Pembrokeshire County Council

2024 Annual Progress Report

Bureau Veritas
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Pembrokeshire County Council 2024 Air Quality Progress Report

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

Local Air Quality Management

Date: September 2024

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Report Reference Number	2024 APR
Date	September 2024

Executive Summary: Air Quality in Our Area

Air Quality in Pembrokeshire

Pembrokeshire County Council's monitoring network in 2023 reports no exceedances of the NO_2 annual mean AQS (Air Quality Strategy) objective of 40 µg/m^3 reported throughout Pembrokeshire. The maximum reported concentration was located at Site ID PCC45 of µg/m^3; this monitoring station is situated along Main Street, located within the Pembroke Air Quality Management Area (AQMA). The remaining monitoring stations reported concentrations well below the AQS objective.

During 2023, 42 passive NO_2 monitoring locations recorded a decrease in annual mean concentrations from 2022, with an average overall decrease of 1.1 µg/m^3 across all monitoring sites.

Pembrokeshire County Council currently have two declared AQMAs (Haverfordwest and Pembroke). Details of these AQMAs can be found on the UKAir website and the Welsh Government Website. All AQMAs have been declared due to exceedances of the NO_2 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. Pembroke and Haverfordwest AQMAs have been compliant for two and four years respectively.

Concentrations at monitoring location PCC45 have shown to be fluctuating near to 40 µg/m^3 over the past five years, however concentrations have now stabilised around ~32 µg/m^3. However, monitoring data will continue to be reviewed at this site over the subsequent years, and in the event of continual decreases, further assessment will be completed into revocation.

No diffusion tube monitoring sites reported an annual mean NO_2 concentration greater than 60 µg/m^3, 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 station located in Narberth (PEMB) reported no 1-hour NO_2 concentrations greater than 200 µg/m^3.

The Narberth automatic monitoring station reports PM_{10} and $PM_{2.5}$ compliance, with both the annual and 24-hour AQS objectives continuing to be maintained.

Actions to Improve Air Quality

Pembrokeshire County Council continue to have two AQMA's declared for exceedances of the NO_2 annual mean AQS objective. An Action Plan has been developed to assist with the control and management of air quality, with the main focus on reducing annual mean NO_2 concentrations. The Council continues to review the monitoring network in order to deploy new monitoring sites where it is expected that there may either be exceedances or in areas where congestion occurs.

Local Priorities and Challenges

Pembrokeshire County Council continues to monitor NO_2 concentrations throughout the County, and in particular within the two AQMAs. The Council intends to revoke the AQMAs once annual mean NO_2 concentrations have remained below 36 µg/m^3 for three consecutive years in order to ensure that compliance is maintained. Concentrations in previous years have been observed to be increased at some locations in the Pembroke AQMA, if this continues in future years then an investigation will be undertaken to determine the cause of this. The Council also intends to continue progressing with air quality measures stated in their action plan to improve air quality within the County and wider area.

How to Get Involved

Specific information on Air Quality in Pembrokeshire can be accessed via Pembrokeshire County Council's website. The Welsh Air Quality website details all Welsh automatic air quality monitoring data with information and links to other sources of air quality data, including educational resources for schools. UK-AIR provides information on the national UK air quality information.

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1 Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

A summary of the reports produced on air quality by Pembrokeshire County Council to date are accessible on the Pembrokeshire County Council website, via previous Annual Status Reports (APR), which summarise previous year air quality reports.

Annual Progress Report 2023 Summary

2023 The monitoring network within Pembrokeshire reported an overall decrease in NO_2 concentrations, with 35 non automatic sites undergoing a decrease from 2021. Both Haverfordwest and Pembroke AQMAs continue to report compliance, with both Haverfordwest and Pembroke reporting three years of full compliance. However, concentrations at monitoring location PCC45 have shown to be fluctuating near to 40 µg/m^3 over the past five years. Therefore, there was no intention to revoke both AQMAs in 2023.

1.2 Air Quality Management Areas

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

A summary of AQMAs declared by Pembrokeshire County Council can be found in Table 1.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online on the Council's website and UK-Air.

Table 1.1 – Declared Air Quality Management Areas

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	City / Town	Description	Action Plan
Haverfordwest	NO_2 Annual Mean	Continued improvement in air quality has been seen in 2023 within Haverfordwest AQMA. A decrease at 19 sites has been observed in 2023.	Haverfordwest	The main road network through the town comprising mixed commercial residential areas.	Action Plan 2014 Updated 2019
Pembroke	NO_2 Annual Mean	Continued improvement in air quality has been seen in 2023 within Haverfordwest AQMA. A decrease at all sites has been observed in 2023.	Pembroke	Part of the main road network through the town, the main shopping high street with a mix of commercial and residential property.	Action Plan 2014 Updated 2019

AQMA boundary maps within Pembrokeshire County Council can be viewed in Appendix D.

1.3 Implementation of Action Plans

Pembrokeshire County Council has taken forward a number of measures during 2023 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.

AQAPs 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	Air Quality Action Plan 2017	Parking Restrictions Pembroke AQMA	County Council	2014	Updated 2019	NO_2 Levels	Compliance e with NO_2 objective in AQMA	Reduction of NO_2 levels but cannot patrol 7 days a week	Compliance with NO_2 objective achieved but <36ug/m^3 required for three consecutive years	Ongoing	Reduction of initial exceedances that led to AQMA declaration
2	LINC	Bwcabus service	Partnership Carmarthenshire, Ceredigion, Pembrokes hire Authority's	Pre 2017	2017 to 2020 RDP	None	n/a	Used by public in other areas	n/a	Ongoing	Remove private vehicles from roads
3	Active Travel Consultation	Walking and cycling	County Council	2017 public consultation	2017	None	n/a	Ongoing	n/a	15 year programme	To ensure planners consider needs of walkers and cyclists and encourage active travel
4	Chimney Links, Fishguard	To alleviate traffic congestion and improve public transport in town centre	County Council	Pre 2017	2017	n/a	n/a	Completed	Completed, traffic diverted from narrow street areas reducing congestion	Completed	Alleviate vehicle congestion and associated emissions within town centre
5	Quality Partnership Scheme	Improve the quality and service provided by bus operators	Welsh Government	Pre 2017	2017	n/a	Contributes to reduced emissions	Funding received	n/a	Ongoing	Encourage use of public transport reducing private vehicle use

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
6	Review of Local Development Plan	Statutory requirement	County Council	2017	2019	n/a	Air quality considerations within planning consultation phase	Public Consultation	Ongoing, extended delivery agreement due to COVID-19	2022	Relevant departments can comment in relation to developments and air quality Specifically.
7	Enforcement Actions	Statutory requirement	Local Authority	Statutory obligation	Statutory obligation	Increase in enforcement action implemented	To mitigate emissions from burning trade wastes	Ongoing	High profile local businesses burning trade wastes. Persons/business contacted via informative letters detailing relevant legislation and enforcement actions.	Ongoing	Protection of public health and the environment
8	Funding Boost	Transport Schemes	Welsh Government	Pre 2018	2018	n/a	n/a	n/a	n/a	Ongoing	Develop cycle/pedestrian routes, electric car charging facilities, transport data studies to deliver sustainable transport initiatives

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
9	Pedestrianisation Scheme Consultation	To remove annual variation to start finish dates in Tenby	Local Authority	Pre 2018	2018	n/a	n/a	Ongoing strategy	Ongoing annual scheme	Ongoing	Questionnaire e to assess public interest in development and possible permanent pedestrianisation of Tenby Centre
10	Website Development	Maps and detailed information of cycle routes around county to website	Local Authority	Pre 2018	2018	n/a	n/a	Ongoing	Ongoing	Ongoing	Information source for cyclists includes traffic free sections of cycle path routes
11	Coastal Bus Service Provision	To provide access for tourists, walkers, and residents in coastal communities	Local Authority and Pembrokeshire Coast National Park	Pre 2015	Pre 2015	Increase in passenger figures	n/a	Ongoing	n/a	Ongoing	Remove private vehicles from road use
12	Vehicle Idling Prevention	To prevent emissions to air from idling vehicles	Local Authority	Pre 2018	2018	Taxi rank in AQMA well within NO_2 objective	Yes	Ongoing	Annual Mean Objective for NO_2 met	Ongoing	Taxi firms contacted directly via Licensing regime, Annual Mean NO_2 Objective met
13	Greening Pembroke Town Centre	To mitigate air borne pollution and protect public health	Local Authority	2019	2020	n/a	Yes	Application stage	n/a for return	n/a	n/a
14	Greening Haverfordwest Town Centre	To mitigate air borne pollution and protect public health	Local Authority	2019	2020	n/a	Yes	Application stage	n/a	n/a	n/a

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
15	Carbon Neutral Pembrokeshire	Combat Climate Change	Local Authority	2019	Carbon Neutral by 2030 survey	Cardiff University and Coastal Communities Adapting Together charged with project	Possible	Questionnaire provided	Collation of responses has not yet taken place	n/a	Joint benefits of CO_2 and NO_2, many measures to reduce CO_2 focus on changing mode of transport

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

2.1 Summary of Monitoring Undertaken in 2023

2.1.1 Automatic Monitoring Sites

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

Pembrokeshire County Council undertook automatic (continuous) monitoring at one site during 2023. Table 2.1 presents the details of the site. National monitoring results are available at both the Welsh Air Quality Forum and UK-AIR. This monitoring site is part of, and managed by, the Automatic Urban and Rural Network (AURN).

Maps showing the location of the monitoring sites are provided in Figure 2.1 and on the Welsh Air Quality Forum. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C: Air Quality Monitoring Data QA/QC.

2.1.2 Non-Automating Monitoring Sites

Pembrokeshire County Council undertook non-automatic (passive) monitoring of NO_2 at 45 sites during 2023. Table 2.2 presents the details of the sites.

Maps showing the location of the monitoring sites are provided in Figure 2.2 – Figure 2.4. 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 either 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)
PEMB	Narberth	Rural	No	214374	212774	NO_2, O_3, PM_{10}, $PM_{2.5}$, SO_2	API Analysers, Fidas, Echotech Serinus	2.5	N/A	N/A	N/A

