

Annual Progress Report (APR)



2017 Air Quality Annual Progress Report (APR) for
East Dunbartonshire Council

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

June 2017

East Dunbartonshire Council

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Executive Summary: Air Quality in Our Area

Air Quality in East Dunbartonshire Council

This report is the 2017 Annual Progress Report undertaken in accordance with East Dunbartonshire Council's statutory obligation under the National Air Quality Strategy.

The report considers measured pollutant concentrations from within East Dunbartonshire for the calendar year of 2016 and considers the potential for exceedences of the air quality objectives.

In East Dunbartonshire, the main pollutants of concern are NO₂ and PM₁₀ and the source of pollutant is mainly due to the volume of traffic and congestion.

East Dunbartonshire Council has four continuous automatic analysers; one in Bishopbriggs, one in Bearsden, one in Kirkintilloch and one in Milngavie. This equipment downloads automatically and pollutant levels can be viewed via the Council web page or Scottish Air Quality website.

Monitoring over 2016 indicates an overall downward trend in annual mean NO₂ concentrations at three out of the four continuous automatic monitors – the exception being Bearsden, which displayed an unexpected exceedence.

There is no discernible overall downward trend indicated across the NO₂ tube network.

Bearsden exceeded the 1 hour NO₂ mean with the first recorded exceedence at any of our four sites in the last five years. Although there were no exceedences of the PM₁₀ annual mean at any of the four automatic monitor sites, there is no noticeable, steady downward trend.

There are no new major sources of emissions although there is an on-going increase in the installation of biomass across East Dunbartonshire. There is a possibility that the cumulative effect of emissions from biomass installations may lead to exceedences of the air quality objectives.

No new AQMAs were declared during 2016 however, dispersion modelling undertaken in Bishopbriggs has indicated that work can begin towards revoking the AQMA. For this reason, the Bishopbriggs Air Quality Action Plan will not be updated.

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The Draft Bearsden Air Quality Action Plan is undergoing further alteration prior to being presented to committee and is not yet a public document therefore only a selection of the content has been presented with this report.

Dispersion modelling undertaken in Kirkintilloch during 2016 has indicated that an AQMA is not required.

Air quality is a material consideration in terms of planning which means that all local development is considered in terms of air quality to ensure implications are examined and considered in advance and appropriate consultation takes place with such partners as the Scottish Environment Protection Agency (SEPA), Transport Scotland and Scottish Natural Heritage (SNH).

Actions to Improve Air Quality

East Dunbartonshire Council has undertaken a number of Clean Air Initiatives during 2016 to help improve air quality. A banner competition in primary schools in Bishopbriggs with the theme “Switch it Off” was successful and we hope to extend this to all our primary schools. Patrols with Environmental Health staff and Police Scotland, with whom we are in partnership, took place to encourage the public to switch off vehicle engines and help improve air quality.

PHOTOGRAPH FROM ST HELENS



Figure 1 Banner from St Helens

Local Priorities and Challenges

Our priority in the coming year is to ensure the smooth running of our monitoring network to gain as accurate a picture as possible of air quality levels across East Dunbartonshire. The challenge presented by biomass and the ever-increasing number of applications and installations remains. Although installations must meet the highest standard possible to help control emissions, not all installations are notified. There is a realistic possibility that the cumulative impact of biomass will result in exceedences of air quality objectives in the near future.

How to Get Involved

Further information on air quality in East Dunbartonshire can be found on the Council website [HERE](#)

You can visit the Scottish Air Quality website and view live air quality data in East Dunbartonshire at <http://www.scottishairquality.co.uk>. You can register for text and email alerts when air quality is forecast to be poor for the day ahead and can visit the Education pages and involve your children and family – all on the same link.

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1. Local Air Quality Management

This report provides an overview of air quality in East Dunbartonshire Council during 2016. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 East 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		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	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
	18 µg/m ³	Annual mean	31.12.2010
Particulate Matter (PM _{2.5})	10 µg/m ³	Annual mean	31.12.2020
Sulphur dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	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

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Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Lead	0.25 µg/m ³	Annual Mean	31.12.2008

2. Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMA) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives.

A summary of AQMA declared by East Dunbartonshire Council can be found in Table 2.1. Further information related to declared or revoked AQMA, including maps of AQMA boundaries, are available online at this [LINK](#)

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
Bishopbriggs AQMA	<ul style="list-style-type: none"> • NO₂ annual mean • PM₁₀ annual mean 	East Dunbartonshire	The designated area incorporates a 60-metre-wide corridor along the A803 Kirkintilloch Road, Bishopbriggs, bordered on the South by the Council's boundary with Glasgow City and by a line 30 metres to the North of Cadder Roundabout.	Bishopbriggs Updated Action Plan
Bearsden AQMA	<ul style="list-style-type: none"> • NO₂ annual mean • PM₁₀ annual mean 	East Dunbartonshire	The designated area incorporates a 60-metre-wide corridor along the A809 to the junction with Antonine Road and to the south beyond Canniesburn Toll to incorporate several road junctions. The eastern boundary is to the east side of Roman Road Carpark with a small section of Stockiemuir Road also incorporated.	Draft Bearsden AQMA Action Plan

2.2 Progress and Impact of Measures to address Air Quality in East Dunbartonshire Council

East Dunbartonshire Council has taken forward a few measures during the current reporting year of 2016 in pursuit of improving local air quality.

A Bishopbriggs Action Plan and a Bishopbriggs Action Plan Update have already been reported in the 2015 Annual Progress Report. Of the original 41 measures, all have been achieved apart from 11 measures where completion is out with the control of East Dunbartonshire Council. Some of the original measures are ongoing and progress has continued to be made, for example, funding during 2016 has allowed for the progress of the Meadowburn Steps Project which is working towards improving a key pedestrian link within a largely residential area adjacent to the AQMA. It is also an access route to Meadowburn Primary School. At present, there is no ramp facility, therefore, cyclists, wheelchair users and parents with pushchairs cannot use this route. Improving accessibility to all should reduce reliance on cars for visiting the school. Pollutant levels over the last few years have reduced to the extent that we are now working towards revoking the Bishopbriggs AQMA, therefore, there appears little to be gained in detailing all the measures again. A copy of the Bishopbriggs Action Plan Update is available [here](#).

The Draft Bearsden Air Quality Action Plan has not yet been approved by committee and is therefore not yet in the public domain, however; several of the proposed measures have been achieved or are ongoing measures such as continuing to participate in vehicle emission testing. A selection of the measures agreed to date are noted in Table 2.2 however, the full draft plan is currently under review prior to proceeding to committee and is therefore subject to change.

Key completed measures from the Draft Bearsden Action Plan are:

Measure -The Council intend to undertake a feasibility study to better understand the possible junction improvements at Bearsden Cross. A few improvement scenarios will be considered by traffic consultants. The results from the traffic modelling study will then be further investigated to determine the Air Quality impact or benefit from each scenario. However, it is recognised that such studies can result in moving congestion to other areas with no overall benefit to air quality.

On completion of the feasibility study the Council will decide whether to progress with any of the junction options assessed.

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Result - This study assessed three separate scenarios aimed at reducing congestion at Bearsden Cross, however; none of the scenarios indicated easing congestion or resulted in improved air quality, therefore, the Council has decided that no further action be taken. A copy of the associated reports is available on request.

Consideration was again given to this measure during 2016 as part of a larger Bearsden Town Centre Redevelopment, however; it was felt that no improvement in air quality would result.

Progress on the following measure has been slower than expected:

Measure - Training for Council Staff as well as a fleet. Fuel good training can help individuals become more efficient drivers either at work or during leisure and help save money on fuel costs. Based on 12,000 miles per annum, this equates to typical annual savings of £250 – and to improvements in Air Quality.

East Dunbartonshire Council hopes to provide free Fuel Good sessions to employees. This would help to improve air quality, reduce emissions, save money and improve EDCs environmental credentials in terms of its carbon footprint.

It is difficult to release staff to attend such sessions, particularly those who drive fleet vehicles providing Council services.

East Dunbartonshire Council expects the following measure to be completed over the course of the next reporting year: The measure will then be evaluated on its success or otherwise and a decision made at that time as to whether to continue with the measure.

Measure - Environmental Fleet Recognition Scheme is a voluntary scheme that provides recognition and guidance on environmental best practice to operators of goods vehicles, buses and coaches whose fleets regularly serve within a Council area.

Environmental Fleet Recognition Scheme rates individual vehicles and the overall operation of a vehicle fleet, using a star rating system, to recognise levels of operational and environmental performance. It aims to reduce the energy used by commercial and passenger transport fleets by encouraging increased adoption of fuel efficiency measures. This will bring about benefits for members through more efficient operations, reduced fuel costs and emissions.

Eco Stars has only recently been introduced.

