to zero emission equivalents in accordance with the Welsh Government's expectation of light commercial vehicles by 2025 and other vehicles by 2030
- Establish a fleet vehicle charge point infrastructure that supports this transition
- Optimise fleet vehicle use and efficiency
- Establish integrated data systems for GHG measurement
- Revise and approve the appropriate supporting policies, procedures and working practices
- Decarbonise Grey Fleet travel
- Decarbonise mobile plant equipment

Land Use

- LDP policy reviewed to protect land soils and habitats rich in carbon
- Increase terrestrial Central Area GI to 26%
- Tree planting areas mapped county wide 1000s new trees planted

- 30% of protected sites (local nature reserves, etc.) in positive management for biodiversity

Waste

- Encourage circular economy values within Swansea Council - to minimise and prevent - reduce, reuse, recycle,
- Reduce operational single use plastics wherever possible
- Reduce operational waste e.g., food, paper
- Encourage operational recycle and repair.
- Reduce Construction Waste

New Ways of Working

- Develop emissions data monitoring processes
- Reduce commuting miles
- Deliver agile working policy
- Develop staff active travel plan
- Implement Healthy Travel Charter in Swansea Council
- Develop an Electric Vehicle Charging Strategy

Supply Chain

- Commit to Net Carbon Zero in our supply chain by 2050
- Through forward planning and innovation develop new specifications for our contracts that deliver Net Carbon Zero
- Map and monitor our progress, with appropriate prioritisation and target setting

As the governance structure implies, 8 critical areas of the authority are working on their action plans in order to deliver the 2030 and 2050 targets.

Local Development Plan

The 2010-2025 Plan provides a clear planning framework to address key issues facing the County, providing certainty and the basis for efficient planning decisions. Its policies and proposals will enable the delivery of sustainable development, and ensure that social, economic, environmental and cultural well-being goals are all suitably balanced in the decision making process so that the right development occurs in the right place.

The Plan is underpinned by an extensive and up to date evidence base which, in combination with extensive public and stakeholder engagement undertaken during Plan preparation, has been used to identify the key opportunities, land use requirements, and issues for the County over the Plan period.

A Trees, Hedgerows and Woodlands SPG was adopted in October 2021. This document provides guidance on how the relevant policies of the Local Development Plan should be applied to planning applications with respect to all existing, retained and newly planted trees, hedgerows, and woodland on development sites. The requirement for biodiversity conservation and enhancement has also been included in the following SPGs which were adopted in 2021:

- Gower AONB Design Guide
- Placemaking Guidance for Residential Development
- Placemaking Guidance for Infill and Backland Developments
- Placemaking Guidance for Householder Developments

[All are available to view.](#)

Procurement Strategy

Swansea Council procurement is underpinned by maximising the economic, social, environmental and cultural benefits that may be obtained from buying power. Best value can be viewed as the optimum combination of whole-life costs in terms of not only generating savings and good quality outcomes for the organisation, but also benefit to society and the economy.

Procurement activity strives to deliver the goals of the Well-being of Future Generations Act through a holistic approach to procurement processes and including where relevant specific provisions within the procurement documents. There is commitment to strive to ensure that carbon reduction ambitions that underpin the sustainable development principle are integrated within procurement practice as appropriate.

Sustainable Transport Strategy

A great deal of positive work has been carried out in this area to date with all activity becoming part of this overarching strategy. This includes how the council deals with its Council fleet, the grey fleet (personal mileage by employees), its emissions from street lighting, the continued promotion of active travel and the development of a local and regional sustainable public transport system.

Some specifics include:

- Continuation of planning for, and improving the active travel network. Refresh of the current Active Travel maps and consult on potential new routes for development, though a new Active Travel Network Map in 2021.
- Increase levels of active travel through promotion, engagement and encouragement of active travel with the general public, businesses, communities and educational establishments, through a behaviour change campaign, Swansea Bayways.
- Further roll out of EV charging infrastructure.
- Continue to deliver a 5 % year on year reduction in council fleet emission via its green fleet strategy.
- The development of the ULEV strategy will support further emissions reductions. Targets will gradually increase over time up to 10% per annum to align with technological advances in coming years.
- Seek to embed the reductions in grey fleet mileage which achieved 50% and 1 million miles less in 2020/21 to date.
- South West Wales Metro - Continue the development of business cases for investment in active travel, bus and rail projects across the region.
- Investigate low-emission public transport alternatives through work with partners, such as Transport for Wales and First Cymru to establish how vehicle emissions could be reduced in the future.

City and County wide Net Zero Carbon by 2050

All activity will be underpinned by the Well-being of Future Generations Act goals and ways of working, the Corporate Plan Priorities and the Strategic Equality Plan actions.

1. **The Well-being of Future Generations Act (Wales) 2015** – This legislation places a duty on the Council to carry out sustainable development improving social, economic, environmental and cultural well-being. It sets out the sustainable development principle's five ways of working and seven national well-being goals.
2. **Strategic equality plan** – This sets out how the Council makes every effort to respect children's rights, promotes healthy lives, helps tackle poverty and play its part in treating people and communities are treated with fairness, dignity and respect. It promotes equal opportunities for all, making a real difference to the lives of those living and working in Swansea.

3. **Corporate plan** – This details how the Council will improve well-being in practice. It lays out priorities for action in six well-being objectives and the steps to achieve them in line with the sustainable development principle.

Swansea Council is taking all possible action alongside Climate Charter signatories, PSB, citizens, schools, businesses, community groups and environmental partners to help deliver the Welsh Government ambition of Net Zero Wales by 2050.

Electricity and Heat Generation

- Complete first phase of Blue Eden
- Develop Energy Parks for example Tir John Solar Farm
- Support delivery of Regional Energy Plan
- Support delivery of Local Area Energy Plan

Transport

- An integrated and affordable public transport system
- Safe active travel networks across the county to recognise work and leisure hubs
- Residential Buildings
- More EV charging points
- Residents aware of and able to access advice and funding for home improvements to cut carbon emissions
- More Homes built to Swansea Standard
- Decarbonisation of Housing Stock
- Create an Energy awareness hub
- Aim for 30% of (non -residential) Council buildings with wildlife features

Industry and Business

- Engagement across the county using Swansea Project Zero branding with a strong support network that instils pride and creates a critical mass of businesses actively cutting carbon emissions and participating in the circular economy.

Agriculture

- More opportunity for healthy, local food production and sales

Waste and Circular Economy

- Achieve Welsh Government recycling targets

- Promote the waste hierarchy and prevent, reduce, or reuse materials wherever feasible
- Continue to monitor technologies and engagement with partners to recycle a wider range of waste material types
- Plastic Free Swansea County to be promoted

Education and Engagement

- Engagement across the county using Swansea Project Zero branding to instil pride and create a critical mass.
- All schools actively reducing their carbon and saving energy through behaviour change and educational initiatives
- Collaboration with Youth Groups to enable the 'youth voice' to be heard
- Environmental Project Partners successfully running projects on behalf of SC and actively engaging with citizens and community groups to increase community climate resilience and reduce community carbon emissions
- All SC staff to be given training on CC and NR as part of induction with service area/job role specific training available

Enriching our Natural Resources

- Deliver Local Area Nature Recovery Action Plan
- Deliver Biodiversity/Section 6 Plan
- Deliver county wide green infrastructure strategy

LULUCF

- More land available for CSA and allotment use
- More community orchards

All activities must align to create a long term Climate Change and Nature Strategy and demonstrate the commitment asked of the Notice of Motions.