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

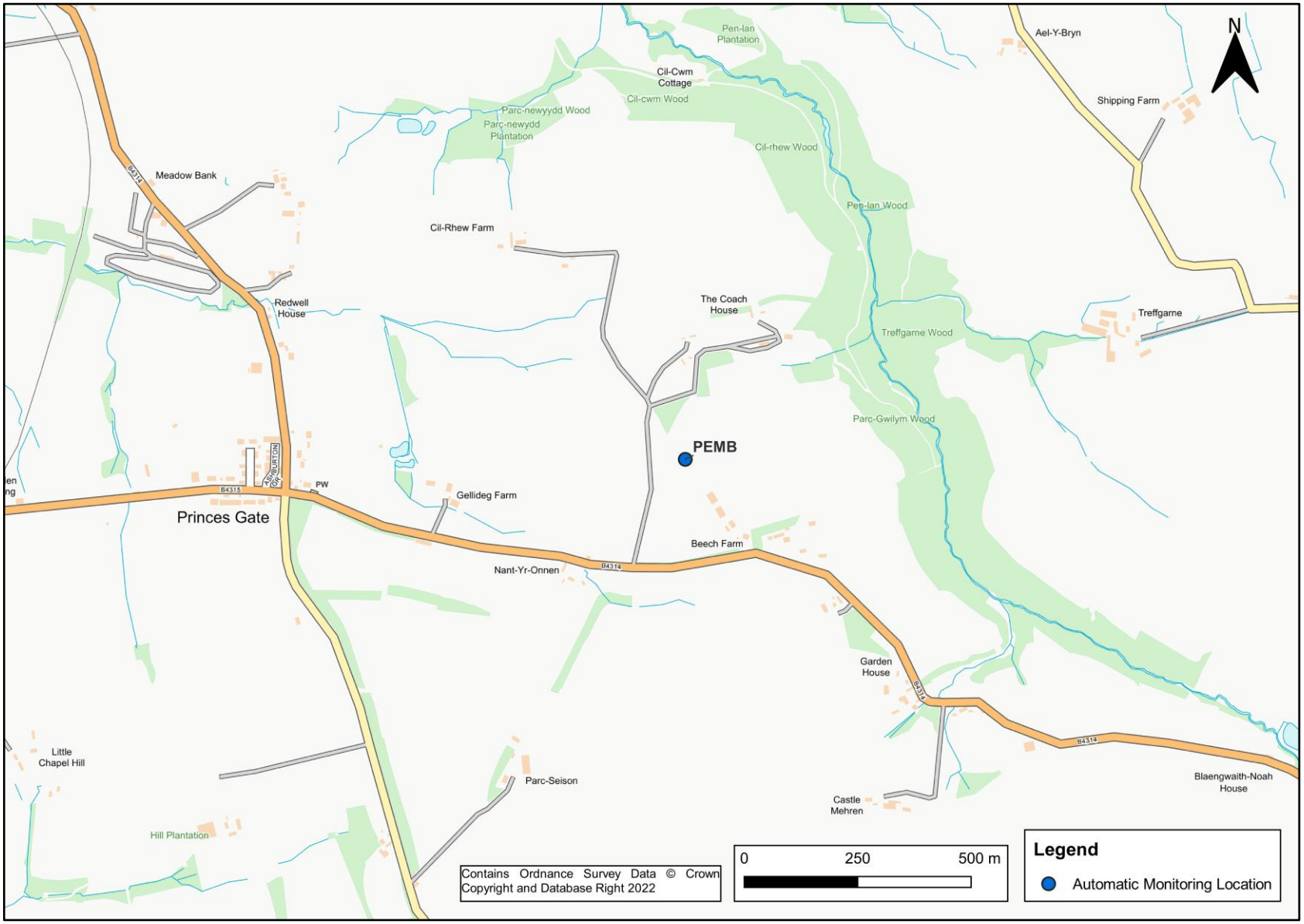


Table 2.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
PCC1	Salutation Square	Roadside	195629	215655	NO_2	N	N/A	N/A	N	2.0
PCC2	Picton Place	Roadside	195574	215704	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0
PCC3	Victoria Place	Roadside	195474	215661	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0
PCC4	High St	Roadside	195402	215634	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0
PCC5	High St	Roadside	195312	215605	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0
PCC6	High St	Roadside	195294	215591	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0
PCC7	High St	Roadside	195203	215544	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0
PCC8	High St	Roadside	195159	215494	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0
PCC9	Dark St	Roadside	195267	215603	NO_2	N	1.0	2.0	N	2.0
PCC10	Dark St	Roadside	195177	215616	NO_2	N	1.0	2.0	N	2.0
PCC11	Dew St	Roadside	195143	215464	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
PCC12	Dew St	Roadside	195110	215394	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0
PCC13	Dew St	Roadside	195101	215357	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0
PCC14	Dew St	Roadside	195028	215269	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0
PCC15	Dew St	Roadside	194998	215255	NO_2	Y - Haverfordwest AQMA	1.0	2.0	N	2.0
PCC16	Shipmans Lane	Roadside	195006	215208	NO_2	N	1.0	2.0	N	2.0
PCC17	Albert St	Roadside	194945	215259	NO_2	Y - Haverfordwest AQMA	0.0	1.0	N	2.0
PCC18	Albert St	Roadside	194937	215254	NO_2	Y - Haverfordwest AQMA	0.0	1.0	N	2.0
PCC19	Albert St	Roadside	194936	215268	NO_2	Y - Haverfordwest AQMA	0.0	1.0	N	2.0
PCC20	Albert St	Roadside	194922	215263	NO_2	Y - Haverfordwest AQMA	0.0	1.0	N	2.0
PCC21	Albert St	Roadside	194930	215276	NO_2	Y - Haverfordwest AQMA	0.0	1.0	N	2.0
PCC22	Albert St	Roadside	194911	215268	NO_2	Y - Haverfordwest AQMA	0.0	1.0	N	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
PCC23	Albert St	Roadside	194911	215279	NO_2	Y - Haverfordwest AQMA	0.0	1.0	N	2.0
PCC24	Albert St	Roadside	194893	215279	NO_2	Y - Haverfordwest AQMA	0.0	1.0	N	2.0
PCC25	Albert St	Roadside	194905	215286	NO_2	Y - Haverfordwest AQMA	0.0	1.0	N	2.0
PCC26	Albert St	Roadside	194886	215284	NO_2	Y - Haverfordwest AQMA	0.0	1.0	N	2.0
PCC27	Albert St	Roadside	194879	215300	NO_2	Y - Haverfordwest AQMA	0.0	1.0	N	2.0
PCC28	Albert St	Roadside	194856	215299	NO_2	N	0.0	1.0	N	2.0
PCC29	Barn St	Roadside	194901	215345	NO_2	N	0.0	1.0	N	2.0
PCC30	Barn St	Roadside	194974	215448	NO_2	N	0.0	1.0	N	2.0
PCC31	Merlins Bridge	Roadside	194730	214554	NO_2	N	N/A	N/A	N	2.0
PCC32	Merlins Bridge	Roadside	194761	214610	NO_2	N	N/A	N/A	N	2.0
PCC33	Haroldston Terrace	Roadside	194774	214465	NO_2	N	N/A	N/A	N	2.0
PCC34	Quay St	Roadside	195453	215594	NO_2	N	1.0	2.0	N	2.0
PCC35	Quay St	Roadside	195642	215273	NO_2	N	1.0	2.0	N	2.0
PCC36	High St	Roadside	210901	214713	NO_2	N	1.0	2.0	N	2.0
PCC40	Main St	Roadside	198244	201554	NO_2	N	1.0	2.0	N	2.0
PCC41	Main St	Roadside	198274	201547	NO_2	Y - Pembroke AQMA	1.0	2.0	N	2.0
PCC42	Main St	Roadside	198333	201549	NO_2	N	1.0	2.0	N	2.0

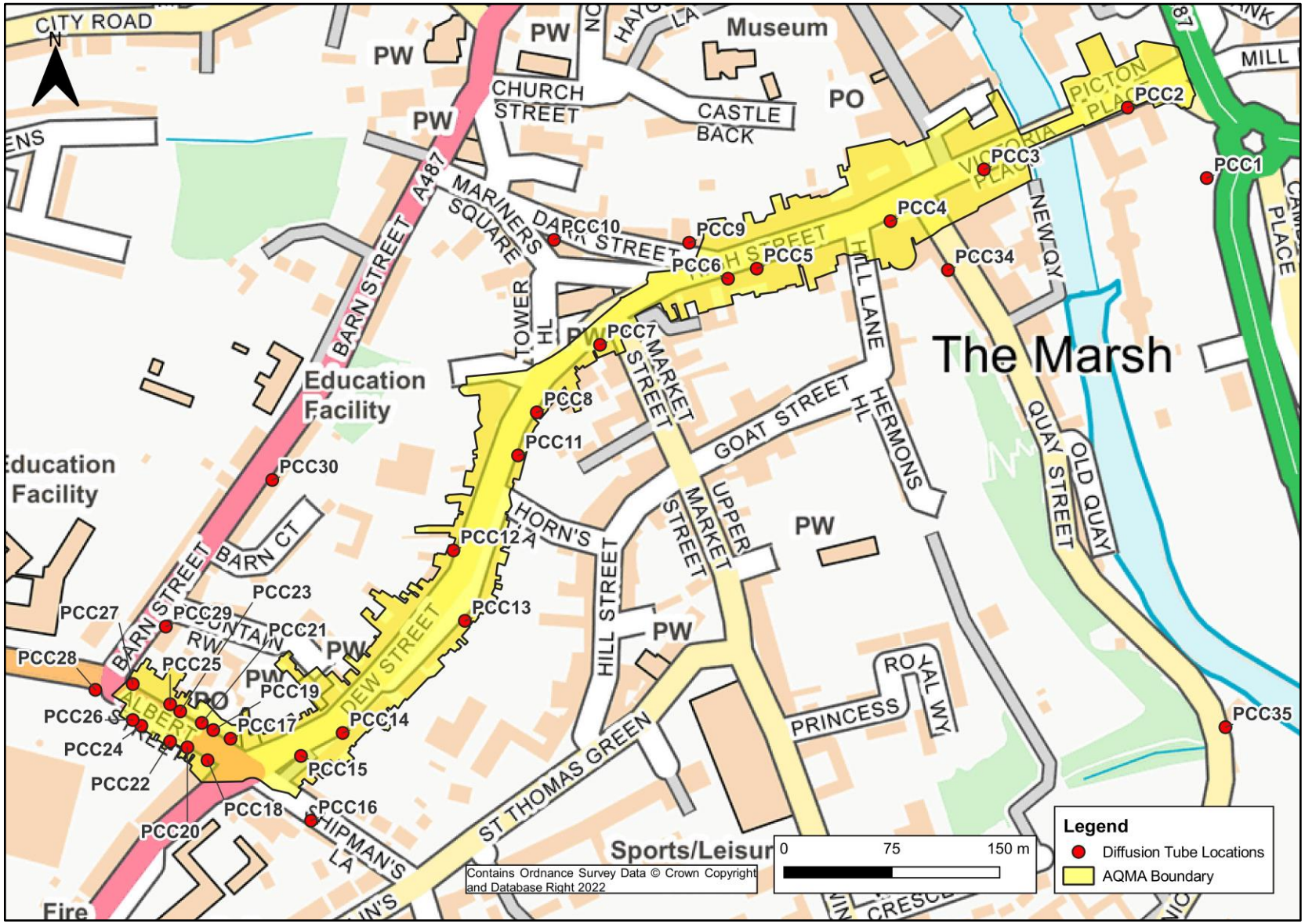
Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
PCC43	Main St	Roadside	198364	201502	NO_2	Y - Pembroke AQMA	1.0	2.0	N	2.0
PCC44	Main St	Roadside	198396	201495	NO_2	Y - Pembroke AQMA	1.0	2.0	N	2.0
PCC45	Main St	Roadside	198407	201489	NO_2	Y - Pembroke AQMA	1.0	2.0	N	2.0
PCC46	Main St	Roadside	198460	201464	NO_2	Y - Pembroke AQMA	1.0	2.0	N	2.0
PCC47	Main St	Roadside	198548	201419	NO_2	Y - Pembroke AQMA	1.0	2.0	N	2.0
PCC48	Main St	Roadside	198869	201299	NO_2	N	1.0	2.0	N	2.0

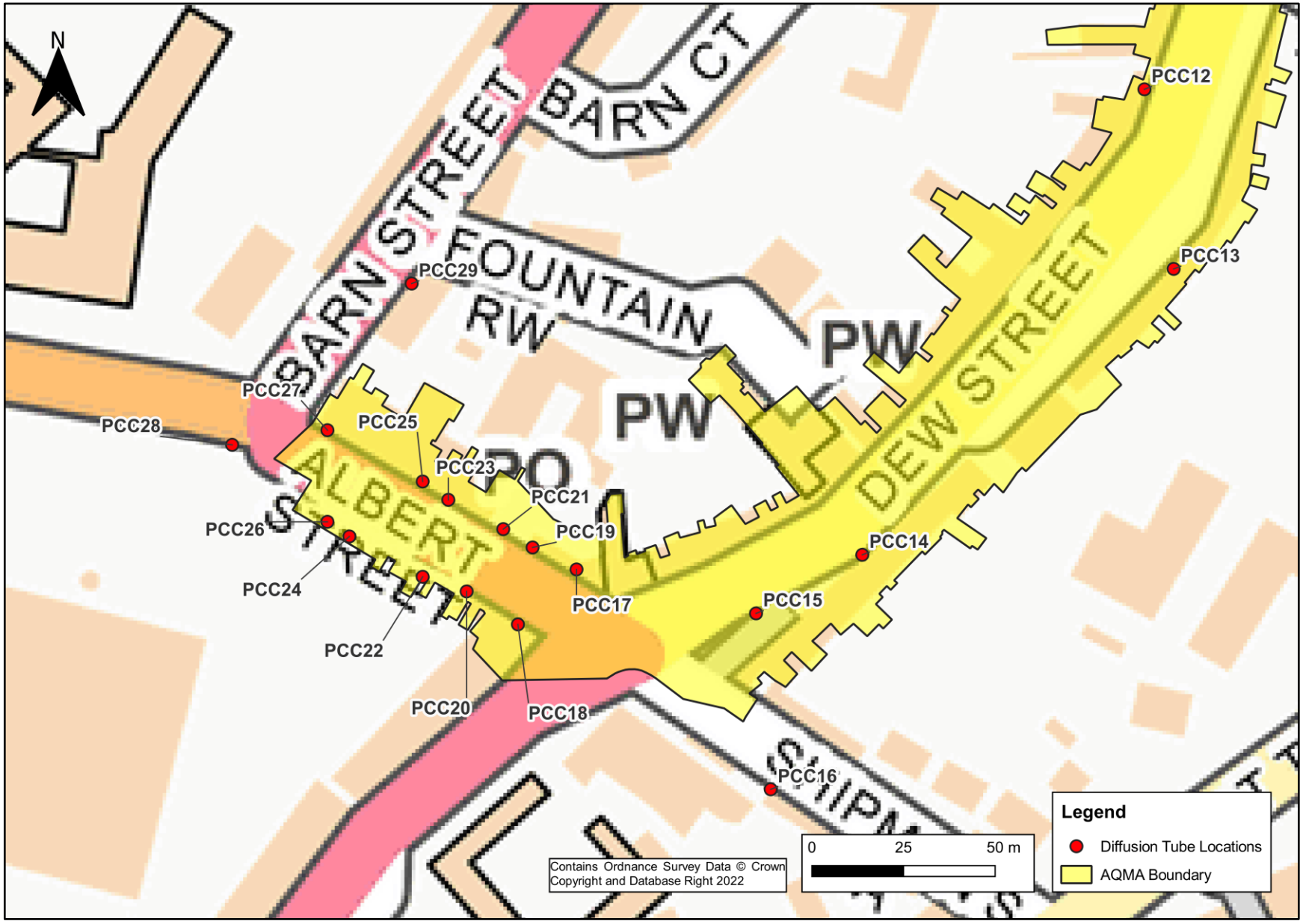
Notes:

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

(2) N/A if not applicable.

