

Annual Progress Report (APR)



2023 Air Quality Annual Progress Report (APR) for West Dunbartonshire Council

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

Local Air Quality Management

June, 2023

West Dunbartonshire Council

| | |
|--------------------------------|--|
| Information | West Dunbartonshire Council |
| Local Authority Officer | Adeyemi Roland |
| Department | Environmental Health |
| Address | 16 Church Street Dumbarton G82 1QL |
| Telephone | 0141 951 7957 |
| E-mail | Adeyemi.Roland@west-dunbarton.gov.uk |
| Report Reference Number | APR/2023/1 |
| Date | June 2023 |

Executive Summary: Air Quality in Our Area

Air Quality in West Dunbartonshire Council

The 2023 Annual Progress Report (APR) considers measured pollutant concentration from within West Dunbartonshire for the calendar year of 2022 and considers the potential for exceedance of the air quality objectives.

The main pollutant of concern within West Dunbartonshire Council area are nitrogen dioxide and particulate matter. Monitoring in West Dunbartonshire was undertaken using automatic (continuous) monitoring at two sites during 2022 and the use of diffusion tubes. Dumbarton monitoring unit only monitors Nitrogen Dioxide (NO₂) and is part of the Automatic Urban and Rural Network (AURN). Both automatic units have triplicate co-located NO₂ diffusion tubes.

Monitoring in 2022 indicates an 11% decrease in Dumbarton, when compared with the previous monitoring year of 2021 and 32% decrease below 2019 data which represent pre-pandemic year.

No exceedances to the short and long term NO₂ limit were registered at the two continuous monitoring locations. The monitoring location with the highest annual mean for NO₂ is DT18 (Milton 1) with a value of 34.4 µg/m³ but still below the national annual mean for this pollutant.

The Annual mean PM₁₀ level was at 10 µg/m³ at Briar Drive Clydebank, recorded an increase of 18% from the previous year and in 2020.

Annual Mean PM_{2.5} levels was 5.8 µg/m³ which is 18% more than previous year 2021 and the highest concentration in the last three years. This value is below the objective level.

The solar powered Zephyr mobile monitor was installed at St Patrick's Primary School for a six month period in 2022 however this was removed for repairs in August 2022 having been damaged/vandalised.

Actions to Improve Air Quality

West Dunbartonshire Council continues to work with internal and external partners to deliver the objectives of Cleaner Air for Scotland 2 – Towards a Better Place for Everyone.

Local Priorities and Challenges

West Dunbartonshire Council has no specific priorities in respect of local air quality beyond that of statutory monitoring and idling engines enforcement. During 2022 we could not continue our programme of educational workshops in targeted local primary schools which would have focused on sustainable travel options and its impact on local air quality.

Environmental Health service continues carrying out vehicle idling enforcement programme across the Council area.

How to Get Involved

The general public can find out more about air quality and related subjects by visiting West Dunbartonshire Council web site at

<http://www.westdunbarton.gov.uk/business/environmental-health/pollution/airquality>

Residents can also visit the Scottish Air Quality website and view live air quality Data at

<http://www.scottishairquality.co.uk>

There is the opportunity to register for text and email alerts when air quality is forecast likely to be moderate or higher. This will enable those with breathing problems to make informed judgement about their levels of activity or exposure.

With high levels of nitrogen dioxide coming mainly from vehicle emission there are many ways in which WDC residents can also help contribute towards reducing air pollution in the area, such as choosing to travel around the area by foot, by bicycle or using public transport whenever possible, this can reduce individual contributions to air pollution in the area.

Further information can be obtained by contacting Environmental Health at:

Environmental.Health@west-dunbarton.gov.uk

Table of Contents

| | |
|---|-----------|
| Executive Summary: Air Quality in Our Area | i |
| Air Quality in West Dunbartonshire Council | i |
| Actions to Improve Air Quality..... | i |
| Local Priorities and Challenges | ii |
| How to Get Involved..... | ii |
| 1 Local Air Quality Management..... | 6 |
| 2 Actions to Improve Air Quality | 7 |
| 2.1 Air Quality Management Areas..... | 7 |
| 2.2 Cleaner Air for Scotland 2..... | 7 |
| 2.2.1 Placemaking – Plans and Policies..... | 7 |
| 2.2.2 Transport – Low Emission Zones | 8 |
| 2.3 Implementation of Air Quality Action Plan(s) and/or measures to address air quality | 9 |
| 3 Air Quality Monitoring Data and Comparison with Air Quality Objectives | 10 |
| 3.1 Summary of Monitoring Undertaken..... | 10 |
| 3.1.1 Automatic Monitoring Sites..... | 10 |
| 3.1.2 Non-Automatic Monitoring Sites..... | 10 |
| 3.1.3 Other Monitoring Activities..... | 11 |
| 3.2 Individual Pollutants | 11 |
| 3.2.1 Nitrogen Dioxide (NO ₂)..... | 11 |
| 3.2.2 Particulate Matter (PM ₁₀) | 13 |
| 3.2.3 Particulate Matter (PM _{2.5})..... | 13 |
| 3.2.4 Sulphur Dioxide (SO ₂) | 14 |
| 3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene | 14 |
| 4 New Local Developments..... | 15 |
| 4.1 Road Traffic Sources | 15 |
| 4.2 Other Transport Sources | 15 |
| 4.3 Industrial Sources | 15 |
| 4.4 Commercial and Domestic Sources | 15 |
| 4.5 New Developments with Fugitive or Uncontrolled Sources | 16 |

| | | |
|----------|---|-----------|
| 5 | Planning Applications | 17 |
| 6 | Conclusions and Proposed Actions | 18 |
| 6.1 | Conclusions from New Monitoring Data | 18 |
| 6.2 | Conclusions relating to New Local Developments | 18 |
| 6.3 | Proposed Actions | 18 |
| | Appendix A: Monitoring Results | 20 |
| | Appendix B: Full Monthly Diffusion Tube Results for 2022 | 29 |
| | Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC | 31 |
| | New or Changed Sources Identified Within West Dunbartonshire Council During 2022 | 31 |
| | Additional Air Quality Works Undertaken by West Dunbartonshire Council During 2022 | 31 |
| | QA/QC of Diffusion Tube Monitoring | 31 |
| | Diffusion Tube Annualisation | 31 |
| | Diffusion Tube Bias Adjustment Factors | 32 |
| | NO ₂ Fall-off with Distance from the Road | 32 |
| | QA/QC of Automatic Monitoring | 32 |
| | PM ₁₀ and PM _{2.5} Monitoring Adjustment | 33 |
| | Automatic Monitoring Annualisation | 33 |
| | NO ₂ Fall-off with Distance from the Road | 33 |
| | Appendix D: Monitoring Site Location Maps | 35 |
| | Glossary of Terms | 39 |
| | References | 40 |

List of Tables

| | |
|---|----|
| Table 1.1 – Summary of Air Quality Objectives in Scotland..... | 6 |
| Table A.1 – Details of Automatic Monitoring Sites..... | 20 |
| Table A.2 – Details of Non-Automatic Monitoring Sites | 21 |
| Table A.3 – Annual Mean NO ₂ Monitoring Results (µg/m ³) | 23 |
| Table A.4 – 1-Hour Mean NO ₂ Monitoring Results, Number of 1-Hour Means > 200µg/m ³ | 25 |
| Table A.5 – Annual Mean PM ₁₀ Monitoring Results (µg/m ³)..... | 26 |
| Table A.6 – 24-Hour Mean PM ₁₀ Monitoring Results, Number of PM ₁₀ 24-Hour Means > 50µg/m ³ | 27 |
| Table A.7 – Annual Mean PM _{2.5} Monitoring Results (µg/m ³) | 28 |
| Table B.1 – NO ₂ 2022 Monthly Diffusion Tube Results (µg/m ³) | 29 |
| Table C.1 – Bias Adjustment Factor | 32 |
| Table C.2 – Annualisation Summary (concentrations presented in µg/m ³) | 34 |
| Table C.3 – Local Bias Adjustment Calculations | 34 |

List of Figures

| | |
|---|----|
| Figure 1 Trend in Automatic analyser –Annual Mean Concentration 2018 - 2022..... | 11 |
| Figure 2 NO ₂ levels measured as an annual average µg/m ³ | 12 |
| Figure 3 Annual Trend of PM ₁₀ Concentration 2018 -2022..... | 13 |
| Figure 4 Annual Trend of PM _{2.5} Concentration 2018 -2022 | 14 |

1 Local Air Quality Management

This report provides an overview of air quality in West Dunbartonshire Council during 2022. 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 West Dunbartonshire 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.

