Annual Progress Report (APR)

Aberdeenshire COUNCIL

2016 Air Quality Annual Progress Report (APR) for
Aberdeenshire Council

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

August 2016

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Report Reference number	APR16-01
Date	09 August 2016

Executive Summary: Air Quality in Our Area

Air Quality in Aberdeenshire

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 is working closely with communities in the towns of Huntly, Inverurie, Fraserburgh, Portlethen and Ellon to help develop more sustainable and active travel choices in each of these towns through the Integrated Travel Town (ITT) project. This work follows a successful pilot project in the town of Peterhead where a year on year increase of 50% in walking and cycling amongst primary schools pupils was observed.

The Council's Local Transport Strategy, discussed in previous rounds of Review and Assessment, aims to encourage individuals to consider how to reduce the number of journeys made in the first instance. Where travel is unavoidable, the emphasis is on supporting active travel for journeys less than 5km.

The ITT Project supports the delivery of Aberdeenshire Council's Local Transport Strategy (LTS)[1] which aims to encourage people to:

- Travel less;
- Travel more actively; and
- Travel more effectively.

Local Priorities and Challenges

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:

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

Additional information regarding the Integrated Travel Town project can be found at:

https://www.aberdeenshire.gov.uk/roads-and-travel/transportation/integrated-travel-towns/

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1. Local Air Quality Management

This report provides an overview of air quality in Aberdeenshire 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) is summarises the work being undertaken by Aberdeenshire 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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
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
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 (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.

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

3.1 Summary of Monitoring Undertaken

In 2015 Aberdeenshire Council carried out passive diffusion tube monitoring at 16 sites within Aberdeenshire.

3.1.1 Automatic Monitoring Sites

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

The Scottish Environment Protection Agency (SEPA) has, on behalf of the Scottish Government, set up a network of volcanic ash monitoring sites[2]. The network of 4 sites is designed to detect transboundary sulphur dioxide and particulate matter from volcanic activity in Iceland. All 4 sites are in isolated, rural locations across the north of Scotland (to minimise measurement of local sources). One of these sites is located at the Loch of Strathbeg, Crimond, Aberdeenshire.

3.1.2 Non-Automatic Monitoring Sites

Aberdeenshire Council carried out non-automatic (passive) monitoring of NO_2 at 16 sites during 2015. Table B.1 in Appendix B 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 (NO_2)

Table B.2 in Appendix B compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2015 dataset of monthly mean values is provided in Table B.3 in Appendix B.

The results shown in Table B.2 in Appendix B demonstrate that there were no exceedances of the NO_2 annual mean objective recorded in Aberdeenshire Council area during 2015.

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 (PM_{10})

Aberdeenshire Council does not carry out any monitoring in respect of PM_{10}.

The SEPA volcanic ash monitoring site at Loch of Strathbeg, Crimond monitors continuously for PM_{10}.

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 in future.

The SEPA volcanic ash monitoring site at Loch of Strathbeg, Crimond monitors continuously for $PM_{2.5}$.

3.2.4 Sulphur Dioxide (SO_2)

Aberdeenshire Council does not carry out any monitoring in respect of Sulphur Dioxide.

The SEPA volcanic ash monitoring site at Loch of Strathbeg, Crimond monitors continuously for Sulphur Dioxide.

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.

4. New Local Developments

4.1 Road Traffic Sources

In Chapter 8.2 of the Aberdeenshire Council Updating and Screening Assessment 2015[3] it was noted that a relatively high flow of traffic through narrow residential streets was identified in the following town centres (although it was considered unlikely these locations would meet the definition of congested):

- Banff
- Inverbervie
- Inverurie
- Oldmeldrum

Consequently, in Chapter 8.3 of the Aberdeenshire Council Updating and Screening Assessment 2015[3] diffusion tube monitoring was proposed at each of these sites by the end of Round 6 of the Review and Assessment period (2017). In 2016 new diffusion tube sites have been set up in Inverurie and Inverbervie. It is proposed to set up new diffusion tube sites in Banff and Oldmeldrum in 2017.

Furthermore, as reported in the Aberdeenshire Council Updating and Screening Assessment 2015[3] construction work on the Aberdeen Western Peripheral Route and the dualling of the A90 between Balmedie and Tipperty commenced in 2015 and will be ongoing throughout 2016.

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 Local Air Quality Management, Technical Guidance (TG16)[4] that would trigger the requirement for a more detailed assessment:

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

4.3 Industrial Sources

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.

Scottish Environment Protection Agency (SEPA) undertook a consultation with Aberdeenshire Council Environmental Health in respect of an air quality impact assessment, submitted as part of the application for a Pollution Prevention and Control (PPC) Permit for Baldarroch Crematorium, Crathes, Banchory. Following receipt of information from the applicant in response to minor queries, the findings of the air quality impact assessment were accepted. No exceedances of the national air quality objectives were predicted, nor any significant detrimental impact on local air quality.

No other significant industrial sources have been identified.

4.4 Commercial and Domestic Sources

All new or proposed biomass or CHP installations identified in 2015 are listed in Table 4.1.

Table 4.1 Biomass or CHP plant identified in Aberdeenshire in 2015

Location	Biomass Type	Capacity (kW)
Park House, Drumoak	Wood pellet/chip boiler	140
Buchan Braes Hotel, Boddam	Wood pellet boilers	200
North Road Industrial Estate, Insch	Wood pellet boilers	800
Cairnfield, Skene	Wood pellet boiler	100
Hilton Craigendarroch, Ballater	Wood pellet boiler	199
Wardhead, Kinneff	CHP and anaerobic digester	400
Candacraig House, Strathdon	Wood chip boiler	350
Drumdarroch House, Insch	Wood pellet boilers	120
Alastrean Care Home, Tarland	Wood chip boiler	500
Thainstone Court, Inverurie	Wood pellet boiler	100
Harpers Transport, Insch	Wood pellet CHP	199
Castleton Farm, Fordoun	Wood chip boiler	990
Palace Hotel, Peterhead	Wood pellet boiler	600
MacDuff Distillery, Banff	Wood pellet boiler	5000
Whittaker Engineering, Stonehaven	Wood chip boiler	700

Screening assessments have been undertaken for the installations listed in the table above. A revised screening assessment has been undertaken for the biomass installation at Tarves Football Club, following the applicant's submission of updated data. Results of the screening assessments are provided in Appendix D, p37-38.

Information is still required for a number of sites listed in the Updating and Screening Report 2015 and at sites identified subsequently during late 2015 and to date during 2016 to enable screening assessments to be undertaken.

Table 4.2 Biomass or CHP requiring information and assessment

Location	Biomass Type	Capacity (kW)
Whitehill, New Deer	Wood chip boiler	950
Lodge on the Loch, Aboyne	Wood chip boiler	50
Peterhead Academy, Peterhead	unknown	unknown
Aberdeen Arms, Tarland	Wood pellet boiler	67
Kemnay Academy, Kemnay	unknown	unknown
Westfield School, Fraserburgh	unknown	unknown
Sandhaven and Pitullie Hall, Fraserburgh	unknown	unknown
Fordoun Sawmill, Fordoun	unknown	unknown
Craigston Castle, Turriff	Wood chip/pellet boiler	199
Cordach, Kincardine O'Neil	unknown	unknown
Coynachie, Gartly, Huntly	unknown	60
Castle of Cromney, Aberchirder	unknown	unknown
Haughead, Laurencekirk	unknown	unknown
Kinnockie Farm, Udny, Ellon	unknown	unknown
Huntly Golf Club, Huntly	unknown	unknown
Kinmundy Farm, Newmachar	unknown	unknown
Buchan House, Peterhead	unknown	80

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.