Figure 2.2 – Map(s) of Non-Automatic Monitoring Sites

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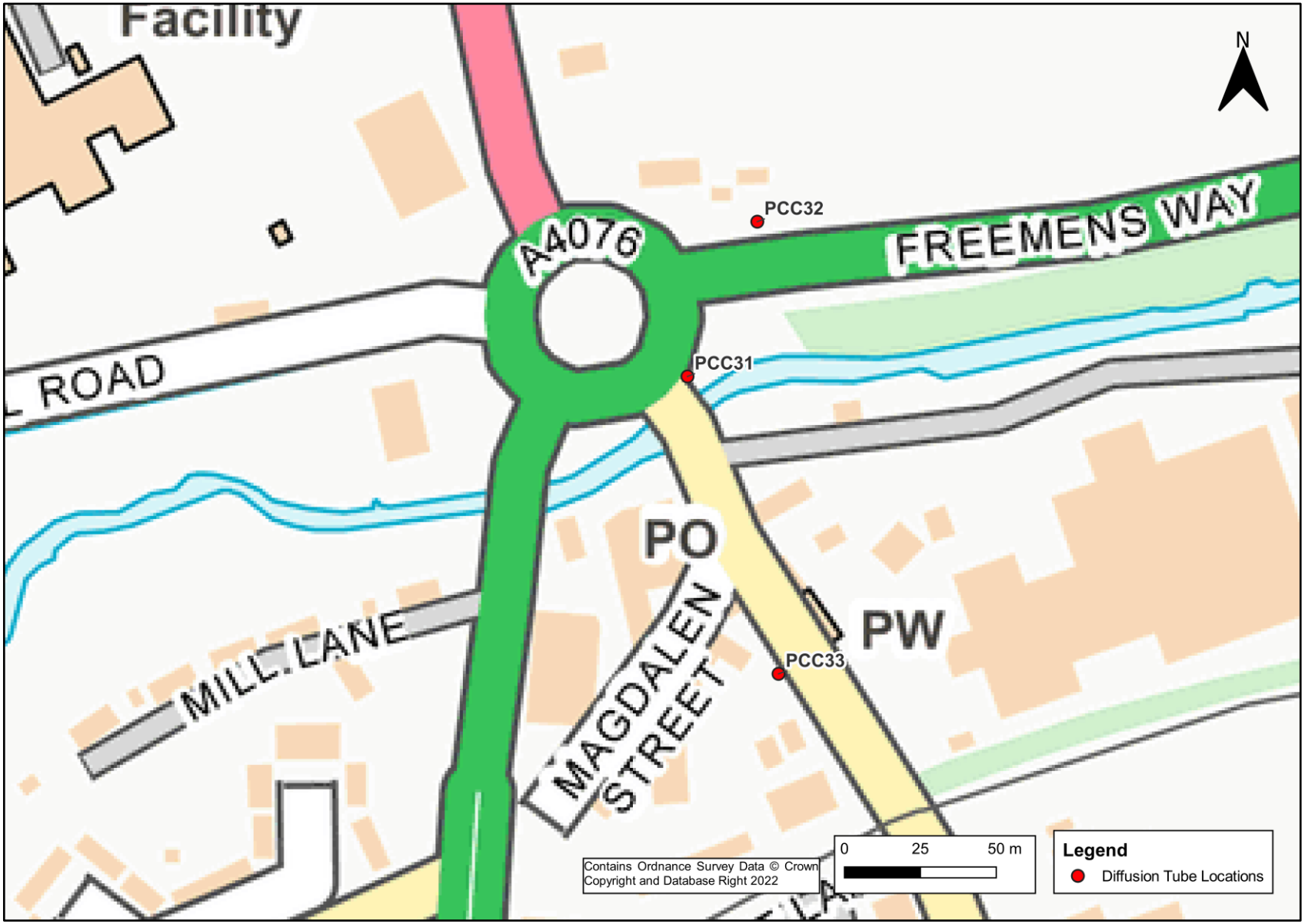
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Figure 2.3 – Map of Non-Automatic Monitoring Sites in Pembroke

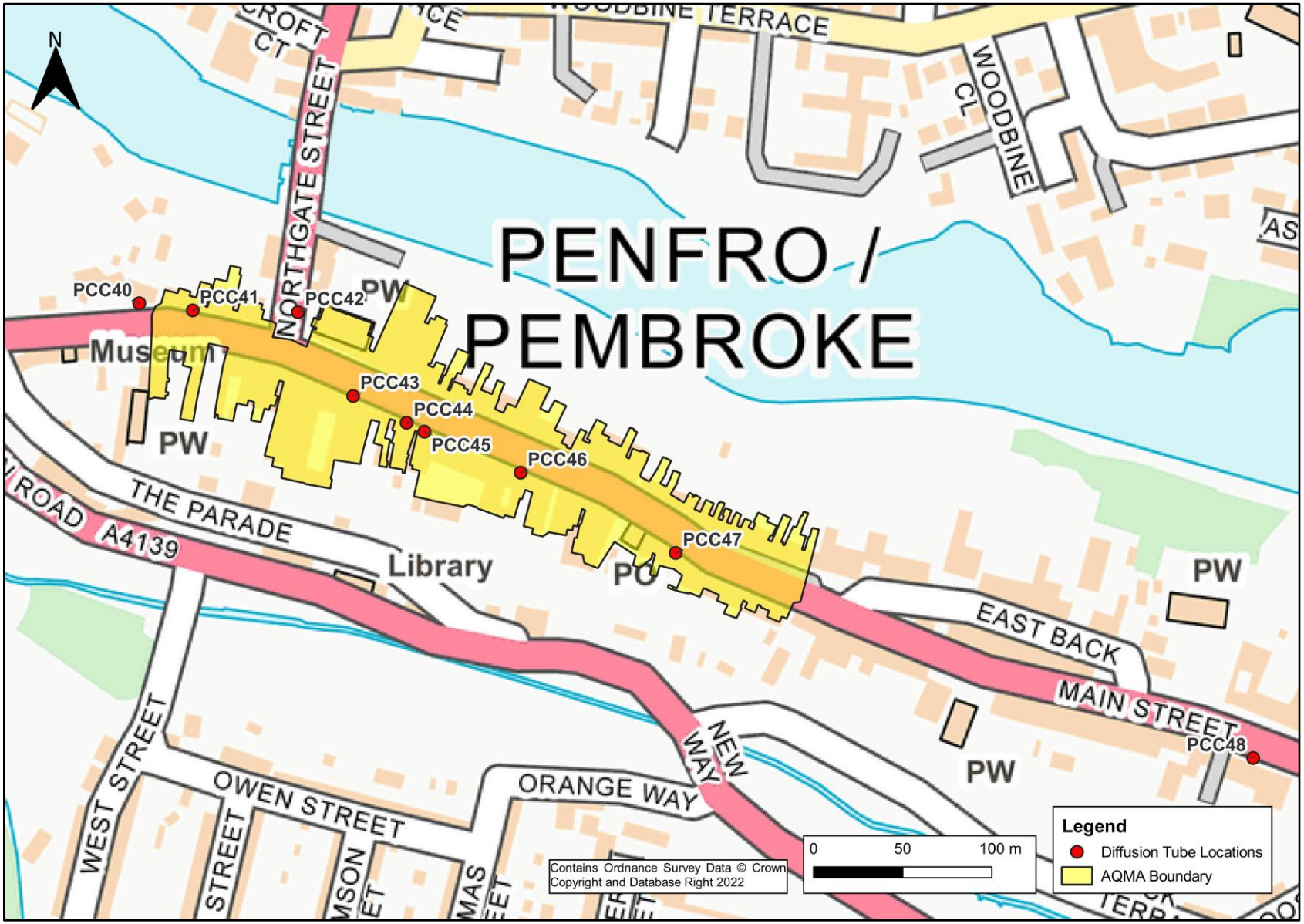


Figure 2.4 – Map of Non-Automatic Monitoring Sites in Narberth

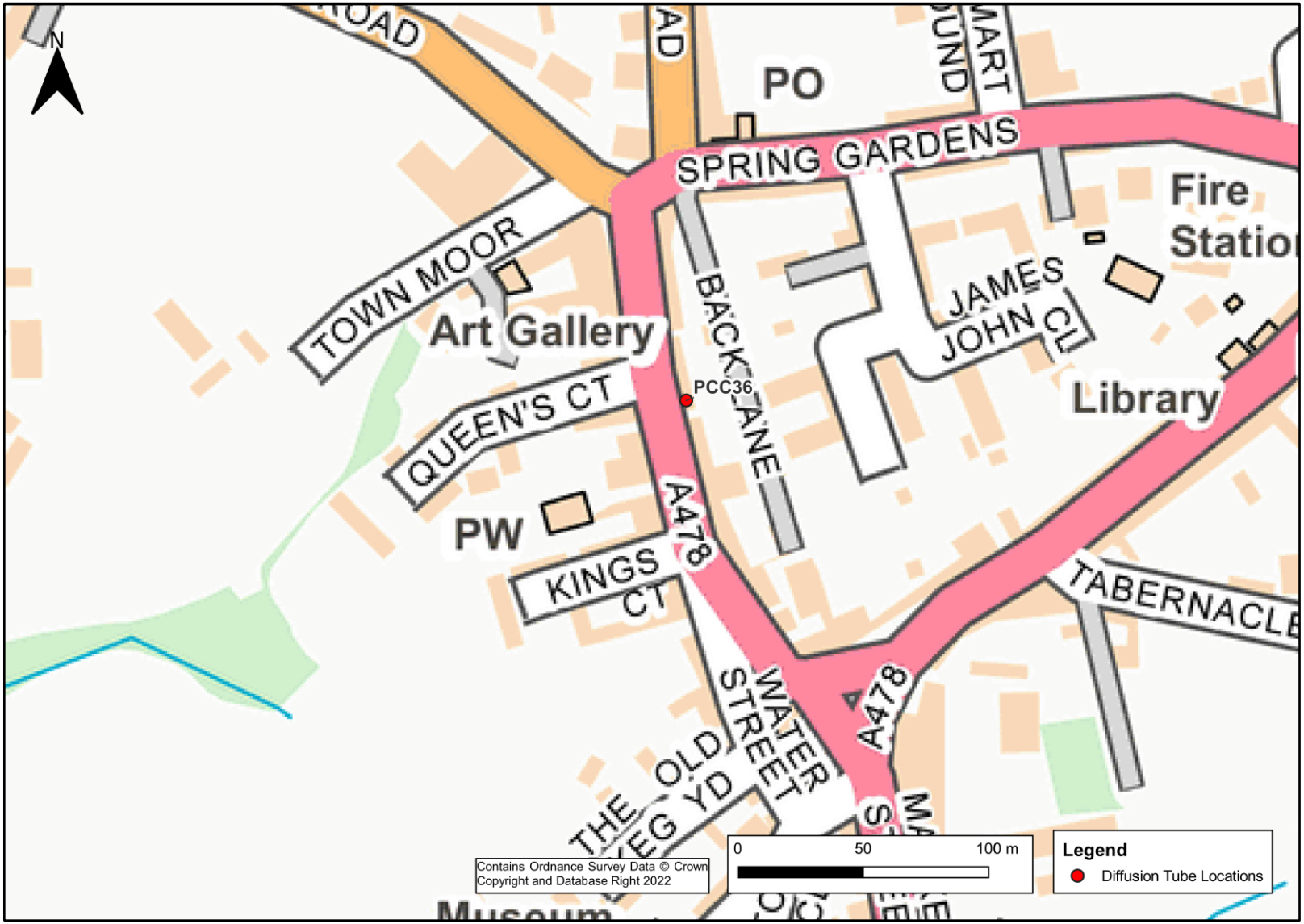
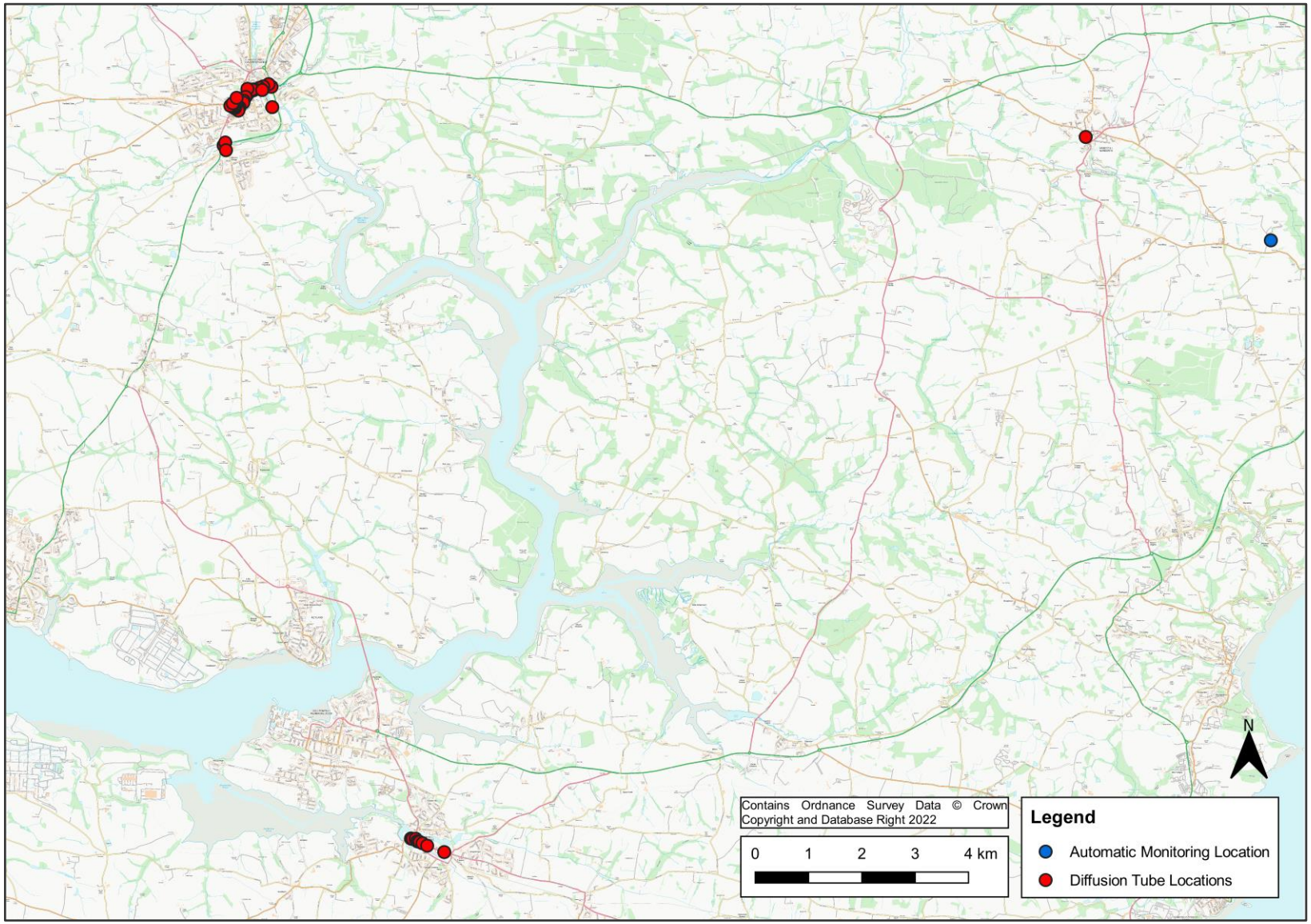