West Dunbartonshire Council currently does not have any AQMAs neither has there been any in the past.

2.2 Cleaner Air for Scotland 2

[Cleaner Air for Scotland 2 – Towards a Better Place for Everyone \(CAFS2\)](#) is Scotland's second air quality strategy. CAFS2 sets out how the Scottish Government and its partner organisations propose to further reduce air pollution to protect human health and fulfil Scotland's legal responsibilities over the period 2021 – 2026. CAFS2 was published in July 2021 and replaces [Cleaner Air for Scotland – The Road to a Healthier Future \(CAFS\)](#), which was published in 2015. CAFS2 aims to achieve the ambitious vision for Scotland "to have the best air quality in Europe". A series of actions across a range of policy areas are outlined, a summary of which is available on the Scottish Government's website.

Progress by West Dunbartonshire Council against relevant actions for which local authorities are the lead delivery bodies within this strategy is demonstrated below.

2.2.1 Placemaking – Plans and Policies

Local authorities with support from the Scottish Government will assess how effectively air quality is embedded in plans, policies, City Deals and other initiatives, and more generally

in cross departmental working, identifying and addressing evidence, skills, awareness and operational gaps. The West Dunbartonshire development plan now includes the Local Plan 2010 and National Planning Framework 4 (NPF4). Clydeplan has been removed from being part of the statutory development plan. The Local Development Plan, Proposed Plan, as modified is not adopted but is a material consideration in relation to assessment of planning applications. The Local Plan includes consideration of air quality under its General Development Policy GD1, which encourages the “provision for public transport, pedestrian and cycling access, and considering the need for a Green Travel Plan” in order to avoid or minimise adverse impacts on air quality.

The Local Development Plan, Proposed Plan as modified, similarly requires measures to mitigate air quality impacts under policy ENV8 Air, Light & Noise Pollution. The Proposed LDP also promotes and requires the prioritisation of active travel across a range of policies, including Policies CP2 Green Infrastructure and CON1 Transport Requirements for New Development, which also requires developers of major development to include electric vehicle charging infrastructure.

West Dunbartonshire Council has relevant initiatives in Transport and Climate change, Policy 13 Sustainable transport seeks “To encourage, promote and facilitate developments that prioritise walking, wheeling, cycling and public transport for everyday travel and reduce the need to travel unsustainably.” This policy also requires the provision of low and zero-emission vehicle and cycle charging infrastructure.

2.2.2 Transport – Low Emission Zones

Local authorities working with Transport Scotland and SEPA will look at opportunities to promote zero-carbon city centres within the existing LEZs structure.

West Dunbartonshire Council has no Low Emission Zones established within the Local Authority area and has decided to take no further action at this stage on introducing Low Emission Zones as there are currently no exceedences of any of the air quality objectives across the West Dunbartonshire area.

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

West Dunbartonshire Council has not undertaken any specific measures to address local air quality in 2022 beyond the statutory monitoring and reporting requirement improving local air quality.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how local concentrations of the main air pollutants compare with the objectives.

West Dunbartonshire Council undertook automatic (continuous) monitoring at two sites during 2022. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at <http://www.scottishairquality.co.uk/>

The annual mean for NO₂ ranged from 12 – 18 µg/m³ across West Dunbartonshire demonstrating compliance with the 40 µg/m³ air quality objective.

Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

Maps showing the location of the monitoring sites are provided in Appendix D.

3.1.2 Non-Automatic Monitoring Sites

West Dunbartonshire Council undertook non- automatic (passive) monitoring of NO₂ at 24 sites during 2022. Table A.2 in Appendix A shows the details of the sites. The sites included two set of triplicates tubes co-located with our automatic monitoring sites given a total of 28 tubes. The diffusion tubes were analysed by Glasgow Scientific Services (GSS), which is a UKAS accredited laboratory, and the data from these tubes was compared against the annual average objective for NO₂.

Since the last Annual Progress Report a review of the NO₂ monitoring locations has been undertaken. The review resulted in reduction of the tubes from 33 to 28. Details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Maps showing the location of the monitoring sites are provided in Appendix D.

3.1.3 Other Monitoring Activities

West Dunbartonshire Council installed Zephyr mobile monitoring units in the area in December 2021, outside a local primary school in order to utilise the data as part of a school educational programme. The unit was damaged in July 2022 and has not been utilised, consideration for its use is been given to community engagement and awareness programmes.

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 (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40 µg/m³. Both automatic monitoring site measuring NO₂ achieved compliance with Air quality objective in 2022.

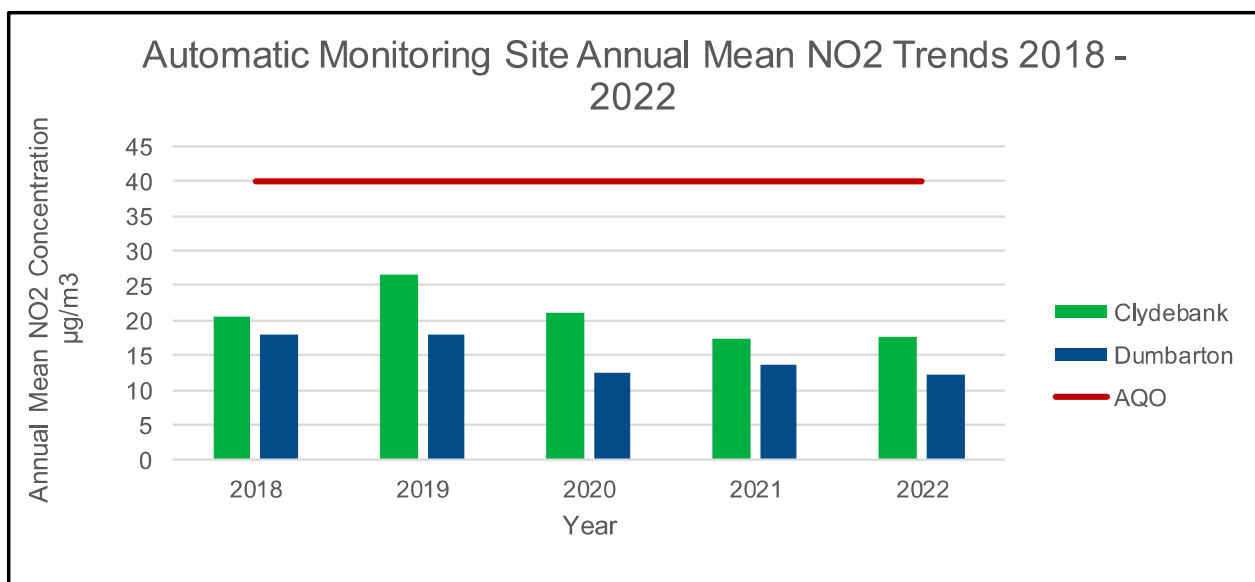


Figure 1 Trend in Automatic analyser –Annual Mean Concentration 2018 - 2022

For diffusion tubes, the full 2022 dataset of monthly mean values is provided in Appendix B. There were two new sites added to the network in 2021 and one diffusion tube monitoring site had only six month of data hence data for that site had to be annualised, this data is show in Table B.1.

