Annual Progress Report (APR)





2019 Air Quality Annual Progress Report (APR) for Aberdeenshire Council

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

June 2019

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Executive Summary: Air Quality in Our Area

Air Quality in Aberdeenshire Council

Aberdeenshire Council is located on the north-east coast of Scotland and surrounds the Aberdeen City Council area. The Council area is split into two distinct geographical types: the western part of the Council area is dominated by the Grampian mountain range and includes large areas of forest and moorland. The northern, eastern and southern parts of the Council area are somewhat less mountainous with large expanses of agricultural land, coastal grassland and a greater density of small towns.

The population of the Aberdeenshire Council area is approximately 240,000 with largest urban populations residing in Peterhead, Fraserburgh, Inverurie, Stonehaven, Westhill and Ellon. A large proportion of the Aberdeenshire population is involved in the off-shore oil and gas industry. A significant proportion of the population are also involved in the traditional industries of farming, forestry and fishing with approximately one third of Scotland's agricultural produce originating in the region. The industrial and commercial areas are primarily located in the east of the Council area around Aberdeen, Stonehaven, Peterhead and Fraserburgh. A large section of the central region of Aberdeenshire is a commuter region for Aberdeen City with a significant proportion of the local population commuting in to Aberdeen City on a regular basis.

The Aberdeenshire Council area enjoys good air quality with no exceedances of the national air quality objectives. Consequently, there is no requirement for Aberdeenshire Council to declare any air quality management areas (AQMAs).

Actions to Improve Air Quality

Aberdeenshire Council continues to work with internal and external partners to deliver the objectives of Cleaner Air for Scotland – The Road to a Healthier Future (CAFS).

Aberdeenshire Council worked with colleagues in neighbouring Aberdeen City Council on Clean Air Day 2019 at an information stall in Aberdeen City Centre to help raise awareness of air pollution and encourage behavioural change across both local authority areas. To compliment this work, advice and awareness messages were also posted on our social media feeds.





Local Priorities and Challenges

There are a large number of biomass installations within the Aberdeenshire area, including many in our rural communities on agricultural holdings. Aberdeenshire Council continues to work with the agricultural sector, providing advice and expertise, and to identify these biomass installations ensuring the appropriate authorisations are obtained where necessary. Planning and Environmental Health services delivered a joint presentation at a recent meeting of the Grampian Biomass Working Group with a view to improving early developer engagement with the Council regarding new biomass installation.

As a neighbouring authority to Aberdeen City Council and with the high number of commuting, leisure and other essential journeys between the two authorities, we are actively engaging through participation in meetings and open dialogue between relevant personnel to assist and enable development of a low emission zone in line with the objectives of CAFS.

Aberdeenshire Council will continue to review and assess local air quality in accordance with the statutory monitoring and reporting requirements.

How to Get Involved

For further information on Air Quality in Aberdeenshire, including information on how to obtain previous annual LAQM reports and a link to the Scottish air pollution forecast please visit the air quality section of our website, or follow our social media feeds:

https://www.aberdeenshire.gov.uk/environment/environmentalprotection/atmospheric-pollution/

Facebook: <u>@EHAberdeenshire</u>

Twitter: <u>@AbshireEnvHlth</u>

You can also find out more about active travel, sustainable travel and advice on funding available to help you choose a low emission vehicle at https://www.aberdeenshire.gov.uk/roads-and-travel/transportation/

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1. Local Air Quality Management

This report provides an overview of air quality in Aberdeenshire Council during 2018. 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) is summarises the work being undertaken by Aberdeenshire Council to improve air quality and any progress that has been made.

Dellutent	Air Quality Objec	Date to be	
Pollutant	Concentration	Measured as	achieved by
Nitrogen	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
dioxide (NO ₂)	40 µg/m ³	Annual mean	31.12.2005
Particulate	50 μg/m ³ , not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
Matter (PM10)	18 μg/m³	Annual mean	31.12.2010
Particulate Matter (PM _{2.5})	10 µg/m³	Annual mean	31.12.2020
	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
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25 μg/m³	Running annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m³	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg/m ³	Running 8-Hour mean	31.12.2003
Lead	0.25 μg/m ³	Annual Mean	31.12.2008

Table 1.1 – Summary of Air Quality Objectives in Scotland

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 an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives.

Aberdeenshire Council currently does not have any AQMAs and the available evidence suggests that Aberdeenshire benefits from generally good air quality in terms of those emissions currently considered under the LAQM regime.