Governance accounts for Regional, Welsh, National and European directive alongside the additional policies and strategies sitting at Council level that will support delivery.

This approach aligns with the council's pledged to "Act in Response to the Climate Emergency" within its Corporate Plan 2020-23, aiming for carbon neutrality by 2030

Wider communication and engagement.

This will be established through a variety of routes:

- The Swansea Charter: Climate Change and Nature Action underpins the path to A Net Zero Swansea.
- The ultimate aim is 2050 Net Zero - City and County of Swansea (all emissions)
- A key milestone will be 2030 Net Zero - Swansea Council (in scope organisational emissions)
- Business, Citizens, the Council, Community, Partners, Government, Youth and the Voluntary sector all play their part. 'It is everyone's business'

There will be a continued commitment to engage with local people, groups and businesses and help them be smarter and better prepared for the impacts of climate change and nature recovery. This will be enhanced via the Climate and Nature Charter and online pledge wall.

Swansea Council recognises that it must lead by example and use its 'Sphere of Influence' to reach out to as many citizens and businesses as possible. The Leader and Cabinet Members have signed the charter, and a more generic version for Swansea Citizens and public sector, business, charities, schools, groups etc. will be used, alongside the more simplistic pledge wall as mechanisms to seek wider buy in across the whole city and county.

Involving partners will be paramount to success, and will help support Swansea Council's ambition to lead by example. Agreed strategies will provide structure and governance to ensure delivery.

Listening to and acting on community groups, school groups ideas will help shape the strategy.

Swansea council will commit to making long term and embedded behaviour change via training and support not only within its own authority but also across the City and County, for all citizens. We want everyone to shape Swansea's vision for reaching net zero carbon.

We can make changes on a huge scale if we all make small changes to how we move, shop, eat, think and live, together.

Reducing emissions and recovering nature needs businesses and households to change. We must use more renewable energy sources such as wind, solar and geothermal. We also have to change how we use energy, by cutting down on the power we use. We need to be more mindful of food sources, the nature surrounding us, its recovery and how our communities need to adapt for the future.

Swansea Council cannot make Swansea net zero carbon on its own. We need everyone in Swansea to act now and consider what they can do to reduce their impact on the planet. We all need to take action at home, in the workplace, and across the county as a whole.

The Council is well placed to work with others. We can make the most of Swansea's collective potential and create solutions together. There will need to be major investments. We will have to make changes to existing systems of how we use and interact with energy. We must change how we live our lives. We will have to redefine how we manage and interact with our environment.

Above all, to meet this challenge, we need collective leadership and shared ambition.

5 Conclusion and Proposed Actions

Conclusions from New Monitoring Data

The passive NO₂ monitoring data from 2022 shows that concentrations at 183 out of 191 monitoring locations decreased from 2021 levels, with an average decrease of 9.1%.

Monitored NO₂, PM₁₀ and PM_{2.5} concentrations at all automatic monitoring stations continue to report annual means well below the AQS annual mean objectives for NO₂, PM₁₀ and PM_{2.5}. In regard to the short term AQS objective for NO₂, in which the 200µg/m³ must not be exceeded more than 18 times/year, and the PM₁₀ AQS objective whereby there should be no more than 35 24-hour mean concentrations greater than 50µg/m³, there were no exceedances reported in both pollutants in 2022.

Conclusions relating to New Local Developments

Ongoing implementation and development of local strategies, as detailed in Table 1.2, will continue to assist in reducing pollutant 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.

Other Conclusions

The existing diffusion tube network within Swansea allows the council to closely monitor hotspot areas and help highlight areas of concern, the monitoring network in 2022 has shown compliance across all monitoring locations within the Swansea AQMA. In relation to the designated AQMA, monitoring results show full compliance within Swansea AQMA and has now reported compliance for over 4 years. The Council will continue to use its monitoring network to closely monitor concentrations at these locations.

Proposed Actions

Swansea Council will continue to actively monitor NO₂ concentrations, reviewing the diffusion tube network where necessary. With annual mean NO₂ concentrations decreasing from 2021, if concentrations next year continue to show compliance and remain low and well below the AQS objective, then the Council will pursue revocation of these AQMAs where appropriate.

References

- I. Technical Guidance LAQM.TG(22)
- II. Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138)
- III. Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298)
- IV. City & County of Swansea Progress Report 2020/2021

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 ($\mu\text{g}/\text{m}^3$)

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.72) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
5	39.9	-	32.8	26.5	21.2	20.0	26.1	28.9	28.2	23.6	22.0	29.9	27.2	19.6	
6	34.6	24.0	26.1	18.4	19.0	18.7	19.2	-	20.2	20.0	24.2	28.6	23.0	16.6	
7	49.6	39.9	42.5	34.1	35.6	32.0	33.3	-	33.6	37.2	20.5	41.6	36.4	26.2	
8	46.5	38.1	56.7	40.6	31.4	30.3	38.1	45.4	41.2	27.5	40.6	40.3	39.7	28.7	
10	30.9	19.7	27.8	16.6	14.5	15.5	17.3	18.6	20.1	20.5	19.3	24.5	20.4	14.8	
11	53.2	30.0	34.8	34.0	24.7	26.7	27.8	-	30.7	36.2	38.4	36.2	33.9	24.5	
12	54.6	-	35.8	36.5	34.3	34.9	-	-	35.3	35.1	39.6	-	38.3	27.1	
16	39.3	34.3	36.0	26.5	22.8	20.1	24.2	-	25.0	22.2	23.0	28.4	27.4	19.8	
18	59.7	36.1	57.5	45.4	31.0	31.2	37.3	44.8	39.5	39.6	10.9	51.4	40.4	29.1	
19	54.2	43.9	49.1	40.0	36.8	34.9	41.8	42.4	43.9	15.0	-	-	40.2	29.0	
20	47.9	33.6	47.1	32.4	25.3	23.6	26.7	30.7	30.8	34.0	40.7	46.7	35.0	25.2	
22	42.8	28.7	28.3	23.5	19.3	21.8	21.2	23.8	22.8	27.9	35.0	34.5	27.5	19.8	
26	45.6	34.8	49.9	36.3	26.3	22.9	28.3	32.1	27.9	31.5	39.9	46.5	35.2	25.4	
27	46.8	33.1	48.1	35.8	26.9	25.8	28.7	33.6	-	36.1	40.1	12.5	33.4	24.1	
29	38.7	23.4	31.8	26.0	20.2	-	21.2	25.7	24.9	24.7	29.4	29.6	26.9	19.4	
32	45.1	26.7	31.0	30.2	26.2	-	28.8	31.0	31.4	-	32.3	29.8	31.2	22.6	
33	53.8	28.9	32.1	27.2	22.2	23.2	24.4	28.8	26.1	24.7	30.2	28.7	29.2	21.1	
35	47.0	-	38.5	30.8	27.0	24.3	28.0	29.6	25.5	-	-	-	31.3	23.1	
36	41.1	-	32.2	24.9	20.3	20.1	-	23.3	22.7	23.6	28.8	22.9	26.0	18.8	
40	38.0	23.8	27.5	20.7	18.3	16.6	-	-	21.4	-	-	24.9	23.9	15.6	
41	45.8	31.5	-	33.6	23.7	25.0	24.1	29.5	29.4	-	33.2	37.1	31.3	22.6	
43	49.0	35.4	37.0	28.8	23.9	24.7	27.5	29.8	30.1	31.8	27.5	-	31.4	22.7	
44	32.9	27.9	22.1	20.3	18.5	18.1	17.2	17.6	23.7	22.3	28.4	22.8	22.7	16.4	
45	42.2	-	32.6	26.4	17.1	18.3	22.2	28.8	23.8	21.2	20.4	27.5	25.5	18.4	
48	32.8	-	21.5	16.1	14.3	12.1	-	13.4	15.0	30.7	-	16.9	19.2	13.9	
50	47.7	32.7		30.7	27.3	17.0	-	28.5	24.1	35.4	27.3	35.8	30.7	22.1	
54	34.7	32.9	22.7	-	-	24.7	26.8	27.3	25.4	31.5	-	31.6	28.6	20.7	

