



# 2017 Air Quality Annual Progress Report for The Moray Council

In fulfilment of Part IV of the  
Environment Act 1995

Local Air Quality Management

August, 2017

**AECOM**

<b>Local Authority Officer</b>	Mr Russell Anderson Environmental Health Officer
<b>Department</b>	Development Services Environmental Services Department
<b>Address</b>	The Moray Council Council Offices High Street Elgin IV30 1BX
<b>Telephone</b>	01343 563463
<b>E-mail</b>	russell.anderson@moray.gov.uk
<b>Report Reference number</b>	MCAPR2017
<b>Date</b>	August 2017

## Executive Summary: Air Quality in Our Area

### Executive Summary

The following Annual Progress Report (APR) was prepared and written by AECOM on behalf of Moray Council in accordance with Local Air Quality Management (LAQM) Technical Guidance (TG) 2016, published by Defra on behalf of the devolved administrations.

### Air Quality in the Moray Council Administrative Area

There are no existing significant air quality issues identified within the Moray Council administrative area. The Council has examined the 2016 air quality monitoring results in its area and concludes that no new Detailed Assessments are required of any pollutant. Atmospheric nitrogen dioxide (NO<sub>2</sub>) is currently the only pollutant of concern within the Moray Council area and is monitored in urban areas via a network of passive diffusion tubes. The average annual mean concentrations of NO<sub>2</sub> within the Moray Council area remain consistently below the Air Quality Standards set by the Scottish Government. In summary the following monitoring statistics are observed;

- A maximum annual mean NO<sub>2</sub> concentration of 28.2 µg/m<sup>3</sup> was monitored at Moss Street, Keith (monitoring site # DT14), well below the Scottish Air Quality Standard of 40 µg/m<sup>3</sup>. This was an increase of just under 3 µg/m<sup>3</sup> from 2015. No specific reason could be established to explain this increase other than the likely change in the traffic situation complemented by weather conditions.
- Annual mean NO<sub>2</sub> concentrations at two out of the 19 monitoring locations show a general improvement in compared to 2015.
- Compared to 2015, 16 out of the 19 sites show a worsening of air quality but five of these recorded a change of less than 1 µg/m<sup>3</sup>.

There are no new major emissions sources within the area and no Air Quality Management Areas (AQMA) were declared in the past year. Other sources of emissions from industry and transport remain unchanged from those reported in the 2015 Annual Progress Report (Ref- 1).

### **Actions to Improve Air Quality**

There are currently no designated AQMAs within the Moray Council area and thus, no planned actions to undertake specific air quality improvement activities.

However, The Local Transport Strategy (Ref- 2) states that schemes will be perceived favourably where they can demonstrate a *“positive impact, particularly in relation to factors such as accessibility, road safety, health, and promotion of a modal shift and associated activities such as walking and cycling.”*

The Moray Council have recently added a 4.5 mile cycle route between Lhanbryde and Elgin to their existing cycle network. The Annual Cycling Report published by Cycling Scotland (Ref- 19) reports that 46% (55% in 2015) of households in Moray have access to bicycles with 1.6% (1.9% in 2015) of the population choosing cycling as their main mode of transport, which is above the national average.

### **Local Priorities and Challenges**

The Moray Council has no specific priorities for the coming year for the improvement of air quality in its area but will continue monitoring NO<sub>2</sub> levels.

### **How to Get Involved**

Members of the public can contribute to improving local air quality by taking alternative modes of transport where possible, becoming part of a cycle to work scheme, walking short distances instead of driving and when driving is unavoidable taking part in car sharing schemes. Drivers are also advised to avoid unnecessary idling and to turn off vehicle engines when parked or stationary for long periods.

If you are interested in obtaining further information regarding air quality within your local area visit the Moray Council website at [www.moray.gov.uk](http://www.moray.gov.uk) and search for “Air Quality”.

The previous LAQM reporting, including the 2015 Updating and Screening Assessment (USA) is available on the Moray Council website at [http://www.moray.gov.uk/moray\\_standard/page\\_1790.html](http://www.moray.gov.uk/moray_standard/page_1790.html)

# Table of Contents

<b>Executive Summary: Air Quality in Our Area</b> .....	<b>i</b>
<b>Executive Summary</b> .....	<b>i</b>
Air Quality in the Moray Council Administrative Area .....	i
Actions to Improve Air Quality .....	ii
How to Get Involved.....	ii
<b>Description of the Local Authority Area</b> .....	<b>1</b>
<b>1. Local Air Quality Management</b> .....	<b>2</b>
<b>2. Actions to Improve Air Quality</b> .....	<b>4</b>
2.1 Air Quality Management Areas.....	4
2.2 Progress and Impact of Measures to address Air Quality in The Moray Council .....	4
2.3 Cleaner Air for Scotland .....	5
2.3.1 Transport – Avoiding travel – T1 .....	5
2.3.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2.....	5
2.3.3 Further air quality actions.....	6
<b>3. Air Quality Monitoring Data and Comparison with Air Quality Objectives</b> .....	<b>7</b>
3.1 Summary of Monitoring Undertaken .....	7
3.1.1 Automatic Monitoring Sites .....	7
3.1.2 Non-Automatic Monitoring Sites.....	7
3.2 Individual pollutants.....	9
3.2.1 Nitrogen Dioxide (NO <sub>2</sub> ).....	9
3.2.2 Particulate Matter (PM <sub>10</sub> ).....	11
3.2.3 Particulate Matter (PM <sub>2.5</sub> ) .....	11
3.2.4 Sulphur Dioxide (SO <sub>2</sub> ) .....	12
3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene .....	12
<b>4. New Local Developments</b> .....	<b>13</b>
4.1 Road Traffic Sources.....	14
4.1.1 Narrow Congested Streets with Residential Properties Close to the Kerb .....	17
4.1.2 Busy Streets Where People May Spend 1-Hour or More Close to Traffic.....	17
4.1.3 Roads with a High Flow of Buses and/or Heavy Goods Vehicles (HGV's) .....	17
4.1.4 Junctions .....	17
4.1.5 New Roads Constructed or Proposed .....	17
4.1.6 Roads with Significantly Changed Traffic Flows .....	17
4.1.7 Bus or Coach Stations .....	17
4.2 Other Traffic Sources .....	17