2.2 Cleaner Air for Scotland

Cleaner Air for Scotland – The Road to a Healthier Future (CAFS) is a national crossgovernment 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 <u>https://www.gov.scot/Publications/2015/11/5671/17</u>. Progress by Aberdeenshire Council against relevant actions within this strategy is demonstrated below.

2.2.1 Transport

At a corporate level, Aberdeenshire Council has fully embraced the use of digital technology to improve collaborative working and reduce the need for employees to travel extensively across the council area. Adoption of Office 365 technology has reduced the need for face to face meetings and the use of modern virtual meeting spaces is encouraged where possible.

We are currently piloting a car club model to reduce business mileage at 3 large Council offices in Stonehaven, Aberdeen and Inverurie. Twelve low emission hybrid vehicles have been leased through this pilot scheme which are available for employee use through an online booking portal. It is anticipated that this solution will provide the following benefits to the Council:

- Reduction in administration costs
- A saving of 15% per mile in comparison to reimbursing private vehicle mileage
- Provision of comprehensive management information around vehicle usage
- The opportunity to increase capacity therefore reducing reliance on private vehicles

Furthermore, as part of an ongoing improvement programme, Aberdeenshire Council has installed telematics in over 800 of our fleet vehicles enabling us to promote safe and efficient driving, optimise vehicle use, reducing exhaust emissions and fuel use across the fleet.

In terms of wider transport strategy across the Aberdeenshire Council area, the Transport Strategy Team are currently working on various health improvement and emission reduction projects detailed at https://www.aberdeenshire.gov.uk/roads-and-travel/transportation/transport-strategies-projects/

Aberdeenshire Council's "Youth Active Travel in Aberdeenshire" project took the Sustainable Transport award at the Chartered Institute of Highways and Transportation (CIHT) awards in June 2018. The aim of the project is to encourage smarter travel choices to schools through school travel planning, tailored to suit the individual needs of the communities each school serves. The project has resulted in the delivery of strongly branded materials and lesson plans, developed jointly with education partners and linking directly into the curriculum; a unique approach in Scotland. The initiative is designed to link into local active travel planning campaigns delivered in parallel with new infrastructure projects, supporting the active journey to school.

The Transportation Strategy Development Team have been working alongside colleagues in Economic Development on a project to introduce an electric bike hire scheme at four locations along the Formartine & Buchan Way – Ellon, Mintlaw, Peterhead and Fraserburgh. The project aims to encourage active travel and foster healthy and sustainable attitudes towards travel, and also aligns well with aspirations to grow tourism in the region. It is hoped the project would see 20 bikes being stationed across the four locations.

Aberdeenshire Council is investing in promoting active travel throughout the region to deliver infrastructure improvements through its Integrated Travel Town (ITT) masterplans for Fraserburgh, Huntly, Ellon, Inverurie and Portlethen. The ITTs for each town are action plans not only for developing infrastructure improvements, but also promotional activities aimed at encouraging more active travel choices. This masterplan project recently won the award for 'Excellence in Walking, Public Realm and Cycling' at the Scottish Transport Awards.



Aberdeenshire Council supports employers and employers to minimise the impact of commuting on health and the environment with a range of guidance and practical support tools; <u>https://www.aberdeenshire.gov.uk/roads-and-</u>travel/transportation/commuting/

We have also developed a Low Emission Vehicle Delivery Plan, published October 2018, to support the growth in electric vehicles within Aberdeenshire;

https://www.aberdeenshire.gov.uk/roads-and-travel/transportation/electric-vehicles/. Integral to the plan is the expansion of the electric vehicle charging point network, which will play a pivotal role in the reduction of greenhouse gas emissions associated with the transportation sector. The delivery plan supports the national approach on Low Emission Vehicles, cementing Aberdeenshire's place as a proactive authority in support of Carbon reduction, air quality improvements and technological innovation.

Aberdeenshire Council is trialling a hydrogen fuel cell van in our corporate vehicle fleet in partnership with neighbouring local authority Aberdeen City Council.

2.2.2 Climate Change

Scottish Government expects any Scottish local authority which has or is currently developing a Sustainable Energy Action Plan to ensure that air quality considerations are covered. Aberdeenshire Council has a partnership agreement with Aberdeen City, Moray and Angus Council who together form the North East Scotland Sustainable Energy Action Plan (NESSEAP).

Aberdeenshire Council submits an annual report each year in respect of work we are doing to mitigate and reduce the impacts of climate change. The full report can be found at <u>https://sustainablescotlandnetwork.org/reports/aberdeenshire-council</u>, however the 2017/18 report is summarised in the image below.