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.72) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
55	40.2	31.8	30.9	28.0	24.2	21.5	24.1	-	23.6	32.6	29.5	25.4	28.3	20.5	
56	35.8	41.2	32.7	28.1	28.7	27.0	26.7	27.1	23.8	31.0	34.9	29.0	30.5	22.0	
58	47.7	32.0	39.7	29.4	30.2	30.6	25.1	28.2	29.1	30.0	32.1	23.0	31.4	22.7	
59	58.6	45.6	54.1	46.0	36.3	35.0	33.4	44.2	42.4	42.4	37.4	47.5	43.6	31.5	
61	46.1	32.2	41.9	33.6	26.5	24.4	25.6	28.7	-	32.6	27.1	38.2	32.4	23.4	
63	32.7	-	22.6	17.3	12.8	14.7	14.8	17.4	15.9	16.1	17.5	23.5	18.7	13.5	
64	50.3	-	40.6	31.7	-	32.0	29.5	-	30.4	29.0	36.8	39.5	35.5	25.7	
65	32.4	-	28.0	21.5	15.0	15.4	19.7	19.6	18.7	19.3	18.9	23.2	21.1	15.2	
66	40.1	-	30.1	22.4	20.2	18.6	20.9	22.8	23.8	22.0	21.6	29.7	24.7	17.9	
67	65.4	47.3	42.7	44.1	38.0	32.8	34.4	42.3	41.6	33.1	30.6	33.2	40.5	29.2	
68	41.5	32.0	33.7	31.8	29.2	27.0	26.5	-	31.1	32.6	34.2	24.6	31.3	22.6	
70	-	-	22.6	20.8	18.2	19.2	19.4	25.9	21.5	26.5	34.0	28.5	23.7	17.1	
75	41.0	-	40.2	30.4	25.9	26.2	24.0	26.0	24.2	37.8	29.7	36.4	31.1	22.4	
84	38.8	-	27.2	25.0	20.5	24.6	22.8	23.4	22.7	25.2	28.5	23.5	25.7	18.5	
85	41.5	31.6	-	-	24.9	23.1	23.8	25.9	23.7	20.8	33.4	35.8	28.5	20.5	
86	37.3	-	-	21.7	17.9	-	18.6	18.5	20.4	21.1	24.3	27.2	23.0	16.6	
87	26.0	-	18.6	13.5	10.8	11.0	11.9	12.0	13.0	12.9	13.0	18.5	14.7	10.6	
88	42.3	-	32.5	23.4	21.4	21.5	24.4	25.2	26.9	25.2	-	26.8	27.0	19.5	
89	25.4	-	19.4	-	16.3	14.8	12.9	16.9	16.1	17.6	14.0	17.1	17.0	12.3	
90	36.0	22.4	37.5	26.8	21.0	23.0	22.0	26.0	22.8	25.1	27.6	31.0	26.8	19.3	
91	37.1	21.2	33.5	24.3	19.6	18.1	21.6	25.4	24.5	22.8	26.4	26.8	25.1	18.1	
94	40.2	27.4	32.1	22.5	16.9	20.6	19.6	21.2	21.0	25.4	-	29.3	25.1	18.1	
95	37.1	-	30.6	20.8	14.8	14.7	17.3	21.2	20.0	17.6	18.3	29.0	21.9	15.8	
96	34.9	21.4	27.6	21.9	18.1	17.9	19.6	22.4	-	-	25.6	24.2	23.4	16.9	
97	41.1	-	-	29.4	23.5	22.4	24.7	30.6	26.5	25.6	28.3	35.5	28.8	20.8	
98	45.4	-	40.9	26.7	21.0	21.3	24.5	26.7	27.2	29.0	8.9	35.6	27.9	20.2	
99	35.4	23.9	29.3	21.0	18.4	18.5	18.5	23.4	26.0	22.5	22.9	28.9	24.1	17.4	
104	30.5	24.5	29.7	23.6	17.1	24.6	20.5	22.8	28.3	26.7	26.6	28.3	25.3	18.2	
110	34.6	20.8	27.3	21.3	14.2	14.7	18.6	24.5	20.3	18.6	20.7	21.4	21.4	15.5	
115	44.5	-	42.0	28.7	26.3	34.5	24.4	23.5	24.8	33.0	-	-	31.3	22.6	
116	51.5	-	48.6	37.5	36.1	25.2	28.1	36.3	32.3	29.8	29.7	34.4	35.4	25.6	
117	48.7	-	38.7	35.7	29.8	30.2	29.3	33.3	36.0	29.3	27.6	19.6	32.6	23.5	
118	32.9	21.0	29.6	22.9	16.2	15.7	16.8	18.3	20.2	-	18.7	28.0	21.8	15.8	
121	56.9	-	46.7	45.3	38.7	36.5	37.7	42.5	40.0	39.1	46.4	35.0	42.3	30.5	
122	-	-	-	40.1	24.6	21.4	27.4	-	33.3	28.2	5.4	36.7	27.1	21.8	