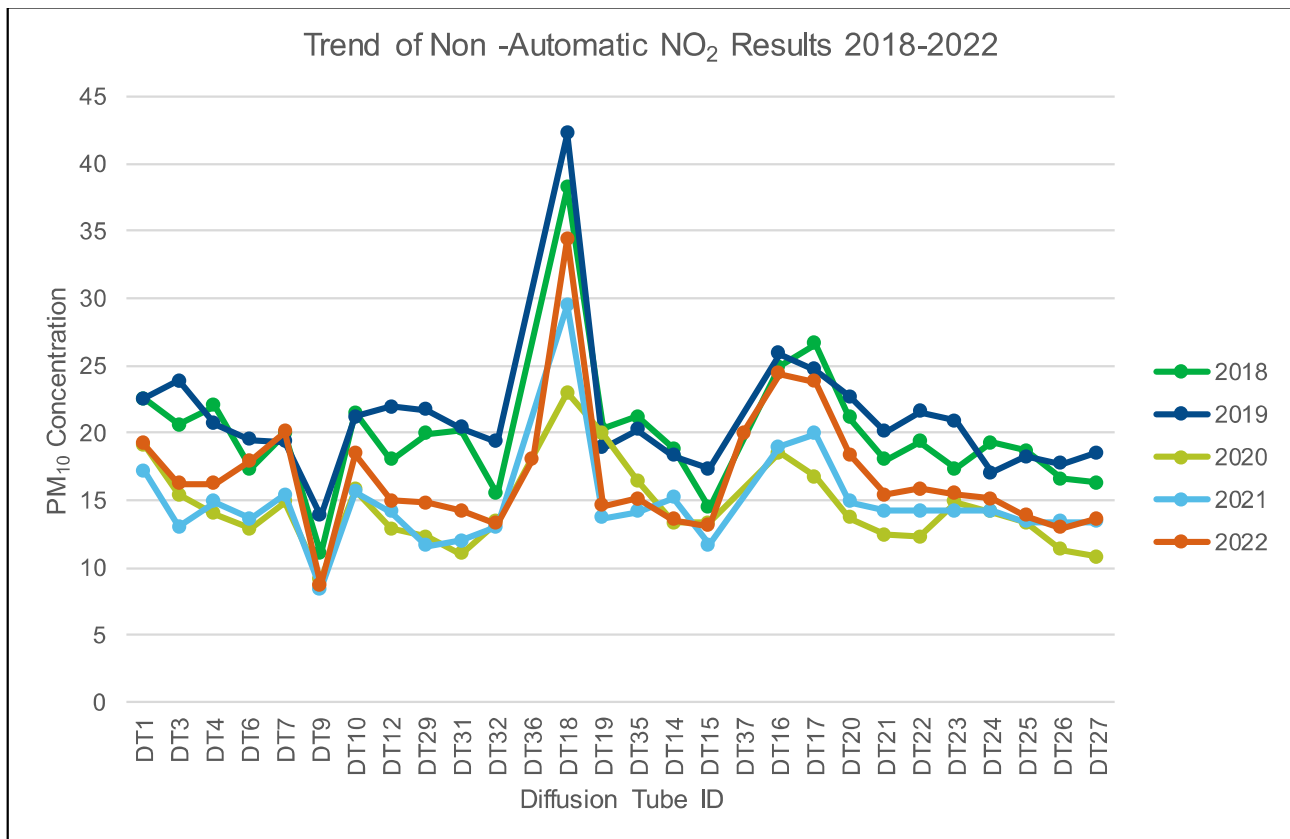


Figure 2 NO₂ levels measured as an annual average µg/m³

Distance correction was not undertaken for any site to estimate the concentration at the nearest receptor. All diffusion tube monitoring location in West Dunbartonshire achieved NO₂ Air Quality Objective compliance in 2022 with Milton 1 reporting the highest concentration of 34.4 µg/m³

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past five years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

There were no exceedences of the air quality objectives for this pollutant within West Dunbartonshire during the calendar year of 2022.

The annual mean concentration of NO₂ at the diffusion tube monitoring locations are shown to be well below the air quality objective with the highest concentration showing as 34.4µg/m³ at location Milton 1 on the A82. None of the diffusion tube monitoring sites reported concentrations exceeding 60µg/m³ which indicates that there are no exceedences of the short-term air quality objective.

3.2.2 Particulate Matter (PM₁₀)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past five years with the air quality objective of 18µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past five years with the air quality objective of 50µg/m³, not to be exceeded more than seven times per year.

There were no exceedances of the air quality objectives for this pollutant at the Clydebank monitoring site during 2022 which was the only site in West Dunbartonshire Council area where particulate matter was monitored. An 18% increase was recorded compared to the previous year, however the PM₁₀ automatic monitoring sites have not recorded an exceedance of the annual mean AQO since 2018.

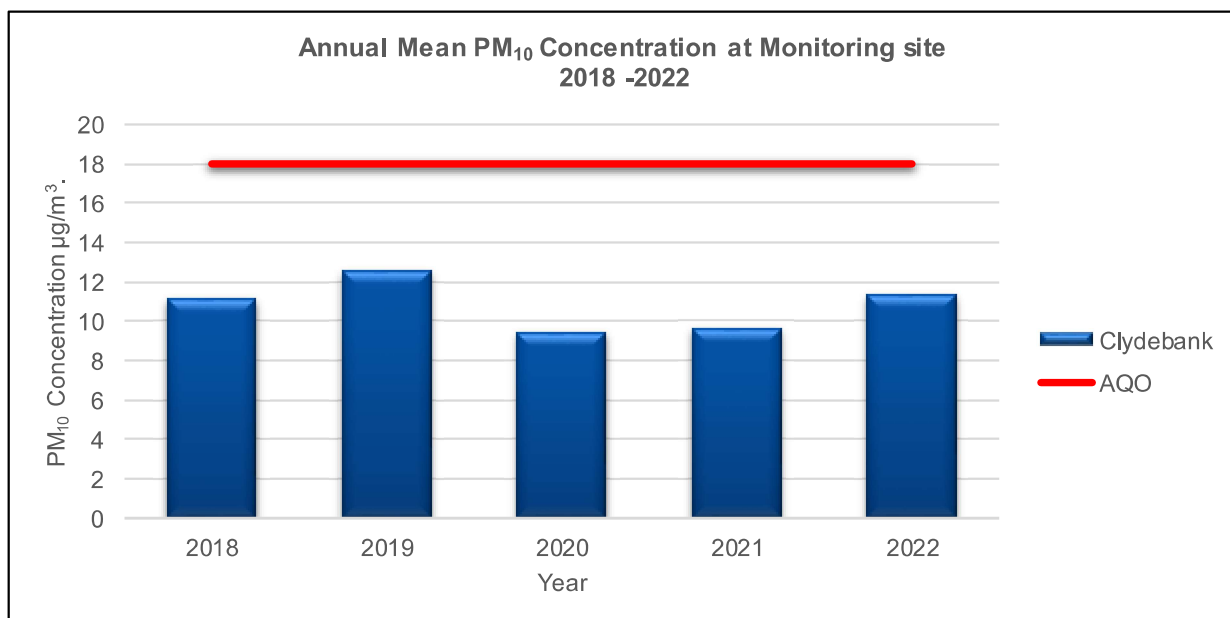


Figure 3 Annual Trend of PM₁₀ Concentration 2018 -2022

3.2.3 Particulate Matter (PM_{2.5})

Table A.7 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/m³. This objective was not exceeded during 2022 and this monitoring location has shown a decrease in annual mean concentration when compared to 2019 data and a marginal increase from 2020.

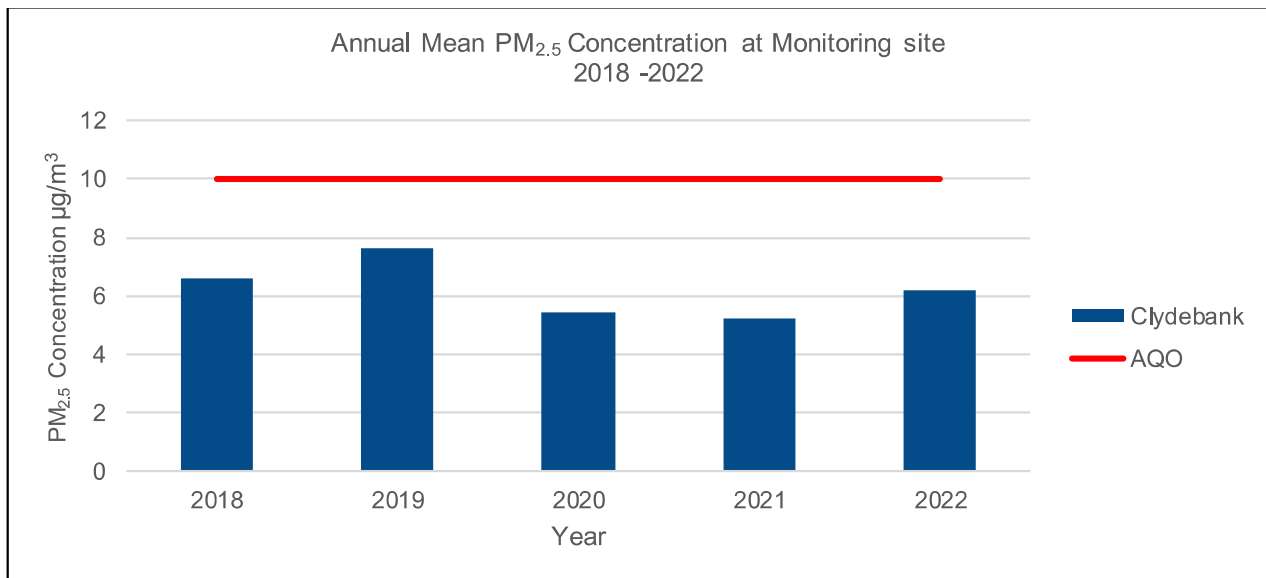


Figure 4 Annual Trend of PM_{2.5} Concentration 2018 -2022

3.2.4 Sulphur Dioxide (SO₂)

Error! Reference source not found. in Appendix A compares the ratified continuous monitored SO₂ concentrations for year 2022 with the air quality objectives for SO₂.