Full details of the ongoing climate change work within Aberdeenshire can be found at https://www.aberdeenshire.gov.uk/environment/environmental-policy/

2.2.3 Placemaking - Air Quality and the Local Development Plan

Aberdeenshire Local Development Plan 2017 provides a framework for land use planning in the Aberdeenshire Council area. Policies R3 (relating to mineral workings) and P4 (relating to potentially polluting development) require that emissions to air from new development must be mitigated where there is potential for significant detrimental impacts.

The Aberdeenshire Local Development Plan 2017 is available at https://www.aberdeenshire.gov.uk/planning/plans-and-policies/aberdeenshire-local-development-plan-2017/

Work has started on the Aberdeenshire Local Development Plan 2021 and discussions are ongoing within Aberdeenshire Council and with other stakeholders to ensure the relevant strategic aims of CAFS are embedded in local planning policy.

3. Air Quality Monitoring Data and Comparison with Air Quality Objectives

3.1 Summary of Monitoring Undertaken

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

3.1.1 Automatic Monitoring Sites

Aberdeenshire Council does not operate any automatic analysers or monitors in respect of the identified LAQM pollutants.

3.1.2 Non-Automatic Monitoring Sites

Aberdeenshire Council undertook non- automatic (passive) monitoring of NO₂ at 14 sites during 2018. Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix A. 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.2 in Appendix A compares the adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of $40\mu g/m^3$. Longer term trends of historical data are presented in Figures B.1 to B.3 in Appendix B. The full 2018 dataset of monthly mean values is provided in Table A.3 of Appendix A.

As there are no exceedances of the air quality objective it has not been considered necessary to apply distance correction to obtain concentrations at nearby relevant receptors for any diffusion tube site.

Analysis of the presented data does not reveal any significant trend at any individual site or across Aberdeenshire as a whole.

3.2.2 Particulate Matter (PM₁₀)

Aberdeenshire Council does not carry out any monitoring in respect of PM₁₀ and has no current plans to do so.

3.2.3 Particulate Matter (PM_{2.5})

Aberdeenshire Council does not carry out any monitoring in respect of PM_{2.5} and there are no current plans to do so.

3.2.4 Sulphur Dioxide (SO₂)

Aberdeenshire 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

Aberdeenshire 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

4.1 Road Traffic Sources

Construction of the Aberdeen Western Peripheral Route began in 2015 and remained ongoing during 2018. The route fully opened early in 2019. Any consequent changes in traffic flow will be considered in subsequent Annual Progress Reports.

Aberdeenshire Council confirms there are no newly identified air pollutant sources attributable to the transport sources listed below:

- Narrow congested streets with residential properties close to the kerb
- Busy streets where people may spend one hour or more close to traffic
- Roads with a high flow of buses and/or HGVs
- Junctions
- New roads constructed or proposed
- Roads with significantly changed traffic flows
- Bus or coach stations

4.2 Other Transport Sources

Aberdeenshire Council confirms that the following transport sources within the local authority boundary do not meet the criteria specified in the Local Air Quality Management, Technical Guidance (TG16)² that would trigger the current 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

All significant industrial processes in Scotland are regulated by the Scottish Environment Protection Agency (SEPA). Information was sought from SEPA regarding any new or significantly changed industrial processes with potential for significant emissions to air; none was identified.

4.4 Commercial and Domestic Sources

All new or proposed biomass or CHP installations identified in 2018, through the planning system, are listed in Table 4.1.

Location	Biomass Type	Capacity (kW)
Meikle Whiterashes, Turriff	Wood and Straw boiler	2 x 295
Ardiffery Mains, Hatton	Straw boiler	225
Ewebrae, Cuminestown	Wood and Straw boiler	295
Burnthill, Fraserburgh	Wood chip Boiler	3 x 250
Inchgray Farm, Fettercairn	Woodchip boiler	2 x 2000
Mains of Woodstone, St Cyrus	Wood and Straw	600
Cairnandrew Energy Plant, Banff	Wood CHP Wood boiler	20 x 50 4 x 990
Craigshowdie, Peterhead	unknown	unknown
Brunthill Farm, New Deer	Wood boiler	210
Oak Lodge, Oldmeldrum	Wood chip boiler Straw boiler	150 845
Crossbrae, Fraserburgh	Wood and Straw boiler	295
Upper Pitforthie, Stonehaven	Wood chip	198
Backhill of Mintlaw, Mintlaw	Wood and Straw boiler	2 x 210
Mossend Farm, Hatton	Wood boiler	295
Waverley, Whiterashes	Wood boiler	2 x 210
Brunstone Farmhouse, St Katherines	Wood and Straw boiler	295*
	Wood chip boiler	750
Yonderton, Hatton	Wood chip boiler	199
	Straw boiler	795
South Percyhorner, Fraserburgh	Straw boiler	795
Cassiegills Farm Ellon	Wood chip boiler	205
	Wood boiler	201
Puffin Pellets CHP, Boyndie	Wood/wood chip boiler	3000
Plot 5 Chapel Park, Mintlaw	Wood chip boiler	110
Mains of Atherb Maud	Wood chip boiler	250
	Wood boiler	199
Chapelpark Methlick	Wood chip boiler	384
	Wood chip boiler	225