The Draft Bearsden Air Quality Action Plan has been subject to a number of alterations and a decision will be made in the near future as to whether the Draft Bearsden Action Plan should continue to progress through committee in its current form or whether an update to the Draft Bearsden Action Plan should be undertaken.

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Table 2.2 – Progress on Measures to Improve Air Quality PLEASE NOTE THAT THIS INFORMATION IS TAKEN FROM THE DRAFT BEARSDEN AIR QUALITY ACTION PLAN WHICH HAS NOT YET BEEN ADOPTED BY EAST DUNBARTONSHIRE COUNCIL.

Measure No. (from Draft Action Plan)	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
2	Promote air quality with planning and transport strategies and other Council Plans	Alternatives to private vehicle use	Investigate possible car club scheme with other organisations/local authorities	East Dunbartonshire Council in conjunction with Liftshare and SPT	2016	2016	No of staff signed up to participate	Reduction in pollutant concentration is expected to be low. Dispersion modelling indicates that emissions from cars are contributing most. Reducing the number of cars on the road should lead to an improvement.	116 staff have signed up to participate to date	No completion date planned	
7	Air quality planning guidance	Policy guidance and Development Control	East Dunbartonshire's Sustainable Transport guidance note for developers will outline the potential requirement to undertake air quality assessments.	EDC Env Health and Planning Policy	2017	2017/2018		Pollution reduction is difficult to quantify in terms of introducing guidance however, it can only be of benefit to overall air quality if all developers know in advance what is expected of them.	This measure has been delayed due to changes in personnel. Now underway in planning terms.	Unknown	

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Measure No. (from Draft Action Plan)	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
9	Council fleet replacement programme	Promoting low emission transport	A. Pool EDC will attempt to increase the availability of electric/hybrid vehicles to appropriate staff B. Increase number of charge points across EDC area	EDC Pool	2016	Ongoing	No of electric/hybrid vehicles available No of charging points available	Dispersion modelling has previously indicated traffic and congestion as the source of the problem. Increasing the number of electric/hybrid vehicles available to staff should lead to a reduction in pollutant emissions.	12 electric vehicles available with 12 charging points across EDC.	Ongoing	
10	Environmental Fleet Recognition Scheme	Freight and delivery management	Introduce an environmental fleet recognition scheme	East Dunbartonshire Council, TRL Ltd and all members	2016	2017	No of companies participating in scheme	Dispersion modelling has previously indicated traffic and congestion is the source of the problem. Improving vehicle fleet should lead to a reduction in emission of pollutants.	Introduced April 2017	March 2018	This measure will be reviewed in March 2018.

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Measure No. (from Draft Action Plan)	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
18	Air quality awareness raising and education	Public Information	<p>Raise awareness of air quality issues as part of joint action days with Police Scotland</p> <p>Raise awareness among EDC staff by providing air quality training sessions</p> <p>Raise awareness in schools by involving pupils in science projects, art competitions and planting days</p>	EDC	2016	2017/18	<p>No of members of the public spoken to</p> <p>No of sessions undertaken</p> <p>No of schools participating in competitions; no of pupils involved in science project; no of schools participating in planting day.</p>	Although these are relatively "soft" measures, awareness raising and education may lead to a reduction in car use, ensuring engines are switched off etc which can only lead to reductions in pollutants.	On-going	On-going	Banner competition undertaken in schools during 2016. To be extended to all primary schools during 2017.

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Measure No. (from Draft Action Plan)	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
23	Vehicle Tracking and Telematics	Vehicle Fleet Efficiency	Council fleet to have vehicle tracking system installed as standard	EDC	2016	2016	Measurable reduction in fuel use, carbon emissions, pollutant emissions	Dispersion modelling has previously indicated traffic and congestion is the source of the problem. Telematics should help ensure that staff vehicles are driven as efficiently as possible leading to pollutant reduction.	All Council fleet has vehicle tracking and telematics installed as standard.	Ongoing	Systems will be upgraded as and when improved technology becomes available.

2.3 Cleaner Air for Scotland

Cleaner Air for Scotland – The Road to a Healthier Future (CAFS) is a national cross-government strategy that sets out how the Scottish Government and its partner organisations propose to reduce air pollution further to protect human health and fulfil Scotland's legal responsibilities as soon as possible. A series of actions across a range of policy areas are outlined, a summary of which is available at this [Site](#). Progress by East Dunbartonshire Council against relevant actions within this strategy is demonstrated below.

2.3.1 Transport – Avoiding travel – T1

All local authorities should ensure that they have a corporate travel plan (perhaps within a carbon management plan) which is consistent with any local air quality action plan. East Dunbartonshire Council began work on a Corporate Travel Plan during this year, however; the Plan is not yet complete. The Plan proposes several alternative travel options thus encouraging a reduction in reliance on cars. On completion, adoption of the Plan should result in a reduction of pollutant levels across East Dunbartonshire through the promotion of active travel, increasing the availability of electric pool cars and charging points and increased provision of cycle storage and facilities.

2.3.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2

Scottish Government expects any Scottish local authority which has or is currently developing a Sustainable Energy Action Plan (SEAP) to ensure that air quality considerations are covered. East Dunbartonshire Council has considered the production of a Sustainable Energy Action Plan, however; the current focus is on corporate issues. It is hoped that a Sustainable Energy Action Plan (SEAP) will follow later and air quality considerations will be covered.

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.

East Dunbartonshire Council undertook automatic (continuous) monitoring at 4 sites during 2016 Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at this [LINK](#).

Map showing the location of the monitoring sites are provided in Figure 2. 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

East Dunbartonshire Council undertook non- automatic (passive) monitoring of NO₂ at 42 sites during 2016. Table A.2 in Appendix A shows the details of the sites.

Map showing the locations of the monitoring sites are provided in Figure 3. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes 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 (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

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The automatic monitoring site at Bearsden recorded an exceedance of the Annual Mean standard with a concentration of $46\mu\text{g}/\text{m}^3$ and with 19 exceedances of the hourly mean objective. The Bearsden AQMA was declared in 2011 and this has been the first annual mean exceedance recorded since 2012. The continuous monitor is located on the pavement of a busy shopping street which is a kerbside site. To further investigate the public exposure, a further NO_2 tube was added several years ago at the doorway of the nearest inhabited property. The annual mean for this tube for 2016 was $32.2\mu\text{g}/\text{m}^3$.

The automatic sites at Bishopbriggs, Kirkintilloch and Milngavie did not record any exceedances of the AQS NO_2 annual mean (Table A.3) or 1- hour mean objectives (Table A.5) during 2016. The trend at the continuous monitoring station in Milngavie has been consistently low over the last five years. This is discussed further in section 6.1 and 6.3.

For the diffusion tubes, the full dataset of monthly mean values is provided in Appendix B. The data has been bias corrected using the average of our local adjustment factors (1.025). The local bias adjustment factor was calculated from triplicate of diffusion tubes co-located with the continuous NO_2 monitoring sites. The local bias adjustments were calculated for each site and further details are provided in Appendix C:

- Bearsden -1.10
- Bishopbriggs -1.03
- Kirkintilloch - 0.94
- Milngavie -1.03

The locally determined bias adjustment factor which is higher than the national figure of 0.97 thus representing the worst case scenario was felt to be the most appropriate. There were no annual mean exceedances for any of the NO_2 tubes. Although several monthly readings exceeded the $40\mu\text{g}/\text{m}^3$, and a few were unusually low, there were no abnormally high results which required to be deleted as erroneous.

3.2.2 Particulate Matter (PM_{10})

There were no exceedances of either the annual mean PM_{10} or the daily mean PM_{10} at any of East Dunbartonshire Council's continuous monitoring sites. The trend data presented in Figure 5 shows that annual mean PM_{10} concentrations for all automatic

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sites has generally been stable since 2014. The overall PM₁₀ concentration within the council area has steadily decreased compared to 2012.

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 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 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 7 times per year.

The PM₁₀ concentration measured at the Milngavie automatic site is well below the annual mean and 24-hour mean objectives in 2016 and all other reported years (5 in total). The data capture for 2016 at this site was above 97%.

3.2.3 Particulate Matter (PM_{2.5})

East Dunbartonshire Council does not currently monitor PM_{2.5} but plan to do so in 2017.

3.2.4 Sulphur Dioxide (SO₂)

East Dunbartonshire Council does not monitor Sulphur Dioxide (SO₂) as there is no significant sources or likelihood of the relevant air quality objectives being exceeded in the local area.

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

East Dunbartonshire Council does not currently monitor carbon monoxide, lead or 1,3-Butadiene.

4. New Local Developments

East Dunbartonshire Council installs biomass boilers as standard in all new build schools, community centres and public buildings. Further details are available in section 5.