West Dunbartonshire Council does not carry out any monitoring in respect of Sulphur Dioxide and has no current plans to do so.

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

West Dunbartonshire Council does not carry out any monitoring in respect of Carbon Monoxide, Lead and 1,3-Butadiene and has no current plans to do so

4 New Local Developments

No new developments in the area which may affect air quality have been identified and requires consideration in this report.

4.1 Road Traffic Sources

There were no new road traffic sources identified within West Dunbartonshire Council Area in 2022.

4.2 Other Transport Sources

The following transport sources within the West Dunbartonshire Council local authority boundary do not meet the criteria specified in the Local Air Quality Management, Technical Guidance (TG16) that would trigger the requirement for a more detailed assessment:

- Airports.
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.
- Locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.
- Ports for shipping.

4.3 Industrial Sources

There were no new industrial sources identified within West Dunbartonshire Council Area in 2022 neither has the Scottish Environmental Protection Agency (SEPA) made West Dunbartonshire Council aware of any significant new industrial sources since the previous Annual Progress Report in June 2022.

4.4 Commercial and Domestic Sources

There are no new commercial or domestic sources identified in the West Dunbartonshire Council area. However, there have been many planning applications received for domestic fuel burning through the use of wood burning stoves which continues to grow in West Dunbartonshire.

4.5 New Developments with Fugitive or Uncontrolled Sources

There are no new developments with fugitive or uncontrolled sources identified in the West Dunbartonshire Council area.

5 Planning Applications

There are no new planning applications in 2022 West Dunbartonshire Council that would have the potential to affect air quality.

6 Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

There were no exceedances of the air quality objectives identified within West Dunbartonshire Council (WDC) during 2022. The monitoring data demonstrates that the concentration of NO₂ remains below the national air quality objectives and the general historic trend in NO₂ concentration across the sites continues downward and/or has remained flat since 2019.

WDC carried out continuous monitoring for NO₂, PM₁₀, PM_{2.5} and passive diffusion tubes monitoring at various sites across the local authority area.

Similarly, PM₁₀ levels at the Clydebank site recorded a slight increase from previous years but remains well below the annual mean objective of 18 µg/m³

PM_{2.5} also show a slight increase in the annual mean objective from 2020 however the value remains well below the annual mean objective of 10 µg/m³

Air quality across West Dunbartonshire has improved over the past couple of years and the trend shows reducing concentrations within the towns.

No AQMAs have been declared in the WDC area and no requirement for detailed assessment has been identified.

6.2 Conclusions relating to New Local Developments

There have been no new local developments that have the potential to introduce new exceedances of relevant air quality objectives in West Dunbartonshire or expected to have significant impact on air quality in the towns within WDC.

6.3 Proposed Actions

Monitoring data for 2022 has not identified any new exceedances of the objectives for any pollutant and all monitored areas of West Dunbartonshire are not only in compliance but are well below the objective levels, even although traffic levels have returned to pre pandemic levels.

All diffusion tube monitoring sites will be reviewed again once the 2023 monitoring calendar is complete and bias adjusted data is available.

The next Annual progress report will be submitted by the end of June 2024.

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 (1) | Distance to kerb of nearest road (m) (2) | Inlet Height (m) |
|---------|-----------|-----------|---------------|---------------|--|----------------------|------------------------|-----------------------------------|--|------------------|
| CM1 | Clydebank | Roadside | 249723 | 672044 | NO ₂ ; PM ₁₀ ; PM _{2.5} | NO | Chemiluminescent; FDMS | 18 | 4.5 | 1.5 |
| CM2 | Dumbarton | Roadside | 240238 | 675193 | NO ₂ | NO | Chemiluminescent | 2.5 | 5 | 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) |
|---------|-------------------------|-----------|---------------|---------------|----------------------|----------------------|--|---|---|-----------------|
| DT1 | Clydebank 1 | Kerbside | 248479 | 671115 | NO ₂ | No | 2 | 1 | N | 2.5 |
| DT3 | Clydebank 7 | Kerbside | 249918 | 669868 | NO ₂ | No | 4 | 1 | N | 2.5 |
| DT4 | Clydebank 9 | Kerbside | 249761 | 669990 | NO ₂ | No | 3 | 1 | N | 2.5 |
| DT6 | Clydebank 11 | Kerbside | 249801 | 672288 | NO ₂ | No | 22 | 1 | N | 2.5 |
| DT7 | Clydebank 12 | Kerbside | 249747 | 671665 | NO ₂ | No | 10 | 1 | N | 2.5 |
| DT9 | Clydebank 14 | Kerbside | 249872 | 671854 | NO ₂ | No | >25 | 10 | N | 2.5 |
| DT10 | Clydebank 15 | Kerbside | 249746 | 671966 | NO ₂ | No | 8.5 | 1 | N | 2.5 |
| DT12 | Clydebank 17 | Kerbside | 249987 | 672440 | NO ₂ | No | 11 | 1 | N | 2.5 |
| DT14 | Dumbarton 11 | Kerbside | 240515 | 675078 | NO ₂ | No | 4 | 1 | N | 2.5 |
| DT15 | Dumbarton 12 | Kerbside | 239410 | 675330 | NO ₂ | No | 7 | 1 | N | 2.5 |
| DT16 | Dumbarton 2 | Kerbside | 240178 | 675228 | NO ₂ | No | 8 | 1 | N | 2.5 |
| DT17 | Dumbarton 3 | Kerbside | 240279 | 675196 | NO ₂ | No | 4.5 | 1 | N | 2.5 |
| DT18 | Milton 1 | Kerbside | 242266 | 674235 | NO ₂ | No | 12 | 1 | N | 2.5 |
| DT19 | Milton 2 | Kerbside | 242160 | 674299 | NO ₂ | No | 2 | 12 | N | 2.5 |
| DT20 | Alexandria 1 | Kerbside | 239024 | 680206 | NO ₂ | No | 5 | 1 | N | 2.5 |
| DT21 | Balloch 1 | Kerbside | 238584 | 681562 | NO ₂ | No | 12 | 1 | N | 2.5 |
| DT22 | Briar Drive 1 | Kerbside | 249723 | 672044 | NO ₂ | No | 2.5 | 5 | Y | 2.5 |
| DT23 | Briar Drive 2 | Kerbside | 240238 | 675193 | NO ₂ | No | 2.5 | 4.5 | Y | 2.5 |
| DT24 | Briar Drive 3 | Kerbside | 248479 | 671115 | NO ₂ | No | 2.5 | 1 | Y | 2.5 |
| DT25 | Dumbarton Triuplicate 1 | Kerbside | 240238 | 675193 | NO ₂ | No | 18 | 4.5 | Y | 2.5 |
| DT26 | Dumbarton Triuplicate 2 | Kerbside | 240238 | 675193 | NO ₂ | No | 18 | 4.5 | Y | 2.5 |
| DT27 | Dumbarton Triuplicate 3 | Kerbside | 240238 | 675193 | NO ₂ | No | 18 | 4.5 | Y | 2.5 |
| DT29 | Clydebank 19 | Kerbside | 249752 | 669981 | NO ₂ | No | 2.5 | 2.5 | N | 2.5 |
| DT31 | Clydebank 21 | Kerbside | 250531 | 669269 | NO ₂ | No | 4 | 1 | N | 2.5 |

| 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) |
|---------|--------------|-----------|---------------|---------------|----------------------|----------------------|--|---|---|-----------------|
| DT32 | Clydebank 22 | Kerbside | 250199 | 669551 | NO ₂ | No | 7 | 1 | N | 2.5 |
| DT35 | Milton 5 | Kerbside | 242413 | 674288 | NO ₂ | No | 2 | 14 | N | 2.5 |
| DT36 | Clydebank 23 | Kerbside | 249868 | 671267 | NO ₂ | No | 2.5 | 1 | N | 2.5 |
| DT37 | Dumbarton 13 | Kerbside | 240858 | 674932 | NO ₂ | No | 2 | 1 | N | 2.5 |