Figure 2.5 – Spatial Map of Pembrokeshire's Automatic and Non-Automatic Monitoring Network



2.2 2023 Air Quality Monitoring Results

Table 2.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PEMB	Rural	Automatic	95.0	95.0	4	3.1	3.1	2.9	2.4

Notes:

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

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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

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

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

Table 2.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PCC1	195629	215655	Roadside	100.0	100.0	20.2	13.7	17.3	16.2	14.4
PCC2	195574	215704	Roadside	84.6	84.6	25.6	16.2	19.3	20.6	19.8
PCC3	195474	215661	Roadside	76.9	76.9	26.1	15.8	18.9	16.4	18.5
PCC4	195402	215634	Roadside	90.4	90.4	32.1	24.8	26.9	22.9	22.2
PCC5	195312	215605	Roadside	100.0	100.0	38.8	28.9	29.1	26.8	26.4
PCC6	195294	215591	Roadside	90.4	90.4	33.2	24.2	27.9	25.9	24.7
PCC7	195203	215544	Roadside	100.0	100.0	35.4	25.2	29.6	27.5	26.2
PCC8	195159	215494	Roadside	100.0	100.0	28.6	19.9	22.4	22.0	21.8
PCC9	195267	215603	Roadside	100.0	100.0	21.8	16.3	18.5	18.9	17.3
PCC10	195177	215616	Roadside	90.4	90.4	15.7	13.4	12.1	13.4	12.9
PCC11	195143	215464	Roadside	100.0	100.0	29.8	20.3	23.0	22.3	20.4
PCC12	195110	215394	Roadside	67.3	67.3	27.3	20.0	24.0	21.1	21.3
PCC13	195101	215357	Roadside	100.0	100.0	27.2	18.5	22.1	20.7	19.8
PCC14	195028	215269	Roadside	100.0	100.0	24.3	16.5	19.4	20.3	17.8
PCC15	194998	215255	Roadside	90.4	90.4	30.2	19.2	21.6	22.9	20.6
PCC16	195006	215208	Roadside	84.6	84.6	19.3	12.6	13.7	15.2	13.7
PCC17	194945	215259	Roadside	92.3	92.3	23.3	20.5	23.6	23.3	20.7
PCC18	194937	215254	Roadside	67.3	67.3	35.4	24.3	28.4	26.3	26.5
PCC19	194936	215268	Roadside	100.0	100.0	24.1	16.7	20.3	19.2	17.5
PCC20	194922	215263	Roadside	84.6	84.6	36.5	26.1	30.4	26.7	25.3
PCC21	194930	215276	Roadside	100.0	100.0	17.2	11.6	14.6	13.7	11.9
PCC22	194911	215268	Roadside	84.6	84.6	35.8	24.7	29.2	26.7	25.6
PCC23	194911	215279	Roadside	100.0	100.0	26.1	18.5	21.9	19.9	18.4
PCC24	194893	215279	Roadside	75.0	75.0	34.7	23.3	28.1	25.8	24.7
PCC25	194905	215286	Roadside	100.0	100.0	22.7	16.1	20.0	18.7	16.7
PCC26	194886	215284	Roadside	75.0	75.0	37.1	22.6	27.7	25.6	24.0
PCC27	194879	215300	Roadside	84.6	84.6	23.9	16.3	18.8	19.1	17.9
PCC28	194856	215299	Roadside	100.0	100.0	20.2	13.8	16.4	14.4	13.9
PCC29	194901	215345	Roadside	90.4	90.4	21.9	15.5	19.8	18.2	16.8
PCC30	194974	215448	Roadside	92.3	92.3	14.7	10.3	11.8	11.6	10.8
PCC31	194730	214554	Roadside	100.0	100.0	29.9	21.9	27.7	27.6	25.9
PCC32	194761	214610	Roadside	100.0	100.0	33.7	23.4	27.2	24.4	22.9
PCC33	194774	214465	Roadside	38.5	38.5	23.0	16.9	19.8	17.1	15.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PCC34	195453	215594	Roadside	90.4	90.4	21.1	13.1	16.1	16.4	15.5
PCC35	195642	215273	Roadside	100.0	100.0	12.2	8.2	9.1	9.9	8.5
PCC36	210901	214713	Roadside	100.0	100.0	21.3	15.0	17.9	17.1	15.7
PCC40	198364	201502	Roadside	100.0	100.0	21.0	15.2	17.8	16.5	15.3
PCC41	198396	201495	Roadside	100.0	100.0	24.5	17.2	21.0	18.3	17.8
PCC42	194893	215279	Roadside	100.0	100.0	22.1	14.2	16.7	17.5	15.9
PCC43	194905	215286	Roadside	100.0	100.0	32.5	22.5	26.1	23.7	23.2
PCC44	194886	215284	Roadside	100.0	100.0	35.4	26.1	29.5	26.6	26.4
PCC45	198407	201489	Roadside	90.4	90.4	39.3	29.1	36.0	32.2	31.6
PCC46	198460	201464	Roadside	100.0	100.0	34.3	24.7	29.5	27.4	26.4
PCC47	198548	201419	Roadside	100.0	100.0	23.9	15.7	19.9	17.9	17.3
PCC48	198869	201299	Roadside	100.0	100.0	12.6	8.6	10.4	9.8	9.1

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

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

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

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

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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 2.6 – Trends in Annual Mean NO_2 Concentrations at Narberth Automatic Monitoring Station