4.1 Road Traffic Sources

East Dunbartonshire Council Roads were consulted on changes to traffic flows on roads within the area in 2016 and the following information is reported:

- Narrow congested streets with residential properties close to the kerb – no new roads that meet this criteria
- Busy streets where people may spend one hour or closer to traffic – no new roads that meet this criteria
- Roads with a high flow of buses and/or HGVs – no new roads that meet this criteria
- New roads constructed or proposed – a large housing development (approximately 800 houses) was granted several years ago at Woodilee Village, Lenzie. The development has progressed slowly however the bulk of the houses are now complete with the new road system almost entirely in place. The main access road is Woodilee Road/ Stoneyetts Road with a number of smaller access roads radiating off. The road system almost entirely serves the development, therefore, there is likely to be little through traffic.
- Roads with significantly changed traffic flow – four phases out of five of the Bishopbriggs Relief Road have been constructed (or almost complete.) This is a measure in the Bishopbriggs Air Quality Action Plan. As development has progressed, traffic in the vicinity of Wester Cleddens Road, Bishopbriggs has increased. This may require further investigation and assessment.
- Bus or coach stations – no new bus or coach stations to report.

4.2 Other Transport Sources

East Dunbartonshire Council confirms that there are no other transport sources as prescribed in the criteria viz: 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 many movements of diesel locomotives, and potential long-term relevant exposure within 30m or ports for shipping.

4.3 Industrial Sources

East Dunbartonshire Council confirms there are no new industrial sources as prescribed in the criteria viz: new or proposed installations for which an air quality assessment has been carried out or existing installations where emissions have increased substantially or new relevant exposure has been introduced or new or significantly changed installations with no previous air quality assessment; major fuel storage depots storing petrol; petrol stations or poultry farms

4.4 Commercial and Domestic Sources

East Dunbartonshire Council received several applications to approve chimney heights for biomass boiler installations. Installations were approved by Planning and Building Standards in two existing schools. The schools were as follows:

St Matthews Primary School – replacing gas with 2 x 300kW biomass pellet boiler

Balmuildy Primary School – replacing gas with 1 x 100 kW biomass boiler

A few applications proposing biomass installations were received during 2016 and are detailed in section 5.

It is not always the case that the local authority is made aware of new installations and there have been occasions when biomass installations which have not been approved have only come to attention because of complaints from the public.

4.5 New Developments with Fugitive or Uncontrolled Sources

East Dunbartonshire Council confirms there are no new developments with fugitive particulate matter emissions in the local authority area.

5. Planning Applications

Environmental Health are consulted on many planning applications and the following relevant planning applications were granted consent during 2016:

TP/ED/16/0838

Erection of a single-storey community centre and nursery together with associated landscaping, parking and infrastructure. Auchinairn Primary School, Beech Road, Bishopbriggs. The location is near the Bishopbriggs AQMA. This application includes installation of a biomass boiler. Air quality assessment submitted with the application. Further information is available at this [Site](#)

TP/ED/16/0729

Construction of a new two-storey primary school, providing 17 classrooms, general purpose spaces, sports halls and administration spaces. St Andrews Primary School, Duntocher Road, Bearsden. Creation of new playground areas incorporating sports pitch, car parking, site access road, landscaping and associated infrastructure. The location is within the Bearsden AQMA. This application includes installation of a biomass boiler. Air quality assessment submitted with the application. Further information is available at this [Site](#)

Additionally, 29 planning applications which included the installation of wood burning stoves were received and granted. This figure does not consider the number of wood burning stoves installed during 2016 which did not require planning permission.

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

The AQMA in Bearsden was declared in 2011 for exceedences of both the NO₂ and PM₁₀ annual mean objective level. The NO₂ annual mean exceeded the objective level for the first time in four years at this site, which is located within the Bearsden AQMA and there were 19 exceedences of the 1 hour NO₂ mean. No upward trend has been observed in the NO₂ tubes for Bearsden. There has been redevelopment work taking place in the vicinity of the continuous monitor which may have led to the rise in NO₂ however; there has been no corresponding rise in PM₁₀. It may be that the exceedences are related more to the resulting traffic congestion associated with the redevelopment rather than the actual redevelopment work itself. Monitoring will continue at Bearsden Cross.

The annual mean NO₂ level in Kirkintilloch has increased considerably from the previous year although still meeting the air quality objective level, however, there is a slight reduction in PM₁₀. Congestion around the junction close to the continuous monitor has increased year on year since the opening of the Kirkintilloch Link Road (KLR) which provides access to the M80. Extensive town centre redevelopment has taken place throughout 2016 to create a Shared Space model integrating pedestrians, cyclists and drivers through Kirkintilloch Town Centre by removing street clutter, narrowing roads and widening footways. This too has increased the traffic around the continuous monitor.

A Detailed Assessment was undertaken in Kirkintilloch during 2016. An assessment undertaken in 2013 indicated that an area of Kirkintilloch should be declared an AQMA. Over the course of the following years, pollutant levels reduced for both NO₂ and PM₁₀ to the extent that the decision to declare was delayed. The Detailed Assessment undertaken in 2016 confirmed that an AQMA in Kirkintilloch is not currently required. A copy of the report can be found here, [Link](#).

Levels in Bishopbriggs have decreased for both NO₂ and PM₁₀ in recent years. A Detailed Assessment was undertaken in 2016 in Bishopbriggs to inform the decision as to whether the Bishopbriggs AQMA should be revoked as levels have been dropping continuously at our monitoring site for several years. The decision to revoke the Bishopbriggs AQMA several years ago was delayed as a large-scale town centre

re-development proposal including alterations to the road layout was anticipated, however; the proposed redevelopment appears to have been withdrawn. The Detailed Assessment confirmed that EDC can now work towards revoking the AQMA however; one additional NO₂ tube has been installed to monitor a modelled hotspot. The full report can be viewed [here](#)

The continuous monitor in Milngavie was installed in 2011 as modelling indicated pollutant hot spots however, five years of data is now available for both NO₂ and PM₁₀ and the levels have been consistently low. Serious consideration should be given to whether monitoring should continue at this site as the monitoring equipment could possibly be better utilised elsewhere within East Dunbartonshire Council area.

6.2 Conclusions relating to New Local Developments

New local developments in East Dunbartonshire are unlikely to introduce new exceedences of relevant objectives, however, if the current upward trend of installing biomass continues, there may be a cumulative effect leading to new exceedences.

Although dispersion modelling has not indicated any exceedences as a result of the new development, hotspots have been identified within play areas. In some instances, the design and layout of new developments is not conducive to best practice or best design in terms of air quality eg biomass flues situated close to raised play areas or outside classrooms.

6.3 Proposed Actions

The procurement process for the purchase and installation of further monitoring equipment was undertaken during 2016. A new continuous monitor capable of measuring PM₁₀ and PM_{2.5} simultaneously will be installed to comply with the changes in legislation. The new continuous monitor for PM_{2.5} and PM₁₀ will be installed at Kirkintilloch.

A review of the NO₂ tube monitoring network was undertaken at the end of 2016 and the findings acted upon. Several tubes will be re-sited. The most notable change in Bishopbriggs will be the addition of a further NO₂ tube to monitor in the one remaining hotspot area of the AQMA to assess whether the Bishopbriggs AQMA should be revoked. This will be undertaken in 2017.

As it seems likely the Bishopbriggs AQMA will be revoked in the near future, the Action Plan will not be updated.

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Further exceedences of the objective levels have been recorded in Bearsden, confirming that the AQMA designation should remain in place. A decision will be made as to whether the Draft Bearsden Action Plan should proceed through committee in its current form or whether a further update is required.

Five years of data is now available for the Milngavie site. No exceedences of the objectives have been measured and in actual fact, levels have been consistently low over the five-year period.

A large-scale development in the Bearsden area for which planning permission was granted on appeal a number of years ago is now well underway at Kilmardinny, close to the boundary of Bearsden and Milngavie. Although a variety of mitigation work has been undertaken, including the provision of cycle lanes, it is possible that the overall traffic in the area will increase substantially and may result in hotspots leading to future exceedences. It may be a better use of resources to move the continuous monitor from the Milngavie site to Milngavie Road, Bearsden to begin monitoring NO₂ and PM₁₀ along this route. Future exceedences could lead to an amendment of the Bearsden AQMA boundary being required.

The next Annual Progress Report will be submitted in 2018.

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?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
EDB1	Bishopbriggs	Roadside	260995	670130	NO ₂ ; PM ₁₀	Y	Chemiluminescent; BAM (heated inlet)	5m	2m	2.0
EDB2	Bearsden	Kerbside	254269	672067	NO ₂ ; PM ₁₀	Y	Chemiluminescent; BAM (heated inlet)	<2m	1m	2.0
EDB3	Kirkintilloch	Kerbside	265675	673516	NO ₂ ; PM ₁₀	N	Chemiluminescent; TEOM FDMS	<2m	1m	3.0
EDB4	Milngavie	Roadside	255328	674115	NO ₂ ; PM ₁₀	N	Chemiluminescent; TEOM FDMS	<40m	1m	3.0

(1) 0 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.