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 NO₂ Monitoring Results (µg/m³)

| Site ID | Site Type | Monitoring Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2022 (%) ⁽²⁾ | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------|-----------|-----------------|---|--|----------------------|---------------------|------|------|-------|
| CM1 | Roadside | Automatic | 99% | 99% | 22.05 ⁽³⁾ | 28.2 ⁽³⁾ | 21 | 17.4 | 17.60 |
| CM2 | Roadside | Automatic | 100% | 100% | 18 | 18 | 12.6 | 13.6 | 12.10 |
| DT1 | Kerbside | Diffusion Tube | 92% | 92% | 22.5 | 22.5 | 19.1 | 17.2 | 19.17 |
| DT3 | Kerbside | Diffusion Tube | 100% | 100% | 20.6 | 23.9 | 15.4 | 13 | 16.21 |
| DT4 | Kerbside | Diffusion Tube | 100% | 100% | 22 | 20.7 | 14 | 14.9 | 16.22 |
| DT6 | Kerbside | Diffusion Tube | 100% | 100% | 17.3 | 19.5 | 12.9 | 13.6 | 17.92 |
| DT7 | Kerbside | Diffusion Tube | 100% | 100% | 19.9 | 19.3 | 14.9 | 15.4 | 20.06 |
| DT9 | Kerbside | Diffusion Tube | 100% | 100% | 11 | 13.8 | 9.1 | 8.4 | 8.72 |
| DT10 | Kerbside | Diffusion Tube | 100% | 100% | 21.5 | 21.2 | 15.8 | 15.6 | 18.47 |
| DT12 | Kerbside | Diffusion Tube | 100% | 100% | 18 | 21.9 | 12.9 | 14.1 | 14.96 |
| DT14 | Kerbside | Diffusion Tube | 100% | 100% | 18.8 | 18.3 | 13.3 | 15.2 | 13.51 |
| DT15 | Kerbside | Diffusion Tube | 92% | 92% | 14.4 | 17.3 | 13.3 | 11.7 | 13.08 |
| DT16 | Kerbside | Diffusion Tube | 100% | 100% | 24.9 | 25.9 | 18.5 | 19 | 24.41 |
| DT17 | Kerbside | Diffusion Tube | 100% | 100% | 26.6 | 24.7 | 16.7 | 19.9 | 23.83 |
| DT18 | Kerbside | Diffusion Tube | 100% | 100% | 38.2 | 42.2 | 23 | 29.5 | 34.44 |
| DT19 | Kerbside | Diffusion Tube | 100% | 100% | 20.3 | 18.9 | 19.9 | 13.7 | 14.60 |
| DT20 | Kerbside | Diffusion Tube | 83% | 83% | 21.1 | 22.7 | 13.7 | 14.9 | 18.34 |
| DT21 | Kerbside | Diffusion Tube | 92% | 92% | 18 | 20.1 | 12.4 | 14.2 | 15.42 |
| DT22 | Kerbside | Diffusion Tube | 100% | 100% | 19.31 | 21.6 | 12.3 | 14.2 | 15.86 |
| DT23 | Kerbside | Diffusion Tube | 100% | 100% | 17.31 | 20.9 | 14.9 | 14.2 | 15.44 |
| DT24 | Kerbside | Diffusion Tube | 100% | 100% | 19.27 | 17 | 14.1 | 14.2 | 15.13 |
| DT25 | Kerbside | Diffusion Tube | 92% | 92% | 18.7 | 18.2 | 13.3 | 13.4 | 13.82 |
| DT26 | Kerbside | Diffusion Tube | 92% | 92% | 16.6 | 17.7 | 11.3 | 13.4 | 12.93 |
| DT27 | Kerbside | Diffusion Tube | 92% | 92% | 16.3 | 18.5 | 10.8 | 13.4 | 13.58 |
| DT29 | Kerbside | Diffusion Tube | 100% | 100% | 19.9 | 21.7 | 12.3 | 11.6 | 14.80 |
| DT31 | Kerbside | Diffusion Tube | 100% | 100% | 20.2 | 20.4 | 11 | 12 | 14.24 |
| DT32 | Kerbside | Diffusion Tube | 100% | 100% | 15.5 | 19.3 | 13.4 | 13 | 13.20 |
| DT35 | Kerbside | Diffusion Tube | 100% | 100% | 21.2 | 20.2 | 16.4 | 14.1 | 15.09 |
| DT36 | Kerbside | Diffusion Tube | 75% | 75% | | | | | 18.07 |
| DT37 | Kerbside | Diffusion Tube | 50% | 50% | | | | | 20.00 |

Notes:

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

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

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.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%).

Table A.4 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

| Site ID | Site Type | Monitoring Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2022 (%) ⁽²⁾ | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------|-----------|-----------------|---|--|-------|--------|-------|-------|------|
| CM1 | Roadside | Automatic | 99 | 99 | 0(92) | 0(110) | 0(85) | 0 | 0 |
| CM2 | Roadside | Automatic | 100 | 100 | 0 | 0 | 0 | 0(86) | 0 |

Notes:

Exceedances of the NO₂ 1-hour mean objective (200 µg/m³ not to be exceeded more than 18 times/year) are shown in bold.

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

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

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

Table A.5 – Annual Mean PM₁₀ Monitoring Results (µg/m³)

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2022 (%) ⁽²⁾ | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------|-----------|---|--|------|------|------|------|------|
| CM1 | Roadside | 100 | 100 | 10 | 11 | 9 | 10 | 10 |

Notes:

Exceedances of the PM₁₀ annual mean objective of 18 µg/m³ 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%).

Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2022 (%) ⁽²⁾ | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------|-----------|---|--|------|------|------|-------|------|
| CM1 | Roadside | 100 | 100 | 0 | 4 | 0 | 0(20) | 0 |

Notes:

Exceedances of the PM₁₀ 24-hour mean objective (50 µg/m³ 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.7 – Annual Mean PM_{2.5} Monitoring Results (µg/m³)

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2022 (%) ⁽²⁾ | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------|-----------|---|--|------|------|------|------|------|
| CM1 | Roadside | 100 | 100 | 6 | 7 | 5 | 6 | 6 |

Notes:

Exceedances of the PM_{2.5} annual mean objective of 10 µg/m³ 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%).

Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO₂ 2022 Monthly Diffusion Tube Results (µg/m³)