Table 4.1Biomass or CHP plant identified in Aberdeenshire in 2018

*Previously listed in APR 2018¹ as "3 x 295". Owner has since sold 2 boilers.

Where current information permits, screening assessments and/or dispersion modelling has been carried out. There is ongoing work to obtain relevant information about biomass plant identified in 2018 and also in 2015, 2016 and 2017 (as listed in the annual progress reports for these years. Details of the screening assessments that have been completed this year are available in Appendix D.

4.5 New Developments with Fugitive or Uncontrolled Sources

There are various quarrying, extraction, landfill and waste management sites located throughout Aberdeenshire which have the potential to give rise to fugitive dust emissions (in addition to those listed in Chapter 5). Where it has been appropriate and possible to do so, conditions have been placed on planning consents relating to such sites in order to minimise the dust emissions from these sites. Additionally, some such sites are regulated by SEPA under the PPC regime.

There were a total of 132 complaints logged by Aberdeenshire Council during 2018 in regard to matters relevant to air quality, comprising of;

Agricultural activities

- 5 complaints about farm manure odour
- 8 complaints about odour from agricultural spreading/land at 7 locations
- 8 complaints about burning from agricultural activities including 3 specifically about the burning of waste material which were referred to SEPA

Biomass installations

- 10 complaints about smoke and/or odour related to non domestic biomass boilers at 7 (mostly agricultural) locations
- 8 complaints (5 identifying wood burning stoves as the source) about smoke from domestic chimney/flue at 8 locations

Bonfires and burning

- 9 complaints about burning waste in/on commercial property at 9 locations
- 7 complaints about bonfires on construction sites
- 30 complaints about domestic garden bonfires and 3 requests for advice

Non-agricultural odour

- 27 complaints logged about odour from non-agricultural sources including 11 in respect of food processors and takeaway outlets.
- 7 complaints were logged about an odour of unknown source in the Portlethen area with several other residents approaching other agencies and council departments about the same issue. Investigations are ongoing with partner agencies.

General emissions to air

- 10 complaints about dust from construction or demolition activities
- 1 complaint about dust from quarry activities
- 2 complaints about vehicle idling

Most of these complaints are generally transient and any significant impact on air quality is unlikely.

The complaints related to non-domestic biomass installations are all currently subject to ongoing investigation. The biomass installation at Meikle Whiterashes is subject to planning enforcement action; operation of the biomass boilers is currently ceased.

Work is ongoing to develop a GIS map layer of all known biomass sites in the Aberdeenshire Council area to enable better spatial awareness of potential impacts of emissions to air. Information continues to be sought regarding unauthorised biomass development to enable screening assessments (as a minimum) to be undertaken.

5. Planning Applications

Planning applications relating to new biomass installation are discussed in Chapter 4.

Additionally, the following applications, which may give rise to air quality impacts, were submitted to Aberdeenshire Council in 2018

- Poultry shed, Nether Kinmundy. Reduction in bird numbers, does not meet target criteria for further assessment. Odour assessment submitted and impacts deemed acceptable.
- Black start facility, Peterhead Power Station, 31 diesel generators at 18MW capacity (total). An air quality impact was submitted and impacts deemed acceptable.
- Retail units and biomass plant. Ury Estate, Stonehaven. An air quality impact was submitted and impacts deemed acceptable.
- 550 dwellings and other mixed uses. Menie Estate, Balmedie. Still under consideration.
- New quarry. Mains of Kirkney Farm, Gartly. Planning condition to control dust. Impacts acceptable.
- Petrol station. Bankhead drive, Portlethen. No information on throughput. Noted for future consideration.

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

Aberdeenshire Council carried out diffusion tube monitoring at 14 sites across the local authority area.. The diffusion tube monitoring data presented in Chapter 3 and Appendices A and B demonstrates that concentrations of NO₂ in Aberdeenshire continue to remain below the national air quality objectives; indeed the general trend in NO₂ concentrations across the sites appears to be downward.