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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?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
EDB5	Bearsden 1 (118 Drymen Road)	R	254218	672193	NO ₂	Y	3m	2m	N
EDB6	Bearsden 3 (5 Ravelston Road)	UB	254655	670158	NO ₂	N	8m	5m	N
EDB7	Bearsden 4 (8 Lowther Ave)	UB	253075	673382	NO ₂	N	6m	5m	N
EDB8	Bearsden 7	R	254269	672069	NO ₂	Y	<2m	2m	N
EDB9	Bearsden 8	R	254275	672047	NO ₂	Y	18m	2m	N
EDB10	Bearsden 9	R	254751	670621	NO ₂	N	30m	2m	N
EDB11	Bearsden 10	R	255394	670683	NO ₂	N	24m	2m	N
EDB12	Bearsden 13	R	254809	671057	NO ₂	Y	26m	2m	N
EDB13	Bearsden 14	R	254877	671000	NO ₂	Y	8m	2m	N

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Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
EDB14	Bearsden 15	R	254898	671023	NO ₂	Y	2m	2m	N
EDB15	Bearsden 16	R	254269	672067	NO ₂	Y	2m	1m	Y
EDB16	Bearsden 16B	R	254269	672067	NO ₂	Y	2m	1m	Y
EDB17	Bearsden 16C	R	254269	672067	NO ₂	Y	2m	1m	Y
EDB18	Bearsden 17	R	254258	672077	NO ₂	Y	<2m	2m	N
EDB19	Bearsden 18	R	254275	672069	NO ₂	Y	<2m	2m	N
EDB20	Bishopbriggs 12	R	260581	669527	NO ₂	Y	4m	2m	N
EDB21	Bishopbriggs 13	R	260549	669312	NO ₂	Y	5m	2m	N
EDB22	Bishopbriggs 14	R	260995	670130	NO ₂	Y	42m	2m	Y
EDB23	Bishopbriggs 14B	R	260995	670130	NO ₂	Y	42m	2m	Y
EDB24	Bishopbriggs 14C	R	260995	670130	NO ₂	Y	42m	2m	Y

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Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
EDB25	Bishopbriggs 16	R	260580	669533	NO ₂	Y	<2m	2m	N
EDB26	Bishopbriggs 17	R	260552	669320	NO ₂	Y	<2m	2m	N
EDB27	Bishopbriggs 18	UB	260604	670337	NO ₂	N	20m	2m	N
EDB28	Bishopbriggs 19	R	261280	670431	NO ₂	N	1m	16m	N
EDB29	Bishopbriggs 20	R	261285	670451	NO ₂	N	15m	1m	N
EDB30	Bishopbriggs 5	UB	260948	669610	NO ₂	N	44m	5m	N
EDB31	Bishopbriggs 6	R	261016	670198	NO ₂	Y	<2m	2m	N
EDB32	Kirkintilloch 15	R	265641	673497	NO ₂	N	2m	2m	N
EDB33	Kirkintilloch 16	R	265697	673524	NO ₂	N	3m	2m	N
EDB34	Kirkintilloch 17	R	265675	673516	NO ₂	N	3m	1m	Y
EDB35	Kirkintilloch 17B	R	265675	673516	NO ₂	N	3m	1m	Y

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Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?
EDB36	Kirkintilloch 17C	R	265675	673516	NO ₂	N	3m	1m	Y
EDB37	Kirkintilloch 18	R	265674	673521	NO ₂	N	<2m	2m	N
EDB38	Milngavie 4	R	255728	674486	NO ₂	N	5m	2m	N
EDB39	Milngavie 5	R	255327	674137	NO ₂	N	5m	2m	N
EDB40	Milngavie 6	R	255288	674121	NO ₂	N	2m	2m	N
EDB41	Milngavie 7	R	255279	674124	NO ₂	N	<2m	9m	N
EDB42	Milngavie 8	R	255251	674198	NO ₂	N	3m	1m	N
EDB43	Milngavie 9	R	255331	674214	NO ₂	N	7m	2m	N
EDB44	Milngavie 10	R	255325	674116	NO ₂	N	40m	1m	Y
EDB45	Milngavie10B	R	255325	674116	NO ₂	N	40m	1m	Y
EDB46	Milngavie10C	R	255325	674116	NO ₂	N	40m	1m	Y

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(1) 0 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.

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Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2012	2013	2014	2015	2016
Bearsden	R	Automatic	97	97	42	36	37	34	46
Bishopbriggs	R	Automatic	97	97	30	33	29	27	29
Kirkintilloch	R	Automatic	95	95	34	32	29	29	34
Milngavie	R	Automatic	94	94	25	23	24	23	22
Bearsden 1 (118 Drymen Rd)	R	Diffusion Tube	100	100	34.26	29.86	28.82	32.87	29.10
Bearsden 3 (5 Ravelston Rd)	UB	Diffusion Tube	100	100	20.89	18.60	19.83	22.80	18.41
Bearsden 4 (8 Lowther Ave)	UB	Diffusion Tube	100	100	11.41	11.36	11.86	11.95	11.76
Bearsden 7	R	Diffusion Tube	92	92	39.11	34.33	34.23	28.84	35.33
Bearsden 8	R	Diffusion Tube	100	100	32.17	34.58	33.39	33.54	32.80
Bearsden 9	R	Diffusion Tube	100	100	28.86	28.23	20.91	30.57	26.07
Bearsden 10	R	Diffusion Tube	92	92	27.23	28.89	26.87	26.07	26.21
Bearsden 13	R	Diffusion Tube	100	100	37.46	37.53	37.49	31.97	33.24
Bearsden 14	R	Diffusion Tube	100	100	33.09	35.24	32.69	32.91	34.83
Bearsden 15	R	Diffusion Tube	100	100	37.15	38.12	27.94	33.90	31.91
Bearsden 16	K	Diffusion Tube	100	100	35.11	39.45	36.61	33.58	35.03
Bearsden 16B	K	Diffusion Tube	92	92	41.90	39.34	37.40	34.43	34.53
Bearsden 16C	K	Diffusion Tube	100	100	39.54	37.87	37.03	34.77	35.92
Bearsden 17	R	Diffusion Tube	100	100	39.69	39.51	37.04	28.79	34.76
Bearsden 18	R	Diffusion Tube	100	100	30.79	33.83	35.75	31.69	31.27
Bishopbriggs 12	R	Diffusion Tube	100	100	37.28	30.66	31.04	25.95	31.98
Bishopbriggs 13	R	Diffusion Tube	100	100	43.15	40.43	33.91	35.99	38.13
Bishopbriggs 14	R	Diffusion Tube	100	100	30.68	28.27	28.26	30.92	31.78

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2012	2013	2014	2015	2016
Bishopbriggs 14B	R	Diffusion Tube	100	100	28.16	26.70	26.88	30.04	29.10
Bishopbriggs 14C	R	Diffusion Tube	100	100	29.30	29.75	29.11	28.88	26.66
Bishopbriggs 16	R	Diffusion Tube	100	100	29.98	28.98	30.28	24.96	26.98
Bishopbriggs 17	R	Diffusion Tube	100	100	35.61	35.50	35.99	27.08	31.02
Bishopbriggs 5	UB	Diffusion Tube	75	75	15.77	14.19	10.94	14.40	16.60
Bishopbriggs 6	R	Diffusion Tube	100	100	30.46	28.28	26.47	28.11	34.35
Bishopbriggs 18	UB	Diffusion Tube	100	100	16.14	20.34	18.53	19.10	16.56
Bishopbriggs 19	R	Diffusion Tube	92	92	-	-	22.13	18.27	21.49
Bishopbriggs 20	R	Diffusion Tube	100	100	-	-	18.16	18.96	16.70
Kirkintilloch 15	R	Diffusion Tube	100	100	32.43	31.44	34.10	34.96	27.36
Kirkintilloch 16	R	Diffusion Tube	100	100	33.73	35.19	37.15	29.93	29.15
Kirkintilloch 17	R	Diffusion Tube	100	100	35.67	34.12	38.07	32.80	33.16
Kirkintilloch 17B	K	Diffusion Tube	100	100	38.73	34.68	38.49	32.85	32.23
Kirkintilloch 17C	K	Diffusion Tube	100	100	40.17	32.40	34.86	28.53	31.91
Kirkintilloch 18	K	Diffusion Tube	100	100	28.77	26.96	28.57	25.45	27.15
Milngavie 4	R	Diffusion Tube	92	92	27.60	27.36	24.03	26.40	24.26
Milngavie 5	R	Diffusion Tube	100	100	22.33	25.83	24.10	22.88	23.92
Milngavie 6	R	Diffusion Tube	100	100	39.88	34.71	39.28	30.02	32.98
Milngavie 7	R	Diffusion Tube	100	100	36.53	34.22	30.90	31.21	30.32
Milngavie 8	R	Diffusion Tube	100	100	24.07	26.30	26.39	24.23	23.78
Milngavie 9	R	Diffusion Tube	83	83	28.60	27.33	22.00	28.40	27.03
Milngavie 10	R	Diffusion Tube	100	100	24.38	25.86	24.08	24.89	22.98
Milngavie10B	R	Diffusion Tube	100	100	27.74	24.73	22.71	21.94	24.44
Milngavie10C	R	Diffusion Tube	100	100	25.67	24.98	22.66	22.42	23.33

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

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

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

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

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG(16) if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2012	2013	2014	2015	2016
Bearsden	Kerbside	Automatic	97	97	1	5	0	5	19
Bishopbriggs	Roadside	Automatic	97	97	0	0	0	0	0
Kirkintilloch	Kerbside	Automatic	95	95	4	12	0	0	0
Milngavie	Roadside	Automatic	95	95	0	0	0	1	0

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

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

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

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

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Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2012	2013	2014	2015	2016
Bearsden	Kerbside	97	97	-	-	14	14	14
Bishopbriggs	Roadside	95	95	15	-	17	15	15
Kirkintilloch	Kerbside	85	85	18	17	17	17	16
Milngavie	Roadside	97	97	14	14	14	13	13

Notes: Exceedences of the PM₁₀ annual mean objective of 18µg/m³ are shown in **bold**.