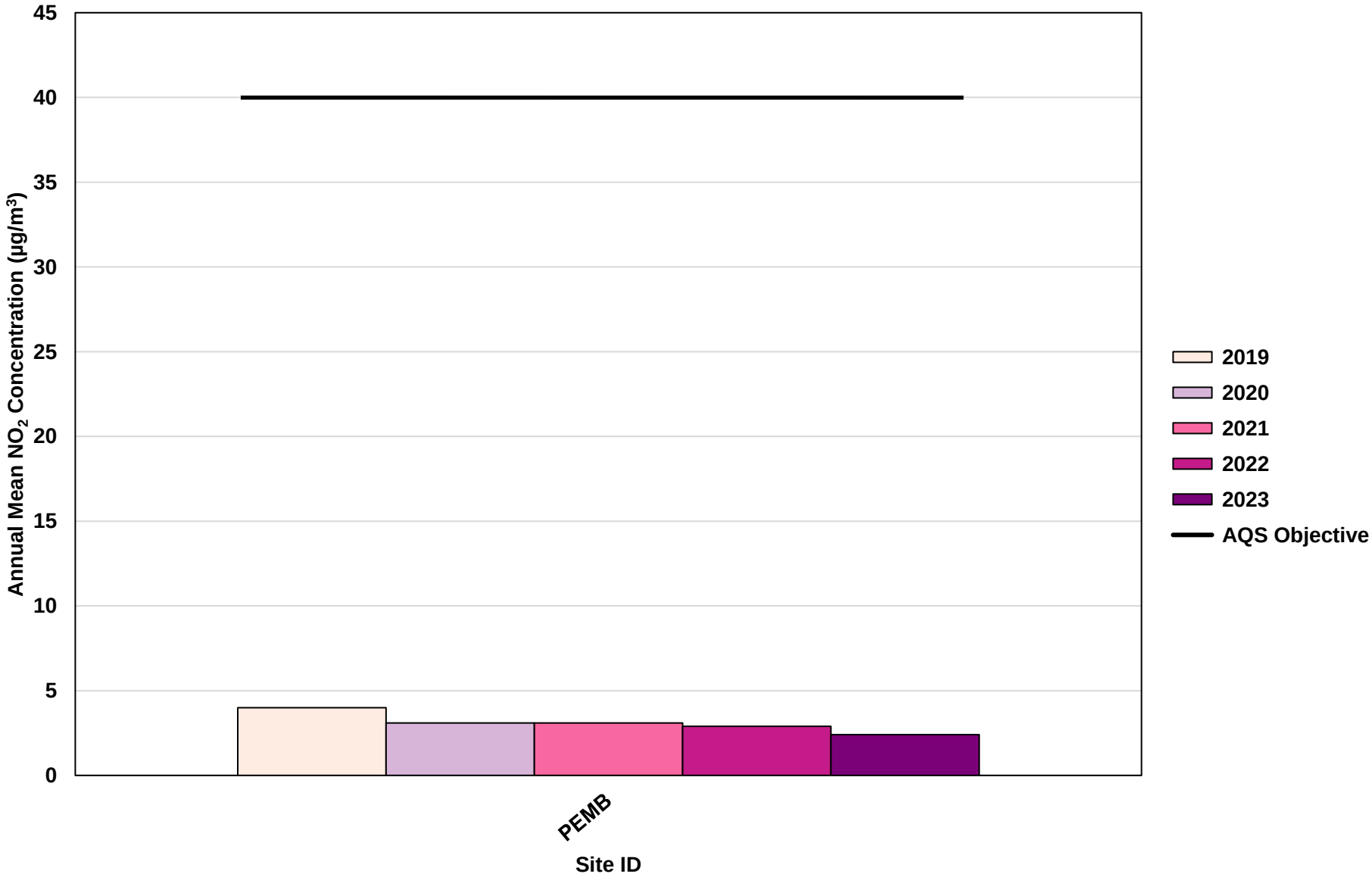


Figure 2.7 – Trends in Annual Mean NO_2 Concentrations in Haverfordwest

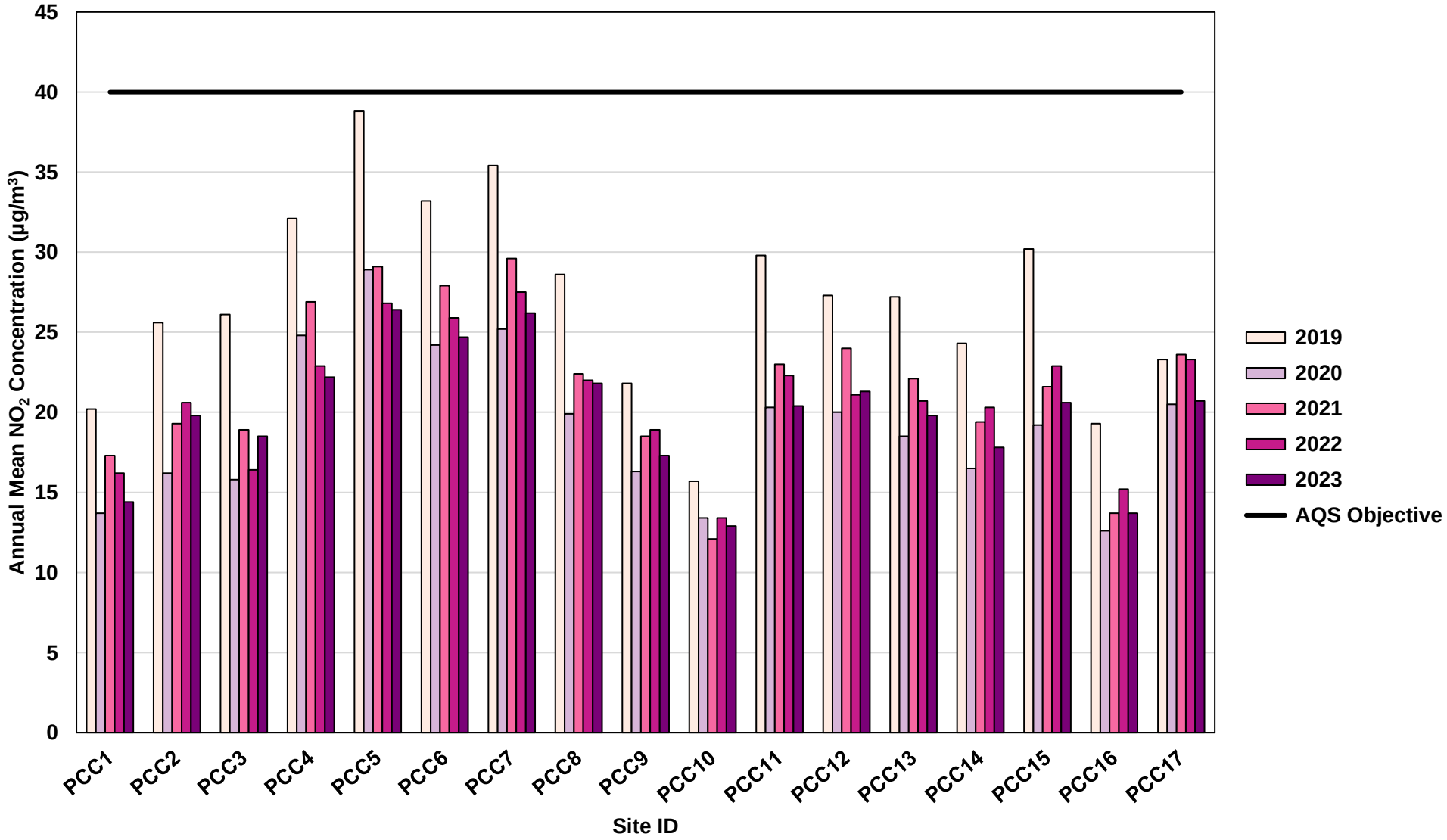


Figure 2.8 – Trends in Annual Mean NO_2 Concentrations in Haverfordwest

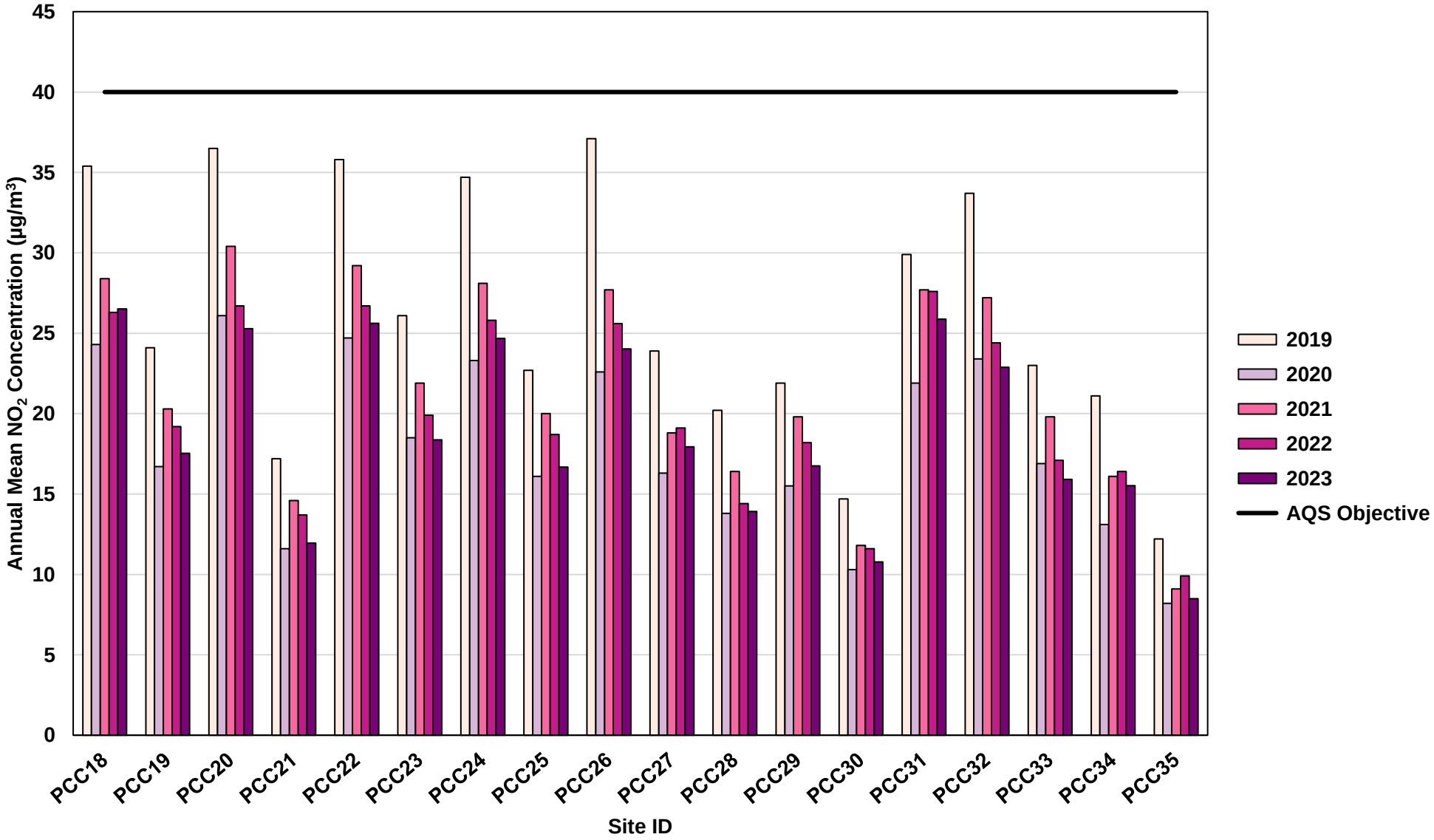


Figure 2.9 – Trends in Annual Mean NO_2 Concentrations in Haverfordwest and Narberth

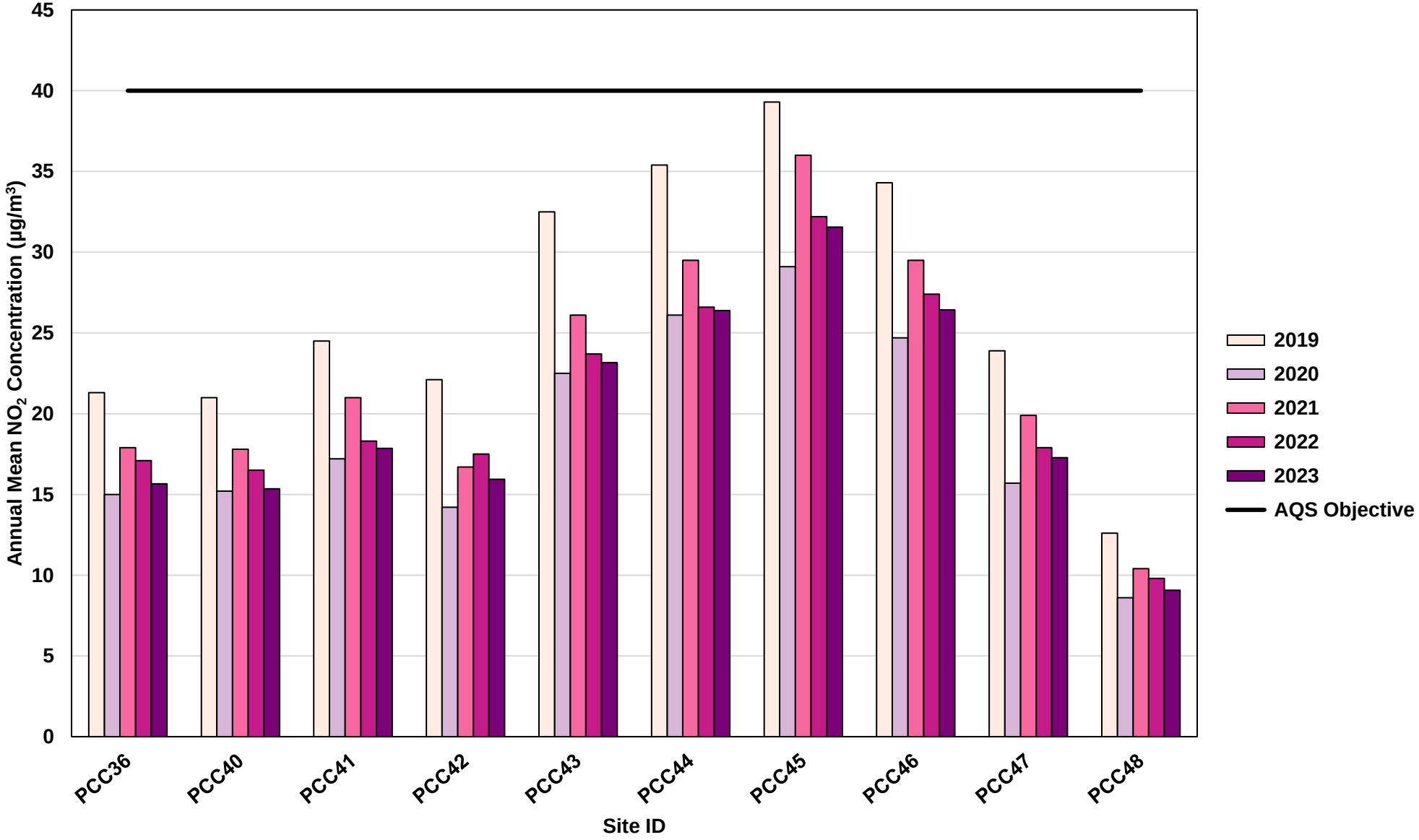


Table 2.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PEMB	Rural	Automatic	95.0	95.0	0	0	0	0	0

Notes:

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

Table 2.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PEMB	Rural	99.6	99.6	11.0	10.5	10.1	11.3	10.0

Notes:

Exceedances of the PM_{10} annual mean objective of 40µg/m^3 are shown in **bold**.