| Site ID | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean: Raw Data | Annual Mean: Bias Adjusted ⁽¹⁾ |
|---------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------------|---|
| DT1 | 19.1 | 25 | 27.4 | TM | 16.1 | 8.9 | 7.6 | 15.9 | 13.8 | 13.8 | 27.8 | 25.4 | 18.25 | 19.17 |
| DT3 | 11.8 | 17.9 | 24.9 | 12.1 | 8.8 | 7.2 | 7.7 | 16.1 | 15.8 | 12.2 | 26.2 | 24.5 | 15.43 | 16.21 |
| DT4 | 10.9 | 13.2 | 25.5 | 12.1 | 8 | 5 | 5 | 12.9 | 25.7 | 15.8 | 22 | 29.3 | 15.45 | 16.22 |
| DT6 | 16.3 | 15 | 26 | 17.6 | 13.5 | 9.2 | 6.5 | 13.1 | 16.8 | 20.8 | 16.7 | 33.3 | 17.07 | 17.92 |
| DT7 | TM | TM | 30 | 11.8 | 11.2 | TM | 9.4 | 15.6 | 14.9 | 21.7 | 29.2 | 28.1 | 19.10 | 20.06 |
| DT9 | 7.4 | 10.9 | 15 | 8.2 | 5.1 | 3.2 | 4.1 | 6 | 7.7 | 6.7 | 10.2 | 15.1 | 8.30 | 8.72 |
| DT10 | 16 | 18.1 | 27.9 | 15.7 | TM | 2.1 | 8.6 | 13.9 | 18.1 | 18.8 | 24.1 | 30.2 | 17.59 | 18.47 |
| DT12 | 19.6 | 17.4 | 22.1 | 15.9 | 11.3 | 5.3 | 7.6 | 2.1 | 13.7 | 16.9 | 16.6 | 22.5 | 14.25 | 14.96 |
| DT29 | 12.6 | 11.3 | 23.4 | 18.1 | 13 | 3.6 | 2.3 | 10.1 | 17.1 | 13.8 | 17.4 | 26.4 | 14.09 | 14.80 |
| DT31 | 14.3 | 15.1 | 24.2 | 9.9 | 9.3 | 8.8 | 7.2 | 11.6 | 13.4 | 12.7 | 12.6 | 23.6 | 13.56 | 14.24 |
| DT32 | 14 | 10.4 | 21.1 | 10.9 | 8.3 | 2.8 | 11.8 | 10.6 | 6.4 | 8.8 | 18.5 | 27.3 | 12.58 | 13.20 |
| DT36 | | | TA | 19.8 | 15.5 | 8 | 12.1 | 10.1 | 18.8 | 20.6 | 16.8 | 33.2 | 17.21 | 18.07 |
| DT18 | 33.2 | 39.6 | 45.8 | 30.2 | 33 | 13.3 | 27.1 | 31.6 | 16.3 | 36.5 | 47.5 | 39.5 | 32.80 | 34.44 |
| DT19 | 12.5 | 15.3 | 20.9 | 16.1 | 12.8 | 7.5 | 6.1 | 16.5 | 8.9 | 14.5 | 19.3 | 16.5 | 13.91 | 14.60 |
| DT35 | 17.3 | 19 | 25.6 | 15.1 | 12.8 | 6.9 | 6.1 | 14 | 12.6 | 10.1 | 11.6 | 21.4 | 14.38 | 15.09 |
| DT14 | 17.9 | 15.9 | 22.7 | 9.8 | 8.6 | 3.4 | 4 | 9.7 | 12.1 | 9.9 | 15.3 | 25.1 | 12.87 | 13.51 |
| DT15 | 11.5 | 12.1 | 20.1 | 14.3 | 12 | 5.6 | 6.5 | 5.4 | 12.5 | 10.2 | TM | 26.8 | 12.45 | 13.08 |

| Site ID | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean: Raw Data | Annual Mean: Bias Adjusted ⁽¹⁾ |
|---------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------------|---|
| DT37 | | | | TA | 19.3 | 10.5 | | 20.1 | | 16.3 | 16.8 | 30.1 | 18.85 | 19.95 ¹ |
| DT16 | 27.7 | 24 | 36.7 | 25.1 | 20.4 | 8.1 | 15.1 | 11.1 | 24.4 | 25.9 | 22.5 | 38 | 23.25 | 24.41 |
| DT17 | 24.8 | 18.5 | 29.7 | 29.3 | 19.6 | 14.6 | 21.8 | 11.7 | 26 | 21.6 | 18.5 | 36.2 | 22.69 | 23.83 |
| DT20 | 19.8 | 14.6 | 27.8 | 18.5 | 7.2 | 7.3 | 10.1 | TM | 13.3 | 16.5 | TM | 39.6 | 17.47 | 18.34 |
| DT21 | 10.3 | 10.7 | 22.7 | 17.9 | TM | 3.1 | 9.8 | 9.2 | 21.1 | 13.6 | 19.1 | 24 | 14.68 | 15.42 |
| DT22 | 16 | 10.7 | 20.9 | 18.5 | 10.6 | 4.7 | 7.3 | 5.8 | 17.1 | 15.5 | 21.7 | 32.5 | 15.11 | 15.86 |
| DT23 | 14 | 12.7 | 15.8 | 17.7 | 9.5 | 6.1 | 6.6 | 8.8 | 16.1 | 17.2 | 22.9 | 29.1 | 14.71 | 15.44 |
| DT24 | 12.8 | 12.6 | 12.2 | 17.5 | 10.7 | 6.5 | 9.6 | 6.2 | 14 | 17.2 | 24.3 | 29.3 | 14.41 | 15.13 |
| DT25 | 16 | 12.5 | TM | 15.3 | 10.9 | 4.3 | 7.3 | 6.8 | 15.8 | 13.2 | 11.6 | 31.1 | 13.16 | 13.82 |
| DT26 | 10.3 | 13.1 | TM | 14.3 | 11.6 | 2.5 | 11.8 | 3.5 | 15.6 | 11.3 | 12 | 29.5 | 12.32 | 12.93 |
| DT27 | 13.2 | 14.3 | TM | 13.5 | 11.6 | 4 | 11.2 | 5.7 | 17 | 11.7 | 12.8 | 27.3 | 12.94 | 13.58 |

Notes:

(1) See Appendix C for details on bias adjustment

¹ Data has been annualised as 19 and bias adjusted

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

New or Changed Sources Identified Within West Dunbartonshire Council During 2022

West Dunbartonshire Council has not identified any new sources relating to air quality within the reporting year of 2022.

Additional Air Quality Works Undertaken by West Dunbartonshire Council During 2022

West Dunbartonshire Council has not completed any additional works within the reporting year of 2022.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2022 are supplied and analysed by Glasgow Scientific Services (GSS) and are prepared using the 20% TEA in water method and in accordance with the procedures set out in the practical guidance. The duration of exposure is normally the 4/5 weeks period as suggested by the calendar provided by Defra. All results have been bias adjusted and annualised where required. The full set of monthly NO₂ diffusion tube results are shown in Table B.1 above.

Glasgow Scientific Services (GSS) Laboratory is UKAS accredited laboratory and participate in the AIR NO₂ Proficiency Testing Scheme. In 2022 the results the lab submitted to the scheme were determined to be satisfactory based on a z-score of ± 2 . The triplicate co-location studies were undertaken at Glasgow Road and Briar Drive to determine a local bias factor.

Diffusion Tube Annualisation

One diffusion tube monitoring location within West Dunbartonshire Council recorded less than 75% data capture and therefore it was required to be annualised. In addition, any sites with a data capture below 25% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

West Dunbartonshire Council have applied a national bias adjustment factor of 1.05 to the 2022 monitoring data. A summary of bias adjustment factors used by West Dunbartonshire Council over the past five years is presented in Table C.1. The 2022 national bias adjustment factor was taken from the national Diffusion Tube Bias Adjustment factor spreadsheet (version 02/23) of which reported six studies analysed by GSS in 2022 to give a national bias adjustment factor of 1.05

The local bias adjustment factor for 2022 was 0.86 from Glasgow Road in Dumbarton co-location site and 1.11 for the Briar Drive co-location site which reported a poor overall precision and good overall precision respectively for the diffusion tubes and therefore not be used to calculate the local bias adjustment factor as per LAQM TG 16.

West Dunbartonshire Council has applied the national bias adjustment factor of 1.05 to the 2022 monitoring data. This has been considered to provide a more conservative, worst case approach, as the combined local bias adjustment factor of 0.97 was not considered appropriate.

Table C.1 – Bias Adjustment Factor

| Year | Local or National | If National, Version of National Spreadsheet | Adjustment Factor |
|------|-------------------|--|-------------------|
| 2022 | National | 03/23 | 1.05 |
| 2021 | Local | - | 0.88 |
| 2020 | National | 03/21 | 0.96 |
| 2019 | National | 03/20 | 0.86 |
| 2018 | National | N/K | 0.86 |

NO₂ Fall-off with Distance from the Road

No diffusion tube NO₂ monitoring locations within West Dunbartonshire required distance correction during 2022 therefore Table C.4 has been removed.

QA/QC of Automatic Monitoring

All automatic sites are part of the Scottish Air Quality Programme and are audited twice per year by Ricardo. Servicing and repair is carried out by Acoem UK, the service

contracts include a six monthly service of instruments, call outs to site for repairs and the routine replacement of consumables. All data is available in real-time, and regularly scaled and ratified by Ricardo on behalf of the Scottish Government.

PM₁₀ and PM_{2.5} Monitoring Adjustment

The type of PM₁₀/PM_{2.5} monitor(s) utilised within West Dunbartonshire do not required the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within West Dunbartonshire 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.