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

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

(3) All means have been “annualised” as per LAQM.TG(16), valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2016 (%) (2)	PM ₁₀ 24-Hour Means > 50µg/m ³ (3)				
				2012	2013	2014	2015	2016
Bishopbriggs	Roadside	95.04	95.04	3	0	0	1(23)	0
Bearsden	Kerbside	97.10	97.10	0	0	1	0	0
Kirkintilloch	Kerbside	84.60	84.60	6	3	2	4	0
Milngavie	Roadside	96.55	96.55	3	0	0	0	0

Notes: Exceedences of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 7 times/year) are shown in **bold**.

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

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

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

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Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO₂ Monthly Diffusion Tube Results for 2016 (Bias correction 1.025)

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
Bearsden 1 118 Drymen Road	35.7	27.7	34.8	22.3	17.5	8.7	20.7	25.2	34.3	30.1	51.6	40.6	29.10	29.83
Bearsden 3 5 Ravelston Road	29.3	20.3	20.7	12.6	10.4	8.5	8.2	12.7	14.7	23.8	35.0	24.7	18.41	18.87
Bearsden 4 (8 Lowther Ave)	16.9	8.8	14.4	5.4			3.9	7.5	10.5	11.4	23.0	15.8	11.76	12.05
Bearsden 7	29.4	56.3	38.1	24.4	27.5	17.7	31.4	36.4	35.4	32.5	56.0	38.8	35.33	36.21
Bearsden 8	32.9	32.3	35.1	19.9	25.9	16.9	30.2	32.1	33.1	31.9	53.3	50.0	32.80	33.62
Bearsden 9	33.6	28.3	35.1	20.2	17.1	6.2	19.7	21.3	28.6	22.4	47.9	32.4	26.07	26.72
Bearsden 10	29.1	20.9	34.6	21.2	17.0	9.6	18.4	21.8	28.7	29.0	47.7	36.5	26.21	26.86
Bearsden 13	43.6	49.8	36.3	25.8	21.1	18.1	24.0	29.1	32.8	33.4	54.0	30.9	33.24	34.07
Bearsden 14	35.7	34.7	48.3	26.2	22.7	16.5	27.4	31.7	36.8	36.9	58.9	42.1	34.83	35.70
Bearsden 15	36.8	31.0	44.3	24.3	21.6	11.2	21.7	25.9	32.1	33.3	53.8	46.9	31.91	32.71
Bearsden 16	22.0	23.4	39.0	26.4	29.1	24.4	32.0	37.2	42.0	40.3	60.0	44.6	35.03	35.91
Bearsden 16B	28.4	33.0	34.4	27.6	27.4	19.0	33.0	36.5	36.4	34.1	61.7	42.8	34.53	35.39

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Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
Bearsden 16C	41.4	22.9	44.0	25.7	27.8	23.1	32.2	32.7	40.1	39.5	58.5	43.1	35.92	36.81
Bearsden 17	36.2	26.6	39.4	37.6	32.4	23.4	20.2	37.1	35.7	35.9	52.0	40.6	34.76	35.63
Bearsden 18		22.9	34.6	37.0	24.9	17.8	28.0	35.0	29.5	28.6	51.7	34.0	31.27	32.05
Bishopbriggs 12	25.3	29.1	35.3	28.7	25.8	23.0	18.5	26.5	30.2	46.0	57.0	38.4	31.98	32.78
Bishopbriggs 13	44.3	43.2	36.8	35.7	25.0	24.2	26.9	32.2	38.8	52.0	57.9	40.5	38.13	39.08
Bishopbriggs 14	37.0	33.8	31.5	31.1	21.0	14.9	20.8	24.1		57.6	43.8	34.0	31.78	32.58
Bishopbriggs 14B	36.8	25.3	37.0	22.8	21.1	14.6	21.8	24.0	27.6	31.3	53.4	33.5	29.10	29.83
Bishopbriggs 14C	25.7	27.9	27.2	20.5	17.1	12.3	22.6	25.2	28.2	29.0	46.0	38.2	26.66	27.32
Bishopbriggs 16	34.7	26.7	28.9	25.7	19.5	18.4	11.7	17.2	26.0	32.5	45.9	36.5	26.98	27.65
Bishopbriggs 17	40.9	34.4	35.2	30.9	23.5	12.8	15.6	25.7	29.8	31.9	51.6	39.9	31.02	31.79
Bishopbriggs 5		23.3	16.4		17.5	8.9	7.2	10.0	15.1	18.0	26.0	23.6	16.60	17.02
Bishopbriggs 6	46.9	37.6	41.0	32.8	21.3	20.6	25.1	28.8	31.5	34.7	49.9	42.0	34.35	35.21
Bishopbriggs 18	24.8	14.8	20.7	12.9	6.8	7.4	5.9	11.0	13.4	21.3	31.7	28.0	16.56	16.97
Bishopbriggs 19	26.1	23.0	22.5	12.5	14.9	6.0	13.7	15.9	21.6	26.7	43.2	31.8	21.49	22.03
Bishopbriggs 20	22.5	16.9	17.0	13.7	8.0	4.6	8.6	13.4	17.6	20.0	31.6	26.5	16.70	17.12
Kirkintilloch 15	33.5	26.6	29.6	25.2	20.3	11.6	16.8	24.4	27.6	34.4	48.2	30.1	27.36	28.04
Kirkintilloch 16	28.9	50.6	37.6	13.5	24.1	18.7	24.5	27.4	31.1	35.5	56.3		29.15	29.88
Kirkintilloch 17	36.2	36.9	45.1	16.1	26.8	22.7	25.8	30.9	31.3	39.1	50.8	36.2	33.16	33.99

East Dunbartonshire Council

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
Kirkintilloch 17B	36.2	23.0	37.8	23.0	27.8	18.9	23.9	28.7	31.5	39.9	55.0	41.1	32.23	33.04
Kirkintilloch 17C	41.4	30.6	37.5	22.0	22.5	20.2	23.2	27.6	32.8	30.5	55.8	38.8	31.91	32.71
Kirkintilloch 18	27.6	26.3	31.4	28.9	18.2	10.0	19.0		43.9	22.1	46.3	25.0	27.15	27.83
Milngavie 4	42.5	25.7	28.4		12.2	8.9	17.4	20.3	24.4	13.7	41.2	32.2	24.26	24.87
Milngavie 5	27.5	22.4	23.2	18.6	18.8	11.2	24.7	15.1	19.1	15.0	61.2	30.2	23.92	24.51
Milngavie 6	49.9	37.6	38.9	33.6	27.1	17.5	19.2	27.9	33.5	36.9	34.0	39.6	32.98	33.80
Milngavie 7	36.8	25.1	28.0	30.2	23.7	19.1	17.0	24.4	32.6	28.9	54.7	43.3	30.32	31.07
Milngavie 8	29.9	28.6	28.0	25.6	18.6	6.8	10.9	24.1	22.3	17.0	42.9	30.7	23.78	24.38
Milngavie 9	37.1	23.7	30.2	25.1	18.8	14.9	17.0	20.5	30.0	24.0	49.5	33.6	27.03	27.71
Milngavie 10	32.4	31.6	23.5	22.8	13.2	11.8	11.6	18.3	21.1	23.6	35.8	30.1	22.98	23.56
Milngavie 10B	32.3	20.7	29.0	23.3	14.4	12.1	30.7	19.1	19.9	23.7	38.5	29.6	24.44	25.05
Milngavie 10C	30.8	23.1	24.4	26.2	15.2	11.2	11.6	17.6	21.2	23.8	39.6	35.2	23.33	23.91

(1) See Appendix C for details on bias adjustment

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

Diffusion Tubes

The diffusion tubes were exposed for a month at a time in accordance with the DEFRA Local Authority Air Quality support programme calendar of suggested exposure periods, before being returned to the laboratory. Analysis of the passive diffusion tubes used by the Council was undertaken by Glasgow Scientific Services (GSS). Glasgow Scientific Services is a UKAS accredited laboratory with documented Quality Assurance/Quality Control (QA/QC) procedures for diffusion tube analysis. The laboratory prepares the diffusion tubes using the 20% triethanolamine (TEA) in water method. GSS also participates in the workplace analysis scheme for proficiency (WASP). A summary of their performance in WASP over the past year is prepared and posted on the Defra web pages at <https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>

Glasgow Scientific Services (GSS) scored the following in 2016: January – February 75%, April –May 100%, July-August 0%, September-October 100%.