Furthermore, the construction phase of the new Aberdeen Western Peripheral Route and the dualling of the A90 between Balmedie and Tipperty has potential for release of particulate matter arising from various construction activities such as use of exposed soil routes, blasting, crushing and screening of rock and aggregates, etc.

Dust suppression measures are used where appropriate and certain activities are subject to SEPA regulation under the PPC regime.

There were a total of 112 complaints logged by Aberdeenshire Council during 2015 in regard to matters relevant to air quality. The 112 complaints comprised of the following;

- 21 domestic bonfire complaints
- 27 complaints relating to burning or dust generating activities on construction sites, forestry, agricultural, industrial or commercial sites
- 1 complaint relating to smoke/odour from small domestic biomass plant
- 1 complaint in relation to vehicle emissions
- 58 complaints relating to odour from domestic properties, agricultural, industrial or commercial sites
- 4 miscellaneous or unsubstantiated complaints

Of the 58 complaints relating to odour, 17 are related to one industrial site and 14 related to one agricultural holding. Investigations are ongoing at both of these sites. All other issues are transient or short term events. Aberdeenshire Council does not consider that the sources mentioned here are likely to have any significant long term effect on local air quality.

5. Planning Applications

A major planning application for a Carbon Capture Plant at Peterhead Power Station, Boddam, was considered by Aberdeenshire Council in 2015. An air quality impact assessment was submitted by the applicant and reviewed by Environmental Health. No significant detrimental impact, nor exceedance of national air quality objectives is predicted. Due to significant demolition works associated with this development, the planning consent requires the developer to submit, agree and implement a dust management plan prior to any development taking place.

There were 5 planning applications for residential, retail or mixed use development submitted to Aberdeenshire Council in 2015, which remain active:

- Housing development (225 houses), West Street, Peterhead
- Retail development, Kirk St, Peterhead (approx. 150 car parking spaces)
- Mixed use development including 250 houses, Mains of Cowie, Stonehaven
- Mixed use development including 500 houses, Mill of Forest, Stonehaven
- Mixed use development including 1500 houses, Durris, Banchory

Although the above developments, in isolation, are not considered to have significant detrimental impact on local air quality they are recorded here with a view to consideration of any potential cumulative impacts that may require consideration in future.

Also worth recording for future consideration are a further 4 pre-planning enquiries that were submitted to Aberdeenshire Council in 2015 in relation to proposed residential, retail or mixed use development:

- Mixed use development at Mill of Forest, Stonehaven
- Mixed use development at Balmellie and Delgaty, Turriff
- Mixed use development at Blackdog, Bridge of Don
- Mixed use development at Hill of Banchory, Banchory

There were 7 planning applications for new quarrying operations or extensions to existing quarry operations in 2015:

- Tom's Forest Quarry, Kintore
- Kemnay Quarry, Kemnay
- Corrennie Quarry, Tillyfourie
- Wester Ord Quarry, Skene
- Loch-hills Quarry, Dyce
- Cross Stones Quarry, Ellon
- Stirling Hill Quarry, Boddam

The planning consents for each of these new quarrying developments contain a requirement for dust suppression measures to be in place.

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

The diffusion tube monitoring data presented in Chapter 2 demonstrates that concentrations of NO_2 in Aberdeenshire continue to remain below the national air quality objectives.

The type and number of complaints made to Aberdeenshire Council in respect of air quality issues has been examined and the sources considered. It is unlikely that any of the sources linked to these complaints is significant in terms of the national air quality objectives.

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

Roads, airports, railways and ports have been considered. None of these sources meet the criteria for detailed assessment and as such are not considered to have significant impact on 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

Screening assessments have been undertaken for a number of identified biomass installations. There is no requirement to proceed to detailed assessment for any of the identified biomass installations. Concentrations of NO_2 and PM_{10} arising from biomass combustion are not expected to have significant impact on national air quality objectives.

Additional information is required to complete screening assessments for several new biomass installations.

Fugitive or Uncontrolled Sources

No fugitive or uncontrolled sources of emissions likely to be significant in respect of the national air quality objectives have been identified.

6.3 Proposed Actions

Diffusion Tube Monitoring Data

An examination of the long term trend of the diffusion tube data shows that concentrations of NO_2 at some sites have remained well below the national objective for some years. Consequently, monitoring at Stonehaven 1, Peterhead 1 and Peterhead 3 sites ceased at the end of 2015.

At the end of 2015, diffusion tube monitoring also ceased at the Merchant Street 2, Merchant's Quay and Fishmarket sites in Peterhead. These sites were set up in 2014 for a short term survey only and it was considered there was limited merit in continuing monitoring at these locations.

New diffusion tube sites have been set up in 2016 in Peterhead, Inverurie and Inverbervie. These will be reported in the Annual Progress Report 2017.

A further review of diffusion tube monitoring locations will be undertaken at the end of 2016 and discussed in detail in the Annual Progress Report 2017.

Transport Sources

There is limited knowledge regarding traffic speeds, patterns or fleet composition in the town centre locations at Banff, Inverbervie, Inverurie and Oldmeldrum identified in the Updating and Screening Assessment 2015. Although, it is unlikely these locations would meet the definition of congested, there is no evidence to support this. Diffusion tube monitoring has been set up at new sites in Inverurie and Inverbervie during 2016 and will be set up at new sites in Banff and Oldmeldrum during 2017.

Commercial and Domestic Sources

Information is continuing to be sought in respect of those biomass installations where sufficient information has not yet been provided. Screening assessments will be completed, and reported, in due course following receipt of the required information.

Aberdeenshire Council intends to submit an Annual Progress Report in 2017.

Appendices

Appendix A: **Maps of Non-Automatic Monitoring Sites**

Appendix B: **Monitoring Results**

Appendix C: **Supporting Technical Information**

Appendix D: **Biomass Screening Assessments**

Appendix A: Maps of Non-Automatic Monitoring Sites

Map A.1 Settlements in Aberdeenshire where NO_2 Diffusion Tube Monitoring was undertaken during 2014

Map A.2 Location of NO_2 Diffusion Tube Sites (Inverurie)

Map A.3 Location of NO_2 Diffusion Tube Sites (Peterhead)

Map A.4 Location of new NO_2 Diffusion Tubes Sites (Peterhead)