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

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

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

Figure 2.10 – Trends in Annual Mean PM_{10} Concentrations

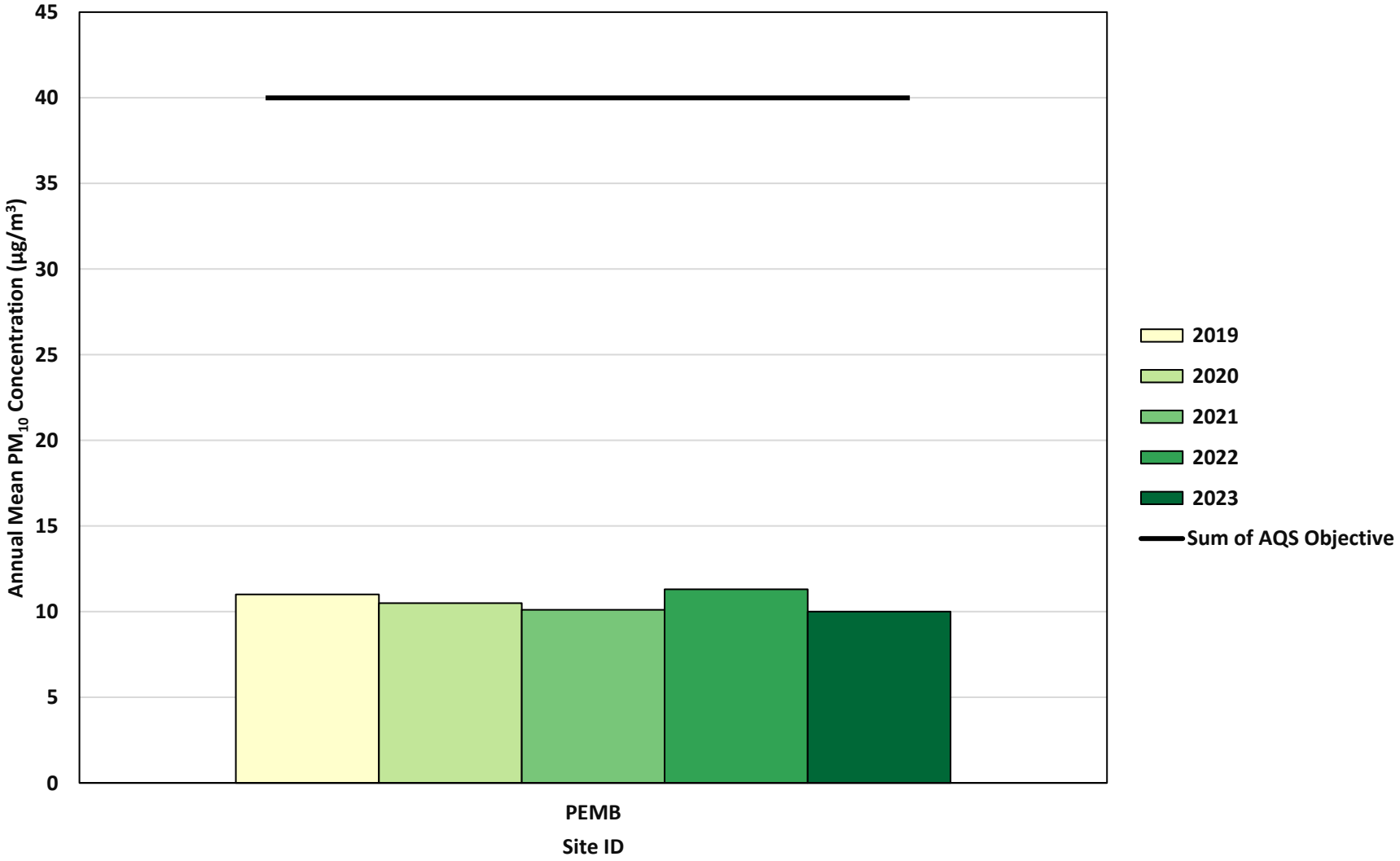


Table 2.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PEMB	Rural	99.6	99.6	0	1	0	2	0

Notes:

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

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

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

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

Table 2.8 – $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
PEMB	Rural	99.6	99.6	7.0	5.9	6.0	6.4	5.6

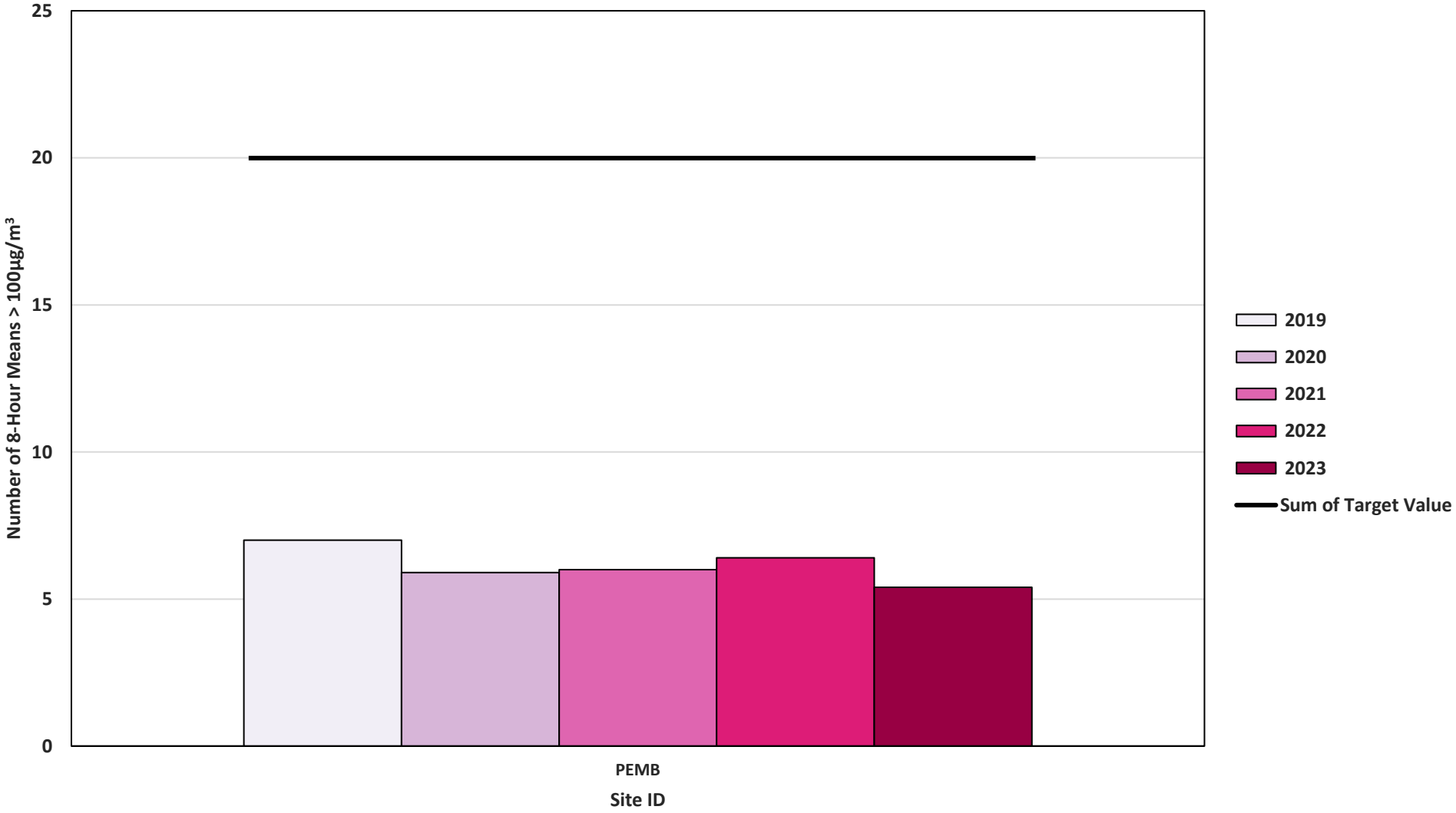
Notes:

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 2.11 – Trends in Annual Mean $PM_{2.5}$ Concentrations



2.3 Comparison of 2023 Monitoring Results with Previous Years and the Air Quality Objectives

2.3.1 Nitrogen Dioxide (NO_2)

The automatic monitoring station located in Narberth continues to report compliance with the annual mean NO_2 AQS objective, with stable concentrations fluctuating between 3 to 4 µg/m^3. This is expected due to the rural nature of the monitoring site.

During 2023, there were no exceedances of the NO_2 AQS objective, with the majority of passive monitoring sites recording concentrations well under the objective. From 2022 to 2023 42 sites reported decreases in NO_2. The maximum NO_2 annual mean concentration in 2023 was 31.6 µg/m^3, reported at PCC45 which is located along Main St within the Pembroke AQMA.

Both Haverfordwest and Pembroke AQMAs continue to report compliance, with Haverfordwest reporting four years of full compliance and Pembroke reporting two years of compliance. Monitoring data will continue to be reviewed at this site over the subsequent years, and in the event of continual decreases, further assessment will be completed into revocation. Pembrokeshire County Council intend to initiate the revocation process of Haverfordwest AQMA.

There are no passive monitoring sites where the NO_2 annual mean is greater than 60 µg/m^3, 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.

As all annual mean NO_2 concentrations reported below 36 µg/m^3, fall-off with distance correction calculations have not been carried out.

2.3.2 Particulate Matter (PM_{10})

During 2023, the Narberth automatic monitoring site recorded PM_{10} concentrations well below the 40 µg/m^3 PM_{10} AQS objective. There is a minor reduction of 1.3 µg/m^3 from 2022, overall, the annual mean concentration remains relatively stable and consistent over the last five years.

There was no exceedances of the 24-hour mean concentrations in excess of 50 µg/m^3 in 2023, therefore compliance to the 24-hour AQS objective. Data capture at Narberth automatic monitoring station in 2023 was greater than 75%, therefore annualisation was not required to be carried out, in accordance with LAQM.TG(22).

2.3.3 Particulate Matter ($PM_{2.5}$)

During 2023 the Narberth automatic monitoring site recorded $PM_{2.5}$ concentrations well below the $PM_{2.5}$ AQS target of 20 µg/m^3. There is a minor decrease of 0.8 µg/m^3 from 2022, but 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.

2.3.4 Ozone (O_3)

The number of 8-hour mean O3 concentrations greater than 100 µg/m^3 reported at the Narberth automatic monitoring location in 2023 was 30. There is no LAQM air quality objective for O_3, however this does exceed the UK National air quality objective of 100 µg/m^3 not to be exceeded more than 10 times a year.

2.3.5 Sulphur Dioxide (SO_2)

For SO_2, the number of 15-minute mean concentrations greater than 266 µg/m^3, 1-hour mean concentrations greater than 350 µg/m^3, and 24-hour mean concentrations greater than 125 µg/m^3 reported at the Narberth automatic monitoring location in 2023 were all 0. There are three LAQM air quality objectives for SO_2, and Pembrokeshire is compliant for all 3 air quality objectives.

2.4 Summary of Compliance with AQS Objectives as of 2023

Pembrokeshire County Council has examined the results from monitoring in the County. Concentrations are all below the Objectives, therefore no further action is required.

Pembrokeshire County Council intends to start the revocation process of the Haverfordwest AQMA for having 4 years of full compliance.

3 New Local Developments

Pembrokeshire County Council confirms that there are no new or newly identified local developments which may have an adverse impact on air quality within the Local Authority area within 2023.

Pembrokeshire County Council confirms that all the following have been considered:

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

3.1 Road Traffic Sources (and Other Transport)

There has been no identification of any new road traffic and other transport sources of concern since the last APR.

3.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

There has been no identification of any new industrial, fugitive or uncontrolled sources and/or commercial sources of concern since the last APR.

3.3 Other Sources

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

Pembrokeshire County Council confirms that all the following have been considered:

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

4 Policies and Strategies Affecting Airborne Pollution

4.1 Local / Regional Air Quality Strategy

Pembrokeshire County Council provide annual reports to the Wales Climate Change Strategy to assist in assessing sector specific emission reduction targets specifically energy and/or green-house gas emissions from the public sector in Wales in relation to the Authority's;

- Housing stock.
- Non-domestic buildings.
- Fleet vehicles and transport provisions.

Encompassing emissions from energy use in buildings, community wide emissions from private sector housing, fleet transport and business travel. The data is compiled and returned as;

- Utility supplier information.
- Annual Welsh Assembly Government Returns.
- Carbon Reduction Commitment Energy Efficiency Scheme returns.
- Annual surveys.
- Internal Business Plan reporting.
- Returns from site managers.

Other reporting indicators to assist strategy development are;

- Welsh Assembly Government National Strategic Indicator EEF/002a (NS18a) (NSPI19) for percentage reduction in carbon emissions in the councils nondomestic public stock;
- Internal local indicator HC HC2 for percentage reduction in carbon emissions
- in the council's non-domestic public stock since 2003;
- Welsh Assembly Government National Strategic Indicator EEF/002bi (NS18bi)
- for percentage reduction in energy use in the housing stock; and,
- Transport emissions reporting.

In 2014, local authorities were advised by the Welsh Assembly Government that the European Commission had formally launched infraction proceedings against the UK for breaching nitrogen dioxide limit values under the EU Air Quality Directive 2008/50.