Bias Correction Factor from Local Co-Location Studies

Four co-location studies were conducted within the East Dunbartonshire Council area during 2016 at sites where NO₂ concentrations were measured using automatic analysers. Bias factors have been calculated for each site.

Discussion of Choice of Bias Adjustment Factor to Use

Diffusion tube bias adjustment factors for 2016 are available from four local co-location studies and the national database of co-location studies. Historically East Dunbartonshire Council has used the higher bias adjustment factor of the local adjustment factors to adjust their diffusion tube results and not the national average.

QA/QC of Automatic Monitoring

Quality Assurance/Quality Control (QA/QC) audits were carried out by Ricardo-AEA Technology Ltd twice a year. The calibration procedure is similar for the Council's four continuous analysers. To ensure that the information obtained from the analysers is as accurate as possible and to quantify any instrument drifts; a stringent two point zero/span calibration check is performed at monthly intervals. The

methodology for the calibration procedure is derived from the manufacturers' instruction handbooks and from the LSO Operator Manual, as follows:

- Pre-calibration check - the site condition and status of the analyser is recorded prior to the zero/span check being conducted;
- Zero check – the response of the analyser to the absence of the gas being monitored;
- Span check – the response of the analyser to the presence of the gas of a known concentration;
- Post calibration check - the site condition and status of the analyser upon completion of all checks

Ricardo-AEA carries out the QA/QC for the automatic monitors and they are calibrated annually to meet the criteria for the national network.

PM Monitoring Adjustment

East Dunbartonshire Council monitors PM₁₀ using two types of analyser:

- Eberline
- Tapered Element Oscillating Microbalance (TEOM) with a Filter Dynamics Measurement System (FDMS);

The Eberline - beta attenuation analysers at Bearsden and Bishopbriggs are maintained by Horiba and undergo regular calibration. The TEOM (FDMS) monitors at Kirkintilloch and Milngavie are maintained by Air Monitors Ltd and undergo regular calibration.

The Eberline used by East Dunbartonshire Council have a heated inlet which can cause evaporation of some semi-volatile particles thereby reducing the measured PM₁₀ concentration. All data has been ratified and multiplied by the gravimetric equivalent by Ricardo Energy and Environment.

The TEOM FDMS is equivalent to the European Reference Sampler and the results are therefore fully comparable to the AQS objectives, with no need for adjustment. All TEOM FDMS data were fully ratified by Ricardo Energy and Environment to AURN standards.