NO₂ Fall-off with Distance from the Road

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

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

| Site ID | Annualisation Factor Glasgow Road | Annualisation Factor Briar Drive | Annualisation Factor Glasgow Townhead | Average Annualisation Factor | Raw Data Annual Mean | Annualised Annual Mean | Comments |
|---------|-----------------------------------|----------------------------------|---------------------------------------|------------------------------|----------------------|------------------------|----------|
| DT37 | 1.0108 | 1.0112 | 1.0090 | 1.0103 | 18.9 | 19.0 | |

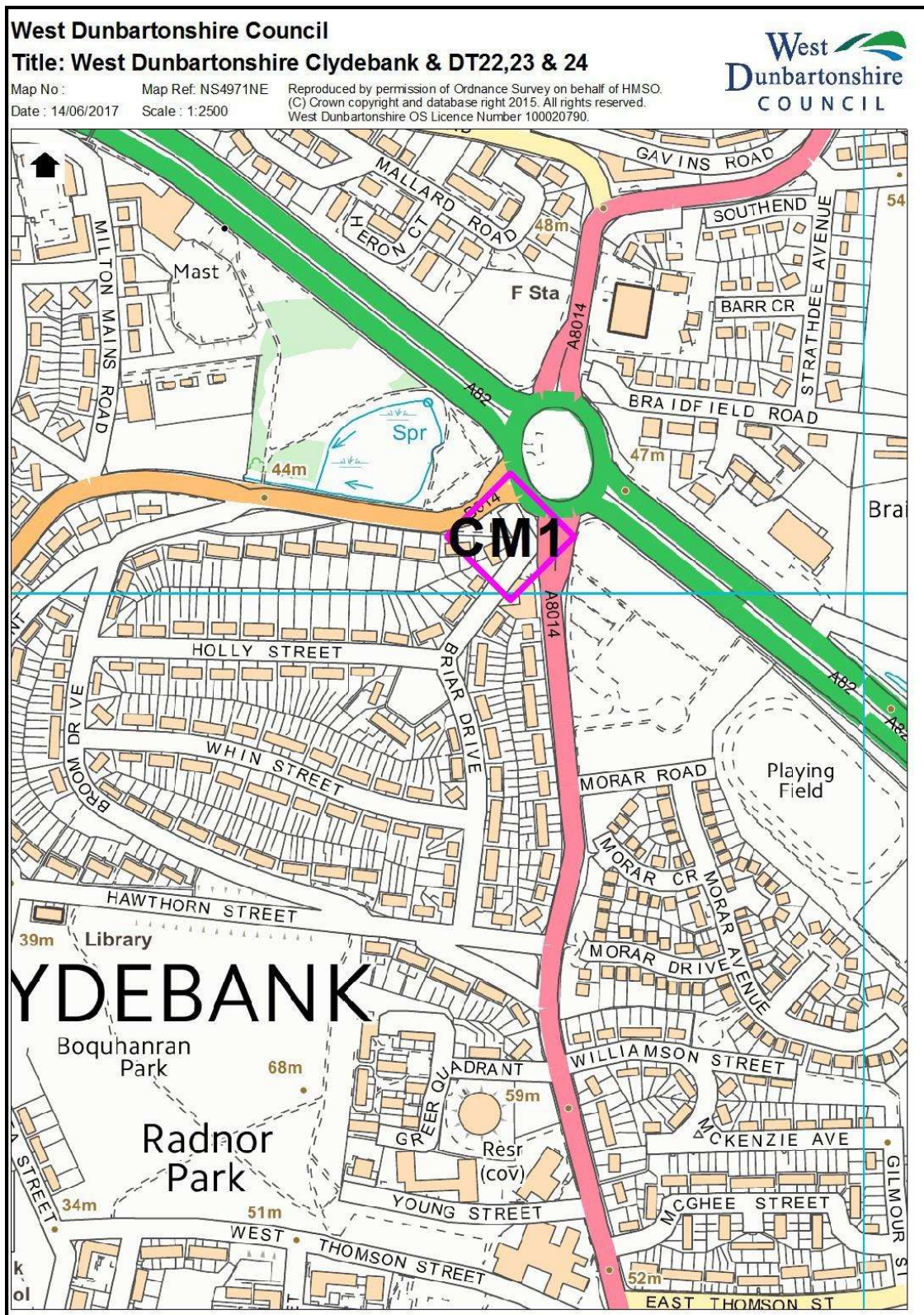
Table C.3 – Local Bias Adjustment Calculations

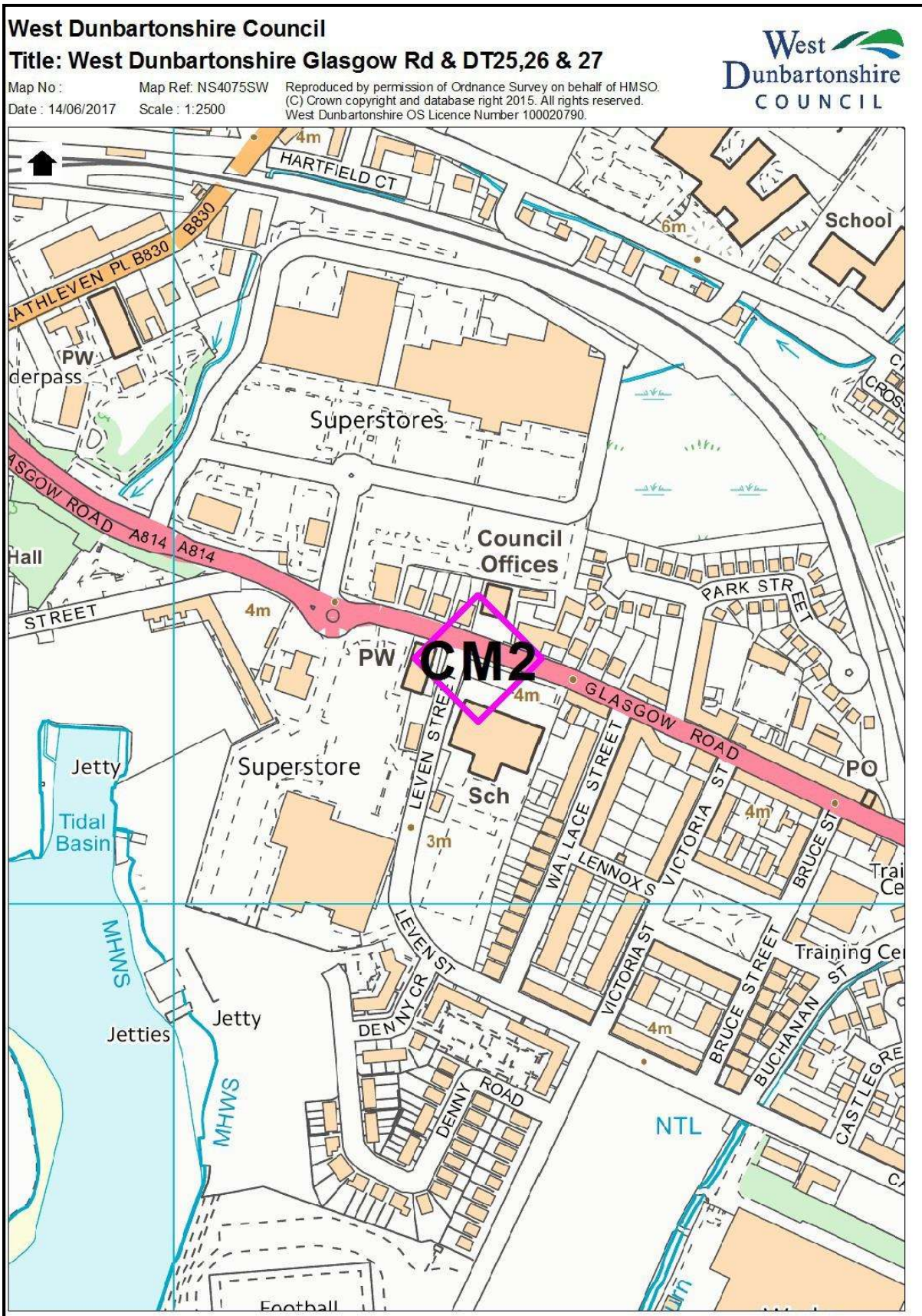
| | Local Bias Adjustment Input 1 | Local Bias Adjustment Input 2 | Local Bias Adjustment Input 3 | Local Bias Adjustment Input 4 | Local Bias Adjustment Input 5 |
|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Periods used to calculate bias | 7 | 9 | | | |
| Bias Factor A | 0.86 (0.71 – 1.08) | 1.11 (1.0 -1.25) | | | |
| Bias Factor B | 17% (-7% - 41%) | -10% (-20% - 0%) | | | |
| Diffusion Tube Mean ($\mu\text{g}/\text{m}^3$) | 15.5 | 16.2 | | | |
| Mean CV (Precision) | 5.9% | 8.3% | | | |
| Automatic Mean ($\mu\text{g}/\text{m}^3$) | 13.3 | 18 | | | |
| Data Capture | 99% | 99% | | | |
| Adjusted Tube Mean ($\mu\text{g}/\text{m}^3$) | 13 (11-17) | 18 (16-20) | | | |

Notes:

The national adjustment factor of 1.05 has been used to bias adjust the 2022 diffusion tube results.