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.72) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
123	44.1	-	45.2	47.3	33.6	37.8	38.8	46.0	41.1	34.6	39.4	40.1	40.7	29.4	
124	49.3	32.5	46.1	41.8	31.1	29.9	32.9	-	32.5	29.4	37.7	36.4	36.3	26.2	
125	34.8	37.5	46.0	40.0	32.0	32.9	36.7	-	33.5	32.1	37.8	38.2	36.5	26.4	
126	37.4	30.6	39.7	36.9	29.9	28.3	29.1	-	31.0	38.2	38.7	36.4	34.2	24.7	
128	40.7	30.9	-	23.2	21.8	19.6	20.9	-	24.9	25.4	32.7	29.8	27.0	19.5	
129	40.1	27.3	-	29.0	23.3	22.4	32.9	26.5	26.0	34.7	25.2	42.4	30.0	21.6	
131	49.2	39.8	38.8	31.3	31.0	32.3	33.3	-	34.1	35.7	34.9	33.5	35.8	25.9	
132	47.8	-	42.0	32.0	21.6	21.1	25.0	-	29.6	-	29.4	37.2	31.7	22.9	
134	-	40.7	43.3	37.1	33.1	33.2	34.7	-	34.8	35.4	38.3	-	36.7	26.5	
180	40.2	27.5	35.8	25.9	21.5	20.2	24.4	27.1	37.8	26.4	9.3	25.3	26.8	19.3	
182	34.2	27.7	32.8	23.5	18.3	22.3	20.7	23.2	23.4	24.4	24.4	27.7	25.2	18.2	
197	39.1	28.4	33.6	23.6	22.2	21.1	21.2	23.9	19.5	-	29.9	34.8	27.0	19.5	
198	39.6	27.3	30.2	23.3	21.6	21.1	21.2	23.1	20.1	24.6	30.8	25.8	25.7	18.6	
206	40.6	33.0	41.8	33.9	31.1	30.0	30.1	36.6	30.2	30.6	30.8	29.7	33.2	24.0	
207	38.0	30.0	35.2	31.0	24.7	23.4	18.9	36.2	31.1	21.6	27.6	27.6	28.8	20.8	
208	42.3	30.1		28.4	23.0	20.4	26.3	35.7	29.6	24.6	11.8	27.0	27.2	19.6	
209	39.4	27.6	36.2	33.0	26.1	25.2	28.9	34.9	25.3	26.9	25.4	34.2	30.3	21.8	
210	37.0	25.0	34.0	30.3	17.7	18.9	26.1	33.8	27.2	21.4	19.4	26.0	26.4	19.1	
211	35.1	25.2	36.8	30.6	21.7	19.6	23.2	31.2	24.5	23.7	25.4	30.5	27.3	19.7	
212	31.0	-	29.8	21.7	14.4	12.3	18.1	19.6	20.3	17.3	18.3	21.4	20.4	14.7	
213	34.7	22.5	36.8	27.6	20.9	18.8	23.7	28.8	23.1	24.6	6.3	25.7	24.5	17.7	
240	41.9	-	40.7	31.1	20.4	20.3	22.4	29.7	25.2	30.4	27.3	33.9	29.4	21.2	
242	50.7	38.9	43.7	44.9	35.3	35.2	36.1	44.3	40.0	34.9	31.5	35.3	39.2	28.3	
243	48.3	34.2	33.5	29.5	27.1	27.2	31.2	33.5	33.0	27.7	38.2	40.0	33.6	24.3	
244	49.9	37.6	48.3	38.1	33.1	-	28.6	39.9	34.8	43.0	48.5	41.6	40.3	29.1	
247	42.0	25.5	39.5	29.5	22.2	20.4	23.2	-	-	-	24.7	-	28.4	20.2	
249	38.3	36.9	39.9	26.3	20.3	19.8	20.9	24.5	21.9	29.4	22.4	18.9	26.6	19.2	
256	51.5	38.8	41.9	-	29.5	29.1	31.5	36.5	34.1	34.6	42.5	-	37.0	26.7	
275	37.7	24.9	27.7	23.5	15.0	15.2	15.4	19.5	20.1	21.3	23.0	21.2	22.0	15.9	
276	41.3	30.3	35.2	27.8	24.5	25.8	25.6	27.5	26.5	26.2	26.0	37.9	29.6	21.3	
277	38.0	30.4	38.1	29.0	25.7	26.5	25.7	29.8	28.5	31.4	29.7	34.4	30.6	22.1	
278	42.0	30.3	-	28.9	24.7	25.7	26.6	28.2	32.8	31.4	33.1	26.5	30.0	21.7	
279	56.5	38.4	47.5	41.7	32.8	32.7	34.6	40.4	37.7	37.9	40.5	47.7	40.7	29.4	
280	53.2	-	54.1	38.0	27.5	27.9	32.1	36.5	36.4	37.8	37.6	44.1	38.7	27.9	
281	55.9	40.0	45.8	37.3	31.6	32.0	31.8	26.2	36.2	38.2	35.2	31.8	36.8	26.6	

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.72) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
282	-	38.7	21.5	38.3	31.7	33.3	-	37.3	39.0	34.7	38.4	47.8	36.1	26.0	
284	37.5	23.8	35.3	27.2	23.9	24.3	28.6	30.8	28.3	29.3	27.1	32.0	29.0	20.9	
285	46.9	27.0	40.3	26.3	21.4	20.5	-	-	30.8	28.2	26.2	41.2	30.9	22.3	
286	43.8	30.9	34.6	28.4	20.3	21.6	24.2	27.1	27.3	-	38.4	25.7	29.3	21.2	
287	44.4	27.0	41.7	31.3	16.6	17.6	24.9	28.9	27.3	28.5		37.1	29.6	21.4	
288	49.2	-	-	30.6	26.5	22.5	25.5	29.6	30.2	31.8	24.1	27.3	29.7	21.5	
289	32.9	36.2	41.7	33.9	26.0	24.5	26.3	31.0	30.4	30.8	35.6	14.3	30.3	21.9	
291	48.9	36.4	38.0	31.9	30.5	26.7	27.5	32.8	27.9	34.7	34.0	-	33.6	24.2	
295	44.0	30.8	34.7	26.2	-	22.2	21.2	26.8	25.2	23.3	32.8	27.9	28.6	20.7	
296	38.7		40.7	-	26.1	25.7	26.0	30.5	26.4	-	34.7	-	31.1	23.3	
323	44.7	32.6	35.6	27.8	26.9	24.6	27.1	30.9	25.3	27.8	34.0	30.6	30.7	22.1	
331	42.6	31.4	42.0	40.6	32.8	30.2	30.6	-	34.5	32.7	-	30.8	34.8	25.1	
334	-	24.2	40.0	35.0	21.9	19.7	-	-	30.9	9.0	25.0	30.0	26.2	18.9	
335	-	-	37.0	34.2	23.6	22.4	26.3	-	29.5	23.2	25.8	25.7	27.5	19.9	
336	-	29.9	41.8	42.2	26.1	26.7	29.0	-	36.0		-	33.5	33.2	24.9	
337	-	46.2	45.3	46.9	40.6	39.4	38.3	-	41.9	33.9	40.7	48.6	42.2	30.5	
338	-	30.4	45.7	39.1	27.7	24.0	29.5	-	30.3	26.6		38.9	32.5	23.4	
339	-	40.7	-	44.6	32.2	29.0	31.1	-	36.1	33.6	32.1	40.9	35.6	25.7	
340	59.6	43.9	45.0	41.9	37.0	33.6	40.6	-	40.8	41.1	-	43.0	42.6	30.8	
341	-	37.9	42.7	41.7		36.1	38.5	-	40.6	25.7	-	40.9	38.0	28.2	
342	-	32.5	51.6	42.9	17.3	30.7	34.2	-	38.9	35.7	36.5	44.4	36.5	26.3	
343	-		38.5	-	20.8	23.4		-	31.2	25.7	27.7	40.5	29.7	21.8	
346	-	27.6	41.1	33.7	22.7	24.0	28.1	-	34.3	24.1	-	28.9	29.4	21.2	
347	-	31.3	34.0	31.0	25.1	24.5	24.1	29.1	28.0	27.2	31.2	25.3	28.3	20.4	
348	46.0	12.7	40.0	32.2	22.3	28.7	27.6	33.1	24.1	32.1	32.8	38.9	30.9	22.3	
349	44.1	33.1	36.0	33.3	32.4	27.4	29.1	32.9	30.8	32.8	30.7	38.2	33.4	24.1	
350	49.9	38.9	45.6	39.7	35.9	37.9	-	39.1	-	36.2	44.1	41.5	40.9	29.5	
356	40.3	25.6	-	27.7	21.3	20.0	-	25.6	18.9	26.3	26.9	27.5	26.0	18.8	
362	48.8	31.2	46.7	37.6	29.8	28.8	29.9	-	-	35.0	-	-	36.0	26.3	
363	40.4	27.0	41.6	34.7	24.5	22.8		-	-	29.7	-	26.1	30.9	20.2	
364	48.8	39.2	-	35.1	31.7	31.0	33.5	-	-	27.9	-	35.5	35.3	25.4	
373	40.6	28.0	33.9	27.7	23.1	24.6	27.9	31.7	27.4	24.2	27.5	25.0	28.5	20.6	
375	25.1	13.7	21.6	14.6	19.6	22.0	12.3	29.9	11.4	11.1	16.2	20.2	18.1	13.1	
376	41.0	26.3	33.1	27.0	9.9	10.2	25.2	15.0	26.1	25.7	29.8	27.6	24.7	17.9	
377	41.5	33.1	29.5	30.2	25.5	26.8	26.7	30.3	28.2	30.8	-	26.4	29.9	21.6	