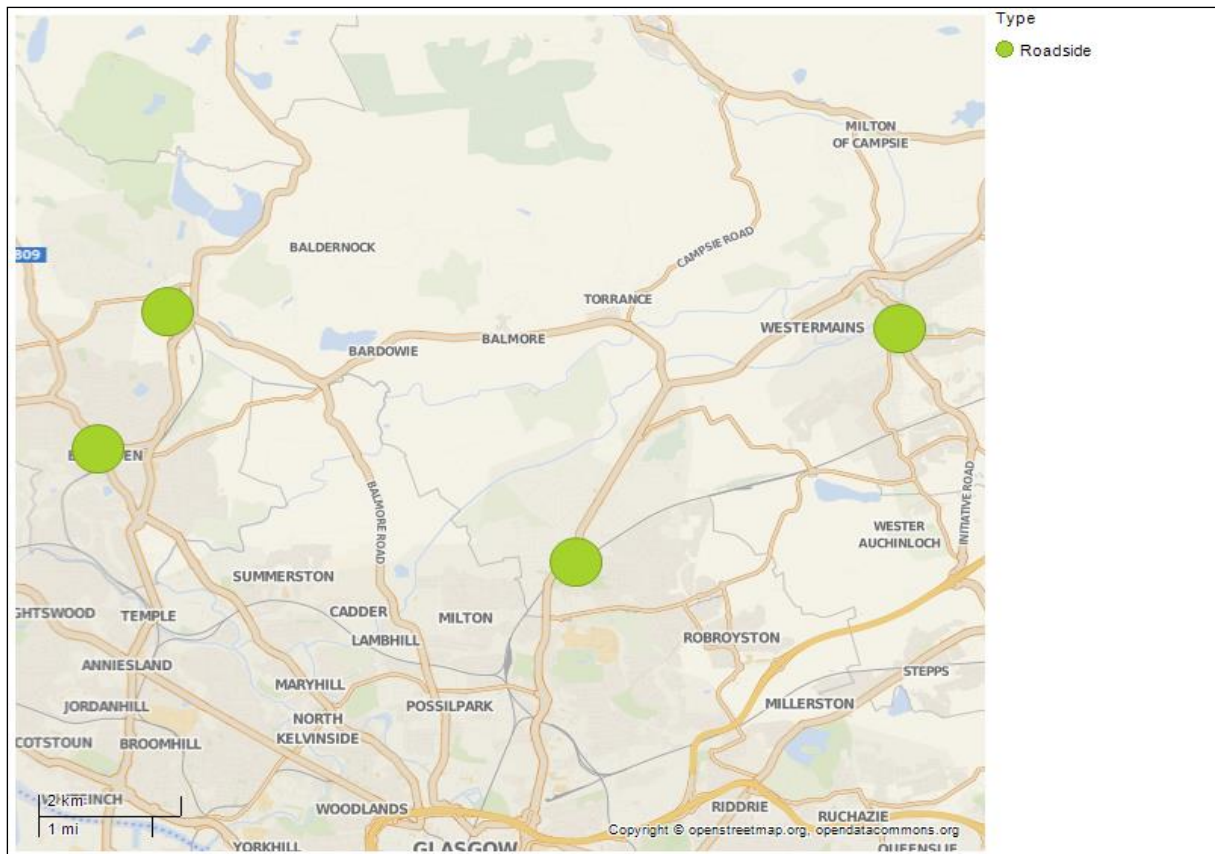


Figure 2 Automatic Monitoring sites

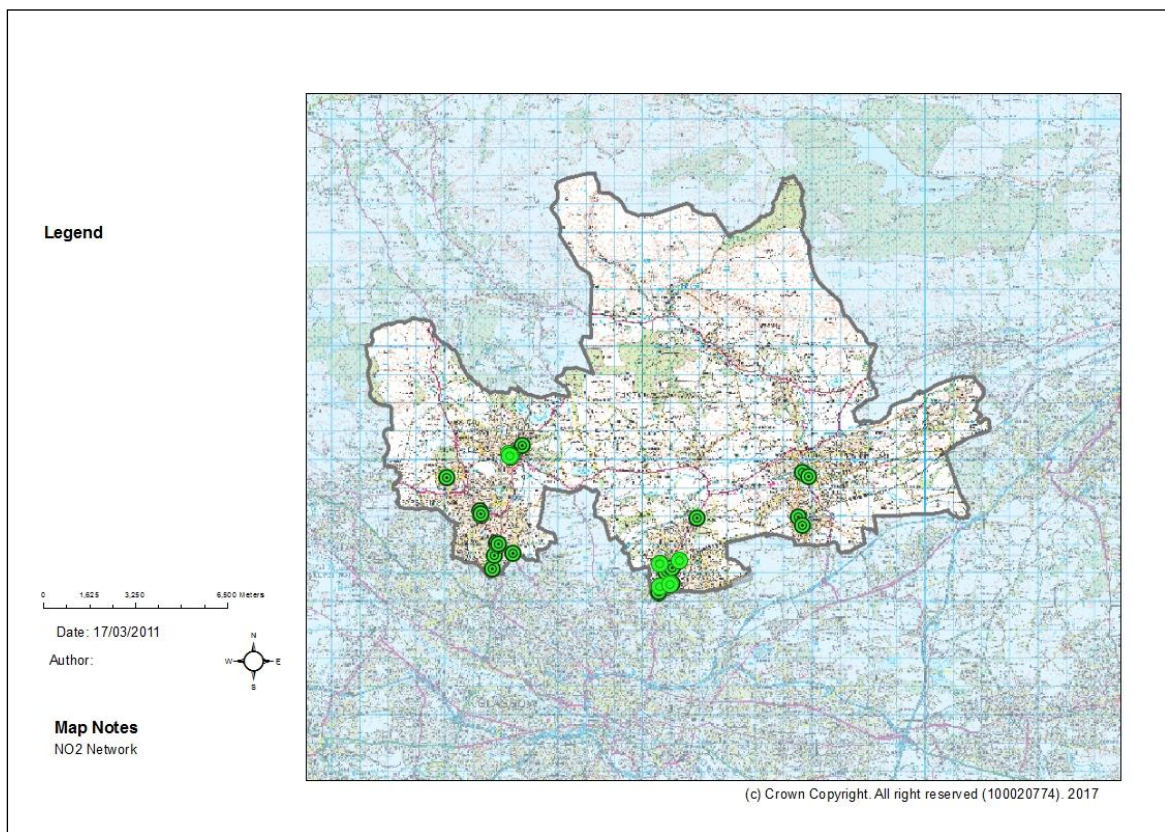


Figure 3 Diffusion Tube Sites

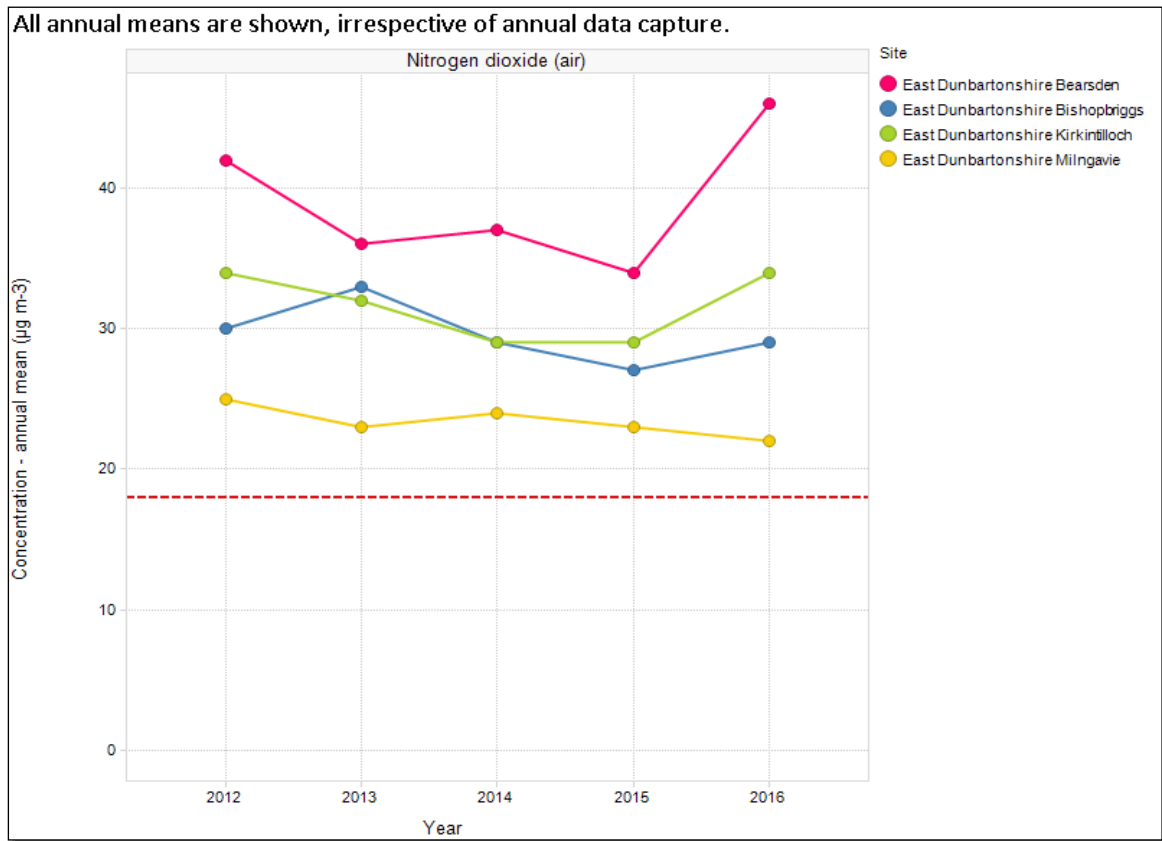


Figure 4 Automatic Monitor NO₂ trend

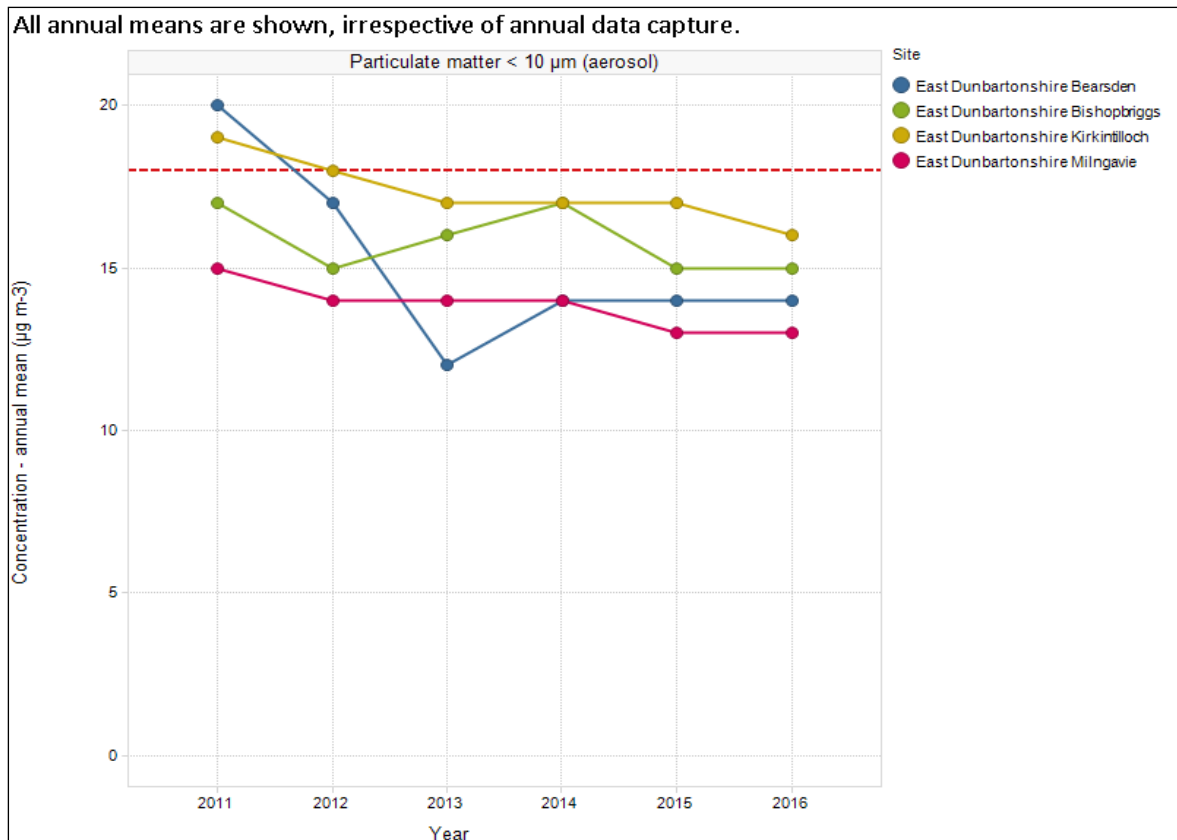


Figure 5 PM₁₀ Annual Mean Trend

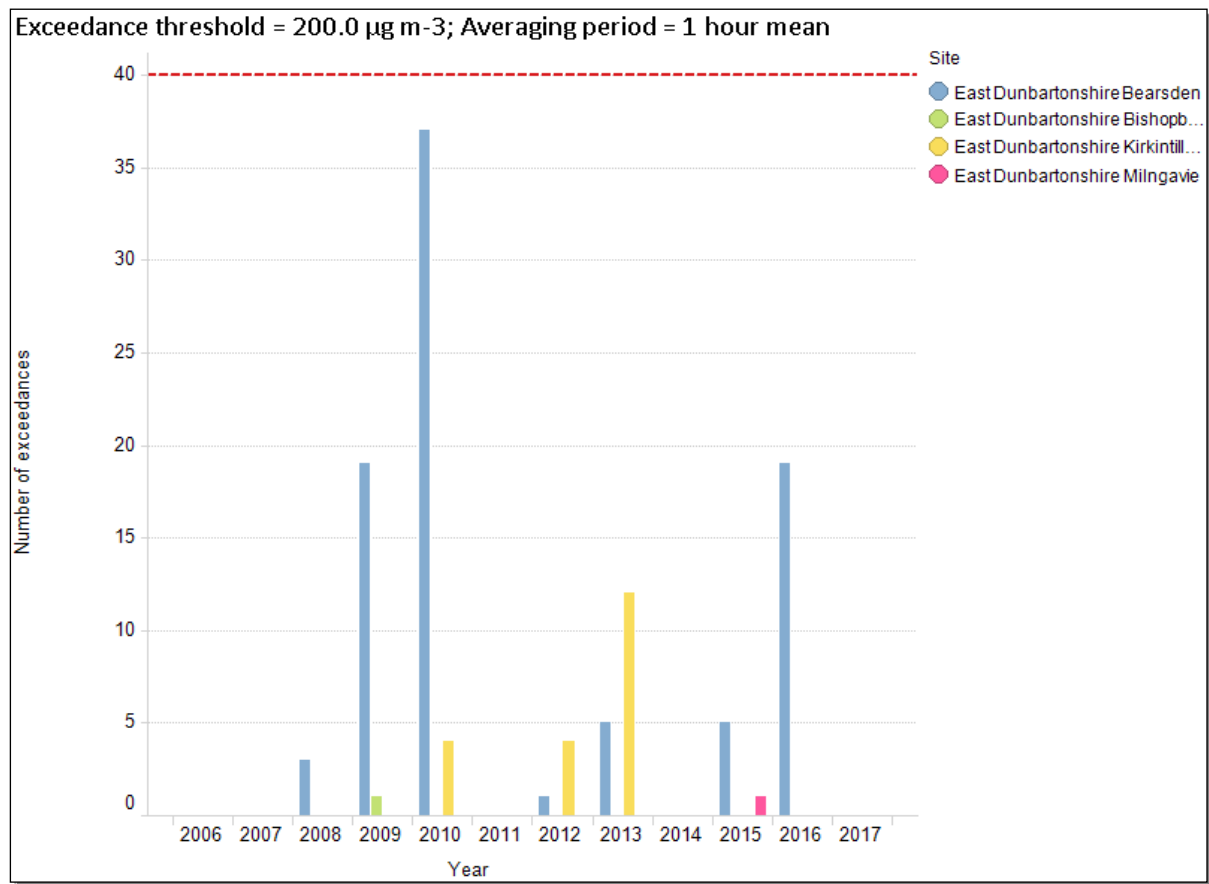


Figure 6 Overview of Exceedance in EDC

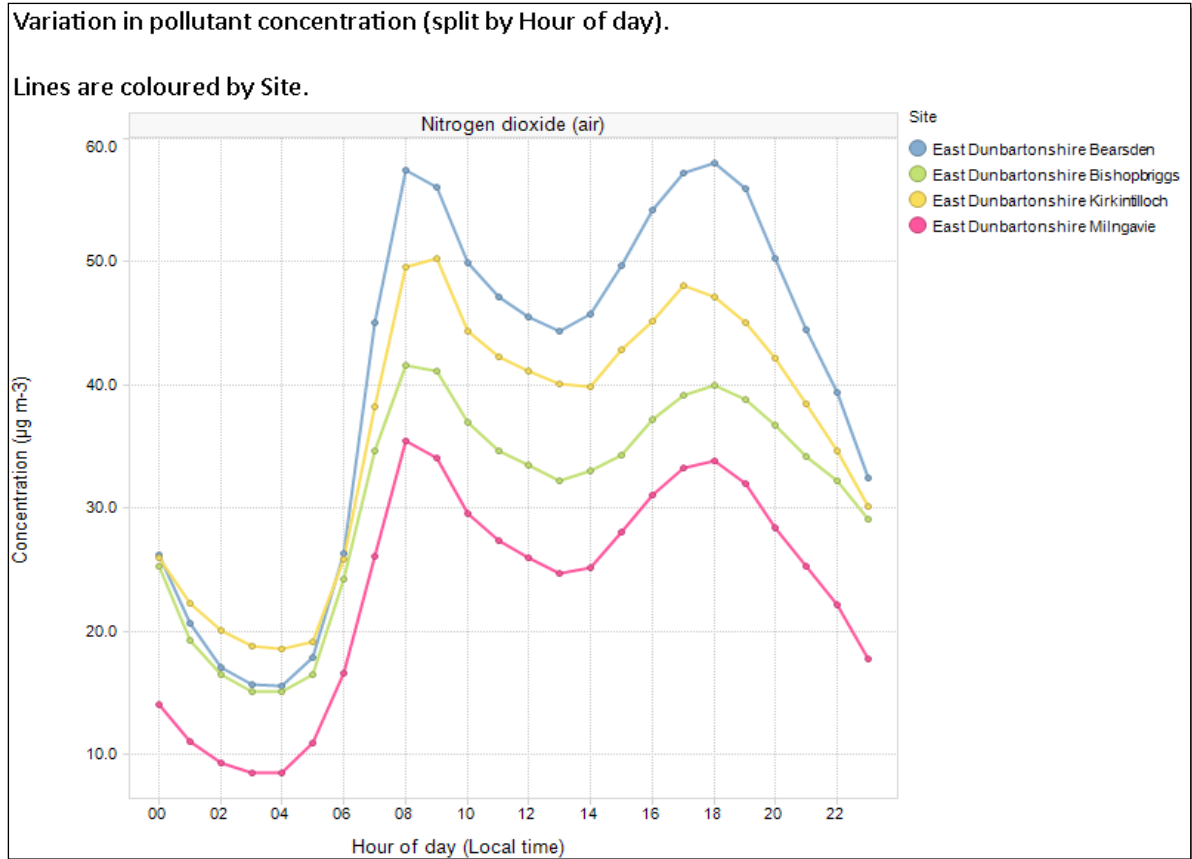