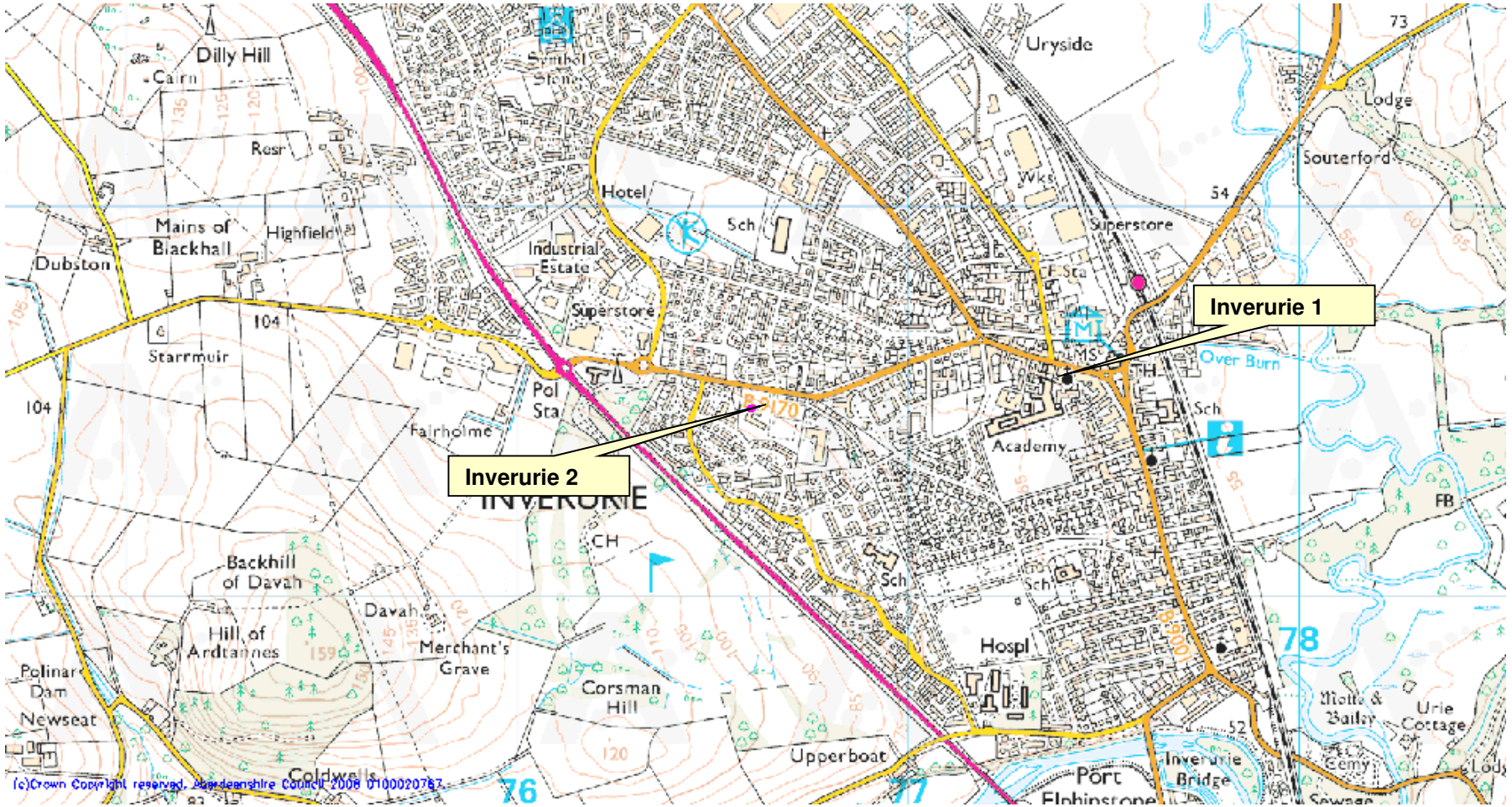
Map A.5 Location of NO_2 Diffusion Tube Sites (Stonehaven)

Map A.6 Location of NO_2 Diffusion Tube Sites (Westhill)

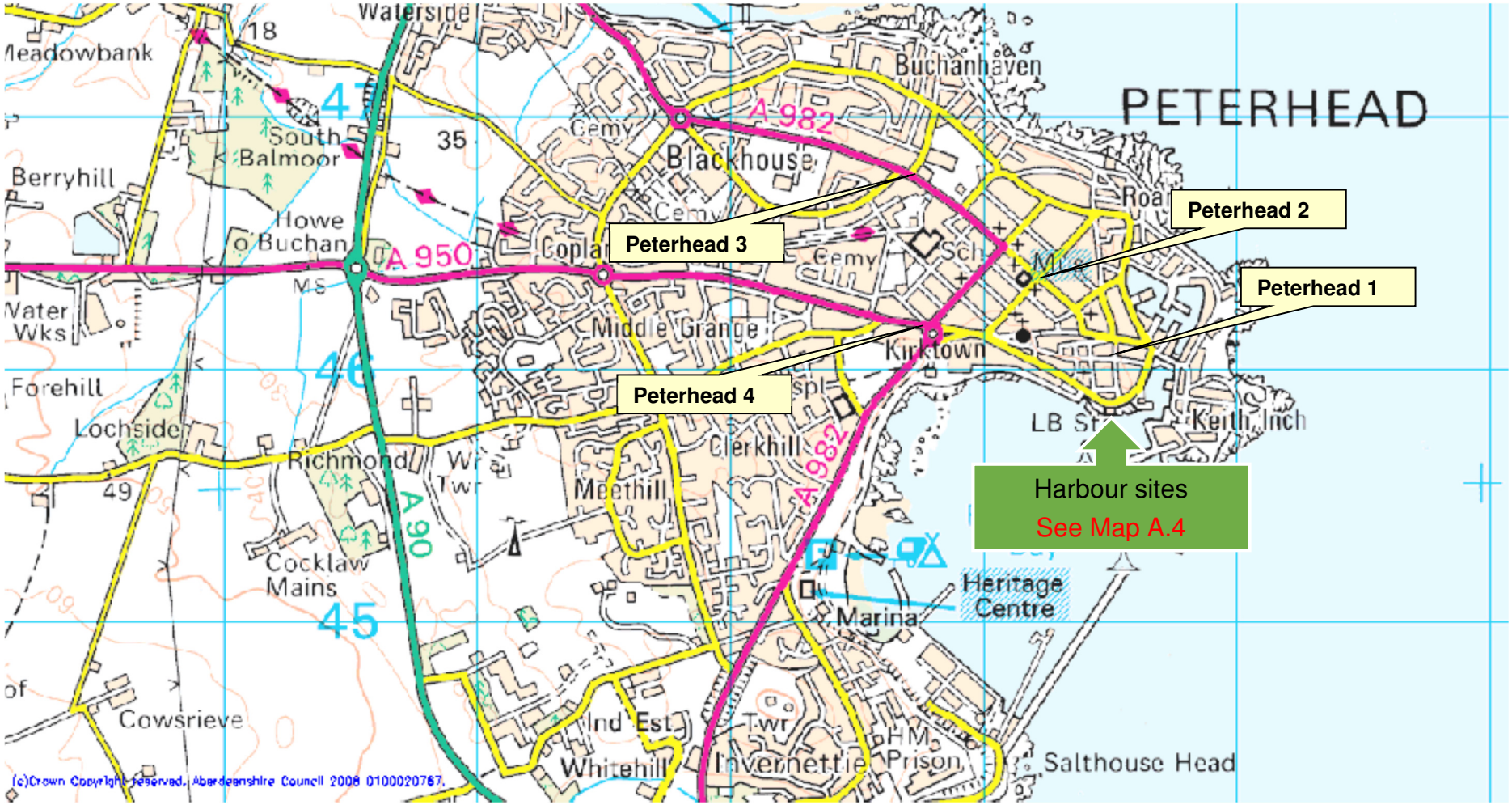
Map A.7 Location of NO_2 Diffusion Tube Sites (Ellon)

Map A.1 Settlements in Aberdeenshire where NO_2 Diffusion Tube Monitoring was undertaken during 2015

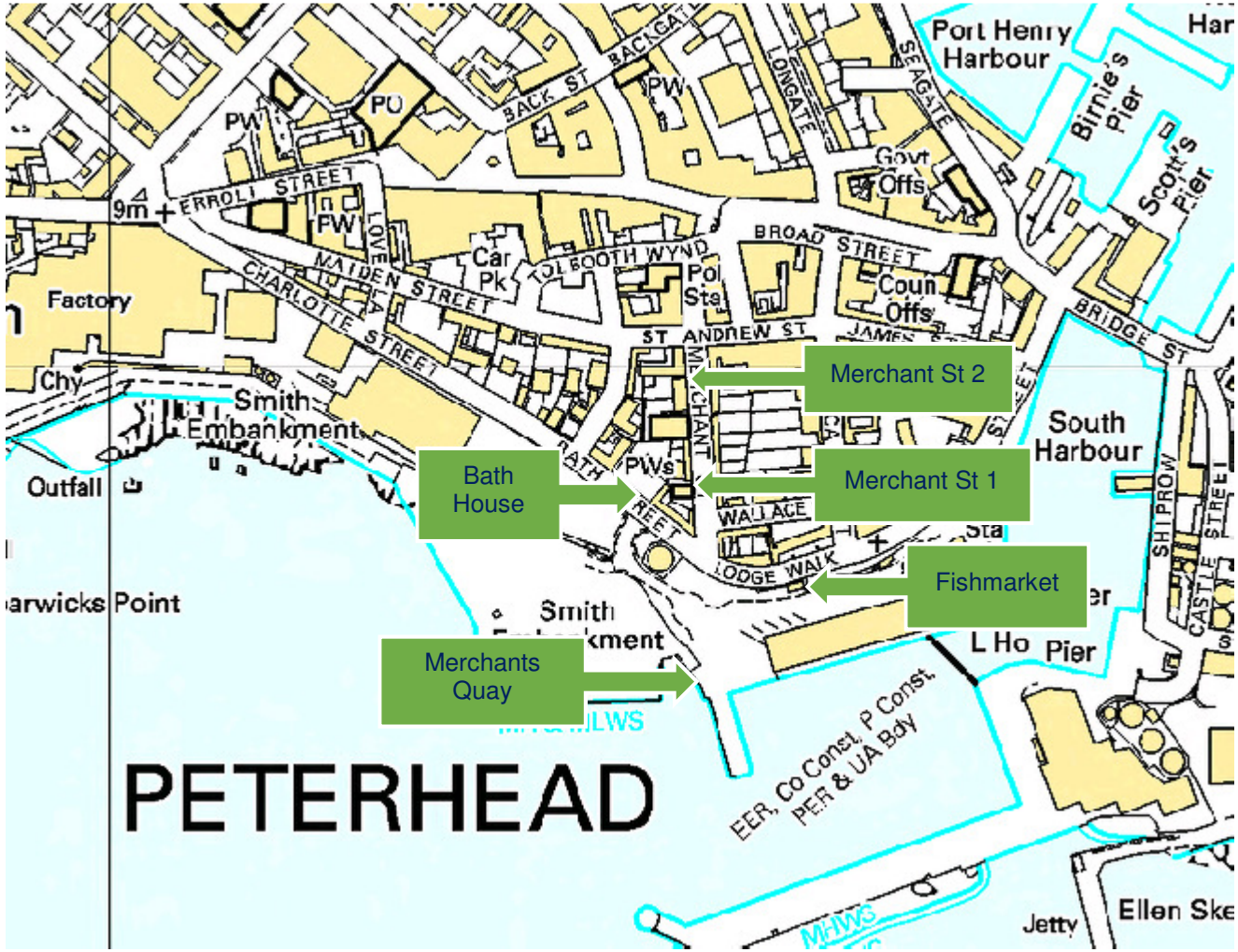
Map A.2 Location of NO_2 Diffusion Tube Sites (Inverurie)



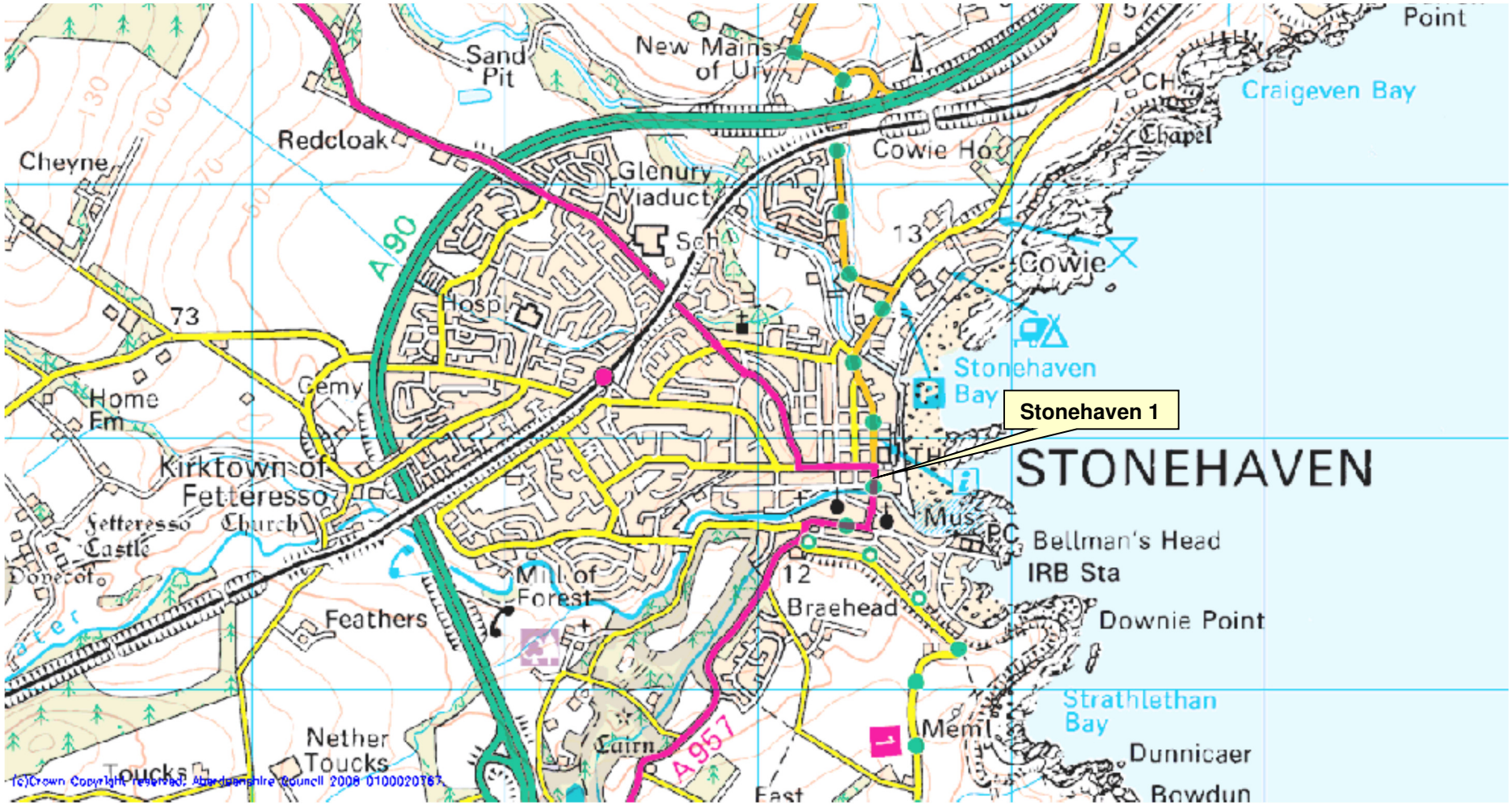
Map A.3 Location of NO_2 Diffusion Tube Sites (Peterhead) (excluding harbour sites)