Appendix D: Monitoring Site Location Maps





West Dunbartonshire Council

Title : Clydebank NO2

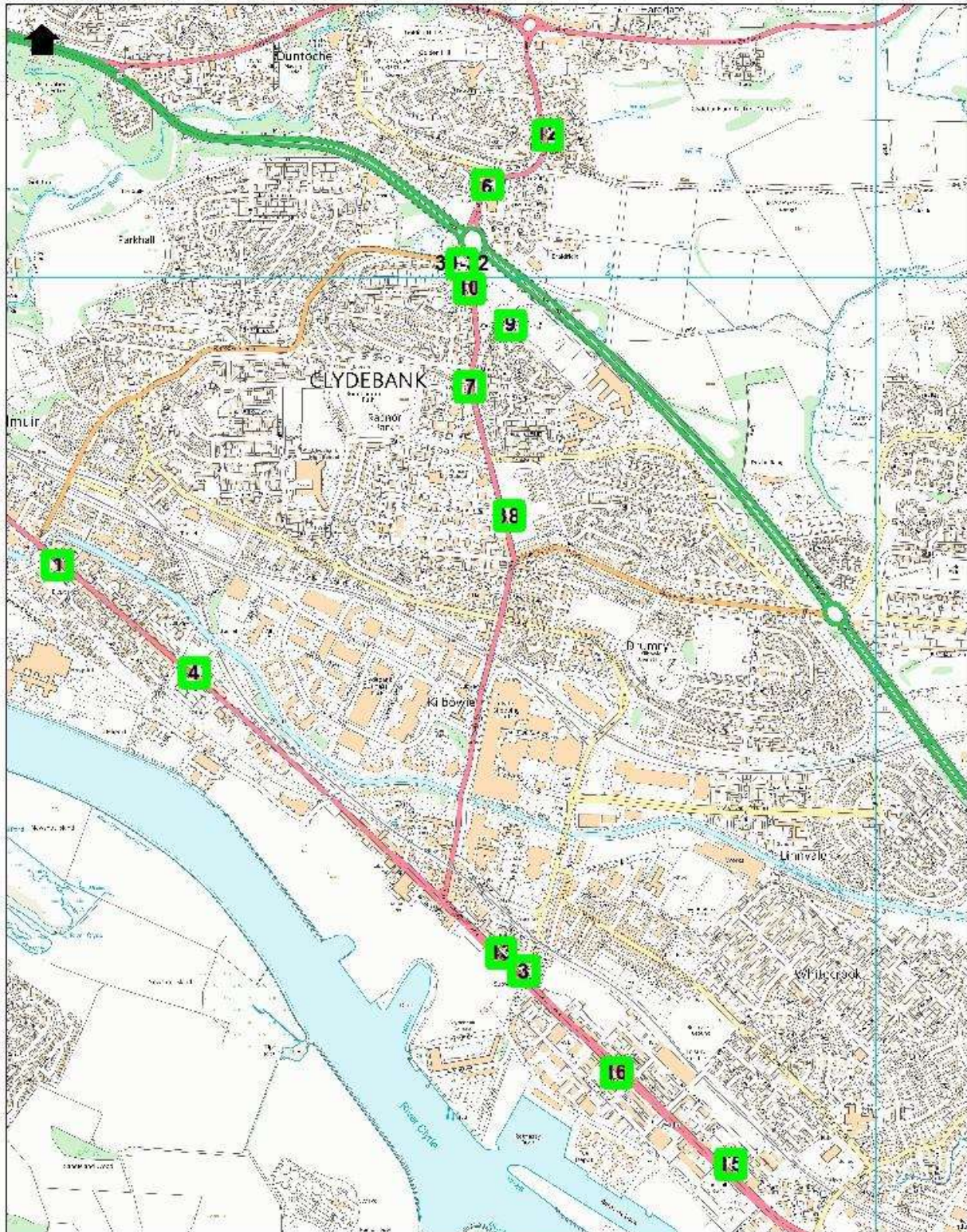
Map No :

Map Ref : NS4970

Reproduced by permission of Ordnance Survey on behalf of HMSO
(C) Crown Copyright and database right 2019. All rights reserved.
West Dunbartonshire Council Licence No. 100020790.

Date : 21/06/2023

Scale : 1:15000



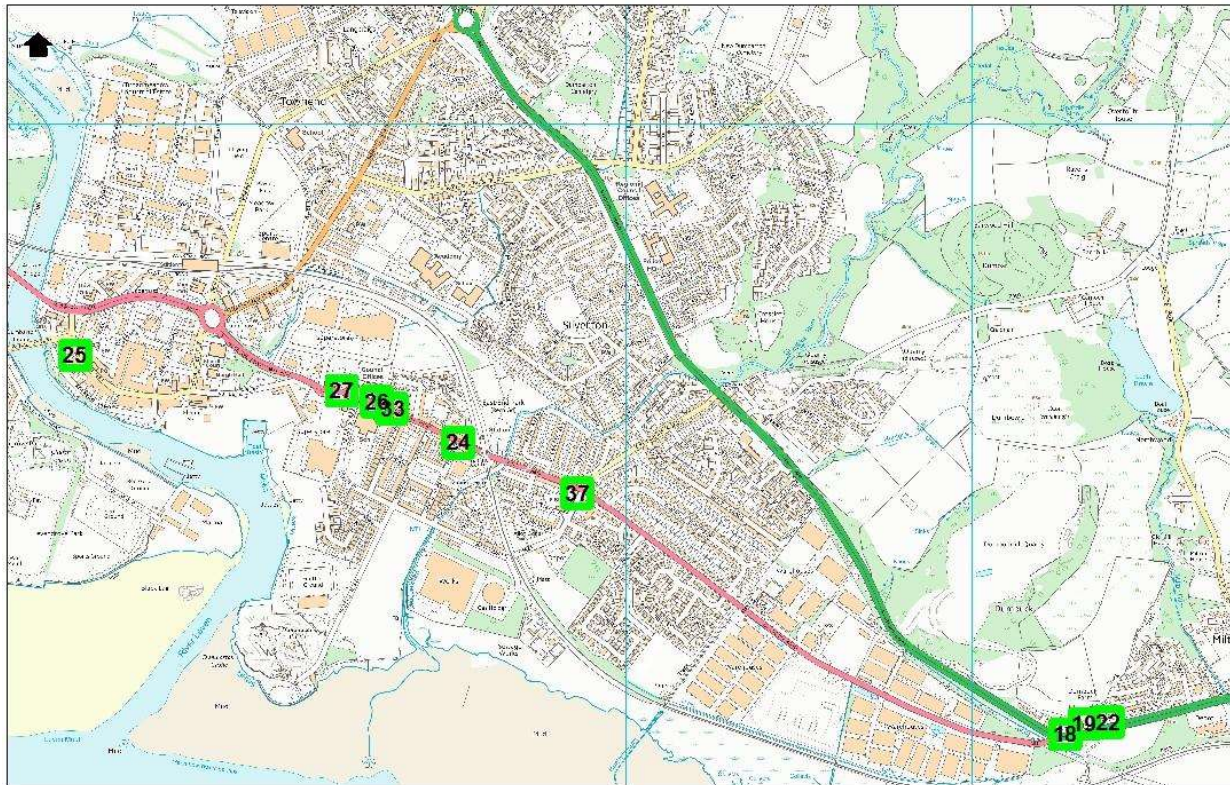
West Dunbartonshire Council

Map Ref: NS4075
Date: 21/06/2023

Map No:
Scale: 1:12500

Title: Dumbarton NO2

Reproduced by permission of Ordnance Survey on behalf of HMSO (C) Crown Copyright and database right 2019. All rights reserved. West Dunbartonshire Council Licence No. 100020790.



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 |

References

Department for Environment, Food and Rural Affairs (Defra). 2016. *Technical Guidance LAQM.TG (16)*, Defra publications. <http://laqm.defra.gov.uk/technical-guidance/>

Local Air Quality Management Policy Guidance LAQM.PG(16). May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland