Angus Council

2025 Annual Progress Report

June 2025

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Annual Progress Report (APR)

2025 Air Quality Annual Progress Report (APR) for Angus Council

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

Local Air Quality Management

June, 2025

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Executive Summary: Air Quality in Our Area

Air Quality in Angus Council

During 2024 Angus Council continued to undertake an extensive monitoring programme including both passive and automatic methods, as part of its ongoing Local Air Quality Management responsibilities.

There were no exceedances of the relevant air quality objectives in Angus for NO_2, PM_{10} or $PM_{2.5}$ and there is a general decreasing trend across all pollutants recorded. During 2024 NO_2 concentrations decreased at ten locations from the previous reporting year of 2023.

There are no designated Air Quality Management Areas (AQMAs) within Angus.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

Angus Council has implemented numerous actions to improve air quality as detailed in the current Angus Local Development Plan (LDP). Angus LDP is now supplemented by National Planning Framework 4 (NPF4) adopted by the Scottish Government in February 2023. Together, the Angus LDP and NPF4 make up the development plan in Angus. Angus Council is currently in the early stages of preparing a new LDP which will be based on new legislative requirements.

Angus Council's Transition to Net Zero Action Plan: 2022 to 2030 was approved in September 2022.

The Sustainable Energy and Climate Action Plan (SECAP) is now being delivered and monitored, with a new team member in the Environment and Climate team to support the review process. The SECAP and associated work programme will be reviewed regularly, with a full review of the actions taking place every two years to monitor progress and identify remedial actions, or new actions, that need to occur to achieve targets. This will ensure the SECAP fully considers and reflects changes to technology, market conditions, and environmental concerns. A progress review was completed in 2023, which showed the SECAP group to be bringing together key industry partners from across the region to

collaborate and enable sustainability improvements across a variety of sectors, with a key focus on a transition to net zero.

Active Travel – Angus Council has asked ARCADIS to look at options available to improve active travel to some routes in Angus. This includes Brechin to Montrose, Kirriemuir to Forfar, Friockheim to Arbroath, School Road (Tealing), and National Cycle Network (NCN) Route 1 between Elliot Links and East Haven.

Construction of the Arbroath Places for Everyone scheme commenced in April 2024 and is expected to be completed by early Autumn 2025.

Angus Council has installed five School Friendly Zones in 2022/23 at Letham Primary School, Carlogie Primary School, Andover Primary School, Liff Primary School, and Southesk Primary School. The zones prohibit traffic from driving on the roads directly outside the schools at the start and end of the school day. The zones are provided to help promote active travel to and from school with the associated benefit of air quality improvement.

Angus Council is running a Smarter Choices Smarter Places programme, with projects funded by Paths for All, which is a series of behaviour change initiatives to promote active travel and encourage walking and cycling.

Angus Council has commissioned a concept design project for the Newtyle to Dundee Green Circular Active Travel Scheme.

Local Priorities and Challenges

Poor air quality is a public health issue that can cause negative impacts for those who are exposed to it and affect quality of life. Air pollution can be harmful to health at all concentrations, whether above or below the air quality objectives so this remains a key issue for Angus Council.

Exposure to NO_2, whether short or long term is known to cause respiratory infections, airway inflammation and aggravates the symptoms of those suffering from chronic lung conditions such as asthma and chronic obstructive pulmonary disease.

Fine particulate matter (particles of a diameter of 2.5μm and below) has been identified as a significant health risk as its small size means that it is easily able to access the nose, throat, lungs and bloodstream leading to increased mortality and morbidity from cardiovascular and respiratory issues. Evidence has also been found linking higher rates

of particulate matter to increased risk of dementia and the International Agency for Research on Cancer has classified particulate matter as carcinogenic to humans.

During 2024 Angus Council has continued to:

- Monitor NO_2, PM_{10}, and $PM_{2.5}$ concentrations during 2024 and will report on progress in 2026.

How to Get Involved

We can all help to maintain good air quality within Angus. Travel choices can have a significant impact on pollutant emissions. Reducing single-occupancy car travel, using alternatives such as public transport, and walking or cycling for short journeys all help to reduce emissions.

Several online tools are available to help you plan your journey at www.travelinescotland.com.

Avoid excessive acceleration and hard braking when you do travel by car to reduce the pollution impacts of the journey.

If you would like further information on Air Quality within Angus, please visit our website, or contact us via ACCESSline (08452 777 778).

Table of Contents

List of Tables

List of Figures

1 Local Air Quality Management

This report provides an overview of air quality in Angus Council during 2024. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

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

Table 1.1 – Summary of Air Quality Objectives in Scotland

Pollutant	Air Quality Objective Concentration	Air Quality Objective Measured as	Date to be Achieved by
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen dioxide (NO_2)	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
Particulate Matter (PM_{10})	18 µg/m^3	Annual mean	31.12.2010
Particulate Matter ($PM_{2.5}$)	10 µg/m^3	Annual mean	31.12.2021
Sulphur dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide (SO_2)	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO_2)	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25 µg/m^3	Running annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg/m^3	Running 8-Hour mean	31.12.2003

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare publish and implement an Air Quality Action Plan (AQAP) within the shortest possible time and no later than 12 months of the date of AQMA Designation Order. The AQAP must set out measures the local authority intends to put in place in pursuit of the objectives within the shortest possible time Measures should be provided with milestones and a final date for completion. The action plan itself should have a timescale for completion and for revocation of the AQMA. Where measures to reduce air pollution may require a longer timescale an action plan shall be reviewed and republished within five years of initial publication and then five-yearly thereafter.

Angus Council currently does not have any AQMAs within its jurisdiction.

2.2 Implementation of Air Quality Action Plan(s) and/or measures to address air quality

Scottish Government's appraisal of last year's APR concluded the report is well structured, detailed, and provides the information specified in the guidance. The following comments from last years' appraisal and what Angus Council has actioned to address the feedback is detailed below.

1. Annual mean $PM_{2.5}$ concentrations have been reported for AFR1. However, $PM_{2.5}$ is not stated as a pollutant that is monitored at this site within Table A.1. The Council should update Table A.1 if appropriate or include additional information if $PM_{2.5}$ concentrations were determined from monitoring of PM_{10}.

   Table A.1 now reflects $PM_{2.5}$ monitoring

2. In Table A.2, NO_2 should include a subscript.

   This error has been rectified

3. The Council have used four automatic monitoring sites to determine factors for annualisation. This is good practice and should be continued in the future where appropriate.

Annualisation not required this reporting year

4. It is encouraging that the Council have developed several measures to maintain good air quality. The Council are encouraged to review these periodically to ensure that good air quality is maintained.

   The council has maintained this during the current reporting year

5. A figure has been included to highlight the locations of monitoring sites. It may be useful to include additional figures which show the locations of monitoring sites at a smaller scale. The inclusion of a north arrow and scale bar is also recommended.

   Additional figures added to show all monitoring sites

Angus Council has taken forward a number of direct measures during the current reporting year of 2024 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. There are eight measures included in Table 2.1, with the type of measure and the progress Angus Council have made during the reporting year of 2024 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

Angus Council does not currently have an Air Quality Action Plan but has taken forward a number of measures during the current reporting year of 2024 in pursuit of improving local air quality.

Key completed measures for this reporting year are:

- Delivery of a fair, accessible and ambitious EV charging network that meets the needs of residents, workers and visitors throughout Angus;
- Acquisition and installation of a mobile Zephyr Air Quality Monitor; and
- A Place for Everyone Arbroath Transport planning and infrastructure; promoting travel alternatives.

These measures are in progress. The Place for Everyone Arbroath is partially completed. The construction for the aid of walking, wheeling and cycling improvements have been completed.

Measure 6 - Promote air quality within planning and transport strategies is a policy guidance development measure. This measure is in progress however, measures of this type require a longer timescale to complete.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Expected/Actual Completion year	Organisations Involved	Measure Status	Funding Status	Key Milestones	Progress	Barriers to implementation
1	Delivery of a fair, accessible and ambitious EV charging network that meets the needs of residents, workers and visitors throughout Angus	Promoting low emission transport;	2025 - 2028	Angus Council/Transport Scotland	In progress	In collaboration with Perth and Kinross Council Angus Council has been successful in securing funding for 3 years from the EV Infrastructure Fund.	Contracts going out to tender in summer of 2025 with project delivery expected to begin in autumn 2025.	Angus Council have identified the following key measures that it is hoped will be implemented over the next 3 years: Procurement and construction of two hubs with likely locations to be A90 (Brechin area) and A92 (Arbroath area); and Approximately 60no. new chargers to be located in community locations (libraries, community centres, on street etc) however the exact locations are yet to be established.	Availability of suitable locations.

2	Acquisition and installation of a mobile Zephyr Air Quality Monitor	Policy guidance and development control.	2025	Angus Council	In progress	Fully funded by Scottish Govt	Grant funding bid has been approved. Currently looking at potential first monitoring locations.	Scottish Govt grant has enabled Angus Council to purchase this unit which will allow far greater flexibility in terms of where monitoring can be undertaken.	N/A
3	A Place for Everyone Arbroath	Transport planning and infrastructure; Promoting Travel Alternatives	Completion scheduled for Autumn 2025	Angus Council, Sustrans on behalf of Transport Scotland	Construction in progress	Funded by Scottish Govt & Angus Council	Project is nearing completion.	Parts of the project are completed and are already helping to deliver walking, wheeling and cycling improvements within Arbroath.	N/A
4	Smarter Choices, Smarter Places	Promoting low emission transport; Promoting Travel Alternatives	Ongoing	Angus Council and Angus Cycle Hub	In progress	Funded by successful bid to Transport Scotland's People and Place Local Authority Direct Fund	In 2023/24 3073 bikes were collected from Household Waste Recycling Centres in Angus and 312 were recycled and sold at low cost from ACH retail outlet. In the same period ACH facilitated the delivery of 109 bike packages free of charge to adults and marginalised people.	Agus Council has partnered with Angus Cycle Hub to deliver a variety of projects across Angus that included recycling of bikes form recycling centres, provision of free bikes, cycle training and continuation of bike buses and the introduction of two new ones	

5	Delivery of the 2020 Angus Active Travel Strategy	Promoting low emission transport; Promoting Travel Alternatives	Ongoing	Angus Council/Transport Scotland/Sustrans	In progress	Partially funded	Design work carried out to make to make significant walking, wheeling & cycling improvements in a key route (Queenswell road) in Forfar. Development of a detailed design for a key part of the National Cycle network (East Haven to Elliot Links) that will support an application for funding from Transport Scotland Installation of cycle storage facilities at locations in Kirriemuir and Arbroath Completion of the Carnoustie Spur – a new link to bypass a short on road section and provide better visibility and directness of the route while improving safety and connectivity.	A number of key points from the Angus Active Travel Strategy have been developed over 2023/24, with a refresh of the current strategy ongoing. Engagement opportunities have occurred for a range of walking, cycling and wheeling projects via the council's Engage Angus page as well as events at locations across Angus. Local communities have been included in a range of behaviour change and infrastructure projects with their feedback being gathered both online and in person	Availability of funding

6	Promote air quality within planning and transport strategies.	Policy guidance and development control.	Ongoing	Angus Council	In progress	Partially funded through developer contributions.	Angus Local Development Plan approved in 2016 is now supplemented by National Planning Framework 4 (NPF4). Angus Council is currently in the early stages of developing a new LDP which will be based on new legislative requirements. Approval of draft Transport Strategy in 2024.	In June 2024, a draft Tayside and Central Scotland Regional Transport Strategy (2024 – 2034) was approved by the Scottish Government Cabinet Secretary for Transport. At the heart of the strategy is a proposed approach which focuses on improving alternatives to car use, promotes the use of electric/low emission vehicle use and effective approaches to reducing car kilometres driven, while focusing on improvements to citizen health and wellbeing	Availability of funding Lengthy timescale
7	Smarter Choices Smarter Places	Promoting low emission transport; Public information. Promoting travel alternative	Ongoing	Angus Council	In progress	Council funded	Measures have been implemented or are ongoing	Promotion of bus travel with on-bus adverts and display in shelters • Provision of cycle racks and cycle training in schools • Provision of	Availability of funding.

								active travel training in schools • Promoting sustainable travel choices to some of the main trip attractors in Angus • Informing young people about travel alternative • Implementation of a rural demand responsive transport scheme within the Sidlaw area	
8	Smarter Choices, Smarter Places	Promoting low emission transport; Promoting Travel Alternatives	Ongoing	Angus Council and Angus Cycle Hub	In progress	Funded by successful bid to Transport Scotland's People and Place Local Authority Direct Fund	In 2023/24 3073 bikes were collected from Household Waste Recycling Centres in Angus and 312 were recycled and sold at low cost from ACH retail outlet. In the same period ACH facilitated the delivery of 109 bike packages free of charge to adults and marginalised people.	Agus Council has partnered with Angus Cycle Hub to deliver a variety of projects across Angus that included recycling of bikes form recycling centres, provision of free bikes, cycle training and continuation of bike buses and the introduction of two new ones	

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Angus Council undertook automatic (continuous) monitoring at one site during 2024. The gravimetric partisol sampler used in the previous annual report (AA1) was not operational during 2024 so PM_{10} was only monitored at AFR1 during 2024.

Table A.1 in Appendix A shows the details of the automatic monitoring sites. The Scottish Air Quality page presents automatic monitoring results for Angus Council. Monitoring site AFR1 which is a Fidas 200 analyser located at the Glamis Road monitored PM_{10} and $PM_{2.5}$ during 2024.

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

3.1.2 Non-Automatic Monitoring Sites

Angus Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 12 sites during 2024. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for annualisation and bias. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3 at automatic monitoring sites.

For diffusion tubes, the full 2024 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Concentrations at all 12 sites were well below the annual mean objective of 40µg/m^3 in 2024.

The annual mean NO_2 concentration at ten sites have decreased from 2023 to 2024. One site (M2) saw an increase in NO_2 concentrations between 2023 and 2024 (0.4µg/m^3). One site (A2) recorded no change between 2023 and 2024.

The highest annual mean concentration was 15.1µg/m^3 at monitoring site A3 located on Keptie Street, Arbroath.

3.2.2 Particulate Matter (PM_{10})

Table A.4 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 18µg/m^3.

Table A.5 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than seven times per year. There were no exceedances of the 24-hour mean objective objective at AFR1 in 2024.

The gravimetric partisol sampler used in the previous annual report (AA1) was not operational during 2024 so PM_{10} was only monitored at AFR1 during 2024.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.6 in Appendix A compares the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years with the air quality objective of 10µg/m^3.

The concentrations at AFR1 was below the objective of 10µg/m^3. However, the concentration was slightly higher than the previous reporting year of 2023.

3.2.4 Sulphur Dioxide (SO_2)

Angus Council does not currently monitor SO_2 concentrations.

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

Angus Council does not currently monitor Carbon Monoxide, Lead and 1,3-Butadiene

4 New Local Developments

4.1 Road Traffic Sources

Angus Council confirms that no new road traffic sources have been identified which may have a significant impact on local air quality.

4.2 Other Transport Sources

Angus Council confirms that no new other transport sources have been identified which may have a significant impact on local air quality.

4.3 Industrial Sources

Angus Council confirms that no new industrial sources have been identified which may have a significant impact on local air quality.

4.4 Commercial and Domestic Sources

Angus Council has not identified any new sources from road traffic relating to air quality within the reporting year of 2024. However, Angus Council has identified that there was a new biomass combustion plant identified during 2024. The details of which are below:

Denfind Farm	**Biomass**	**Building Height**	**Stack diameter**	**Stack height**	
	58.5kw	5.4m	0.15m	6.7m	
Background	**PM_{10}**	**NO_x**	**Annual Mean**	**PM_{10}**	**NO_x**
	10.74	3.58		0.0179	0.893
Emission rates	0.0007	0.005			

4.5 New Developments with Fugitive or Uncontrolled Sources

Angus Council confirms that no new fugitive or uncontrolled sources have been identified which may have a significant impact on local air quality.

5 Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

Concentrations at all 12 sites were well below the annual mean objective limit in 2024. The highest annual mean concentration was 15.1µg/m^3 at monitoring site A3 located on Keptie Street, Arbroath. The annual mean NO_2 concentration have decreased at ten sites from 2023 to 2024.

6.2 Conclusions relating to New Local Developments

Angus Council is satisfied there have been no new local developments proposed or completed during 2024 that have the potential to introduce new exceedances of any relevant air quality objectives.

6.3 Proposed Actions

Monitoring in 2024 has shown no exceedances of any relevant air quality objectives, meaning a detailed assessment is not required for any pollutants. Monitoring locations will continue to be reviewed to ensure the locations are still relevant, though relocation may not be necessary.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
AFR1	Glamis Road, Forfar	Roadside	345249	750386	PM_{10}, $PM_{2.5}$	No	N/A	FDMS	20.0	6.0	1.5

Notes:

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

(2) N/A if not applicable.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? 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)
A1	Ethie Terrace, Arbroath	Urban Background	364585	742349	NO_2	No	0.0	1.0	No	2.4
A2	Arbirlot Road, Arbroath	Roadside	362534	740848	NO_2	No	9.0	2.0	No	2.4
A3	Keptie Street, Arbroath	Roadside	363881	740904	NO_2	No	0.0	2.0	No	2.4
A4	22 Lordburn, Arbroath	Kerbside	364158	741122	NO_2	No	3.0	1.0	No	2.4
B1	High St, Brechin	Kerbside	359727	760170	NO_2	No	2.0	1.0	No	2.4
B2	Sacone 1, Brechin	Industrial	361216	759644	NO_2	No	N/A	8.0	No	2.4
CAR	High St, Carnoustie	Roadside	356243	734526	NO_2	No	3.0	2.0	No	2.4
FOR	High St, Forfar	Kerbside	345825	750674	NO_2	No	3.0	1.0	No	2.4

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
F1	St James Road, Fordar	Roadside	345628	750307	NO_2	No	1.0	2.0	No	2.4
KIR	Manse Close, Kirriemuir	Roadside	338621	754032	NO_2	No	5.0	6.0	No	2.4
M1	High St, Monifieth	Roadside	349759	732549	NO_2	No	0.0	2.0	No	2.4
M2	High St, Montrose	Kerbside	371418	757767	NO_2	No	2.0	1.0	No	2.4

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results: 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 2024 (%) [2]	2020	2021	2022	2023	2024
A1	364585	742349	Urban Background	98.9	98.9	7.1	5.1	5.7	5.5	4.5
A2	362534	740848	Roadside	98.9	98.9	8.3	8.0	7.2	6.6	6.5
A3	363881	740904	Roadside	98.9	98.9	15.6	18.9	16.9	16.0	15.1
A4	364158	741122	Kerbside	98.9	98.9	14.0	12.9	10.8	11.4	10.8
B1	359727	760170	Kerbside	98.9	98.9	7.8	8.2	7.4	9.6	7.6
B2	361216	759644	Industrial	98.9	98.9	4.1	4.9	4.2	5.0	3.8
CAR	356243	734526	Roadside	90.0	90.0	10.3	12.0	9.3	11.1	11.1
FOR	345825	750674	Kerbside	90.3	90.3	10.0	10.1	9.7	9.9	8.3
F1	345628	750307	Roadside	90.6	90.6	13.2	13.7	11.9	11.9	11.0
KIR	338621	754032	Roadside	78.7	78.7	5.5	7.8	7.1	10.0	7.8
M1	349759	732549	Roadside	91.4	91.4	10.0	10.2	10.6	9.2	9.3

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 2024 (%) (2)	2020	2021	2022	2023	2024
M2	371418	757767	Kerbside	94.6	94.6	13.1	14.8	13.3	14.2	14.4

☒ **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:

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.TG(22) 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 A.1 – Trends in Annual Mean NO_2 Concentrations

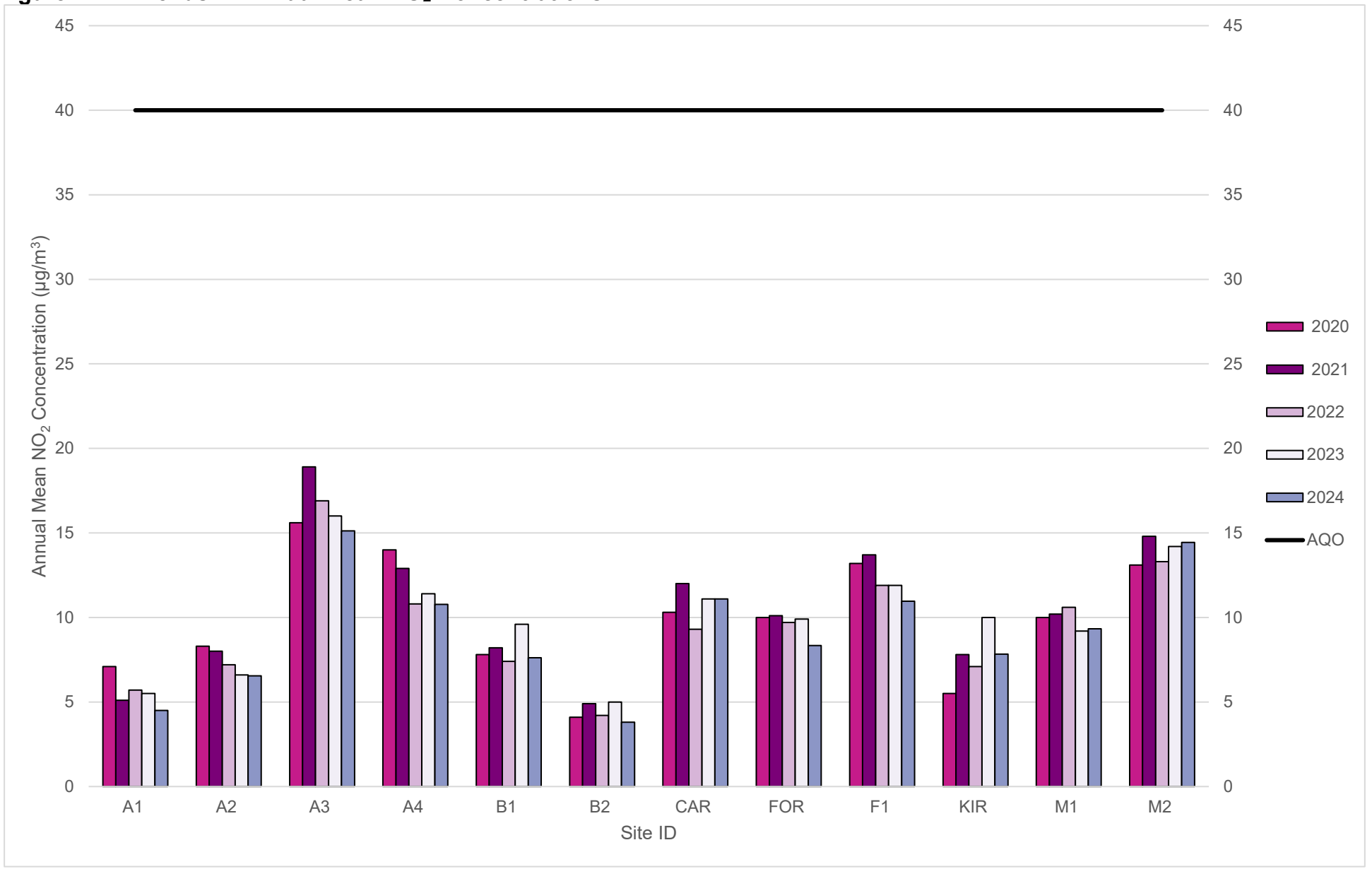


Table A.4 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
AFR1	345249	750386	Roadside	97.8	97.8	10.0	9.1	9.6	8.8	9.1

Notes:

Exceedances of the PM_{10} annual mean objective of $18\mu g/m^3$ are shown in bold.

All means have been “annualised” as per LAQM.TG(22), 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 A.2 – Trends in Annual Mean PM_{10} Concentrations

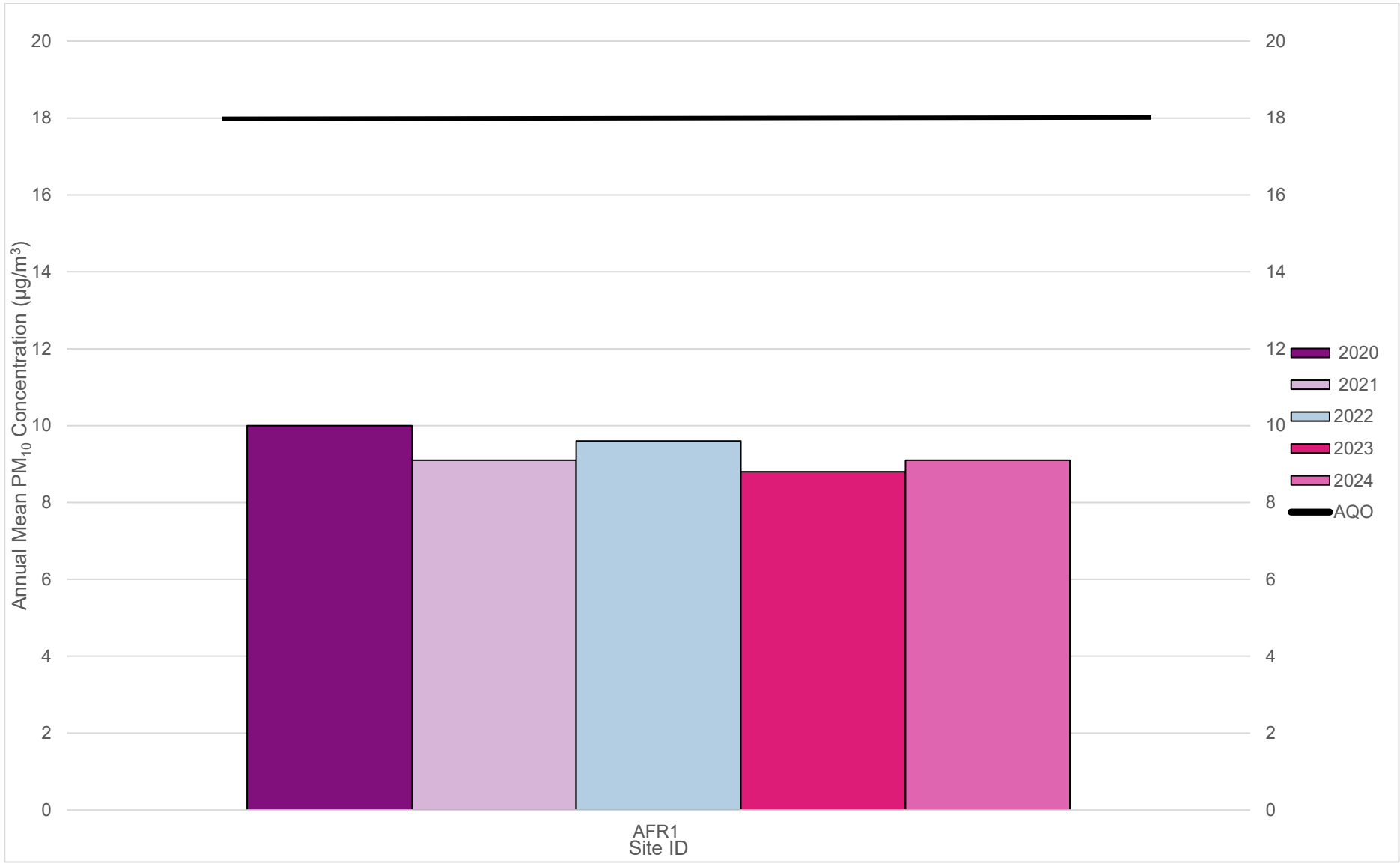

20
18
16
14
12
10
8
6
4
2
0
Annual Mean PM10 Concentration (µg/m3)
AFR1
Site ID
2020
2021
2022
2023
2024
AQO

Table A.5 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50 µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
AFR1	345249	750386	Roadside	97.8	97.8	0 (23.5)	3 (23.7)	2	0	0

Notes:

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

If the period of valid data is less than 85%, the 98.1st 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 A.6 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
AFR1	345249	750386	Roadside	97.8	97.8	-	-	5.4	4.7	5.2

Notes:

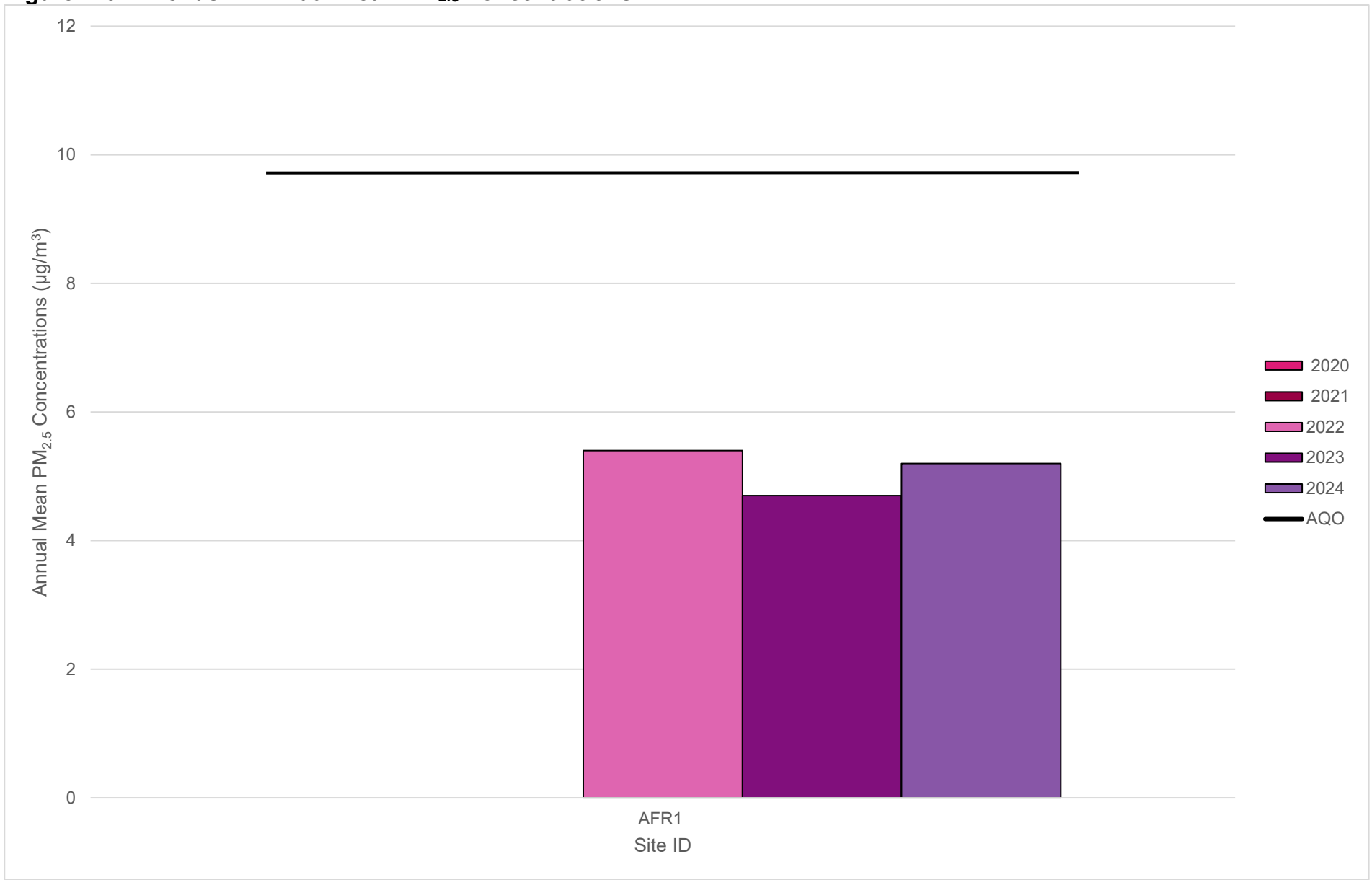
Exceedances of the $PM_{2.5}$ annual mean objective of 10µg/m^3 are shown in bold.

All means have been "annualised" as per LAQM.TG(22), 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 A.3 – Trends in Annual Mean $PM_{2.5}$ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2024

Table B.1 – NO_2 2024 Monthly Diffusion Tube Results (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 (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
A1	364585	742349	5.8	8.9	5.4	4.9	6.1	3.9	3.2	4.1	7.4		5.6	7.0	5.9	4.5		Over exposed October data missing
A2	362534	740848	10.7	12.5	7.1	7.3	8.0	5.8	5.9	6.8	10.1		9.0	8.9	8.6	6.5		Over exposed October data missing
A3	363881	740904	24.3	24.8	16.5	18.6	19.1	15.4	16.8	15.7	20.7		24.6	22.9	19.9	15.1		Over exposed October data missing
A4	364158	741122	19.2	17.7	11.1	13.1	12.8	9.5	9.5	11.0	15.8		18.3	16.6	14.2	10.8		Over exposed October data missing
B1	359727	760170	13.3	13.0	11.4	10.8	11.4	7.0	6.2	5.0	11.0		10.6	9.0	10.0	7.6		Over exposed October data missing
B2	361216	759644	6.5	6.8	3.8	4.5	6.2	2.5	2.1	2.1	7.0		6.0	4.6	5.0	3.8		Over exposed October data missing.
CAR	356243	734526		18.4	30.7	14.2	12.2	1.0	8.4	14.0	14.3		13.4	16.8	14.6	11.1		Over exposed October data missing. Missing data in January
FOR	345825	750674	19.6	16.5		9.6	8.8	6.7	6.7	0.6	12.0		20.4	11.9	11.0	8.3		Over exposed October data missing. Abnormally low result omitted from March
F1	345628	750307	21.5		19.8	13.4	12.0	9.8	8.1	8.5	15.4		19.2	16.5	14.4	11.0		Over exposed October data missing. Missing data in February
KIR	338621	754032	14.9	16.2	7.2	8.9	8.8	5.8	5.4	5.3			10.0	19.7	10.3	7.8		Over exposed October data missing. Missing data in September

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 (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
M1	349759	732549	16.7	15.8	12.0	10.5	11.4		5.6	10.7	11.5		16.6	13.7	12.3	9.3		Over exposed October data missing Abnormally low result omitted from June
M2	371418	757767	24.7	20.1	16.2	16.5	14.2	16.1	14.3	15.5	19.1			32.5	19.0	14.4		Over exposed October data missing Abnormally low result omitted from November

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

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

☒ **National bias adjustment factor used.**

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

☒ **Angus Council confirm that all 2024 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 C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

New or Changed Sources Identified Within Angus Council During 2024

Angus Council has not identified any new sources from road traffic relating to air quality within the reporting year of 2024. However, Angus Council has identified that there was a new biomass combustion plant identified during 2024. The details of which are below:

Denfind Farm	**Biomass**	**Building Height**	**Stack diameter**	**Stack height**	
	58.5kw	5.4m	0.15m	6.7m	
Background	**PM_{10}**	**NO_x**	**Annual Mean**	**PM_{10}**	**NO_x**
	10.74	3.58		0.0179	0.893
Emission rates	0.0007	0.005			

Additional Air Quality Works Undertaken by Angus Council During 2024

Angus Council has not completed any additional works within the reporting year of 2024.

QA/QC of Diffusion Tube Monitoring

Angus Council deploy diffusion tubes prepared and analysed by Tayside Scientific Services (TSS; 20% TEA in water method). Diffusion tubes that recorded <0.5µg/m^3 were removed as abnormal data.

Diffusion Tube Deployment Calendar

During 2024, the diffusion tubes deployed by Angus Council adhered to the dates outlined on the Defra monitoring calendar for all months except for October. The diffusion tubes that were deployed at the beginning of September were not changed in October and were instead exposed until mid-November. Therefore, the October diffusion tubes were over exposed beyond the recommended period of four to five weeks.

Section 7.199 of LAQM.TG22 states that:

"If diffusion tubes are left out for significantly longer or shorter periods than the four and five weeks recommended, then the data may not be reliable as the diffusion rate may not have been accurately defined".

Therefore, in order to determine if the overexposed October data is reliable and suitable for inclusion in the annual mean calculation, a sensitivity analysis was performed on the annual mean concentration at each diffusion tube site. This involved investigating the impact that including or excluding the September - October data had on the NO_2 annual mean concentration (as shown in Table C.1). It was evident that the overall change in the annual mean concentration between either including or excluding the October data was minimal at the majority of the sites.

Furthermore, removing the over-exposed data resulted in the data capture falling below the threshold for requiring annualisation, which introduces additional uncertainty to the results. This is because three of the nearest background monitoring sites that can be used for annualisation are at a distance of 30 miles or over - Edinburgh Nicholson St (40 miles), Aberdeen Erroll Park (38 miles), Dundee Mains Loan (10 miles) and Aberdeen Wellington Road (32 miles).

On the basis of the minimal difference between the reported annual mean concentrations, and the process of annualisation adding uncertainty into the results, the overexposed September - October data has been included in the NO_2 annual mean concentrations presented throughout this report.

Table C.1 – Sensitivity Analysis (Overexposed September - October Diffusion Tube Data)

Diffusion Tube Site ID		Annual Mean Concentration (µg/m^3)		
Site ID	**Site Name**	**Overexposed Data Included**	**Overexposed Data Excluded**	**Difference**
A1	Ethie Terrace, Arbroath	4.50	4.22	-0.29
A2	Arbirlot Road, Arbroath	6.55	6.26	-0.29
A3	Keptie Street, Arbroath	15.13	14.97	-0.16
A4	22 Lordburn, Arbroath	10.77	10.45	-0.32
B1	High St, Brechin	7.61	7.42	-0.19
B2	Sacone 1, Brechin	3.81	3.42	-0.39
CAR	High St, Carnoustie	11.09	11.81	0.72
FOR	High St, Forfar	8.33	8.28	-0.05
F1	St James Road, Fordar	10.96	11.43	0.47
KIR	Manse Close, Kirriemuir	7.83	7.83	0.00
M1	High St, Monifieth	9.33	9.28	-0.05
M2	High St, Montrose	14.43	14.99	0.56

Diffusion Tube Annualisation

When the over-exposed diffusion tubes are not removed from the dataset, all diffusion tube monitoring locations within Angus Council recorded data capture over 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.

However, when the over-exposed diffusion tubes from September – October are removed for sensitivity testing, this caused data capture to fall below 75% and the following sites required annualisation. Table C.2 presents the results of the annualisation process.

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

Site ID	Annualisation Factor Edinburgh Nicholson St	Annualisation Factor Aberdeen Erroll Park	Annualisation Factor Dundee Mains Loan	Annualisation Factor Aberdeen Wellington Road	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
CAR	1.0574	1.0698	1.1246	0.9828	1.0586	14.7	15.5
FOR	0.9982	1.0086	1.0537	1.0252	1.0214	10.7	10.9
F1	1.0438	1.0973	1.0979	1.0151	1.0635	14.1	15.0
M1	0.9934	0.9777	0.9868	0.9524	0.9776	12.5	12.2
M2	1.0315	1.0484	1.1152	0.9666	1.0404	19.0	19.7
CAR	1.0574	1.0698	1.1246	0.9828	1.0586	14.7	15.5

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2025 APR 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/NO_2

continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Angus Council have applied a national bias adjustment factor of 0.76 to the 2024 monitoring data. A summary of bias adjustment factors used by Angus Council over the past five years is presented in Table C.3. The national bias adjustment factor spreadsheet is shown overleaf.

Figure C.1 – National Bias Adjustment Factor Spreadsheet (06/25)

National Diffusion Tube Bias Adjustment Factor Spreadsheet

Spreadsheet Version Number: 06/25

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 2025

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:	Step 2:	Step 3:	Step 4:
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	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 undo your selection, choose (All) from the pop-up list)	Year[5] (To undo 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[6]	Bias Adjustment Factor (A) (Cm/Dm)
Tayside Scientific Services	20% TEA in water	2024	KS	Marylebone Road Intercomparison	11	47	36	31.5%	G	**0.76**
Tayside Scientific Services	20% TEA in water	2024		**Overall Factor[3] (1 study)**				**Use**		**0.76**

Table C.3 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2024	National	06/25	0.76
2023	National	06/24	0.68
2022	National	03/23	0.75
2021	National	03/22	0.77
2020	National	03/21	0.80

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Angus Council required distance correction during 2024.

QA/QC of Automatic Monitoring

During 2024 the Fidas monitor is serviced in July by AECOM UK Ltd and in November by Enviro Technology Services Ltd.

Appendix D: Map(s) of Monitoring Locations and AQMAs

Figure D.1 - Map of all monitoring locations

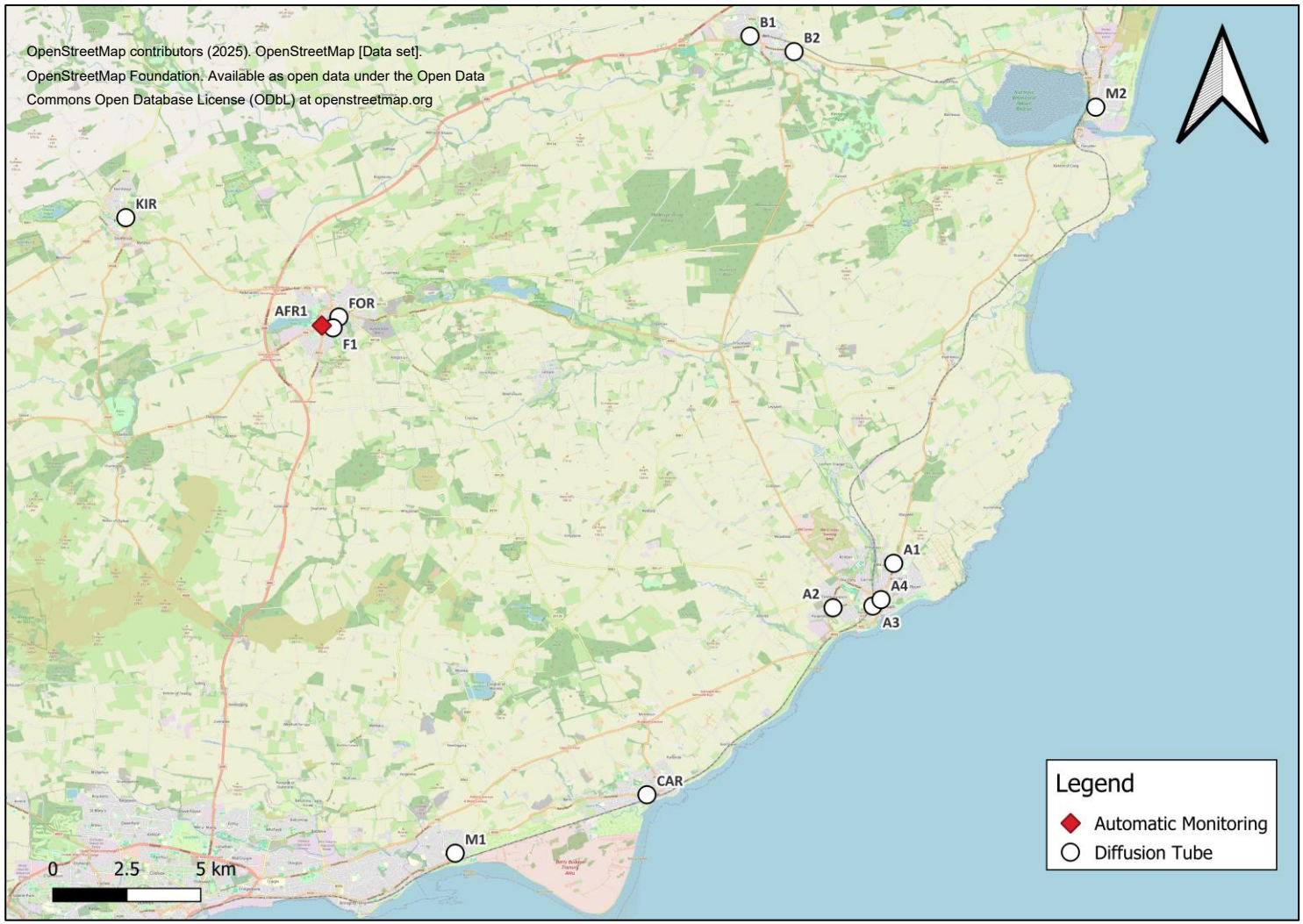


Figure D.2 - Monitoring locations within Arbroath

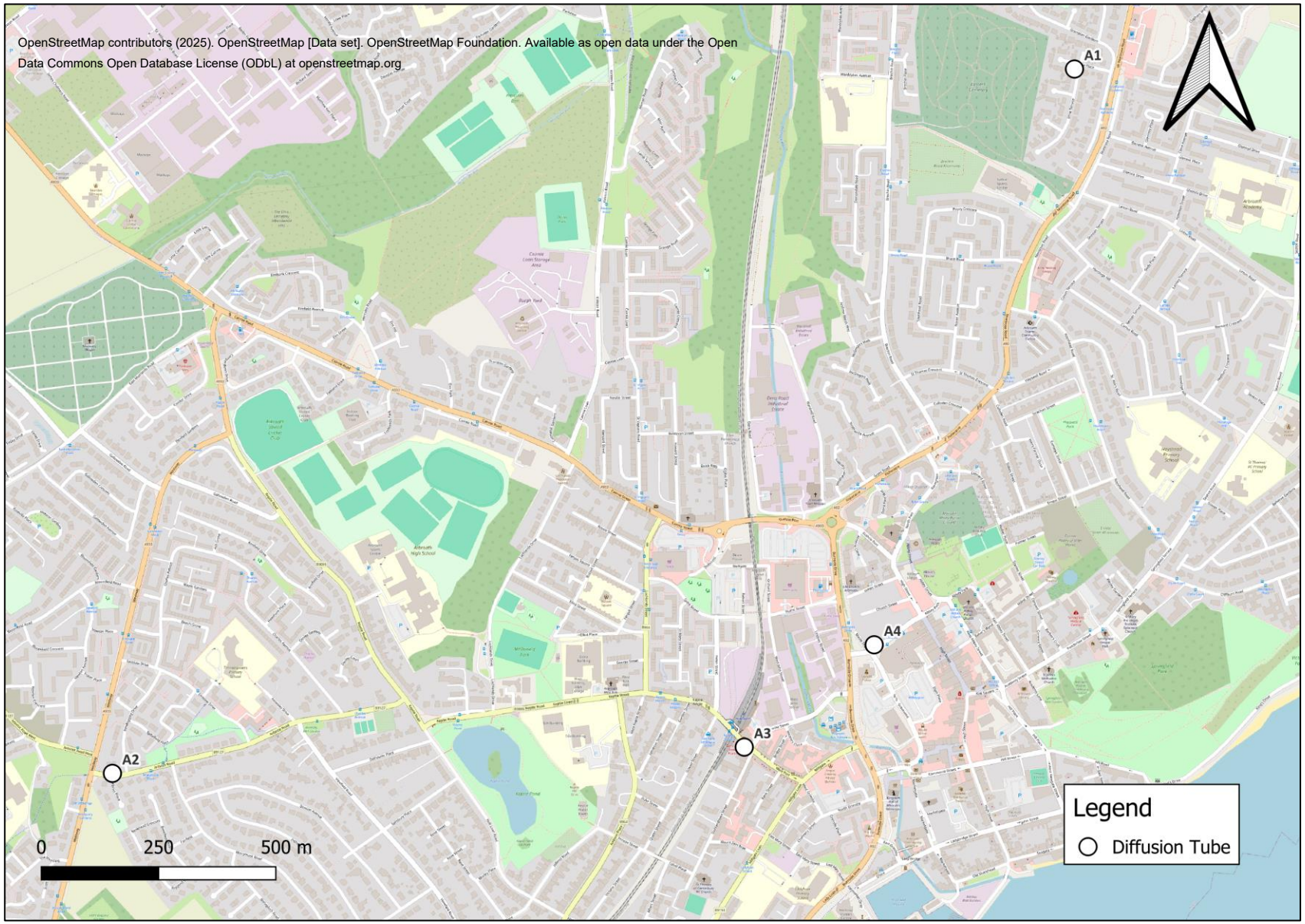


Figure D.3 – Monitoring locations within Forfar

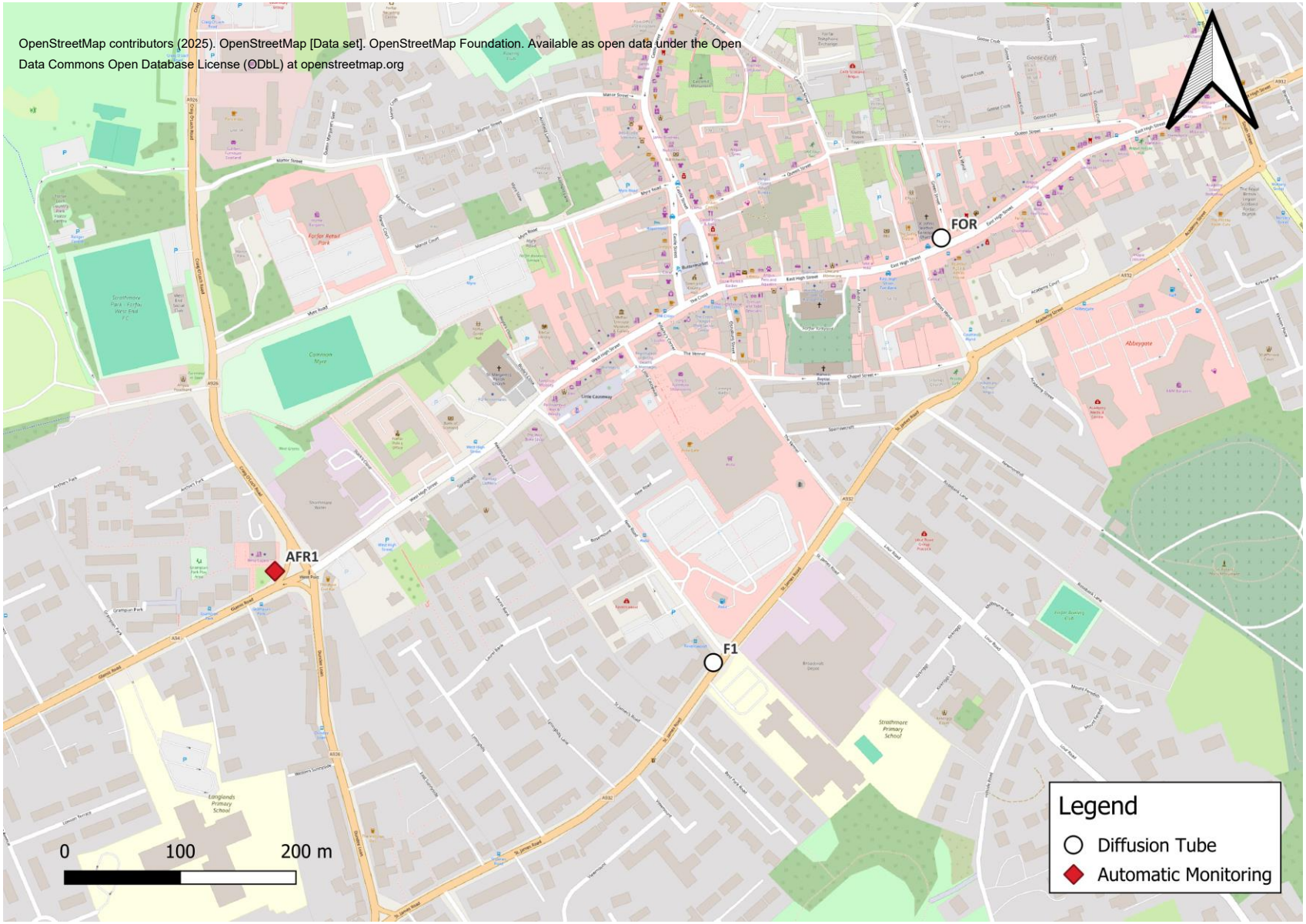


Figure D.4– Monitoring locations within Carnoustie and Monifieth

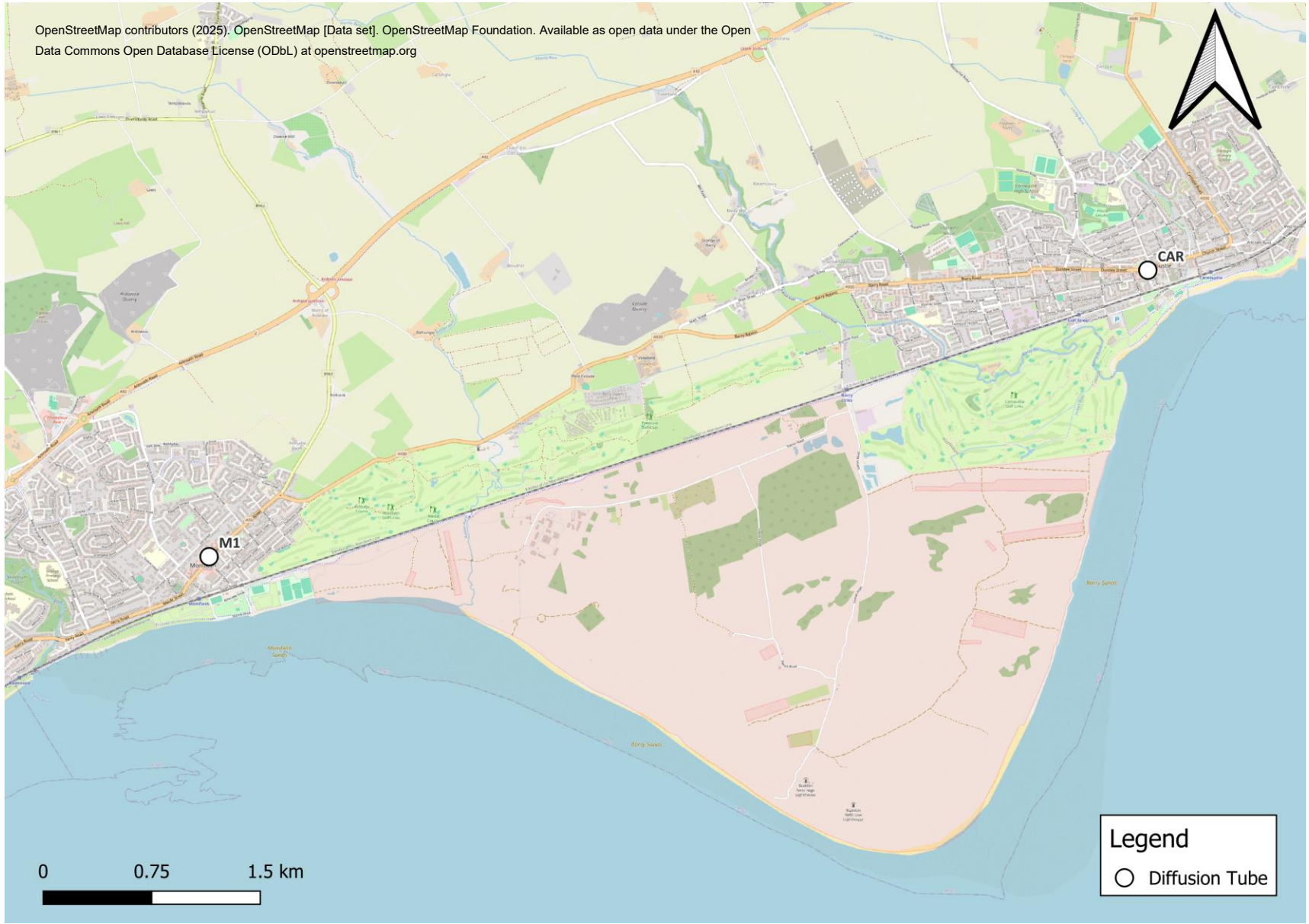