Pembrokeshire County Council, along with all local authorities, completed a log sheet as requested to assist with the development of a National Air Quality Plan to resolve the nitrogen dioxide exceedance.

In July 2017, the UK Government announced that new petrol and diesel cars and vans will be phased out by 2040 in a bid to tackle air pollution with a £255m fund to help councils tackle emissions from diesel vehicles as part of a £3bn package of spending on air quality. The Party of Wales aim to phase out the sale of new petrol and diesel only cars and vans in Wales by 2027.

4.2 Air Quality Planning Policies

Pembrokeshire County Council, Carmarthenshire County Council, Ceredigion County Council and Powys County Council have developed and published the Mid and West Wales Air Quality: A Guide for Developers guidance document in 2012. This a reference document intended for use by developers and advisers who may be involved in the assessment of air quality at proposed developments. This document details the information required by the Local Planning Authority in order to accurately assess the impact of a planning application on air quality. This document was last updated in 2012.

The guidance focuses on:

- Pollutants regulated under the LAQM regime, as well as PM2.5;
- Impacts of traffic emissions;
- Impacts of emissions from biomass boilers; and,
- The assessment and control of dust impacts during construction.

Where a proposed development is likely to give have significant negative air quality impacts on the surrounding areas or is in an area of existing poor air quality, the planning process required an air quality assessment to be carried out. Additionally, measures to reduce and minimise any adverse impacts are also to be required.

The guidance also aims to provide advice on describing air quality impacts and assessing their significance.

It is highly recommended that dialogue between the developers, planners, and pollution control officers begins as early as possible. Failure to provide adequate supporting information with the planning application may result in significant delays in the planning process, or planning permission may be refused by the Local Planning Authority.

4.3 Local Transport Plans and Strategies

The Joint Transport Plan for South West Wales 2015 – 2020 is in effect as the Local Transport Plan initiative. This also details medium and long-term projects and aspirations spanning to 2030.

The Local Transport Plan is intended to "improve transport and access within and beyond the region to facilitate economic regeneration, reduce deprivation and support the development and use of sustainable and healthier modes of transport". The primary objectives are detailed as follows:

1. To improve the efficiency and reliability of the movement of people and freight within and beyond South West Wales to support economic growth in the Swansea Bay City Region.
2. To improve access for all to a wide range of services and facilities including employment and business, education and training, health care, tourism and leisure activities.
3. To improve the sustainability of transport by improving the range and quality of, and awareness about, transport options, including those which improve health and wellbeing.
4. To improve integration between policies, service provision and modes of transport in South West Wales.
5. To implement measures which will protect and enhance the natural and built environment and reduce the adverse impact of transport on health and climate change.
6. To improve road safety and personal security in South West Wales.

4.4 Active Travel Plans and Strategies

Pembrokeshire County Council details information on Active Travel Plans currently in place on their website. These are important for joint wins in promoting healthier lifestyles alongside reducing the negative impacts of traffic upon neighbourhoods and communities.

Pembrokeshire County Council took part in Clean Air Day 2023, consisting of a no idling initiative with local schools and the production of banners to locate outside schools to educate parents/drivers taking children to school. More details are provided on their website: Pupils lead project to get parents to switch off car engines at the school gates - Pembrokeshire County Council.

4.5 Local Authorities Well-being Objectives

Information on Pembrokeshire County Council's Well-Being Plan and objectives are available to view on their website. This sets out how the Public Services Board will work together to improve the well-being of people and communities in Pembrokeshire both now, and in the future.

4.6 Green Infrastructure Plans and Strategies

Pembrokeshire County Council's Green Infrastructure Plans are available on their website. These are intended to guide Green Infrastructure improvements within settlements, to be used by public, private and voluntary sector bodies.

4.7 Climate Change Strategies

Pembrokeshire County Council's Climate Change Strategies are available on their website. The plan is designed to outline work Pembrokeshire County Council has currently undertaken to steer Pembrokeshire County Council towards becoming net zero-carbon by 2030.

5 Conclusion and Proposed Actions

5.1 Conclusions from New Monitoring Data

The passive NO_2 monitoring data from 2023 shows that 41 out of 45 monitoring locations reported a decrease in concentrations from 2022, with an average decrease of 0.9 µg/m^3. All annual mean NO_2 concentrations have complied with the NO_2 annual mean AQS objective and remain below the AQS objective.

Monitored NO_2, PM_{10} and $PM_{2.5}$ concentrations at the Narberth automatic monitoring station continue to report annual means well below the AQS annual mean objectives for NO_2, PM_{10} and $PM_{2.5}$ (2.4 µg/m^3, 10.0 µg/m^3 and 5.6 µg/m^3 respectively), and short term SO_2 AQS objectives. In regard to the short term AQS objective for NO_2, in which the 200 µg/m^3 must not be exceeded more than 18 times/year, and the PM_{10} AQS objective whereby there should be no more than 35 24-hour mean concentrations greater than 50 µg/m^3, there were no exceedances reported in both pollutants in 2023. The Narberth automatic monitoring station is a rural background site which reports low concentrations amongst all pollutants and is expected to meet AQS objectives on yearly reporting.

5.2 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.

5.3 Other Conclusions

The existing diffusion tube network within Pembrokeshire allows the council to closely monitor hotspot areas and help highlight areas of concern, the monitoring network in 2023 has shown compliance across all monitoring locations. In relation to both designated AQMAs, Haverfordwest has reported four years of compliance, and Pembroke AQMA has reported two years of compliance with the 36 µg/m^3 confidence threshold. The Council intends to revoke the AQMAs once annual mean NO2 concentrations have remained below 36 µg/m3 for three consecutive years in order to ensure that compliance is maintained.

5.4 Proposed Actions

Pembrokeshire County Council will continue to actively monitor NO_2 concentrations, reviewing the diffusion tube network where necessary. The Council intend to revoke the Haverfordwest AQMA, with it now complying for 4 years. If concentrations in future years continue to remain low at Pembroke AQMA well below the AQS objective, then the Council will pursue revocation of this AQMA where appropriate.

References

- Pembrokeshire County Council's Progress Report 2023
- Part IV of the Environment Act 1995, Local Air Quality Management, Technical Guidance LAQM.TG(22) 2022
- Welsh Air Quality Forum data downloads.
- Mid and West Wales Air Quality: A Guide for Developers (2012)
- Joint Transport Plan for South West Wales 2015 – 2020
- Local Air Quality Management in Wales. Policy Guidance June 2017

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 2023 (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PCC1	195629	215655	21.8	22.7	20.1	20.0	15.9	16.7	10.7	14.9	18.2	17.7	20.7	13.3	17.7	14.4		
PCC2	195574	215704	23.9	27.8	26.8	24.8	-	24.6	19.7	20.5	26.0	28.9	21.1	-	24.4	19.8		
PCC3	195474	215661	-	25.7	25.5	22.2	-	21.3	-	18.4	22.7	25.6	22.6	21.9	22.9	18.5		
PCC4	195402	215634	32.0	33.8	-	23.4	27.8	26.1	24.1	24.4	28.2	23.3	30.5	27.3	27.4	22.2		
PCC5	195312	215605	35.0	42.4	34.7	32.4	32.8	34.9	28.0	28.1	35.1	32.2	34.0	21.6	32.6	26.4		
PCC6	195294	215591	33.0	37.0	34.7	34.0	22.9	-	26.0	25.0	32.0	35.5	29.1	26.3	30.5	24.7		
PCC7	195203	215544	31.1	36.2	37.9	37.5	29.2	35.8	27.0	29.5	34.3	37.1	28.7	24.2	32.4	26.2		
PCC8	195159	215494	25.6	34.1	33.9	32.1	24.7	27.7	18.4	21.5	28.3	31.9	26.2	18.1	26.9	21.8		
PCC9	195267	215603	25.0	31.4	24.5	21.0	18.2	19.6	13.7	16.9	21.7	22.9	22.4	18.5	21.3	17.3		
PCC10	195177	215616	22.5	21.9	21.2	16.8	11.7	13.5	9.4	12.7	14.3	18.5	-	12.3	15.9	12.9		
PCC11	195143	215464	24.6	34.4	30.7	29.0	22.4	26.1	16.4	20.8	26.2	30.2	23.7	17.1	25.1	20.4		
PCC12	195110	215394	-	30.2	26.7	-	26.0	-	17.4	20.6	25.1	-	27.0	21.0	24.3	21.3		
PCC13	195101	215357	28.8	31.3	29.8	25.7	22.5	22.0	15.2	20.4	24.8	28.9	27.0	16.6	24.4	19.8		
PCC14	195028	215269	26.5	28.1	27.4	23.6	17.7	20.1	14.7	16.6	22.1	26.0	23.9	17.1	22.0	17.8		
PCC15	194998	215255	33.2	28.8	-	28.0	19.8	24.8	19.3	20.2	27.1	28.6	28.3	21.1	25.4	20.6		
PCC16	195006	215208	20.4	20.6	17.9	-	12.5	15.7	12.6	13.4	16.9	20.4	19.2	-	17.0	13.7		
PCC17	194945	215259	28.1	33.1	25.6	-	27.6	25.8	17.8	22.8	27.3	28.0	28.2	16.2	25.5	20.7		
PCC18	194937	215254	-	35.2	-	-	25.7	32.8	28.8	27.7	30.4	31.1	33.2	-	30.6	26.5		
PCC19	194936	215268	23.0	25.7	23.7	24.7	22.6	20.9	13.8	19.1	22.9	23.9	24.6	14.7	21.6	17.5		
PCC20	194922	215263	-	33.9	31.8	-	25.4	32.9	29.1	29.1	33.2	35.4	33.0	28.4	31.2	25.3		
PCC21	194930	215276	19.6	17.3	15.9	13.0	10.8	12.1	10.6	13.7	15.2	16.9	17.1	14.7	14.7	11.9		

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PCC22	194911	215268	34.5	33.7	32.6	-	24.7	34.0	27.9	27.2	33.8	35.5	32.4	-	31.6	25.6		
PCC23	194911	215279	27.5	26.6	24.1	25.3	24.0	22.1	15.4	19.9	22.3	25.2	23.4	16.3	22.7	18.4		
PCC24	194893	215279	-	34.7	-	-	23.8	32.6	25.5	28.3	35.5	36.9	32.9	23.9	30.5	24.7		
PCC25	194905	215286	23.9	23.7	22.4	22.2	22.2	19.5	13.2	18.9	21.1	22.9	23.0	14.0	20.6	16.7		
PCC26	194886	215284	-	34.4	-	-	23.4	31.6	25.8	27.9	32.4	34.9	31.9	24.6	29.7	24.0		
PCC27	194879	215300	27.9	26.4	22.5	-	18.6	21.1	14.4	18.6	23.2	24.2	24.6	-	22.2	17.9		
PCC28	194856	215299	22.4	20.2	18.4	17.8	15.6	16.9	9.5	15.5	16.7	19.5	19.7	14.0	17.2	13.9		
PCC29	194901	215345	22.8	26.1	23.9	22.6	19.0	21.9	15.7	18.3	22.0	21.9	-	13.3	20.7	16.8		
PCC30	194974	215448	17.9	18.0	15.4	12.2	8.8	10.7	8.5	10.0	13.2	16.8	14.8	-	13.3	10.8		
PCC31	194730	214554	34.7	35.9	32.9	29.8	31.6	33.3	28.5	28.6	31.2	36.4	31.8	28.6	31.9	25.9		
PCC32	194761	214610	30.6	30.9	29.6	28.4	27.1	29.1	20.2	25.8	31.0	32.2	30.5	23.5	28.2	22.9		
PCC33	194774	214465	23.1	-	-	-	22.0	-	-	-	-	23.5	-	16.0	21.2	15.9		
PCC34	195453	215594	24.1	21.7	18.6	18.0	14.8	17.4	15.0	-	18.7	21.2	23.2	18.0	19.2	15.5		
PCC35	195642	215273	14.7	13.0	9.8	9.9	7.8	8.6	6.9	8.5	11.0	13.5	12.4	9.6	10.5	8.5		
PCC36	210901	214713	21.4	23.3	22.2	21.9	20.6	19.6	12.1	17.7	17.9	21.9	22.4	11.0	19.3	15.7		
PCC40	198244	201554	23.8	20.9	20.5	18.4	22.4	19.2	14.8	18.4	17.9	17.1	21.1	12.9	19.0	15.3		
PCC41	198274	201547	29.7	25.5	20.6	21.8	24.3	21.1	15.4	22.4	21.3	24.3	21.8	16.2	22.0	17.8		
PCC42	198333	201549	20.1	24.0	23.9	26.0	19.5	-	13.1	19.3	18.5	-	20.4	11.9	19.7	15.9		
PCC43	198364	201502	32.1	30.3	30.0	30.8	23.0	34.5	27.8	28.2	28.8	30.6	26.7	20.4	28.6	23.2		
PCC44	198396	201495	35.9	36.7	35.2	37.4	28.0	37.8	29.6	30.0	32.2	33.9	29.9	24.2	32.6	26.4		
PCC45	198407	201489	43.7	44.5	39.7	42.1	37.0	43.8	33.7	-	36.3	40.4	37.6	29.7	39.0	31.6		
PCC46	198460	201464	39.5	35.6	34.6	32.5	28.3	33.3	29.8	32.3	30.4	31.5	34.9	28.8	32.6	26.4		
PCC47	198548	201419	28.7	21.9	20.8	22.8	19.5	23.1	15.3	20.6	19.0	19.2	26.2	18.9	21.3	17.3		
PCC48	198869	201299	15.9	11.6	10.1	10.8	8.1	10.2	7.2	10.4	9.2	18.2	13.5	9.1	11.2	9.1		

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table A.1.**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

☐ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **Pembrokeshire County Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

Appendix B: A Summary of Local Air Quality Management

5.5 Purpose of an Annual Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995, as amended by the Environment Act 2021, and associated government guidance. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas and to determine whether 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.