Concentrations of NO2 have risen slightly in Oldmeldrum and Banff over the past year of monitoring. Monitoring continues at the Oldmeldrum site during 2019 and a further review of this site will be carried out in 2020. Monitoring has ceased at the Banff site in 2019 however, perhaps prematurely. It is proposed to carry out a rolling programme of monitoring at sites where there may be increasing impacts but where concentrations are well below the national air quality objective. Consequently, it is likely that the Banff site will be subject to additional monitoring in future.

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

6.2 Conclusions relating to New Local Developments

Transport Sources

There are no significant changes in transport sources since the previous Annual Report in 2018. The full route of the Aberdeen Western Peripheral Route opened in early 2019. Any changes in traffic flow as a result of the new route opening will be examined in subsequent annual reports.

There are no current or projected exceedances of relevant national air quality objectives.

Industrial Sources

Industrial sources were considered following receipt of information from SEPA and consideration of planning applications received by Aberdeenshire Council.

No industrial sources have been identified that are likely to have significant impact on national air quality objectives.

Commercial and Domestic Sources

A large number of new biomass installations have been identified. Additional information is required to complete screening assessments for many of these new biomass installations and investigations into complaints of smoke from some these installations (for which planning permission was applied for retrospectively) are ongoing.

Fugitive or Uncontrolled Sources

Potential fugitive or uncontrolled sources of emissions are unlikely to be significant in respect of the national air quality objectives.

6.3 Proposed Actions

Diffusion Tube Monitoring Data

Whilst concentrations of NO₂ at all diffusion tube sites are below the national objective, examination of long term diffusion tube data suggests that monitoring should continue at 3 sites in Inverurie, Westhill 2, Ellon 3, Oldmeldrum and all 4 sites in Peterhead until a further review at the end of 2019. Monitoring was ceased at Inverurie 21HS, Ellon 1 and Ellon 4 as propose in APR 2018¹.

Concentrations of NO2 have risen slightly in Oldmeldrum and Banff over the past year of monitoring. Monitoring continues at the Oldmeldrum site during 2019 and a further review of this site will be carried out in 2020. Monitoring has ceased at the Banff site in 2019 however, perhaps prematurely. It is proposed to carry out a rolling programme of monitoring at sites where there may be increasing impacts but where concentrations are well below the national air quality objective. Consequently, it is likely that the Banff site will be subject to additional monitoring in future. All diffusion tube monitoring sites will be reviewed once 2019 bias adjusted results are available.

Commercial and Domestic Sources

Information will be sought in respect of biomass installations where sufficient information has not yet been provided. Additionally, changes to the Great Britain Non-Domestic Renewable Heat Incentive (RHI) programme mean that all existing and new participants must provide evidence of compliance with all national and local laws relating to the protection of the environment (including planning permission). Aberdeenshire Council has received a notable increase in retrospective applications for planning permission in light of these changes, which will provide opportunity for improved scrutiny of the impacts of biomass installations on local air quality.

Investigation of complaints relating to new biomass developments is ongoing. Screening assessments will be completed in due course following receipt of the required information. An update on biomass installations in Aberdeenshire will be provided in the next Annual Report in 2020.

Aberdeenshire Council intends to submit an Annual Progress Report in 2020.

Aberdeenshire Council

Appendix A: Non-Automatic Monitoring Sites

- Map A.1 Settlements in Aberdeenshire where NO₂ Diffusion Tube Monitoring was undertaken during 2018
- Map A.2 Location of NO₂ Diffusion Tube Sites (Inverurie)
- Map A.3 Location of NO₂ Diffusion Tube Sites (Peterhead)
- Map A.4 Location of NO₂ Diffusion Tube Sites (Westhill)
- Map A.5 Location of NO₂ Diffusion Tube Sites (Ellon)
- Map A.6 Location of NO₂ Diffusion Tube Site (Oldmeldrum)
- Map A.7 Location of NO₂ Diffusion Tube Site (Banff)
- Table A.1
 Details of Non-Automatic Monitoring Sites
- Table A.2
 Annual Mean NO2 Monitoring Results
- Table A.3NO2 Monthly Diffusion Tube Results for 2018



Map A.1 Settlements in Aberdeenshire where NO₂ Diffusion Tube Monitoring was undertaken during 2018



Map A.2 Location of NO₂ Diffusion Tube Sites - Inverurie



Map A.3 Location of NO₂ Diffusion Tube Sites - Peterhead

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Map A.4 Location of NO₂ Diffusion Tube Site - Westhill