Figure D.5 – Monitoring locations within Kirriemuir

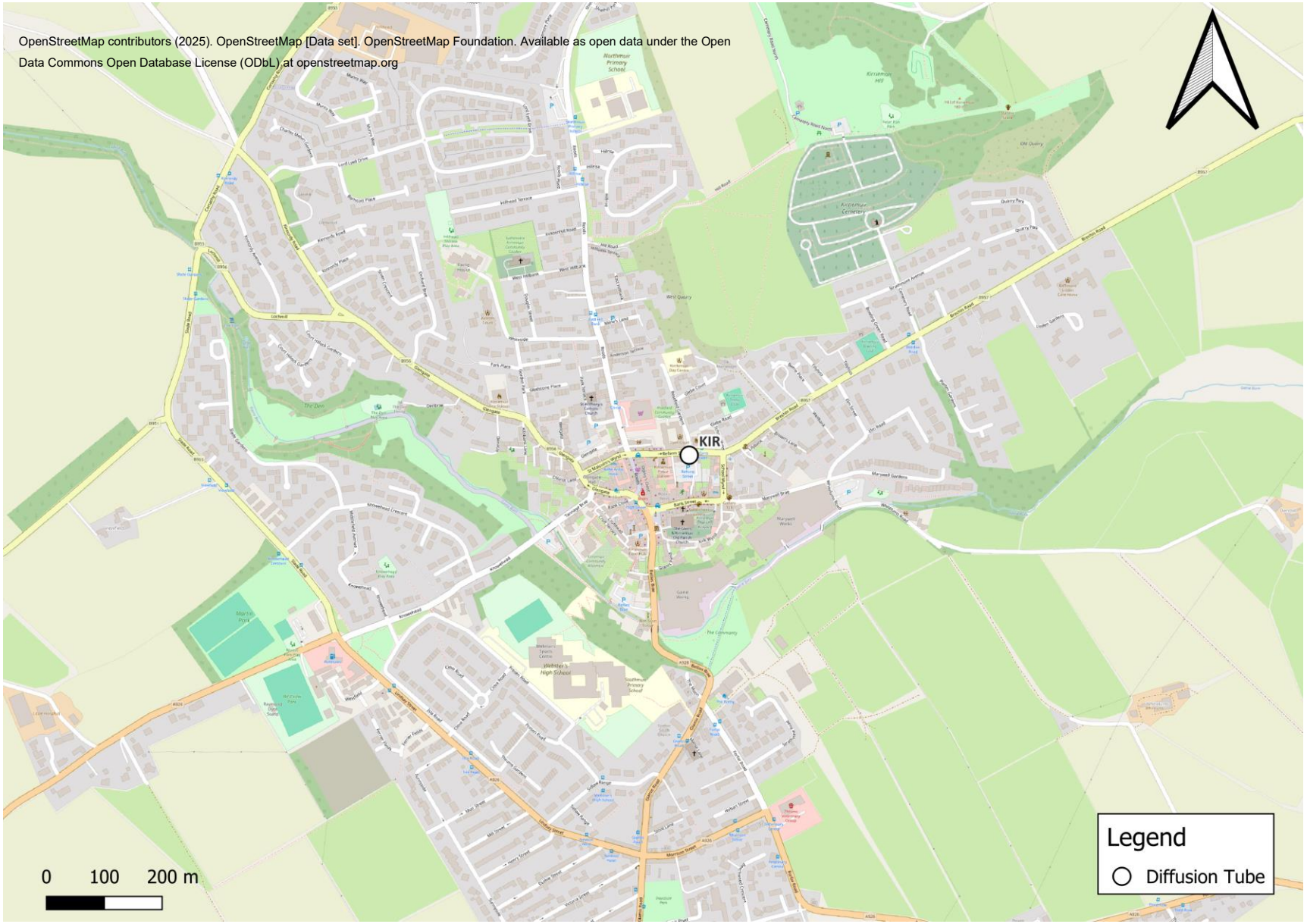


Figure D.6– Monitoring locations within Brechin

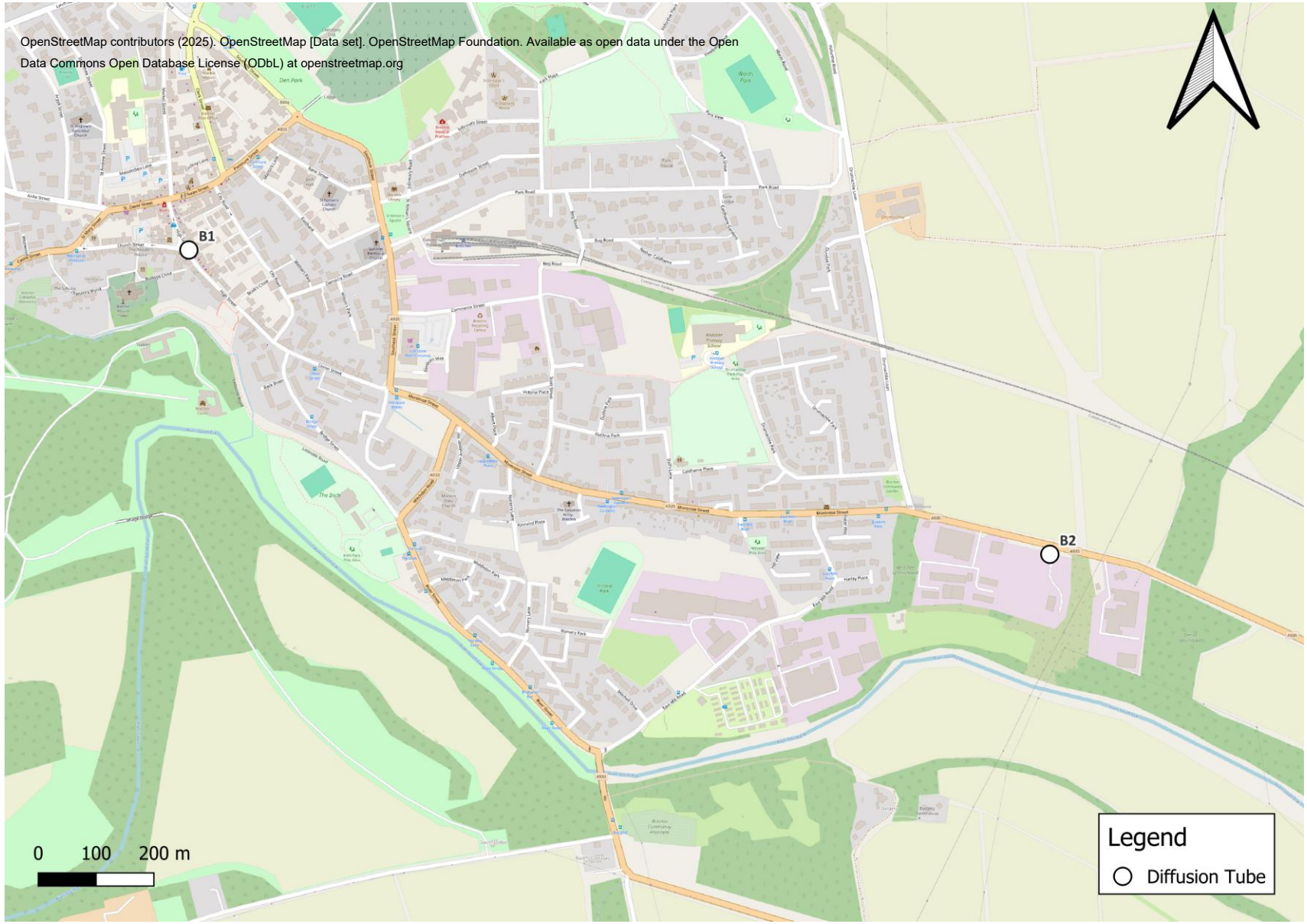
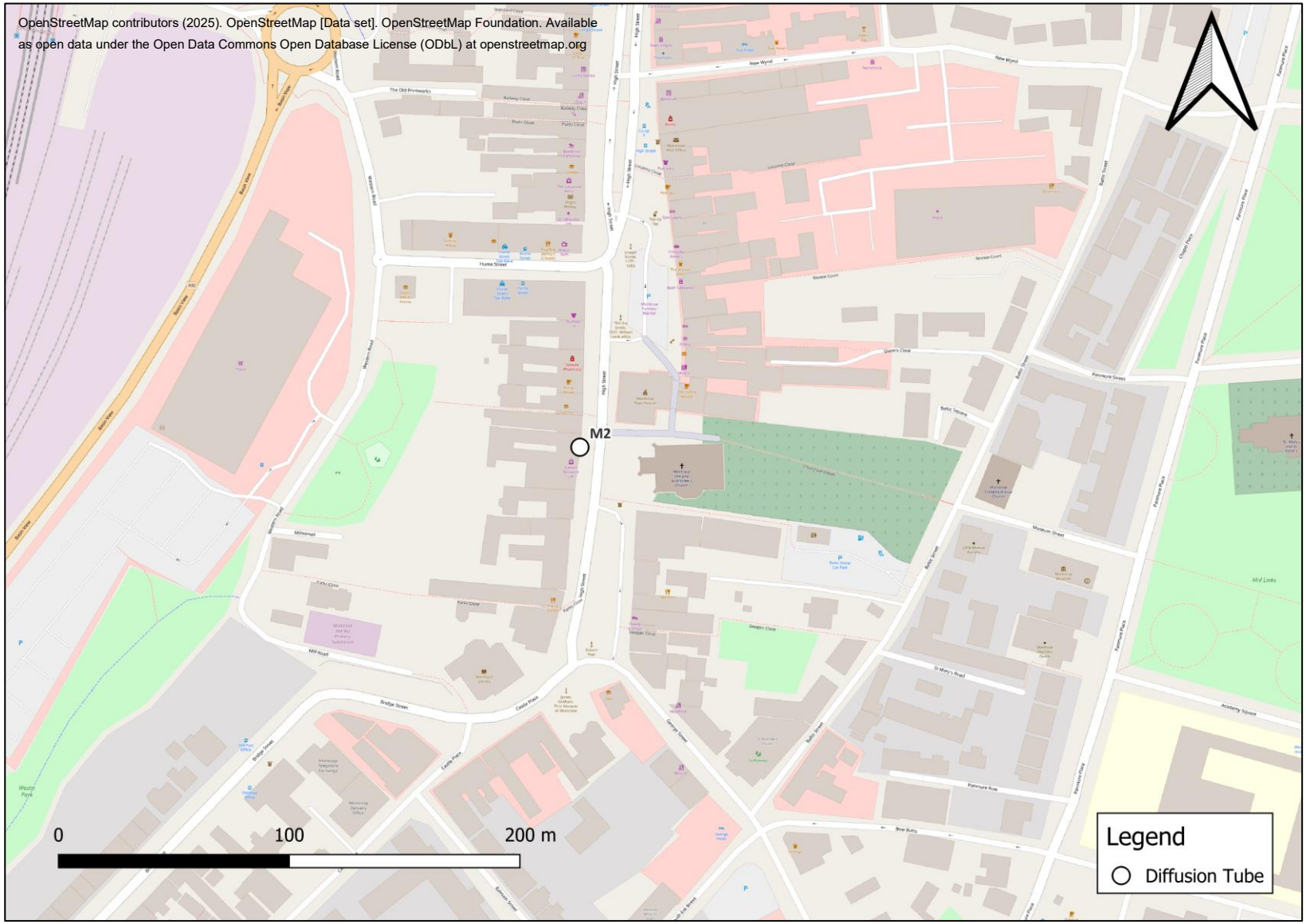


Figure D.7 – Monitoring locations within Montrose



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	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
DT	Diffusion Tube
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
LDP	Local Development Plan
NCN	National Cycle Network
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NPF4	National Planning Framework 4
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
SECAP	Sustainable Energy and Climate Action Plan
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.
- Travel line Scotland - www.travelinescotland.com
- The Sustainable Energy and Climate Action Plan SECAP - https://www.angus.gov.uk/media/angus_sustainable_energy_and_climate_action_plan_pdf.