5.6 Air Quality Objectives

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

The table shows the objectives in units of micrograms per cubic metre µg/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 (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
Particulate Matter (PM_{10})	40µg/m^3	Annual mean	31.12.2010
Sulphur dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO_2)	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

5.7 QA/QC of Diffusion Tube Monitoring

Pembrokeshire County Council's diffusion tubes in 2020 were supplied and analysed by Gradko International Ltd., using the 20% Triethanolamine (TEA) in water preparation method. Gradko's laboratory is UKAS accredited, participating in the AIR-PT Scheme for NO2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance.

All local authority co-location studies which use tubes supplied by Gradko with the 20% TEA in water preparation method in 2023 were rated as 'good', as shown by the precision summary results. This precision reflects the laboratory's performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Tubes are considered to have a "good" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more monitoring periods during a year is less than 20%.

Monitoring in 2023 was completed in adherence with the 2023 Diffusion Tube Monitoring Calendar, whereby most changeovers were completed within ±2 days of the specified date.

Diffusion Tube Annualisation

LAQM.TG(22) states that annualisation is required for any site which has a data capture of less than 75%, but greater than 25%. Passive monitoring site PCC12, PCC18 and PCC33 recorded data captures of 66.7%, 66.7% and 41.7% respectively in 2023, therefore required annualisation. Annualisation was completed using version 4.0 of the 'Diffusion Tube Data Processing Tool'. Two continuous background monitoring locations were used:

- Cardiff; and
- Narberth

Two continuous background monitoring sites were applicable to use as they both had >85% data capture and therefore could be used for annualisation. Table C.1 presents the annualisation summary, taken from the 'Diffusion Tube Data Processing Tool'.

Diffusion Tube Bias Adjustment Factors

Pembrokeshire County Council have applied a national bias adjustment factor of 0.81 to the 2023 monitoring data. A summary of bias adjustment factors used by Pembrokeshire County Council over the past five years is presented in Table C.2.

No co-location studies are carried out by Pembrokeshire County Council therefore only the national factor could be applied. The national factor for Gradko 20% TEA in water, as presented in the Diffusion Tube Bias Factors Spreadsheet v06_24 (Figure C.1), is 0.81 based on 27 studies.

Figure C.1 – Diffusion Tube Bias Adjustment Factors Spreadsheet

National Diffusion Tube Bias Adjustment Factor Spreadsheet — **Spreadsheet Version Number: 06/24**

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of September 2024

LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data[2]

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To apply your selection, choose [All] from the top)	Year[2] (To apply your selection, choose [All])	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in Water	2023	R	Monmouthshire County Council	11	33	26	26.5%	G	0.79
Gradko	20% TEA in water	2023	R	Blackburn With Darwen Bc	12	23	16	43.8%	G	0.70
Gradko	20% TEA in water	2023	R	Lancaster City Council	10	35	27	28.6%	G	0.78
Gradko	20% TEA in water	2023	R	Eastleigh Borough Council	12	33	26	26.4%	G	0.79
Gradko	20% TEA in water	2023	R	Eastleigh Borough Council	12	22	19	12.5%	G	0.89
Gradko	20% TEA in water	2023	R	Plymouth City Council	12	35	26	38.3%	S	0.72
Gradko	20% TEA in water	2023	R	Plymouth City Council	10	39	31	24.2%	S	0.80
Gradko	20% TEA in water	2023	UC	Belfast City Council	10	26	19	38.3%	G	0.72
Gradko	20% TEA in water	2023	R	Cheshire West And Chester	12	35	32	10.0%	G	0.91
Gradko	20% TEA in water	2023	R	Cheshire West And Chester	10	32	28	14.6%	G	0.87
Gradko	20% TEA in water	2023	R	Dudley Mbc	12	27	23	17.1%	G	0.85
Gradko	20% TEA in water	2023	UB	Dudley Mbc	12	19	13	45.4%	G	0.69
Gradko	20% TEA in water	2023	R	Dudley Mbc	12	40	37	7.7%	G	0.93
Gradko	20% TEA in water	2023	R	Gateshead Council	12	23	20	17.7%	G	0.85
Gradko	20% TEA in water	2023	R	Gateshead Council	11	23	18	26.9%	G	0.79
Gradko	20% TEA in water	2023	R	Gateshead Council	12	27	22	20.7%	G	0.83
Gradko	20% TEA in water	2023	R	Gateshead Council	12	29	23	25.9%	G	0.79
Gradko	20% TEA in water	2023	R	Gateshead Council	12	30	33	-7.8%	G	1.08
Gradko	20% TEA in water	2023	KS	Marylebone Road intercomparison	11	45	38	20.3%	G	0.83
Gradko	20% TEA in water	2023	B	South Holland District Council	10	8	7	12.4%	G	0.89
Gradko	20% TEA in water	2023	R	Worcestershire	12	12	12	3.3%	G	0.97
Gradko	20% TEA in Water	2023	R	Ards And North Down Borough Council	12	33	21	60.2%	G	0.62
Gradko	20% TEA in Water	2023	R	Lisburn & Castlereagh City Council	11	24	20	22.1%	G	0.82
Gradko	20% TEA in water	2023	R	Nottingham City Council	11	30	21	41.8%	G	0.71
Gradko	20% TEA in water	2023	R	Belfast City Council	12	46	35	29.3%	G	0.77
Gradko	20% TEA in water	2023	R	Belfast City Council	12	25	21	18.6%	G	0.84
Gradko	20% TEA in water	2023	R	Belfast City Council	12	37	28	30.2%	G	0.77
Gradko	20% TEA in water	2023		**Overall Factor[3] (27 studies)**					Use	0.81

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	06/24	0.81
2022	National	03/23	0.83
2021	National	06/22	0.84
2020	National	06/21	0.81
2019	National	03/20	0.93

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Pembrokeshire County Council required distance correction during 2023.

5.8 QA/QC of Automatic Monitoring

The Narberth automatic monitoring location is part of the Automatic Urban and Rural Network (AURN). The Council carries out LSO duties, including calibration, in accordance with the AURN standards. Site audits and maintenance are provided by Ricardo E&E.

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

The type of PM_{10} monitor utilised within Pembrokeshire County Council does not require the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within Pembrokeshire County Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Pembrokeshire County Council required distance correction during 2023.

Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Narberth	Annualisation Factor Cardiff	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
PCC12	1.1524	1.0169	1.0847	24.3	26.3	
PCC18	1.0719	1.0665	1.0692	30.6	32.7	
PCC33	0.9177	0.9389	0.9283	21.2	19.6	

Appendix D: AQMA Boundary Maps

Figure D.1 – Map of the Haverfordwest AQMA Boundary

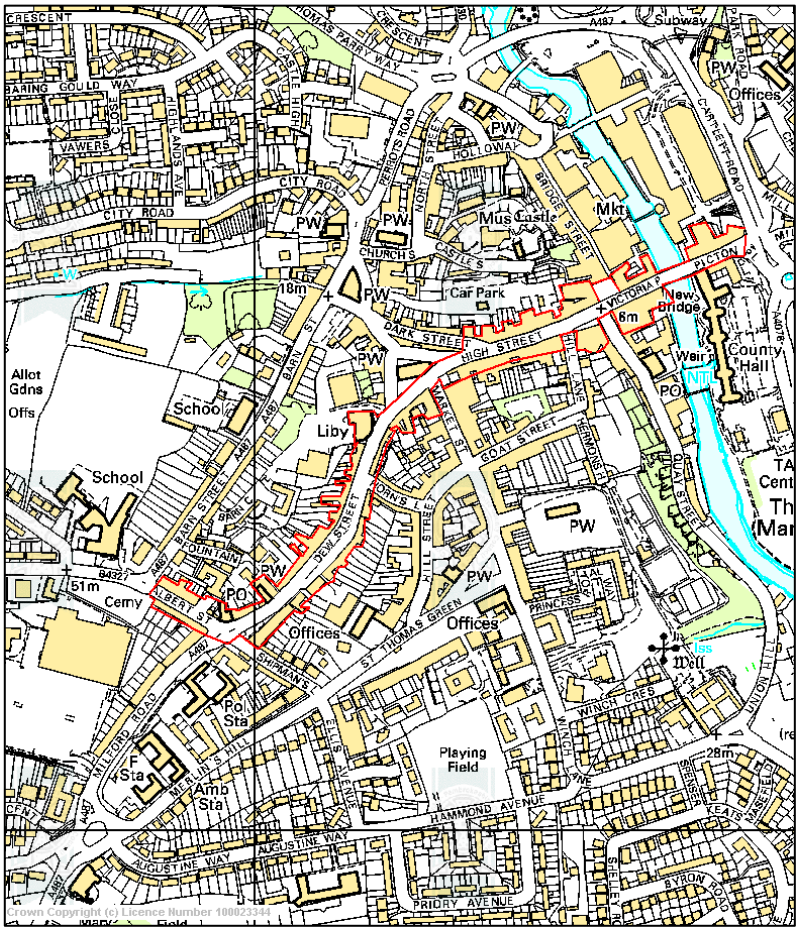
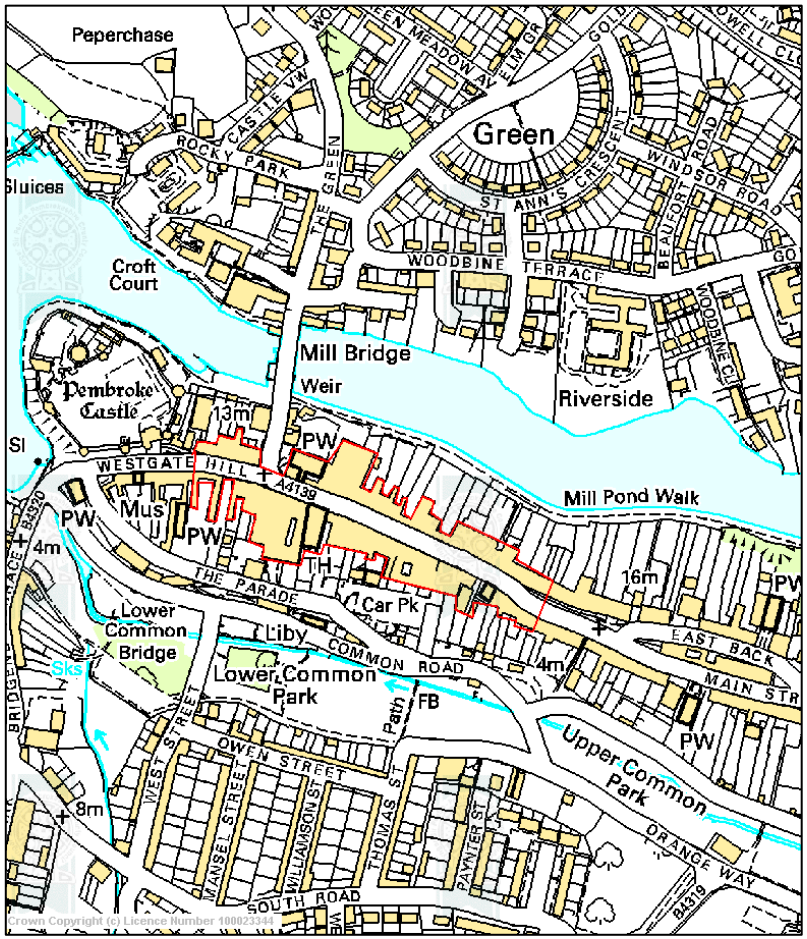


Figure D.2 – Map of the Pembroke AQMA Boundary



Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
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