Map A.5 Location of NO₂ Diffusion Tube Sites - Ellon



Map A.6 Location of NO₂ Diffusion Tube Site - Oldmeldrum



Map A.7 Location of NO₂ Diffusion Tube Site - Banff

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Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref (Easting, Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m)	Distance to kerb of nearest road (m)	Tube collocated with a Continuous Analyser?
Inverurie 1	Roadside	E 377408 N 821583	NO ₂	No	1.8	1.5	No
Inverurie 2	Background	E 376622 N 821476	NO ₂	No	46.0	53.0	No
Inverurie MC	Roadside	E 377624 N 821295	NO ₂	No	0 ⁽¹⁾	1.5	No
Inverurie 21HS	Roadside	E 377602 N 821323	NO ₂	No	O ⁽¹⁾	2.3	No
Westhill 2	Roadside	E 381837 N 806691	NO ₂	No	10.0	2.4	No
Ellon 1	Roadside	E 395604 N 830472	NO ₂	No	O ⁽¹⁾	2.5	No
Ellon 3	Roadside	E 395713 N 830172	NO ₂	No	5.5	2.5	No
Ellon 4	Roadside	E 395893 N 830509	NO ₂	No	2.7	1.0	No
Oldmeldrum	Kerbside	E 380849 N 827226	NO ₂	No	2.0	0.5	No
Peterhead 2	Roadside	E 413209 N 846356	NO ₂	No	1.0	2.0	No
Peterhead 4	Roadside	E 412758 N 846144	NO ₂	No	12.0	2.0	No
Peterhead BH	Roadside	E 413379 N 845906	NO ₂	No	10.0	2.0	No
Peterhead MS1	Kerbside	E 413420 N 845918	NO ₂	No	0(1)	0.8	No
Banff	Kerbside	E 368876 N 864021	NO ₂	No	0(1)	1.0	No

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

		Valid Data	Valid Data	NO ₂ Annual Mean Concentration (µg/m ³) ⁽¹⁾							
Site Name	Monitoring Type	Capture for Monitoring Period (%)	Capture 2018 (%)	2014	2015	2016	2017	2018			
Inverurie 1	Diffusion Tube	100	100	34.9	31.9	31.5	27.7	26.4			
Inverurie 2	Diffusion Tube	83	83	11.3	9.4	10.5	8.8	10.3	ļ		
Inverurie MC	Diffusion Tube	100	100	N/A	N/A	31.0	24.3	24.0			
Inverurie 21HS	Diffusion Tube	92	92	N/A	N/A	28.2	21.6	23.1			
Westhill 2	Diffusion Tube	92	92	25.1	21.2	22.4	19.0	18.8	ļ		
Ellon 1	Diffusion Tube	92	92	23.4	20.8 ^a	26.2	21.1	20.0			
Ellon 3	Diffusion Tube	100	100	26.9	23.9 ^a	24.3 ^a	22.0	21.2			
Ellon 4	Diffusion Tube	100	100	22.1	19.8 ^a	23.1	18.1 ^a	18.8			
Oldmeldrum	Diffusion Tube	100	100	N/A	N/A	N/A	17.9	19.4			
Peterhead 2	Diffusion Tube	100	100	30.0	28.3	23.0	19.7	22.0			
Peterhead 4	Diffusion Tube	75	75	25.3	22.5	21.4	26.3	21.6			
Peterhead BH	Diffusion Tube	100	100	32.2 ^a	31.4	26.6	26.4	24.0			
Peterhead MS1	Diffusion Tube	100	100	28.1 ^a	28.1	25.4	25.2	24.8			
Banff	Diffusion Tube	83	83	N/A	N/A	N/A	16.0ª	21.1	1		