4.2.1	Airports .....	17
4.2.2	Railways (Diesel and Steam Trains) .....	18
4.2.3	Ports (Shipping) .....	18
4.3	Industrial Sources.....	18
4.3.1	Industrial installations: New or proposed with air quality assessments .....	19
4.3.2	Industrial installations: Where emission have increased or exposure has been introduced.....	19
4.3.3	Industrial installations: New or significantly changed with no previous air quality assessment .....	19
4.3.4	Major fuel storage depots storing petrol.....	19
4.3.5	Petrol stations.....	20
4.3.6	Poultry Farms .....	20
4.4	Commercial and Domestic Sources .....	20
4.4.1	Biomass Combustion Plants – Individual Installations.....	20
4.4.2	Biomass Combustion Plants – Combined Sources .....	20
4.4.3	Domestic Solid Fuel Burning.....	21
4.4.4	Combined heat and power (CHP) plant .....	21
4.5	New Developments with Fugitive or Uncontrolled Sources.....	21
<b>5.</b>	<b>Planning Applications .....</b>	<b>21</b>
<b>6.</b>	<b>Conclusions and Proposed Actions.....</b>	<b>22</b>
6.1	Conclusions from New Monitoring Data.....	22
6.2	Conclusions relating to New Local Developments .....	22
6.3	Proposed Actions .....	22
	<b>Appendix A: Monitoring Results .....</b>	<b>23</b>
	<b>Appendix B: Full Monthly Diffusion Tube Results for 2016.....</b>	<b>33</b>
	<b>Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC .....</b>	<b>34</b>
	<b>Appendix D: Traffic Monitoring Locations within Moray .....</b>	<b>36</b>
	<b>Glossary of Terms .....</b>	<b>41</b>
	<b>References .....</b>	<b>42</b>

**List of Tables**

Table 1 – Summary of Air Quality Objectives in Scotland.....2  
 Table 2 - Summary of Council Operated Traffic Counts Elgin 2012-2016.....14  
 Table 3 - Summary of Trunk Road Traffic Count Data for A95 & A96 2012-2016.....15  
 Table 4 - Details of Non-Automatic Monitoring Sites .....23  
 Table 5 - Annual Mean NO<sub>2</sub> Monitoring Results .....24  
 Table 6 - NO<sub>2</sub> Monthly Diffusion Tube Results for 2016 .....33  
 Table 7 - Aberdeen Scientific Services Laboratory Results in LGC Standards Proficiency Testing Scheme .....35  
 Table 8 - Biomass Installations in the Moray Council Area.....39

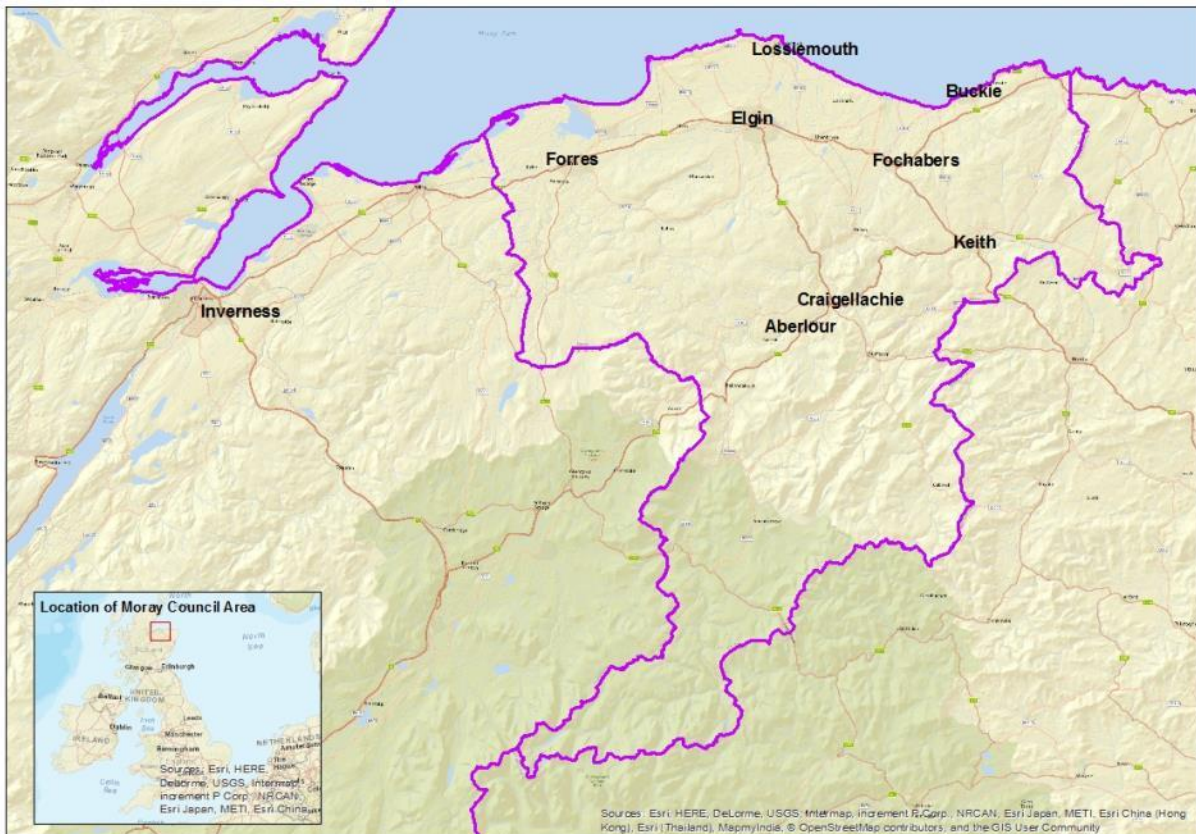
**List of Figures**

Figure 1 - Extent of Moray Council Administrative Area .....1  
 Figure 2 - Map of Non-Automatic Monitoring Sites .....9  
 Figure 3 - Trends in Annual Mean Nitrogen dioxide Concentrations Measured at Diffusion Tube Monitoring Sites (the red line indicates the national Air Quality Objective value) .....26  
 Figure 4 - Elgin NO<sub>2</sub> Monitoring Sites.....27  
 Figure 5 - Fochabers NO<sub>2</sub> Monitoring Sites .....28  
 Figure 6 - Forres NO<sub>2</sub> Monitoring Sites .....29  
 Figure 7 - Keith NO<sub>2</sub> Monitoring Sites .....30  
 Figure 8 - Lossiemouth NO<sub>2</sub> Monitoring Sites .....31  
 Figure 9 - Rothes NO<sub>2</sub> Monitoring Sites .....32  
 Figure 10 – Moray Council Traffic Monitoring Locations.....36  
 Figure 11 - Transport Scotland Traffic Monitoring Locations Appendix E: Details of Biomass Installations within the Moray Council Area .....37  
 Figure 12- Location Map of Biomass Installations in Moray: 33 installations.....38

## Description of the Local Authority Area

The Moray Council area is located in the north-east of Scotland between the main cities of Inverness and Aberdeen. It is bordered by The Highland Council area to the west and by Aberdeenshire Council to the south and east. The northern border of the Moray Council area is the coastline of the Moray Firth.

The extent of the Moray Council administrative area is shown in Figure 1.



**Figure 1 - Extent of Moray Council Administrative Area**

Topographically, the area is dominated by the Glens of the Grampian Mountain Range including large areas of forest and moorland to the south. The northern area is relatively flat with large expanses of agricultural land and coastal grassland.

The population of the Moray Council area is approximately 95,510 (as of 2015) with the majority of residents living in the towns of Elgin, Forres, Fochabers, Keith, Buckie, Aberlour and Lossiemouth. The main industries are distilling, food processing and traditional farming, forestry and fishing. The former RAF base in Kinloss is now an army barracks with minimal flight movements while RAF Lossiemouth site is still operational as a Typhoon flight centre.



There is a mainline passenger rail route passing through the north of the area that runs between Inverness and Aberdeen and the main Trunk Roads are the A96, part of which forms the Fochabers and Mosstodloch bypass, which passes through Elgin, and the A95 which passes through Keith, Craigellachie and Aberlour.

## 1. Local Air Quality Management

This report provides an overview of air quality in Moray 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 (Table 1). 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 Moray Council to improve air quality and any progress that has been made.

**Table 1 – Summary of Air Quality Objectives in Scotland**

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide (NO <sub>2</sub> )	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m <sup>3</sup>	Annual mean	31.12.2005
Particulate Matter (PM <sub>10</sub> )	50 µg/m <sup>3</sup> , not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 µg/m <sup>3</sup>	Annual mean	31.12.2010
Particulate Matter (PM <sub>2.5</sub> )	10 µg/m <sup>3</sup>	Annual mean	31.12.2020
Sulphur dioxide (SO <sub>2</sub> )	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25 µg/m <sup>3</sup>	Running annual mean	31.12.2010

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
<b>1,3 Butadiene</b>	2.25 µg/m <sup>3</sup>	Running annual mean	31.12.2003
<b>Carbon Monoxide</b>	10.0 mg/m <sup>3</sup>	Running 8-Hour mean	31.12.2003
<b>Lead</b>	0.25 µg/m <sup>3</sup>	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.

The Moray Council currently has not been required to declare any AQMA's within its area and as a result no AQAP, Air Quality Strategy (AQS) or similar documentation is necessary.

### **2.2 Progress and Impact of Measures to address Air Quality in the Moray Council area**

The signing of the Climate Change (Scotland) Bill in 2009 introduced an interim target of achieving a 42% reduction in Scottish carbon dioxide (CO<sub>2</sub>) emissions by 2020 and a national target of 80% reduction in CO<sub>2</sub> emissions by 2050. As a Scottish local authority, Moray Council can contribute to achieving these targets by introducing schemes to further improve air quality within the Council's area.

Current air quality within the Moray Council area is considered to be good, with air pollutant concentrations well below the standard air quality objectives set by the Scottish Government (Table 1). As a result there have been no Council led schemes explicitly dedicated to improving local air quality. With not having to declare any AQMA's within its area, Moray Council has not had to publish an Air Quality Action Plan and has no planned actions designed explicitly to improve local air quality.

The Moray Council Local Transport Strategy (Ref- 2) highlights one Strategic Environmental Assessment (SEA) Objective in relation to air quality:

*“To protect and enhance the quality of local air quality in Moray and to ensure that emissions are below National Air Quality Standards and thus air quality objectives are met.”*

The Moray Council made a number of comments outlining how the Transport Strategy is designed to address this objective, stating:

- *“Whilst recognising the peripheral nature of Moray and the higher reliance on private car ownership, the Strategy highlights the importance of modal shift through a number of objectives, sub objectives and actions. These components/commitments of the Strategy will contribute to the government’s target to reduce Greenhouse Gas emissions by 80% by 2050 from a 1990 baseline” ;*
- *“The strategy includes commitments relative to rail freight and improved facilities at ports and harbours to reduce the level of road transport across the region.” ; and*
- *“Further detailed assessment of individual schemes may be required where these involve significant new infrastructure or upgrades in close proximity to sensitive receptors.”*

### **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 <http://www.gov.scot/Publications/2015/11/5671/17>. Progress by Moray 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, possibly linked to a carbon management plan, which is consistent with any local air quality action plan. Moray Council produced a travel plan in 2009 which was then updated in 2012 appraising the existing conditions of accessibility to its offices and providing site specific recommendations on how sustainable accessibility might be improved upon (Ref- 5).

#### **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 to ensure that air quality considerations are covered. Moray Council produced a Climate Change Action Plan in 2011 (Ref- 6). Although not explicit the Council had introduced initiatives which would benefit air

quality. For example, promoting low carbon vehicles and reducing emissions associated with staff travel and fleet journeys. All new diesel vehicles at that time were Euro V/5 compliant. Also upgrading of the fleet was being considered to improve overall efficiencies in terms of fuel consumption, emissions and maintenance. Clearly, whilst these initiatives have a reducing effect on carbon and emissions the impact on air quality would not be as significant. The commitment behind this document, and the initiatives included therein, has been revisited with the development of the North East Scotland Sustainable Energy Action Plan for Moray, Aberdeenshire, Aberdeen City and Angus Councils. The adoption of this Plan by Moray Council has been delayed due to the Local Elections in June but this is due to happen in the autumn.

### **2.3.3 Further air quality actions**

There are no additional actions geared specifically to improving air quality. Actions to promote low carbon futures will however have a positive effect on reducing air quality emissions across a variety of sources including:

- Energy efficiency
- Renewable electricity generation
- Low-carbon heat
- Transport
- Waste
- Land use change

In particular, Moray Council is committed to a number of air quality relevant climate changing targets such as TMC005/7 (reducing staff travel), TMC006/11 (fleet emissions) and TMC003 (sustainable development and renewable energy) (Ref- 6).

### 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.

Note there are no automatic monitoring sites operated by Moray Council.

##### 3.1.2 Non-Automatic Monitoring Sites

The Moray Council undertook non-automatic monitoring of NO<sub>2</sub> at 19 locations during 2016 using passive diffusion tubes.



Figure 2 show locations of all the sites, whilst Table 4 (Appendix A) provides further details of the monitoring locations. Maps showing the detailed locations of the monitoring sites are provided in Figure 4 to Figure 9 (Appendix A). The sites are classified as a mixture of kerbside, roadside and urban background sites.

The tubes are provided and analysed by Aberdeen Scientific Services Laboratory (ASSL) using 20% TEA in Acetone and are changed on a monthly basis by Moray Council personnel.

There was 100% data capture from 17 of the 19 locations and the others were above 90%. However, several monitoring periods recorded values that were below the Limit of Detection (LoD, shown as  $<5 \mu\text{g}/\text{m}^3$  in Table 6 (Appendix B) notably DT4, 12, 16 and 17. There is no reference to any specific low limit of detection in LAQM-TG16 or guidance offered on this subject by the LAQM helpdesk. The only issue perhaps is that diffusion tubes perform less well at low concentrations and that data should therefore be removed from the analysis and an alternative method applied such as using a background site to estimate an alternative concentration for those questionable periods. However, the very low monthly values recorded in 2016 in the Moray data are in most cases consistent with that particular location (year on year) which suggests that tubes are in fact observing as might be expected. Therefore, where these low values were observed the concentration was assumed to be  $5 \mu\text{g}/\text{m}^3$  thus adopting a moderate approach with respect to annual mean concentrations.

Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for diffusion tubes are included in Appendix C: Supporting Technical Information. AQ/QC.



Figure 2 - Map of Non-Automatic Monitoring Sites

### 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<sub>2</sub>)

Table 5 (Appendix A) compares the adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>.

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Table 6 (Appendix B). All monitoring applies a single diffusion tube at each location<sup>1</sup>.

A trend graph is shown in Appendix A, which illustrates that across the diffusion tube network there is a general downward trend in annual mean NO<sub>2</sub> concentrations from 2012 to 2014. From 2014 concentrations have tended to increase slightly. However,

<sup>1</sup> In some cases tubes are deployed as duplicates or even triplicates as a means of improving the robustness of observed results



the annual mean was lower in 2016 at 13 out of 17<sup>2</sup> sites compared to 2012. The following points are noted for year 2016:

- The highest annual mean NO<sub>2</sub> recorded was 28.2 µg/m<sup>-3</sup> at 106 Moss Street, Keith (DT14), and this was an increase of 3 µg/m<sup>-3</sup> compared to 2015. Equally DT15 on the opposite side of the road increased by over 4 µg/m<sup>-3</sup> (although this monitoring site is located at kerbside and so slightly nearer to vehicle emissions). No specific reason could be established to explain this increase other than the likely change in the traffic situation complemented by weather conditions.
- The lowest annual mean NO<sub>2</sub> recorded was 4.9 µg/m<sup>3</sup> at Sunndach George Street, Focahabers (DT12).
- Compared to 2015, one site remained the same, two sites showed an improvement in air quality and 16 sites showed a worsening of air quality. However of these 16 sites, five recorded a change of less than 1 µg/m<sup>3</sup>.
- The annual mean NO<sub>2</sub> at 26-28 Priory Place, Elgin (DT4) includes a November reading of 37µg/m<sup>3</sup> compared to a reading of 17 µg/m<sup>3</sup> for October. This appears to be out of character with the other eleven months and other sites in Elgin and further afield. That said, the Newmill Road site, Elgin (DT8) recorded a 58% increase in the NO<sub>2</sub> annual mean (19 µg/m<sup>3</sup> to 30 µg/m<sup>3</sup>). The average increase in the NO<sub>2</sub> annual mean was 32% between October and November. Concentrations may have been exacerbated by low dispersion weather conditions.
- The annual mean remains well below the objective of 40 µg/m<sup>3</sup> at all monitoring locations, therefore there is no need to proceed to a Detailed Assessment.

---

<sup>2</sup> Two sites (DT9 and DT10) were not operating in 2012

### 3.2.2 Particulate Matter (PM<sub>10</sub>)

The Moray Council does not undertake monitoring for PM<sub>10</sub> and does not expect PM<sub>10</sub> concentrations to exceed air quality objectives. A review of PM<sub>10</sub> data available from the Automatic Urban Rural Monitoring Network (AURN) (Ref- 9) in Aberdeen to the east and Inverness to the west show that for the Moray Council administrative area the concentration is likely to be low. The 2016 annual average for Aberdeen was 11.7 µg/m<sup>3</sup> and for Inverness 8.6 µg/m<sup>3</sup>. Given that these are both sites close to urban development the likelihood of concentrations differing markedly to these levels in the Moray administration area will be low. These concentrations are well below the standards set out in the AQS(S) (Table 1).

### 3.2.3 Particulate Matter (PM<sub>2.5</sub>)

There is no monitoring undertaken by Moray Council for PM<sub>2.5</sub>.

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

The main sources of anthropogenic PM<sub>2.5</sub> in the region are road traffic emissions (comprising engine exhaust, road and tyre/brake abrasion), although there are also a number of construction and mineral extraction and industrial processes.

Annual average background pollutant concentration estimates have been sourced from Defra's 2011 based background maps for 2015 (Ref- 17) for PM<sub>2.5</sub> over the study area. The value for estimated background pollutant concentrations do not use Scotland specific data to estimate future atmospheric pollutant background concentrations, instead using data sources UK wide, and thus predicted background concentrations may not be as accurate as those sourced for NO<sub>2</sub> and PM<sub>10</sub>.

The average modelled background concentration<sup>3</sup> of PM<sub>2.5</sub> for the Moray Council area is 5.7 µg/m<sup>3</sup> predicted over an agricultural area to the northeast of the village of Mosstodloch, with a maximum concentration of 7.4 µg/m<sup>3</sup> which is below the PM<sub>2.5</sub> target value of 10 µg/m<sup>3</sup> to be achieved by 2020.

---

<sup>3</sup> Estimated Background Air Pollution Maps (base year 2013), downloaded from <http://uk-air.defra.gov.uk/data/laqm-background-home>. Total annual mean concentrations based on 1 km x 1 km grid squares are provided. For further information please refer to the LAQM Support Helpdesk at <http://laqm.defra.gov.uk/helpdesks.html>. XY Grid coordinates - 333500:861500

The Scottish Government aims to establish a PM<sub>2.5</sub> monitoring network as part of the Cleaner Air for Scotland Strategy (Ref- 10). The Moray Council has no plans in place to install any such monitoring over the coming year.

### **3.2.4 Sulphur Dioxide (SO<sub>2</sub>)**

Sulphur dioxide is not monitored within the Moray Council area. It is not expected that existing SO<sub>2</sub> emissions will cause SO<sub>2</sub> objectives to be exceeded.

### **3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene**

There is no monitoring for carbon monoxide, lead or 1,3-Butadiene within the Moray Council area. It is not expected that existing emissions of carbon monoxide, lead or 1,3-Butadiene will exceed AQS(S) objectives

#### 4. New Local Developments

Two planning applications were received by Moray Council in 2016 which involved having to produce an air quality assessment, namely Blairs Home Farm, Forres and Phase 1 of the Elgin LONG2 South masterplan.

For Blairs Home Farm, the assessment report concluded there would be no significant air quality impact as a result of developing a biomass installation.

Phase 1 of the new large development around the southern edge of Elgin (ref- 20) has been approved by Moray Council and is set to comprise 870 houses, two primary schools, a sports centre and a range of retail and community facilities. Future development of the overall Elgin south masterplan (Ref- 11) will take the form of three linked villages and is due to take place over the next 30 years. A development of this magnitude has the potential to impact on local air quality and Moray Council has confirmed that further air quality assessments will be required for future applications related to this development.

With respect to Phase 1, the air quality assessment (ref- 12) indicated that the proposed development will have a negligible effect on local air quality during both the construction and operational phases. Mitigation measures suitable for a high risk site will be implemented during the construction phase to limit the impact of dust soiling and exposure to fine and very fine particles (PM<sub>10</sub> and PM<sub>2.5</sub>). The effects of traffic movements associated with the operation of the proposed development were predicted to be negligible for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>.

#### 4.1 Road Traffic Sources

A review of traffic data was undertaken in order to establish if there were any significant changes to traffic flow since 2015 that could impact on air quality. The Moray Council Transportation Section was consulted to obtain automatic traffic count information for Council operated sites in and around Elgin for 2016 (as this is an area where development is being proposed). The Moray Council operates 13 traffic counters at locations within Elgin and a map showing these count locations is shown in Appendix D.

The data returned for 2012-2016 are summarised in Table 2 and shows increases in the annual average daily traffic at 8 of 11 traffic count locations operational during 2015 to 2016 and reductions at 3 locations. There are no sites however with sufficient increases in traffic flow that would require a screening assessment to gauge the likely impact on air quality (Ref- 13).

**Table 2 - Summary of Council Operated Traffic Counts Elgin 2012-2016**

ID	Description	Annual Average Daily Traffic (AADT)					% Change 2014-2015	% Change 2015-2016
		2012	2013	2014	2015	2016		
1	Linkwood Road	8,600	8,946	8,257	9,235	9,666	12.9	4.7
2	Maisondieu Road	7,938	8,016	7,975	8,386	8,208	5.2	-2.1
3	Newmill Road	-	-	-	-	10435	-	-
4	Reiket Lane	7,377	7,885	8,011	8,799	9,524	9.8	8.2
5	Thornhill Drive	5,787	6,833	6,866	6,851	6,586	-0.2	-3.9
6	Wittet Drive	3,593	3,712	3,772	3,941	4,127	4.5	4.7
7	A941 Hay Street	12,998	12,741	13,100	13,271	13,522	1.3	1.9
8	A941 North Street	15,307	-	-	-	15190	-	-
9	A941 Main Street	10,718	10,680	10,824	10,652	11273	-1.6	5.8
10	A941 Bridge over Railway	20,252	19,348	19,852	19,203	21365	-3.3	11.3
11	Edgar Road	8,220	8,901	9,140	9,758	9284*	6.8	-4.9
12	Thornhill Road Shops	3,061	3,245	3,373	3,615	3773	7.2	4.4
13	Glenmoray Drive	4340	5,163	4,644	4,856	5173	4.6	6.5

\* No data Apr-July inclusive

In terms of trends, the rate of traffic flow at 6 out of 11 sites declined and 5 increased compared to the previous year. Two of the sites (i.e. Maisondieu Road and Edgar Road) saw increased rates in 2015 and a decrease in 2016. This variation in traffic on the whole does not raise any specific concerns when compared to monitoring

results. The concentrations are well below the AQS(S) objectives, resulting in no unacceptably high exposure in the local area.

The highest traffic flow was recorded on the A941 bridge over the railway (Site 10). The traffic flow here had risen by 11.3% from 2015 making it the highest rate of change at all locations. The NO<sub>2</sub> monitoring sites DT5 and DT7 which are the closest to provide an indication as to the air quality impact of these traffic flows showed increases in the adjusted NO<sub>2</sub> annual mean concentrations (i.e. 15.6 µg/m<sup>3</sup> - 17.9 µg/m<sup>3</sup> and 8.2 µg/m<sup>3</sup> – 10.0 µg/m<sup>3</sup>). This is not cause for concern given that these concentrations are below the annual mean NO<sub>2</sub> Scottish air quality objective of 40 µg/m<sup>3</sup>.

There was a 5.8% increase in the traffic on A941 Main Street (Site 9) which is worth specific attention as it is the nearest to ongoing plans for development along the southern perimeter of Elgin. This road will clearly be an important link road for new residents accessing the town centre. There is currently no air quality monitoring adjacent to this traffic count site and Moray Council will consider this as an option for additional monitoring in the future.

Similarly, Reiket Lane has seen traffic flows increasing year on year from 2012. There is currently no air quality monitoring on Reiket Lane and the review of the monitoring campaign will also consider introducing a new site at a relevant location there. It will also be important to consider whether the new development to the south of Elgin will impact on traffic flows along Reiket Lane.

Transport Scotland was consulted in order to obtain automatic traffic count data for 2016 for the main routes through the Moray Council area, the trunk roads A95 and A96 and the data for 2012-16 is summarised in Table 3 for years 2012 to 2016, with a map of the locations shown in Appendix D.

**Table 3 - Summary of Trunk Road Traffic Count Data for A95 & A96 2012-2016**

Counter ID	Description	Annual Average Daily Traffic (AADT)						% Change 2014-2015	% Change 2015-2016
		2012	2013	2014	2015	2016	2016 months captured		
JTC08238	A98 Fochabers	No Data	6,528	No Data	6,861	7058	8	No Data	3%
ATCNE014	A96 Forres to Elgin	11,054	11,309	No Data	No Data	13053	3	No Data	No Data

## The Moray Council

Counter ID	Description	Annual Average Daily Traffic (AADT)						% Change 2014-2015	% Change 2015-2016
		2012	2013	2014	2015	2016	2016 months captured		
ATCNE006	A96 Elgin to Lhanbryde	16,211	16,408	15,657	15,987	17789	8	2.1	11%
ATCNE003	A95 Dowans Brae	2,773	2,757	2,732	2,793	3015	10	2.2	8%
ATC02040	A96 Elgin Town Centre	16,525	17,271	16,414	16,772	16495	12	2.2	-2%
ATC02038	A96 Forres	11,376	11,641	No Data	No Data	13049	6	No Data	No Data
ATC02037	A96 Mosstodloch	1,436	14,016	No Data	No Data	No Data	No Data	No Data	No Data
ATC02036	A96 North of Keith	6,341	6,287	6,886	7,203	No Data*	5	4.6	No Data
ATC02028	A95 West of Keith	1,794	2,005	1,626	No Data	No Data	No Data	No Data	No Data
ATC00022	A96 Elgin - East Road	21,981	22,853	22,685	No Data	22467	9	No Data	No Data
ATC00021	A96 Elgin - Alexandra Road	21,290	22,789	20,744	No Data	21098	12	No Data	No Data
ATC00020	A96 Elgin - High Street West	12,849	13,454	12,703	13,161	13227	12	3.6	1%
ATC00019	A96 Elgin - West Road	14,791	13,494	15,871	16,413	16323	12	3.4	-1%
126400	A96 Forres (aka Brodie) (Core 744)	9,881	10,714	10,244	10,717	10962	11	3.5	2%
126401	A96 Brodie (WiM)	9,856	10,694	10,354	10,651	8829	11	4	-17%
109502	A95 Ballindalloch (Core 905)	2,096	2,197	No Data	1,770	2342	9	-	32%

The traffic data indicates little change on the A95 with annual average daily traffic being relatively low (e.g. AADT<=3000). Equally there are no areas of material air quality concern on the A96 which would trigger criteria described in the following sections. The 17% reduction in AADT on the A96 Brodie section will be studied further for the 2018 Annual Progress Report. Moray Council recognises the value in continuing to track this data across the region in order to respond to potential air quality concerns.

#### **4.1.1 Narrow Congested Streets with Residential Properties Close to the Kerb**

There are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

#### **4.1.2 Busy Streets Where People May Spend 1-Hour or More Close to Traffic**

There are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

#### **4.1.3 Roads with a High Flow of Buses and/or Heavy Goods Vehicles (HGV's)**

There are no new/newly identified roads with 2,500 heavy duty vehicles (HDVs) per day with exposure within 10 metres from the kerb.

#### **4.1.4 Junctions**

There are no new/newly identified busy junctions with 10,000 vehicles per day and with exposure within 10 metres from the kerb.

#### **4.1.5 New Roads Constructed or Proposed**

There are no new/newly proposed roads since the last round of Review and Assessment with 10,000 vehicles/day and exposure within 10 metres from the kerb.

#### **4.1.6 Roads with Significantly Changed Traffic Flows**

There are no newly identified roads with a 25% increase in traffic from an existing flow greater than 10,000 vehicles per day and with exposure within 10 metres from the kerb.

#### **4.1.7 Bus or Coach Stations**

No new bus or coach stations have been constructed or are planned for the foreseeable future.

### **4.2 Other Traffic Sources**

#### **4.2.1 Airports**

The RAF airbase at Kinloss closed in 2011 and is now used as an Army barracks. The Lossiemouth base remains operational. While the Ministry of Defence retains the right to reopen the Kinloss base in the future, a previous study of local air quality in the vicinity of each base while they were both operational (Ref- 14) showed that there



was no risk of exceedance of air quality objectives. However, as the assessment was undertaken several years ago, in the event that the base is proposed to reopen then the potential local air quality effects may be reassessed.

There are no other airports in the local authority area requiring further assessment. The nearest commercial airport is Inverness Airport located within the Highland Council area, which is located 28 km to the east of the boundary of the Moray Council administrative area. Inverness Airport is further than 1 km from any relevant public exposure within the Moray Council area and therefore requires no further assessment.

### **4.2.2 Railways (Diesel and Steam Trains)**

There have been no significant changes to rail movement within the Moray Council administrative area since the last APR. The Moray Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15 metres. There are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30 metres.

### **4.2.3 Ports (Shipping)**

The Moray Council has previously reviewed emissions from shipping and has a responsibility for six harbours within the Council area, namely Buckie, Burghead, Cullen, Findochty, Hopeman and Portknockie. Lossiemouth also has an operational harbour and there is a small harbour, pier and ship building yard at Findhorn.

The types of vessels using the harbours are mainly small fishing vessels and recreational boats. It is concluded that no further assessment of these ports is required. The Moray Council confirms that there are no ports or shipping that meet the specified criteria (Ref- 13) within the Moray area.

## **4.3 Industrial Sources**

Both the Scottish Environment Protection Agency (SEPA) and the Moray Council Planning Department were consulted to confirm the presence of new and existing industrial sources of atmospheric pollutants within the Moray Council administrative area.

#### **4.3.1 Industrial installations: New or proposed with air quality assessments**

The Council provide an online database of information for this purpose. No records were provided showing that in 2016 any changes occurred to the industrial emissions source inventory which required an air quality assessment.

#### **4.3.2 Industrial installations: Where emission have increased or exposure has been introduced**

With regards to SEPA this report notes the following;

- In October 2016 the Glenlossie Dark Grains Plant had a significant fire which led to the pellet making process being mothballed. The evaporators on site are still operational and under PPC (Pollution Prevention and Control) regulation but the stack emissions have ceased.
- Baxters Food Group in Fochabers extended its plant requiring a Part A permit in May 2016.
- James Jones Timber Treatment at the Mosstodloch Sawmill came into PPC in the 2012 revised regulations and was permitted in March 2016.
- Part B low risk Cement Batching Plant permitted at Tennants of Elgin in June 2016.
- Walkers of Aberlour extended its plant and now requires a PPC Part A Permit.

The Moray Council is advised to monitor development of these and all other installations which could potentially affect air quality and or exposure.

#### **4.3.3 Industrial installations: New or significantly changed with no previous air quality assessment**

In addition to identifying Walkers of Aberlour as having extended its plant and now requiring a PPC Part A Permit, SEPA also advised of the following.;

- There were no SEPA regulated processes that increased its emissions to air by more than 30%.
- There were no Part A or B processes that have ceased to operate.
- There were no new mineral extraction processes likely to have a significant impact on the local air quality.

#### **4.3.4 Major fuel storage depots storing petrol**

There were no fuel storage facilities in the Moray Council area.

#### **4.3.5 Petrol stations**

There are no new petrol stations with an annual throughput of over 2000m<sup>3</sup> of petrol.

#### **4.3.6 Poultry Farms**

There have been no newly permitted poultry farms in the Moray Council area since the 2016 Annual Progress Report. There have been no significant changes at the two SEPA regulated poultry farms within the Moray Council area since the 2016 Report (i.e. no new poultry units that house more than 400 000 birds (with mechanical ventilation), or more than 200 000 birds (with natural ventilation) or more than 100 000 turkeys). It is therefore concluded that no further assessment is necessary.

### **4.4 Commercial and Domestic Sources**

The Environmental Services Department within the Moray Council has an established team of personnel who undertake the air quality impact screening assessments of all proposed installations in accordance with the Environmental Protection UK guidance (Ref- 18) and ensure installations are compliant with the Clean Air Act 1993 and the LAQM air quality objectives before granting permission.

Where the screening assessment approach does not indicate compliance, or the proposed scheme is a complex one, Moray Council requires an air quality assessment to be submitted by the applicant as part of the planning process.

#### **4.4.1 Biomass Combustion Plants – Individual Installations**

There have been no new individual biomass combustion installations that require consideration. Air quality assessments are generally required by applicants of biomass combustion installations

#### **4.4.2 Biomass Combustion Plants – Combined Sources**

To date there are a total of 33 permitted wood burning biomass installations within the Moray Council area. While these have all been assessed for potential air quality impacts as individual installations, the potential combined impact of clusters of installations should be assessed for PM<sub>10</sub> in accordance with TG(16) using the biomass calculator posted on the LAQM support website (Ref- 16) . The biomass installations with their geographical location are summarised in Table 8 (Appendix E) and shown on the map in Figure 12 (Appendix E).

The 2016 Moray Council Annual Progress Report concluded that the installations are spread widely across the Council area, mostly in rural locations, and do not cluster in

a 500 x 500 m<sup>2</sup> area. The addition of the newly permitted biomass installations does not cause a significant increase in clustering; therefore no further Detailed Assessment is required.

#### **4.4.3 Domestic Solid Fuel Burning**

Previous reports concluded that there were no areas of domestic solid-fuel burning with a density of greater than 100 houses in a 500 x 500m area. There are no new areas of significant domestic fuel use and it is therefore not necessary to undertake further assessment

#### **4.4.4 Combined heat and power (CHP) plant**

There have been no new CHP's within The Moray Council area since the 2016 Annual Progress Report submission

#### **4.5 New Developments with Fugitive or Uncontrolled Sources**

There were no other potential sources of fugitive emissions or uncontrolled particulate matter that have not been previously assessed within the Moray Council area.

### **5. Planning Applications**

There are currently no known planning applications for new developments under consideration which may affect air quality within the Moray Council area.

## **6. Conclusions and Proposed Actions**

### **6.1 Conclusions from New Monitoring Data**

The results of the NO<sub>2</sub> monitoring across the Moray Council area during 2016 confirm that there are no known exceedances of the AQS(S) objectives for this pollutant. Analysis of NO<sub>2</sub> concentrations illustrates that across the diffusion tube network there was a general downward trend in annual mean NO<sub>2</sub> concentrations from 2012 to 2014. From 2014 concentrations have tended to increase slightly but the annual mean was lower in 2016 at 13 out of 17 sites compared to 2012. The review of new monitoring data available for 2016 confirms that the Moray Council does not need to proceed to a Detailed Assessment.

### **6.2 Conclusions relating to New Local Developments**

Two planning applications were received by Moray Council in 2016 which involved having to produce an air quality assessment, namely Blairs Home Farm, Forres and Phase 1 of the Elgin LONG2 South masterplan. Both assessments concluded there would be no significant air quality impact as a result of these developments.

### **6.3 Proposed Actions**

Monitoring data from 2016 does not identify any exceedances of the AQS(S) objectives for NO<sub>2</sub>. This indicates there is no need for additional air quality monitoring or changes to the existing monitoring programme within the Moray Council area. However, existing traffic survey data indicates a few locations where, with the combined development to the south of Elgin air quality monitoring, may need to be considered as part of the review of the current monitoring programme. The current NO<sub>2</sub> and traffic flow monitoring particularly in Elgin is planned to continue through 2017. The results of these activities will be included in the Annual Progress Report to be submitted in 2018.

## Appendix A: Monitoring Results

**Table 4 - Details of Non-Automatic Monitoring Sites**

Site ID	Site Name	Location	Site Type	Grid Reference Coordinates		Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?	Tube height (m)
				X	Y						
DT1	Elgin 1	Lamp Post West Park Court – Elgin	Kerbside	321105	862669	NO <sub>2</sub>	N	<5	1	N	3
DT2	Elgin 2	Junction East & Maisondieu Road – Elgin	Kerbside	322348	862745	NO <sub>2</sub>	N	<2	1	N	3
DT3	Elgin 3	99-101 Maisondieu Road - Elgin	Roadside	322302	862727	NO <sub>2</sub>	N	<5	2	N	3
DT4	Elgin 4	26-28 Priory Place – Elgin	Urban Background	322249	862630	NO <sub>2</sub>	N	<5	N/A	N	3
DT5	Elgin 5	Main Street New Elgin	Kerbside	322233	861869	NO <sub>2</sub>	N	<5	1	N	3
DT6	Elgin 6	Queen Street Roundabout – Elgin	Kerbside	322029	862832	NO <sub>2</sub>	N	<5	1	N	3
DT7	Elgin 7	Hay Street – Elgin	Roadside	321615	862307	NO <sub>2</sub>	N	<5	1	N	3
DT8	Elgin 8	Newmill Road – Elgin	Roadside	322492	863309	NO <sub>2</sub>	N	<5	2	N	3
DT9	Elgin 9	37 Sandy Road – Elgin	Kerbside	321775	861115	NO <sub>2</sub>	N	5	2	N	3
DT10	Elgin 10	47 Wittet Drive – Elgin	Kerbside	320641	862291	NO <sub>2</sub>	N	5	1	N	3

Site ID	Site Name	Location	Site Type	Grid Reference Coordinates		Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?	Tube height (m)
				X	Y						
DT11	Fochabers 1	50A High Street – Fochabers	Kerbside	334634	858726	NO <sub>2</sub>	N	<2	2	N	3
DT12	Fochabers 2	Sundach George Street – Fochabers	Kerbside	334423	858663	NO <sub>2</sub>	N	<2	2	N	3
DT13	Forres	Tolbooth, High Street – Forres	Urban Background	303726	858931	NO <sub>2</sub>	N	<2	N/A	N	3
DT14	Keith 1	106 Moss Street – Keith	Roadside	343323	850458	NO <sub>2</sub>	N	<5	2	N	3
DT15	Keith 2	87 Moss Street – Keith	Kerbside	343329	850415	NO <sub>2</sub>	N	<5	2	N	3
DT16	Lossie 1	1 Merryton Court – Lossiemouth	Kerbside	322463	870293	NO <sub>2</sub>	N	<5	2	N	3
DT17	Lossie 2	7 James Street – Lossiemouth	Urban Background	323515	870931	NO <sub>2</sub>	N	<2	N/A	N	3
DT18	Rothies 1	New Street – Rothies	Kerbside	327756	849658	NO <sub>2</sub>	N	<2	1	N	3
DT19	Rothies 2	New Street - Rothies	Roadside	327740	849239	NO <sub>2</sub>	N	<5	2	N	3

(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.

**Table 5 - Annual Mean NO<sub>2</sub> Monitoring Results**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2016 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
					2012	2013	2014	2015	2016
DT1	Kerbside	Diffusion Tube	100	100	23.5	23.8	20.9	22.3	22.9
DT2	Kerbside	Diffusion Tube	100	100	26.2	22.9	19.5	19.8	23.3
DT3	Roadside	Diffusion Tube	100	100	14.1	13.6	14.4	12.8	12.5
DT4	Urban Background	Diffusion Tube	91.7	91.7	9.7	8.9	8.6	7.9	10.6
DT5	Kerbside	Diffusion Tube	100	100	18.2	16.8	15.6	15.6	17.9
DT6	Kerbside	Diffusion Tube	100	100	18.5	17.1	14.9	15.8	17.5
DT7	Roadside	Diffusion Tube	100	100	11.5	10.3	9.3	8.2	10.0
DT8	Roadside	Diffusion Tube	100	100	14.9	13.8	12.8	14.1	14.3
DT9	Kerbside	Diffusion Tube	100	100	-	7.8	6.7	6.7	7.9
DT10	Kerbside	Diffusion Tube	100	100	-	12.7	12.3	13.3	15.1
DT11	Kerbside	Diffusion Tube	91.7	91.7	12.2	11.3	10.4	10.1	11.6
DT12	Kerbside	Diffusion Tube	100	100	4.7	4.7	4.4	4.9	4.9
DT13	Urban Background	Diffusion Tube	100	100	14.1	12.7	11.8	13	13.9
DT14	Roadside	Diffusion Tube	100	100	28.8	25.8	23.8	25.3	28.2
DT15	Kerbside	Diffusion Tube	100	100	22.8	23.1	20.9	21.3	25.7
DT16	Kerbside	Diffusion Tube	100	100	6.2	5.4	4.8	5.2	5.9
DT17	Urban Background	Diffusion Tube	100	100	6.1	5.3	4.8	5.6	5.9
DT18	Kerbside	Diffusion Tube	100	100	18.5	16.5	15.3	17.1	16.8
DT19	Roadside	Diffusion Tube	100	100	18.9	18	16.3	17.5	19.6

Notes: Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 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.