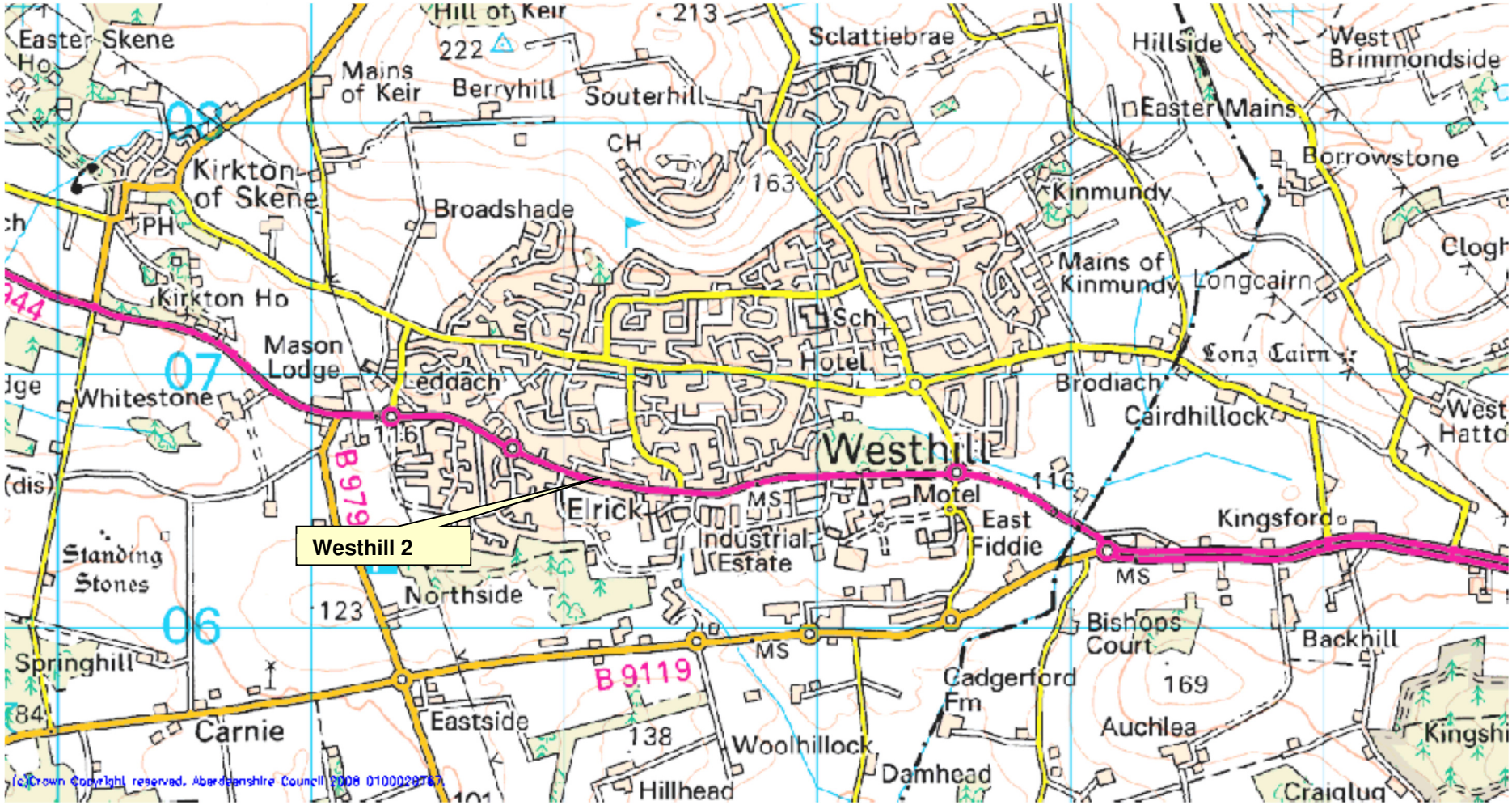
Map A.4 Location of Harbour NO_2 Diffusion Tubes Sites (Peterhead)



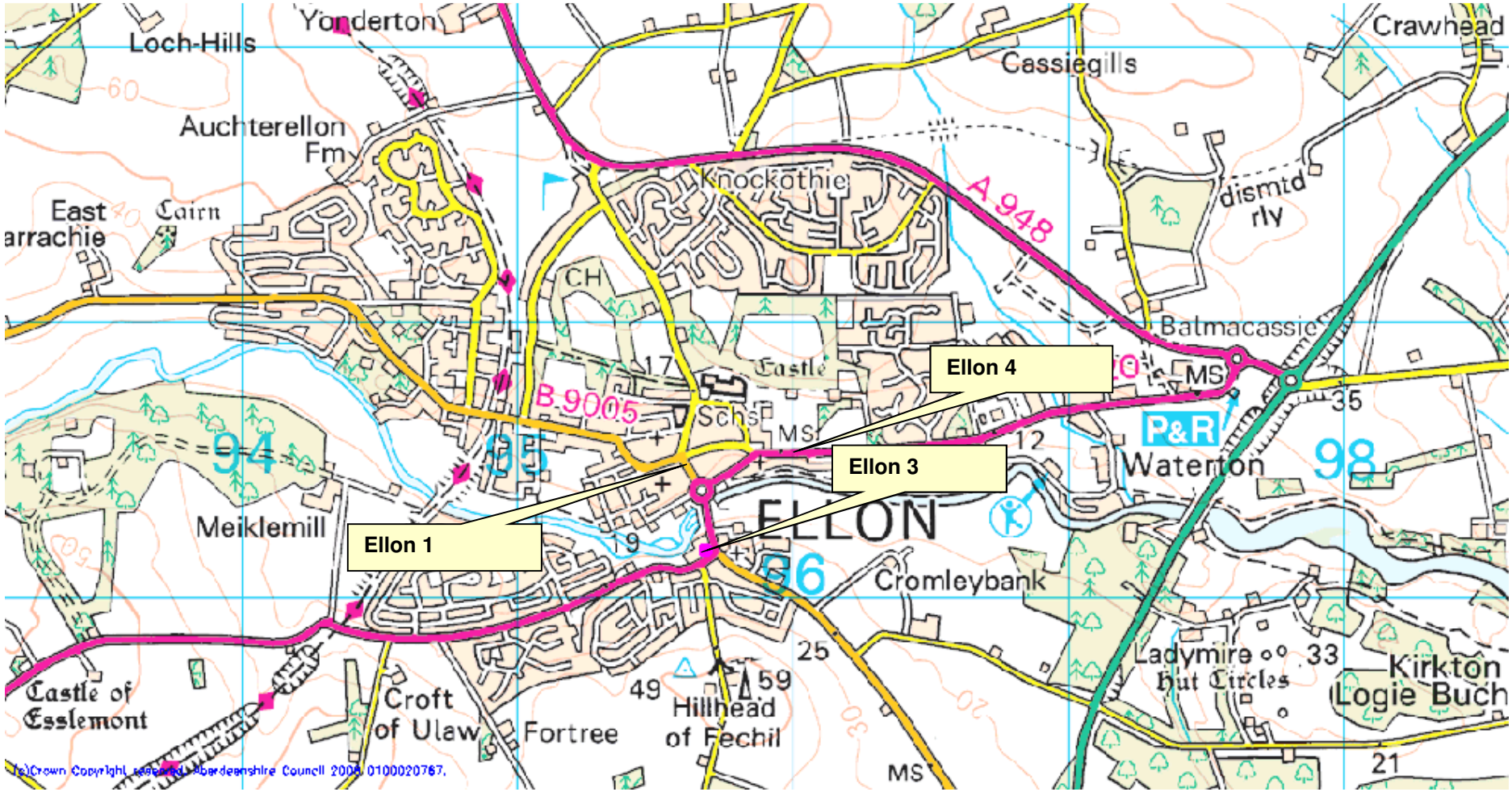
Map A.5 Location of NO_2 Diffusion Tube Sites (Stonehaven)