Table A.2 – Annual Mean NO₂ Monitoring Results

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

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

(1) 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

		NO ₂ Mean Concentrations (μg/m ³)													
Site Name	_					_							Annı	ial Mean	
	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted ⁽¹⁾	
Inverurie 1	42	37	33	30	26	23	22	28	29 ⁽³⁾	42 ⁽³⁾	42	37	33	26.4	
Inverurie 2	19	16	11	10	7	n/a	n/a	10	7 ⁽³⁾	12 ⁽³⁾	15	20	13	10.3	
Inverurie MC	41	35	30	31	23	25	22	24	21 ⁽³⁾	31 ⁽³⁾	39	34	30	24.0	
Inverurie 21HS	38	40	31	24	25	n/a	21	20	17 ⁽³⁾	28 ⁽³⁾	37	33	29	23.1	
Westhill 2	32	26	29	29	22	19	17	16	15 ⁽³⁾	21 ⁽³⁾	n/a	29	23	18.8	
Ellon 1	31	33	n/a	26	27	16	18	18	20	26	27	30	25	20.0	
Ellon 3	36	32	25	29	24	22	19	23	23	30	24	27	26	21.2	
Ellon 4	29	30	23	24	22	18	17	20	18	23	27	27	23	18.8	
Oldmeldrum	31	28	27	26	21	21	17	19	16	23	29	30	24	19.4	
Peterhead 2	27	31 ⁽²⁾	30 ⁽²⁾	38	29	24	27	26	17	23	30	24	27	22.0	
Peterhead 4	28	32 ⁽²⁾	29 ⁽²⁾	35	26	19	21	22	n/a	n/a	n/a	28	27	21.6	
Peterhead BH	38	38(2)	32 ⁽²⁾	36	32	22	26	28	22	27	32	22	30	24.0	
Peterhead MS1	35	59 ⁽²⁾	28(2)	33	35	25	26	27	20	26	34	19	31	24.8	
Banff	30	30(2)	27 ⁽²⁾	29	29	n/a	24	23	16	n/a	29	24	26	21.1	

Table A.3 – NO₂ Monthly Diffusion Tube Results for 2018

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

(2)&(3) Exposure different to recommended Diffusion Tube Calendar duration. See Appendix C.1 for discussion.

Appendix B: Trends and Historical Data

- Figure B.1 Inverurie Diffusion Tube Trends (2005-18)
- Figure B.2 Peterhead Diffusion Tube Trends (2005-18)
- Figure B.3 Other Towns Diffusion Tube Trends (2005-18)





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Appendix C: Air Quality Monitoring Data QA/QC

Diffusion Tube Bias Adjustment Factors

Laboratory analysis of passive diffusion tubes used by Aberdeenshire Council is undertaken by Aberdeen Scientific Services (Aberdeen City Council). Aberdeen 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.

The 2018 bias adjustment factor for Aberdeen Scientific Services is **0.81**. This factor was obtained from the National Diffusion Tube Bias Adjustment Spreadsheet, version 03/19 (available at <u>http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html</u>), and is based on 7 studies.

QA/QC of Diffusion Tube Monitoring

The National Diffusion Tube Bias Adjustment Spreadsheet, version 03/19 presents Tube Precision for Aberdeen Scientific Services as **GOOD** for all 7 studies.

Aberdeen Scientific Services (Aberdeen City Council) participates in the AIR NO2 PT scheme, and has a **100% SATISFACTORY** score during 2018 (AR024, AR025, AR026, AR027 and AR028 inclusive) (performance statistics available at https://laqm.defra.gov.uk/assets/laqmno2performancedatauptofebruary2019v1.pdf).

Factor from Local Co-location Studies (if available)

Aberdeenshire Council does not undertake any co-location studies.

Departure from Diffusion Tube Calendar Exposure Periods

Period 2 diffusion tubes at Peterhead sites were changed one week early due to human error (ie, 3 week exposure). In order to get back in sequence with the national exposure calendar, period 3 diffusion tubes at Peterhead sites were therefore changed after a 5 week exposure rather than a 4 week exposure. These results are marked (2) in Table A.3 of Appendix A.

Period 9 diffusion tubes at Peterhead sites were changed one week late due to human error (ie, 5 week exposure). In order to get back on track with the national exposure calendar, period 10 diffusion tubes at Peterhead sites were therefore changed after a 3 week exposure rather than a 4 week exposure. These results are marked (3) in Table A.3 of Appendix A.

As both sets of diffusion tube results were generally as would otherwise be expected it was decided these results could be included in the annual mean calculations.

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Appendix D Biomass Assessments 2018