Figure 7 Variation in NO_2 concentration

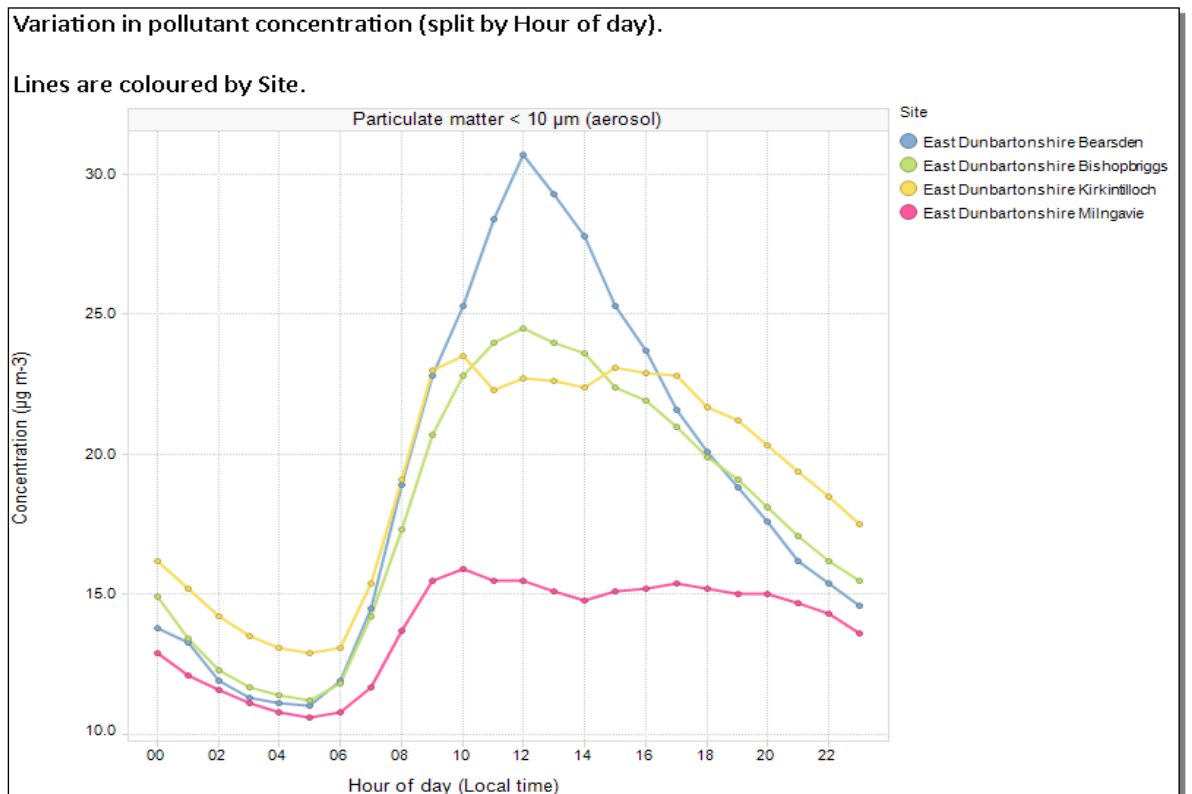


Figure 8 Daily Variation in PM_{10} concentration

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

Local Air Quality Management Technical Guidance (TG16)

Local Air Quality Management Policy Guidance (PG(S)16)

Bishopbriggs Air Quality Management Area Action Plan

Bishopbriggs Air Quality Management Area Update