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.72) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
385	35.7	22.7	-	22.2	16.0	16.2	18.0	20.5	21.7	23.1	23.9	27.7	22.5	16.3	
386	42.1	-	26.0	25.5	23.0	22.6	22.9	27.1	21.6	28.7	28.2	32.1	27.3	19.7	
388	29.8	20.8	19.6	6.9	13.3	9.5	12.0	11.9	13.3	17.8	17.1	17.7	15.8	11.4	
390	46.4	31.6	31.9	27.8	26.4	22.0	23.9	26.5	26.9	30.7	39.2	32.1	30.4	22.0	
391	37.4	30.9	30.9	25.0	24.5	24.5	24.1	26.1	32.0	28.7	28.7	31.7	28.7	20.7	
394	23.6	15.4	19.0	13.2	11.7	11.2	9.3	11.8	12.3	13.6	17.2	20.4	14.9	10.8	
396	28.4	17.7	-	-	-	13.2	13.1	13.4	15.1	14.7	16.8	21.4	17.1	12.3	
398	29.0	18.7	20.5	18.5	14.3	13.5	14.0	12.9	13.4	14.8	-	20.5	17.3	12.5	
399	44.2	24.4	30.5	27.6	-	25.1	22.9	26.5	27.4	16.6	28.7	29.7	27.6	19.9	
401	44.4	28.3	-	31.3	-	22.9	18.9	29.2	28.9	30.6	22.8	25.3	28.3	20.4	
403	49.0	37.6	39.0	34.7	28.5	-	29.2	-	27.7	31.3	33.8	38.0	34.9	25.2	
404	43.8	27.9	36.7	32.5	22.7	24.7	-	32.3	26.5	23.3	20.7	34.0	29.6	21.3	
406	48.9	42.6	41.2	37.5	34.3	33.8	30.5	38.5	-	40.7	36.6	41.2	38.7	27.9	
407	30.0	22.3	26.1	19.2	15.5	17.1	16.8	17.6	18.2	21.8	21.2	25.3	20.9	15.1	
408	55.2	40.0	45.1	32.7	-	24.3	29.7	32.3	28.4	32.0	22.4	25.5	33.4	24.1	
412	36.7	22.7	26.4	29.0	19.3	19.2	22.1	30.3	21.1	27.4	25.3	27.2	25.6	18.5	
413	32.7	22.6	35.7	22.1	13.7	22.0	23.7	25.9	25.2	20.3	15.6	18.5	23.2	16.7	
415	39.1	-	31.9	27.2	24.0	24.2	26.8	28.8	30.9	32.3	31.4	30.5	29.7	21.5	
416	32.1	20.3	21.5	16.9	15.6	14.8	18.2	21.0	15.8	20.7	22.0	16.7	19.6	14.2	
417	35.9	25.1	26.0	22.6	18.3	15.5	19.4	20.9	16.9	23.5	14.8	21.3	21.7	15.7	
418	-	24.0	26.1	21.8	17.4	14.4	18.5	22.0	22.1	20.4	20.9	24.3	21.1	15.2	
419	37.5	25.8	29.2	22.4	19.4	18.1	-	19.6	21.5	21.9	15.8	27.2	23.5	17.0	
422	28.3	16.2	18.5	14.4	14.0	12.5	15.8	15.5	14.6	16.7	12.3	24.9	17.0	12.3	
423	-	10.8	20.4	13.5	8.3	8.6	10.7	12.6	12.1	9.6	11.0	19.8	12.5	9.0	
424	37.9	-	25.6	19.8	13.8	14.5	-	-	18.0	20.9	22.9	27.2	22.3	16.1	
425	-	26.4	38.5	26.1	21.9	22.2	34.3	26.9	26.2	27.9	20.7	26.1	27.0	19.5	
426	1.1	40.6	-	38.0	32.0	30.2	37.2	41.8	38.3	35.3	28.4	40.0	33.0	23.8	
427	54.3	29.0	54.4	44.7	34.1	42.0	43.2	50.1	52.2	44.9	-	48.4	45.2	32.6	
428	26.6	-	16.0	13.2	8.2	-	15.2	12.7	13.3	11.8	9.3	19.2	14.6	10.5	
429	29.0	19.3	38.6	21.0	-	14.7	18.5	20.9	19.4	21.0	-	22.9	22.5	16.3	
430	23.4	23.7	16.9	12.0	10.2	10.9	9.9	11.0	10.4	12.7	11.9	16.2	14.1	10.2	
431	23.1	-	15.3	12.3	11.1	12.1	12.5	14.3	12.1	15.2	8.4	18.2	14.1	10.1	
432	26.9	16.8	24.9	17.4	11.8	11.7	14.9	16.4	15.2	22.5	25.2	26.3	19.2	13.8	
433	35.0	20.4	-	-	-	-	-	17.7	18.2	-	-	-	22.8	16.1	
434	38.8	23.8	34.3	25.1	19.0	19.6	24.9	26.0	26.3	22.3	28.3	31.6	26.7	19.3	

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.72) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
435	31.9	19.8	26.4	17.3	14.5	14.1	-	14.8	16.4	18.9	17.8	27.1	19.9	14.4	
436	33.1	17.6	44.2	18.2	15.7	-	17.2	16.8	14.0	19.4	20.8	23.2	21.8	15.8	
437	46.5	33.1	35.0	25.6	26.6	24.8	22.5	25.2	21.6	18.6	17.6	24.9	26.8	19.4	
438	34.7	25.1	24.8	23.0	16.8	14.3	19.4	22.0	20.3	23.4	23.8	25.9	22.8	16.5	
439	31.4	16.6	-	18.7	16.7	17.4	14.3	16.4	16.8	21.2	24.0	-	19.4	14.0	
440	-	-	-	-	-	-	15.0	16.7	16.6	16.4	17.9	19.4	17.0	13.4	
441	41.7	23.1	32.8	23.7		18.4	19.4	22.3		20.5	21.2	20.3	24.3	17.6	
442	33.3	25.8	21.1	20.4	22.5		-	19.3	17.8	22.0	20.5	28.5	23.1	16.7	
443	-	-	-	-	-	27.0	-	-	-	-	-	-	-	-	
444	35.3	23.8	33.5	29.5	26.0	26.5	24.7	29.9	29.4	29.6	19.5	31.9	28.3	20.4	
445	41.8	23.2	44.3	34.1	25.6	28.5	28.7	33.0	29.0	31.9	23.9	31.7	31.3	22.6	
446	43.7	22.3	43.7	34.2	25.7	27.5	28.5	34.8	28.9	30.3	27.8	33.2	31.7	22.9	
447	27.6	16.2	23.4	16.4	12.4	13.8	13.4	14.7	17.7	17.7	19.4	19.1	17.7	12.7	
448	39.2	-	33.2	26.6	23.2	23.9	20.9	25.4	24.8	27.3	30.2	32.8	28.0	20.2	
449	40.7	-	32.3	25.2	-	21.0	-	25.0	22.9	22.6	20.2	32.3	26.9	19.4	
450	36.1	-	39.6	28.8	21.7	23.1	25.9	32.5	24.7	29.2	24.7	32.4	29.0	20.9	
451	29.1	19.8	28.4	20.0	17.3	17.8	17.8	23.0	18.1	23.3	21.0	19.4	21.2	15.3	
452	29.9	15.9	20.8	16.9	13.4	14.9	-	19.3	14.5	12.7	10.2	21.7	17.3	12.5	
453	17.3	7.3	13.9	8.5	5.4	4.7	6.3	8.7	-	7.2	5.1	15.1	9.0	6.5	
454	35.3	23.3	27.2	18.5	16.3	14.9	19.7	19.7	18.9	21.3	27.8	28.6	22.6	16.3	
455	45.3	25.7	33.4	28.4	18.3	18.7	24.4	28.0	29.0	24.1	23.8	-	27.2	19.6	
458	42.8	29.8	34.6	31.4	25.3	27.8	27.5	31.1	25.9	24.9	30.5	10.7	28.5	20.6	
459	63.1	-	61.4	52.7	43.7	44.5	48.1	51.6	51.6	55.8	52.7	48.6	52.2	37.7	20.5
460	35.9	24.4	29.6	19.5	14.6	15.0	18.0	20.0	22.4	22.3	-	25.0	22.4	16.2	
461	22.3	12.0	16.3	12.6	9.0	8.2	10.7	11.5	9.8	11.2	12.8	15.0	12.6	9.1	

Notes:

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

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

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

(2) Distance corrected to the nearest relevant public exposure

Appendix B: A Summary of Local Air Quality Management

Purpose of an Annual Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995, as amended by the Environment Act 2021, and associated government guidance. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas and to determine whether or not the air quality objectives are being achieved. Where exceedances occur, or are likely to occur, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) within 18 months of declaration setting out the measures it intends to put in place in pursuit of the objectives. Action plans must then be reviewed and updated no later than every five years; or if a local authority considers there is a need for further or different measures to be taken in order to achieve air quality standards; or if significant changes to sources occur within your local area.

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

Air Quality Objectives

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

The table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, 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 (NO₂)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen Dioxide (NO₂)	40µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
Particulate Matter (PM₁₀)	40µg/m ³	Annual mean	31.12.2010
Sulphur dioxide (SO₂)	350µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide (SO₂)	125µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO₂)	266µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	16.25µg/m ³	Running annual mean	31.12.2003
Benzene	5µg/m ³	Annual mean	31 12 2010
1,3 Butadiene	2.25µg/m ³	Running annual mean	31.12.2003
Carbon Monoxide	10.0mg/m ³	Maximum Daily Running 8-Hour mean	31.12.2003
Lead	0.25µg/m ³	Annual Mean	31.12.2008

Appendix C: Air Quality Monitoring Data QA/QC

QA/QC of Diffusion Tube Monitoring

Swansea Council employs the services of SOCOTEC, formerly ESG Didcot for the diffusion tube network. The method used is 50% TEA in acetone and the National Bias factor for 2022 was 0.76 (spreadsheet version 06/23).

Diffusion Tube Annualisation

The LAQM.TG(22) states that annualisation is required for any site which has a data capture of less than 75%, but greater than 25%. Annualisation was completed using version 3 of the 'Diffusion Tube Data Processing Tool'. The following diffusion tubes required annualisation: 12, 35, 40, 122, 247, 296, 336, 341, 343, 362, 363, 364, 433 and 440. Table C.2 presents the annualisation summary.

Three continuous background monitoring locations within a 50 mile radius were used. to annualise the data:

- Cwmbran Crownbridge;
- Narberth; and,
- Newport

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Swansea Council have applied a local bias adjustment factor of 0.72 to the 2022 monitoring data. A summary of bias adjustment factors used by Swansea Council over the past five years is presented in Table C.1.

Swansea Council has been carrying out a local tri-location study for many years. The locally derived bias factor has been utilised in the reports since it began and so, for consistency of approach, the factor will continue to be used.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	Local	-	0.72
2021	Local	-	0.78
2020	Local	-	0.78
2019	Local	-	0.72
2018	Local	-	0.72

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table C.4

The annual mean NO₂ concentration was corrected for distance to relevant exposure at one diffusion tube site (459). This diffusion tube was subject to the fall-off with distance correction due to the annual mean concentrations greater than 36 µg/m³ and the site not located at a point of relevant exposure. After distance correction calculations, 459 reported concentrations below 10% of the NO₂ AQS of 20.5 µg/m³.

QA/QC of Automatic Monitoring

Swansea AURN

This calibration data is automatically logged as invalid by the analyser. In addition, officers from this authority performed routine fortnightly manual calibrations. The analyser is subjected zero cylinder generated zero air to assess the analyser's response to zero air. The analyser is also subjected to traceable calibration gases at a known concentration and the response of the analyser recorded. All manual calibration data is then forwarded to Ricardo to perform data management procedures. The data is then further subjected to full network QA/QC procedure's undertaken by Ricardo on behalf of the Department of

Environment, Food and Rural Affairs (DEFRA). The station is serviced and maintained twice yearly by Enviro Technology Services Plc. In addition, the authority has a 5 day call out response for any on-site equipment problems with Enviro Technology Services Plc. All equipment on site is fully audited twice yearly by Ricardo together with the calibration gases stored on site.

Swansea Morriston Roadside

This calibration data is automatically logged as invalid by the data-logger. In addition, officers from this authority perform routine fortnightly manual calibrations. The analysers are subjected to scrubbed internal generated zero air to assess the analyser's response to zero air. The analysers are also subjected to traceable calibration gases at a known concentration and the response of the analyser and data-logger is recorded. All manual calibration data is recorded as invalid data by the data-logger and is removed from any subsequent analysis.

The station is operated and calibrated in accordance with the UK National Network Local Site Operators manual. The station is serviced and maintained twice yearly by Enviro Technology Services Ltd. In addition, the authority has a 5 day call out response for any on-site equipment problems with Enviro Technology Services Plc. Since the awarding of the contract by the Welsh Assembly Government to Ricardo (formally AEA Energy & Environment) to run the Welsh Air Quality Forum in April 2004, all equipment on site will be fully audited yearly by Ricardo AEA together with the calibration gases stored on site. The L40 span gas cylinders are replaced on a regular basis and are to a certified and traceable standard.

Swansea Cwm Level Park

The API gas analysers have been configured so that a daily automatic calibration is carried out (between 00:30 hours and 01:00 hours). This calibration data is automatically logged as invalid by the data-logger. In addition, officers from this authority perform routine monthly manual calibrations. The analysers are subjected to scrubbed internal generated zero air to assess the analyser's response to zero air.

The NO_x analyser is subjected to traceable calibration gas at a known concentration and the response of the analyser and data-logger is recorded. The internal span calibration is used with the ozone analyser. All manual calibration data is recorded as invalid data by the data-logger and is removed from any subsequent analysis.

The station is operated and calibrated in accordance with the UK National Network Local Site Operators manual. The station is serviced and maintained twice yearly by Enviro

Technology Services Ltd. In addition, the authority has a 5 day call out response for any on-site equipment problems with Enviro Technology Services Plc. Since the awarding of the contract by the Welsh Assembly Government to Ricardo to run the Welsh Air Quality Forum in April 2004, all equipment on site will be fully audited yearly by Ricardo AEA, together with an audit of the calibration gases stored on site. Data is re-scaled by Ricardo following the authority supplying routine monthly calibration reports. The L10 span gas cylinders (NO) will be replaced on a regular basis and are to a certified and traceable standard.

Swansea Hafod DOAS

- QA/QC for NO, Nitrogen Dioxide and Ozone

If (C1 >0 and C3 > 10) then result: = C1 else result: = C0

C0 – Null value

C1 – Pollutant Concentration

C2 – Standard Deviation of pollutant

C3 – Light Level of pollutant

- QA/QC for Benzene

If (C1 >0 and C3 > 40) then result: = C1 else result: = C0

C0 – Null value

C1 – Pollutant Concentration

C2 – Standard Deviation of pollutant

C3 – Light Level of pollutant

It should be noted that the data presented here represents the spatial average over the whole of the 250-meter measurement path and not a "point measurement" as seen within other "traditional or conventional" monitoring equipment/locations. It should also be noted that the DOAS methodology of monitoring does not comply with the EU Directive methods of measurement (chemiluminescent for NO₂, UV fluorescence for SO₂ etc.) at present but the system has achieved MCERTS certification and TUV certification.

The station is now subject to Xenon lamp changes on a quarterly basis, with zero and span calibrations now taking place on an annual basis. These works are undertaken by Enviro Technology Plc, the UK distributor for Opsis of Sweden.

Swansea St Thomas DOAS

All individual measurement points that have not met the QA/QC conditions (detailed below) are replaced with null values within the new dataset. The user can then compile 5 minute means from the validated dataset and undertake analysis.

- QA/QC for SO₂, Nitrogen Dioxide and Ozone

If (C1 >0 and C3 > 10) then result: = C1 else result: = C0

C0 – Null value

C1 – Pollutant Concentration

C2 – Standard Deviation of pollutant

C3 – Light Level of pollutant

- QA/QC for Benzene

If (C1 >0 and C3 > 40) then result: = C1 else result: = C0

C0 – Null value

C1 – Pollutant Concentration

C2 – Standard Deviation of pollutant

C3 – Light Level of pollutant

The station is subject to Xenon lamp changes on a 6 monthly basis with zero and span calibrations now taking place on a yearly basis. These works are undertaken by Enviro Technology Plc, the UK distributor for Opsis of Sweden. The frequency of lamp change differs to that of the Hafod DOAS as this station does not measure the NO channel and as such does not suffer the drop off/degradation in lamp intensity during the 5th and 6th months of operation. Changing the Xenon lamps every 6 months does not invoke any data issue concerns at this site.

Swansea Station Court High Street

In addition, officers from this authority perform routine fortnightly manual calibrations. The analyser is subjected to scrubbed internal generated zero air to assess the analyser's response to zero air. The NO_x analyser is subjected to traceable calibration gas at a known concentration and the response of the analyser and data-logger is recorded. All manual calibration data is recorded as invalid data by the data-logger and is removed from any subsequent analysis.

The station is operated and calibrated in accordance with the UK National Network Local Site Operators manual. The station is serviced and maintained twice yearly by Enviro Technology Services Ltd. In addition, the authority has a 5 day call out response for any on-site equipment problems with Enviro Technology Services Plc. At present, the data is collected by the Welsh Air Quality Forum, but it does not form part of the QA/QC contract with Ricardo. The L10 span gas cylinder (NO) will be replaced on a regular basis and is to a certified and traceable standard.

PM₁₀ and PM_{2.5} Monitoring Adjustment

The MetOne PM₁₀ units are indicative measurements and no adjustment factors have been applied.

The Bam1020 PM₁₀ data reported in the document has been ratified as part of the AURN network and so Swansea Council has not applied any factors to the dataset.

The Bam1020 PM_{2.5} data is reported from a SMART Bam and so no offset is applied.

Automatic Monitoring Annualisation

The LAQM.TG(22) states that annualisation is required for any site which has a data capture of less than 75%, but greater than 25%. Three automatic monitoring sites recorded below the acceptable data capture in 2022 for NO₂ and PM₁₀, therefore required annualisation. Annualisation was carried out for the annual mean NO₂ at Swansea Hafod DOAS and Swansea High Street (with data captures of 41.5% and 41.5%, respectively) and PM₁₀ at Sketty Ebam (with a data capture of 52.1%). Four continuous background monitoring locations were used, the three locations within a 50 mile radius were selected to annualise the data:

- Cardiff Centre;
- Cwmbran Crownbridge;
- Newport; and
- Narberth

These continuous background monitoring sites were applicable to use as they all had >85% data capture and therefore could be used for annualisation. Table C.3 and Table C.4 presents the annualisation summary.

NO₂ Fall-off with Distance from the Road

No automatic NO₂ monitoring locations within Swansea Council required distance correction during 2022.

Table C.2 – Annualisation Summary (concentrations presented in $\mu\text{g}/\text{m}^3$)

Site ID	Annualisation Factor Narberth	Annualisation Factor Cwmbran Crownbridge	Annualisation Factor Cardiff Centre	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
12	0.9948	0.9677	0.9767	0.9797	38.3	37.5	
35	0.9634	1.0483	1.0571	1.0229	31.3	32.1	
40	0.8612	0.9146	0.9427	0.9061	23.9	21.7	
122	1.1446	1.1273	1.0718	1.1146	27.1	30.2	
247	0.9607	0.9741	1.0223	0.9857	28.4	28.0	
296	1.0609	1.0177	1.0351	1.0379	31.1	32.3	
336	0.9763	1.0843	1.0600	1.0402	33.2	34.5	
341	1.0001	1.0531	1.0243	1.0258	38.0	39.0	
343	1.0717	1.0045	0.9734	1.0165	29.7	30.2	
362	0.9737	1.0287	1.0398	1.0141	36.0	36.5	
363	0.8752	0.9114	0.9332	0.9066	30.9	28.0	
364	0.9713	1.0054	1.0086	0.9951	35.3	35.2	
433	0.9664	0.9721	0.9927	0.9771	22.8	22.3	
440	1.2021	1.0626	1.0025	1.0890	17.0	18.5	

Table C.3 – Annualisation Summary for Automatic Monitors for Annual Mean NO_2

Site ID	Annualisation Factor Cwmbran Crownbridge	Annualisation Factor Cardiff Centre	Annualisation Factor Narberth	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
CM4	1.015	0.948	1.173	1.046	34.6	36.2	
CM11	0.944	0.934	0.982	0.953	36.2	34.6	

Table C.4 – Annualisation Summary for Automatic Monitors for Annual Mean PM₁₀

Site ID	Annualisation Factor Cardiff Centre	Annualisation Factor Newport	Annualisation Factor Narberth	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
CM8	0.960	0.924	0.892	0.925	16.1	14.9	

Table C.5 – Local Bias Adjustment Calculations

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2
Periods used to calculate bias	11	10
Bias Factor A	0.69 (0.63 - 0.78)	0.75 (0.66 - 0.89)
Bias Factor B	44% (29% - 60%)	33% (13% - 53%)
Diffusion Tube Mean (µg/m³)	25.0	13.9
Mean CV (Precision)	5.7%	6.1%
Automatic Mean (µg/m³)	17.3	10.5
Data Capture	100%	100%
Adjusted Tube Mean (µg/m³)	17 (16 - 20)	10 (9 - 12)

Notes:

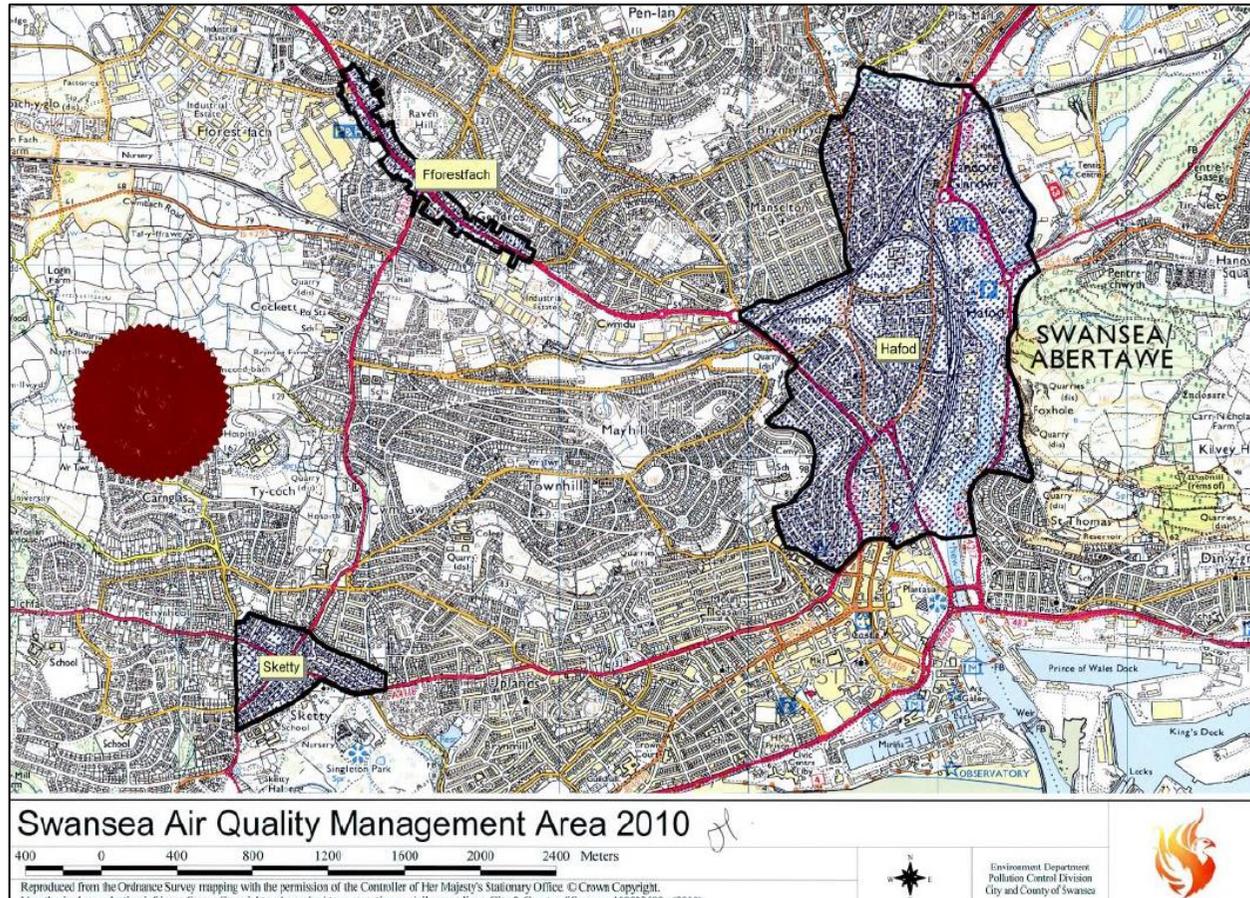
A combined local bias adjustment factor of 0.72 has been used to bias adjust the 2022 diffusion tube results.

Table C.6 – NO₂ Fall off With Distance Calculations (concentrations presented in µg/m³)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted)	Background Concentration	Concentration Predicted at Receptor	Comments
459	1.9	30.8	37.7	11.1	20.5	

Appendix D: AQMA Boundary Maps

Figure D.1 – Swansea AQMA 2010



Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO 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