Map A.6 Location of NO_2 Diffusion Tube Sites (Westhill)



Map A.7 Location of NO_2 Diffusion Tube Sites (Ellon)



Appendix B: Monitoring Results

Table B.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	Kerbside	E 377403 N 821584	NO_2	No	2	< 5m	No
Inverurie 2	Roadside	E 376646 N 821469	NO_2	No	5	< 2m	No
Westhill 2	Kerbside	E 382118 N 806577	NO_2	No	2	< 5m	No
Stonehaven 1	Kerbside	E 387445 N 785823	NO_2	No	2	< 5m	No
Ellon 1	Roadside	E 395604 N 830472	NO_2	No	2	< 5m	No
Ellon 3	Roadside	E 395711 N 830170	NO_2	No	3	< 5m	No
Ellon 4	Roadside	E 395893 N 830509	NO_2	No	2	< 5m	No
Peterhead 1	Kerbside	E 413594 N 846066	NO_2	No	2	< 5m	No
Peterhead 2	Kerbside	E 413209 N 846356	NO_2	No	2	< 5m	No
Peterhead 3	Kerbside	E 412716 N 846734	NO_2	No	2	< 5m	No
Peterhead 4	Kerbside	E 415758 N 846144	NO_2	No	2	< 5m	No
Merchants Quay	Other	E 413422 N 845775	NO_2	No	None	N/A	No
Fishmarket	Other	E 413496 N 845841	NO_2	No	None	N/A	No
Bath House	Roadside	E 413379 N 845906	NO_2	No	10	< 5m	No
Merchant Street 1	Kerbside	E 413420 N 845918	NO_2	No	1	< 5m	No
Merchant Street 2	Kerbside	E 413418 N 845977	NO_2	No	1	< 5m	No

Table B.2 – Annual Mean NO_2 Monitoring Results

Site Name	Monitoring Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2015 (%)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (1)				
				2011	2012	2013	2014	2015
Inverurie 1	Diffusion Tube	92	92	34.8	34.9[a]	33.1	34.9	31.9
Inverurie 2	Diffusion Tube	100	100	9.1	8.9	8.5	11.3	9.4
Westhill 2	Diffusion Tube	92	92	20.9	22.3	22.6	25.1	21.2
Stonehaven 1	Diffusion Tube	83	83	22.4	23.8	21.7	23.1	20.1
Ellon 1	Diffusion Tube	50	50	N/A	N/A	22.6	23.4	20.8[a]
Ellon 3	Diffusion Tube	67	67	N/A	N/A	26.3	26.9	23.9[a]
Ellon 4	Diffusion Tube	67	67	N/A	N/A	21.0	22.1	19.8[a]
Peterhead 1	Diffusion Tube	100	100	23.3	22.1	21.5	24.8	22.4
Peterhead 2	Diffusion Tube	83	83	28.7	29.3	27.5	30.0	28.3
Peterhead 3	Diffusion Tube	100	100	24.3	25.5	21.2	22.4	22.0
Peterhead 4	Diffusion Tube	83	83	25.9	22.4[a]	28.5[a]	25.3	22.5
Merchants Quay	Diffusion Tube	92	92	N/A	N/A	N/A	36.8[a]	29.6
Fishmarket	Diffusion Tube	100	100	N/A	N/A	N/A	38.0[a]	35.4
Bath House	Diffusion Tube	100	100	N/A	N/A	N/A	32.2[a]	31.4
Merchant Street 1	Diffusion Tube	100	100	N/A	N/A	N/A	28.1[a]	28.1
Merchant Street 2	Diffusion Tube	100	100	N/A	N/A	N/A	28.1[a]	24.6

Notes: (1) 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% (marked [a]). See Appendix C for details.

Figure B.1: Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites in Aberdeenshire Towns (excluding Peterhead) 2005-2015

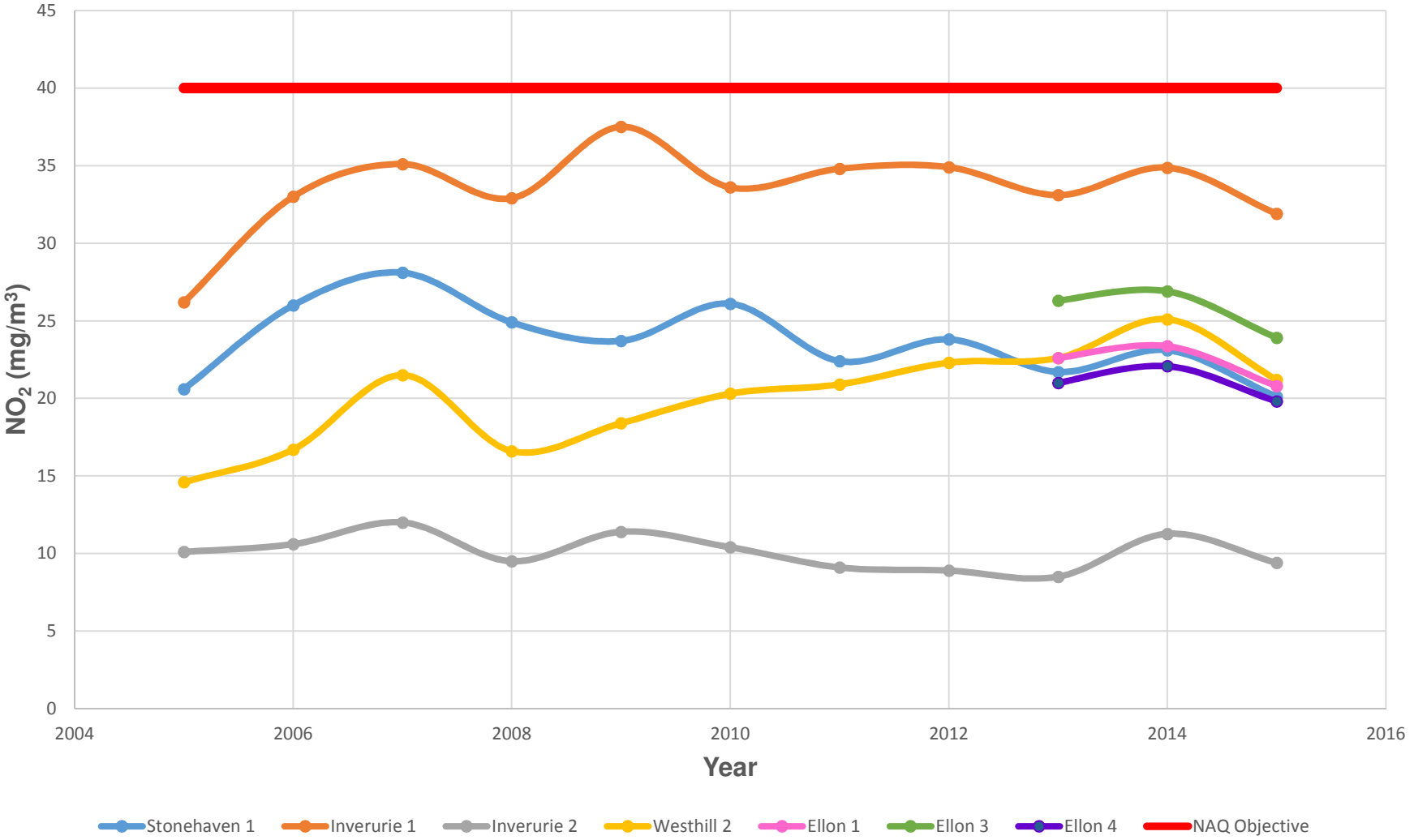


Figure B.2: Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites In Peterhead 2005-2015