Site	Stack height	Stack diameter	Fuel	Thermal Capacit	Nearest Effectiv Estimated building e stack emissions (g/s)			Background (ug/m3)	d concentration	Threshold emission rate (g/s)			
	(m)	(m)		y (kW)	height (m)	height (m)	PM ₁₀	NO ₂	PM ₁₀	NO ₂	PM ₁₀	NO _{2 am}	NO _{2 1-hr}
Land at Mossend Farm, Hatton	9	0.25	Mixed Logs	295	7.7	2.2	0.0161	0.033	5.537	11.281			
Yonderton Farm, Hatton	Froling Lambdam at – 7.5	0.3	Wood Chip	750									
	Froling TX200 – 6	0.25	Straw	199	Dispersion Modelling Pending Due to Short Flue Stack								
	Gizex Bio- pal - 6	0.5	Straw	795									
Backhill Lenabo, Mintlaw	6	0.2	Wood Chip	199 x 2	32	1.3	0.0132	0.032	7.355	17.830			
Mains of Arberth,	Froling TM250 – 6.8	0.25	Wood Chips	250	15	6.8	0.0113	0.0778	1.4165	9.7522			
	Unical – 6.8	0.3	Wood Logs	200									
Cassiegills	Froling x1 7.7m	0.25	Wood Chips	205				Dianar	aian Madallina	Donding			
	Unical x5 7.25m	0.3	Wood Logs	201				Disper	SIGH MODElling	Pending			
Chapelpark Methlick	9m	FACI 390 305mm FACI 225 203mm	Virgin wood chips	FACI 390 384 FACI 225 225	7.4	2.7	0.0172	0.0787	11.1430	4.3254			
Ewewbrae Turriff	7.5m	0.3m	Wood and straw	295kW	7.0m	7.5m	0.009	0.018	8.4	4.5	0.009	0.018	
Oaklodge Oldmeldrum	Froling 5.5m	0.2	Wood Chip	150									
	Girex 5.5m	0.5	Straw	845									
Waverley Bruntsmiddy Turriff	6.0m	0.2	Mixed Wood	2 x 210kW	5.0m	6.0m							

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Bruntstone St Katherines Fyvie	13.1m	0.25m	Wood and straw	295kW	12.5m	13.0m	56.5 mg/m3	115.3 mg/m3			0.34	0.066	
Puffin Pellets Boyndie Banff	10.6m	0.6m	Wood chips and wood	Internet Ekomat MR 3000kW	12m		27g/GJ	81g/GJ					
Meikle Whiterashes Turriff	8.6	0.25	Mixed Logs and Straw	2No Glen Farrow 295kW	7.0m	8.0m	0.008	0.008	12.66	3.92			
Gask Farm Turriff	8.0m	0.3m	Wood chips	Heizmat RHK-AK 200kW	7.0m	8.0m	0.021	0.005					
Bruntsmiddy Turriff	7.5m	0.25	Wood pellets	Faci FSS 390kW	6.0m	7.5m							
Braeside of Fortie, Rora	9.1	0.2	Wood Chip	2 x Fci FSS 225kW	8.1	9.1	0.0059	0.0145	8.971591	4.910264	0.0198	0.0769	
Ardiffary Mains, Hatton	10	0.34	Straw	Ekopal RM45 225kW	8.7	2.2	0.0016	0.0211	10.32454	5.066318	0.254	0.1157	0.1578
Brunthill Farm, New Deer, Turriff	8m	0.2	Mixed wood	GF210	6	3.33	0.0080	0.0163	10.71683	4.184628	0.0272	0.134	0.1558
Crossbrae, Fraserburgh	9	0.25	Mixed wood	GF 295	6.2	4.7	0.0116	0.0253	10.01145	4.549083	0.0419	0.1857	0.2207
South Percyhorner, Fraserburgh.	7	0.25	Straw	795	6.4	1	0.0064	0.015	10.83572	5.257268	0.0064	0.015	0.0827
Chapel Park, Mintlaw	6	0.2	Wood chip	110	5.0	1.7	0.0015	0.0087	8.929598	5.096752	0.0199	0.0765	0.1045
Backhill of Mintlaw	8	0.2	Mixed wood	210 x 2	6.5	2.5	0.0176	0.036	9.6283	5.02967	0.0252	0.1054	0.1294
Burnthill, Fraserburgh	7.2	0.25	Wood Chip	250 x 3	6.5	1.2	0.0138	0.0564	10.6445	4.660679	0.0116	0.0556	0.0893
Inchgray, Fettercairn	12.0	0.6	Wood Chip	2 x 2000	8.2	6.3	0.0624	0.1884	11.58	3.36	0.0701	0.4	0.5768
Mains of Woodstone, St Cyrus	10.5	0.5	Wood and Straw	600	5.5	8.3	0.021	0.028	9.83	3.76	0.1075	0.4769	0.6576
Upper Pitforthie, Stonehaven			Wood Chip	198		Dispersion Modelling carried out due to other boilers on site							

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
NOx	Nitrogen Oxides
PM10	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

- 1 Aberdeenshire Council, *Air Quality Updating and Screening Assessment 2018 for Aberdeenshire Council*, available at <u>https://www.aberdeenshire.gov.uk/environment/environmental-</u> <u>protection/atmospheric-pollution/</u>,
- 2 Department for Environment, Food and Rural Affairs: London, *Local Air Quality Management Technical Guidance (TG16)*, April 2016