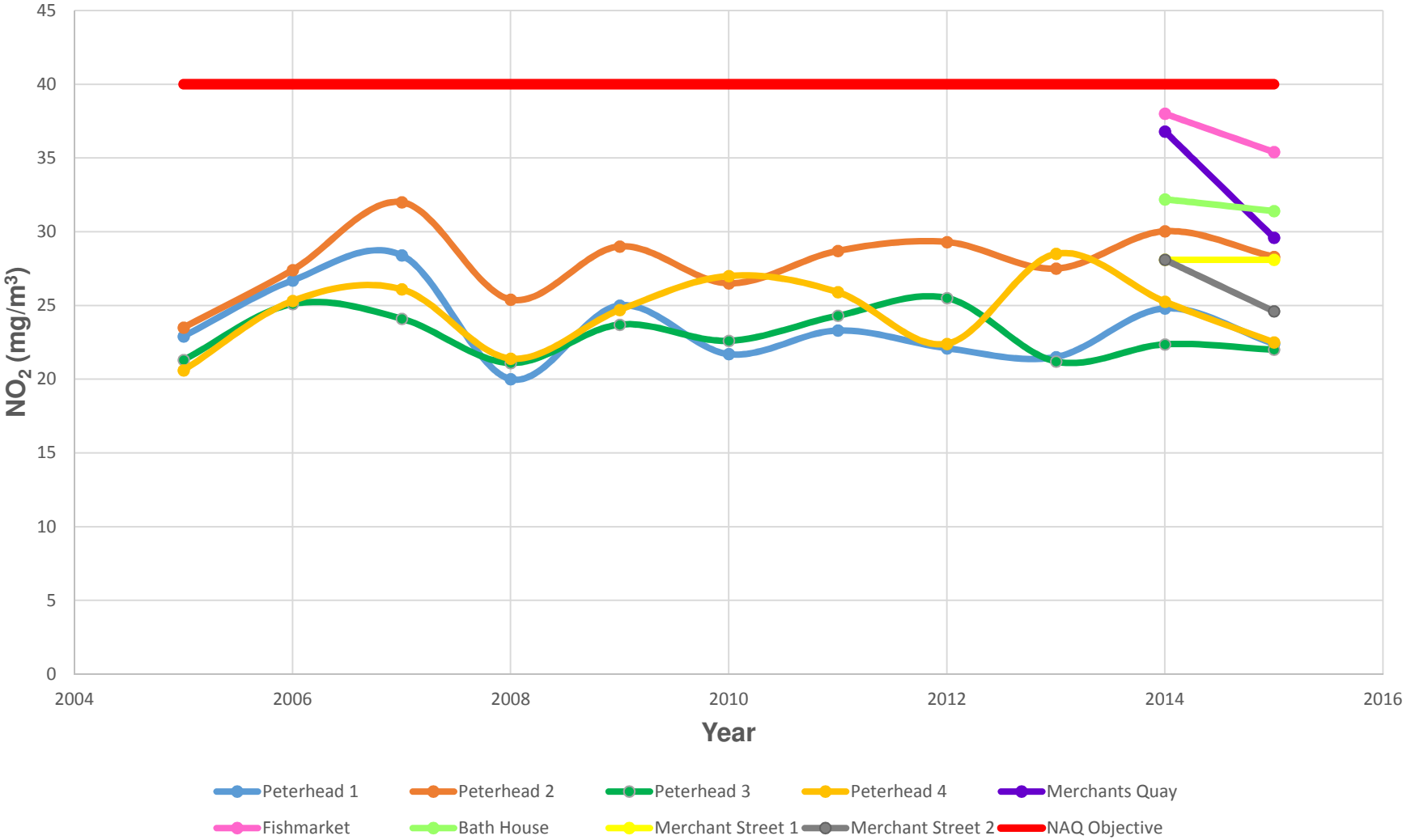


Table B.3 – NO_2 Monthly Diffusion Tube Results for 2015

Site Name	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)
Inverurie 1	48	48	44	32	-	20	26	29	32	44	52	43	38.0	31.9
Inverurie 2	16	15	12	10	8	8	7	7	8	13	17	13	11.2	9.4
Westhill 2	25	26	27	26	22	23	23	23	-	32	30	21	25.3	21.2
Stonehaven 1	18	26	23	24	-	-	22	25	23	28	27	23	23.9	20.1
Ellon 1	27	-	25	-	-	22	15	-	-	29	-	28	24.8(2)	20.8(2)
Ellon 3	31	31	32	-	-	26	23	-	-	31	41	29	28.4(2)	23.9(2)
Ellon 4	24	28	25	-	-	19	19	-	-	27	34	27	23.6(2)	19.8(2)
Peterhead 1	33	30	22	30	19	23	21	31	28	31	28	24	26.7	22.4
Peterhead 2	32	28	38	32	31	-	-	37	33	39	35	32	33.7	28.3
Peterhead 3	32	23	29	29	18	23	21	26	26	32	27	28	26.2	22.0
Peterhead 4	27	25	29	27	19	-	-	23	24	35	29	30	26.8	22.5
Merchants Quay	-	36	31	38	26	32	39	50	32	37	37	29	35.2	29.6
Fishmarket	47	56	39	41	36	33	32	48	42	47	41	44	42.2	35.4
Bath House	43	37	35	37	31	37	36	43	34	42	39	34	37.3	31.4
Merchant Street 1	38	33	32	32	24	29	29	38	31	40	39	36	33.4	28.1
Merchant Street 2	35	29	26	28	21	26	30	35	28	35	31	27	29.3	24.6

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

(2) Data has been annualised. See Appendix C.2 for details of annualisation

Appendix C: Supporting Technical Information

Appendix C.1 Air Quality Monitoring Data QA/QC

Appendix C.2 Short to Long Term Data Adjustments

Appendix C.1: 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 2015 bias adjustment factor for Aberdeen Scientific Services was obtained from the National Diffusion Tube Bias Adjustment Spreadsheet, version 06/16 (available at http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html).

QA/QC of Diffusion Tube Monitoring

The National Diffusion Tube Bias Adjustment Spreadsheet, version 06/16, presents Tube Precision for Aberdeen Scientific Services as **GOOD**.

Aberdeen Scientific Services (Aberdeen City Council) participates in the AIR NO2 PT scheme, and with the exception of AR009 (which achieved a rating of 75% SATISFACTORY) have **100% SATISFACTORY** score during 2015 (AR006-AR007 inclusive and AR010). The 75% rating for AR009 is not thought to be significant to the conclusions of this Annual Progress Report.

Factor from Local Co-location Studies (if available)

Aberdeenshire Council does not undertake any co-location studies.

Appendix C.2: Short to Long Term Data Adjustments

Diffusion Tube Exposure Periods

Aberdeenshire Council follows the Defra recommended exposure calendar for NO_2 diffusion tube monitoring (available at the following link http://laqm.defra.gov.uk/diffusion-tubes/diffusion-tubes.html). Where NO_2 diffusion tubes exposure periods are outwith the recommended +/- 2 days of the due date, results are excluded from the calculation of the annual mean.

Short to Long Term Data Adjustments

Due to missing diffusion tubes, data capture at NO_2 diffusion tubes sites in the town of Ellon was below 75%. It is therefore necessary to annualise the data captured at all 3 Ellon sites as per the advice provided in Box 7.10 of TG16[4].

Aberdeenshire Council does not operate, or have within the local authority boundary, any continuous monitoring sites for NO_2. Data from a continuous background site within the neighbouring local authority (Aberdeen City) has therefore been used in the calculations to annualise the data for the Ellon sites. Data capture at the continuous monitoring Aberdeen City Errol Place site is above 90% for each month during 2015 (data available at http://www.scottishairquality.co.uk/latest/site-info?site_id=ABD&view=statistics).

Month	Aberdeen Errol Place (monthly mean µg/m^3)	Ellon 1 (monthly measured µg/m^3)	Ellon 3 (monthly measured µg/m^3)	Ellon 4 (monthly measured µg/m^3)
January	26	27	31	24
February	33		31	28
March	25	25	32	25
April	24			
May	14			
June	16	22	26	19
July	14	15	23	19
August	19			
September	19			
October	28	29	31	27
November	29		41	34
December	25	28	29	27
Average	22.7	24.3	30.5	25.4

The 2015 annual mean (A_m) of the Aberdeen City Errol Place site is equivalent to the calculated average of 22.7µg/m^3.

The period mean ($P1_m$) of the Aberdeen City Errol Place site when Ellon site 1 has data capture is ((26+33+25+16+14+28+29+25) divided by 8) equal to 22.3µg/m^3.

The period mean ($P2_m$) of the Aberdeen City Errol Place site when Ellon sites 3 and 4 both have data capture is ((26+25+16+14+28+25) divided by 6) equal to 24.5µg/m^3.

	For Ellon Site 1 ($P1_m$)	For Ellon Sites 3 and 4 ($P2_m$)
Annualisation Factor Ratio of Annual Mean to Period Mean (A_m/P_m)	**1.02**	**0.93**

The annualised mean for all 3 sites is calculated as follows:

	Ellon 1	Ellon 3	Ellon 4
Measured period mean concentration (µg/m^3)	24.3	30.5	25.4
Annualisation Factor	1.02	0.93	0.93
Annualised mean concentration (µg/m^3)	24.8	28.4	23.6
Bias Adjustment Factor	0.84	0.84	0.84
Bias Adjusted Annualised Mean Concentration (µg/m^3)	**20.8**	**23.9**	**19.8**

Appendix D: Biomass Screening Assessments

Table D.1 Biomass screening assessments

Table D.1: Biomass screening assessments

Site	Stack height (m)	Stack diameter (m)	Combustion appliance	Thermal Capacity (kW)	Nearest building height (m)	Effective stack height (m)	Estimated emissions (g/s)		Background concentration (ug/m3)		Threshold emission rate (g/s)			Background adjusted emissions (g/s)		
							PM_{10}	NO_2	PM_{10}	NO_2	PM_{10}	NO_2 am	NO_2 1-hr	PM_{10}	NO_2 am	NO_2 1-hr
Tarves Football Club, Tarves (revised stack height)	6.1	0.30	Wood pellet boiler	199	3.5	4.3	0.0024	0.0151	13.4	3.8	0.024	0.191	0.235	0.0001	0.0004	0.0031
Park House, Drumoak	5.5	0.25	Woodchip/ wood pellet boiler	140	4.2	2.2	0.0019	0.0095	13.2	5.2	0.014	0.101	0.132	0.0001	0.0003	0.0020
Buchan Braes Hotel, Boddam	5.4	0.20	Wood pellet boilers	100 (x2)	>5.4	N/A	0.0007	0.0045	Dispersion modelling carried out and accepted							
North Road Industrial Estate, Insch	10.5	0.30	Wood pellet boilers	200 (x4)	8.4	3.5	0.0160	0.0782	12.1	5.2	0.026	0.155	0.198	0.0008	0.0022	0.0165
Cairnfield Farm, Skene	5.5	4.8	Wood pellet boiler	100	4.8	1.2	0.0013	0.0076	12.3	7.6	0.009	0.051	0.087	0.0001	0.0002	0.0017
Hilton Craigendarroch, Ballater	14.5	0.20	Wood pellet boiler	199	13.5	1.7	0.0024	0.0137	9.5	3.7	0.019	0.080	0.106	0.0001	0.0004	0.0028
Wardhead, Kinneff	10	<0.50	CHP (biogas)	400	Screening Assessment undertaken by applicant in accordance with TG(09) and accepted											
Candacraig House, Strathdon	5.5	0.30	Wood chip boiler	350	4.0	2.5	0.0019	0.0205	7.9	2.8	0.035	0.129	0.162	0.0001	0.0006	0.0042
Drumdarroch House, Insch	7.4	0.015	Wood pellet boilers	60 (x3)	>7.4	N/A	0.0009	0.0066	Dispersion modelling carried out and accepted							
Alastrean Care Home, Tarland	9.5	0.35	Wood chip boiler	250 (x2)	6.7	4.6	0.0092	0.0372	9.4	3.4	0.052	0.221	0.280	0.0004	0.0010	0.0077
Thainstone Court, Inverurie	7.9	0.25	Wood pellet boiler	100	7.3	1.0	0.0030	0.0094	13.4	7.3	0.006	0.044	0.082	0.0002	0.0003	0.0020
Harpers Transport, Insch	10.7	0.18	Wood pellet CHP	199	9.7	1.7	0.0008	0.0375	12.1	5.2	0.012	0.073	0.097	0.0000	0.0011	0.0079
Castleton Farm, Fordoun	14.0	0.5	Wood chip boiler	990	12.4	2.7	0.0037	0.0340	14.9	5.1	0.015	0.169	0.250	0.0002	0.0010	0.0072

Palace Hotel, Peterhead	5.5	0.2	Wood pellet boiler	200 (x3)	>5.5	N/A	0.0092	0.0014	Dispersion modelling carried out and accepted							
MacDuff Distillery, Banff	19	0.7	Wood pellet boiler	5000	10.0	15.0	0.2400	1.1950	Dispersion modelling carried out and accepted							
Whittaker Engineering, Stonehaven	13.4	0.35	Wood chip boiler	350 (x2)	12.5	1.5	0.0068	0.0427	13.4	4.8	0.010	0.074	0.102.	0.0004	0.0012	0.0090

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

1 Aberdeenshire Council, Local Transport Strategy 2012, available at https://www.aberdeenshire.gov.uk/media/2374/2012finallts.pdf, January 2012

2 SEPA, Volcanic Ash Emissions Network (BETA), available at http://apps.sepa.org.uk/volcanicemissionsnetwork/Dashboard.aspx?id=LochOfStrathbeg, as viewed August 2016

3 Aberdeenshire Council, *Air Quality Updating and Screening Assessment 2015 for Aberdeenshire Council*, available at https://www.aberdeenshire.gov.uk/environment/environmental-protection/atmospheric-pollution/, July 2015

4 Department for Environment, Food and Rural Affairs: London, *Local Air Quality Management Technical Guidance (TG16)*, April 2016