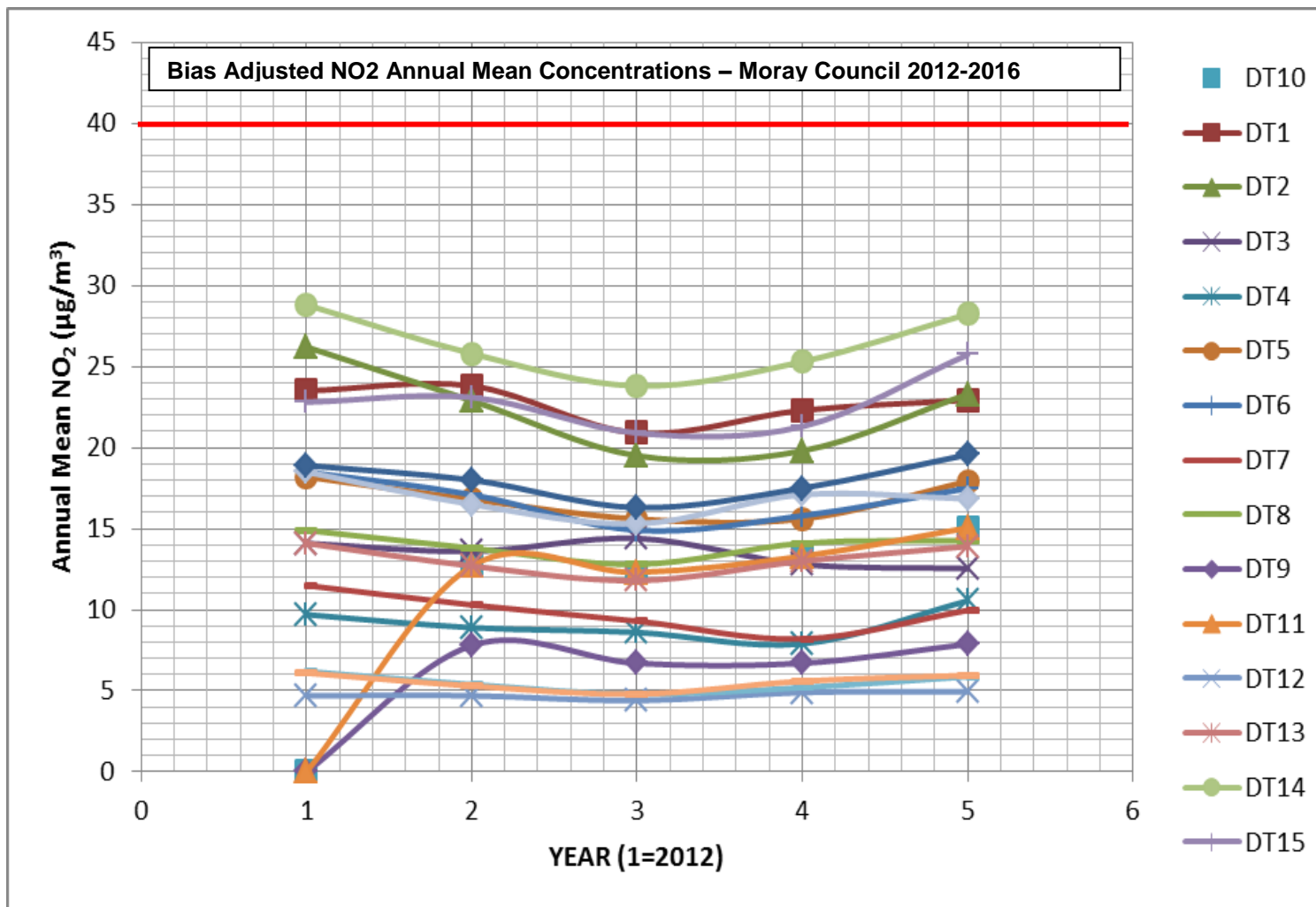


Figure 3 - Trends in Annual Mean Nitrogen dioxide Concentrations Measured at Diffusion Tube Monitoring Sites (the red line indicates the national Air Quality Objective value)

### Maps Showing Non-Automatic Monitoring Locations

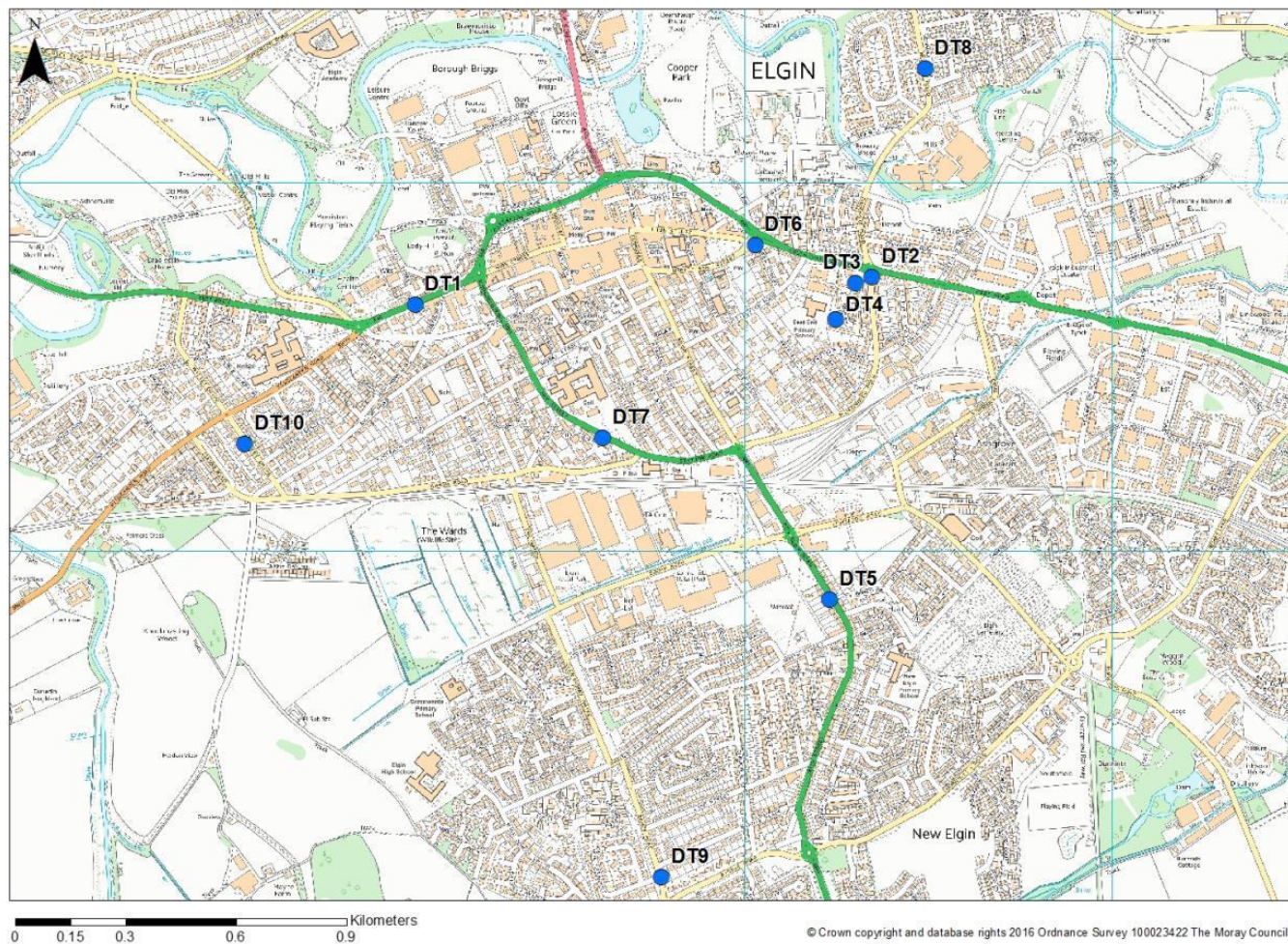


Figure 4 - Elgin NO<sub>2</sub> Monitoring Sites



Figure 5 - Fochabers NO<sub>2</sub> Monitoring Sites

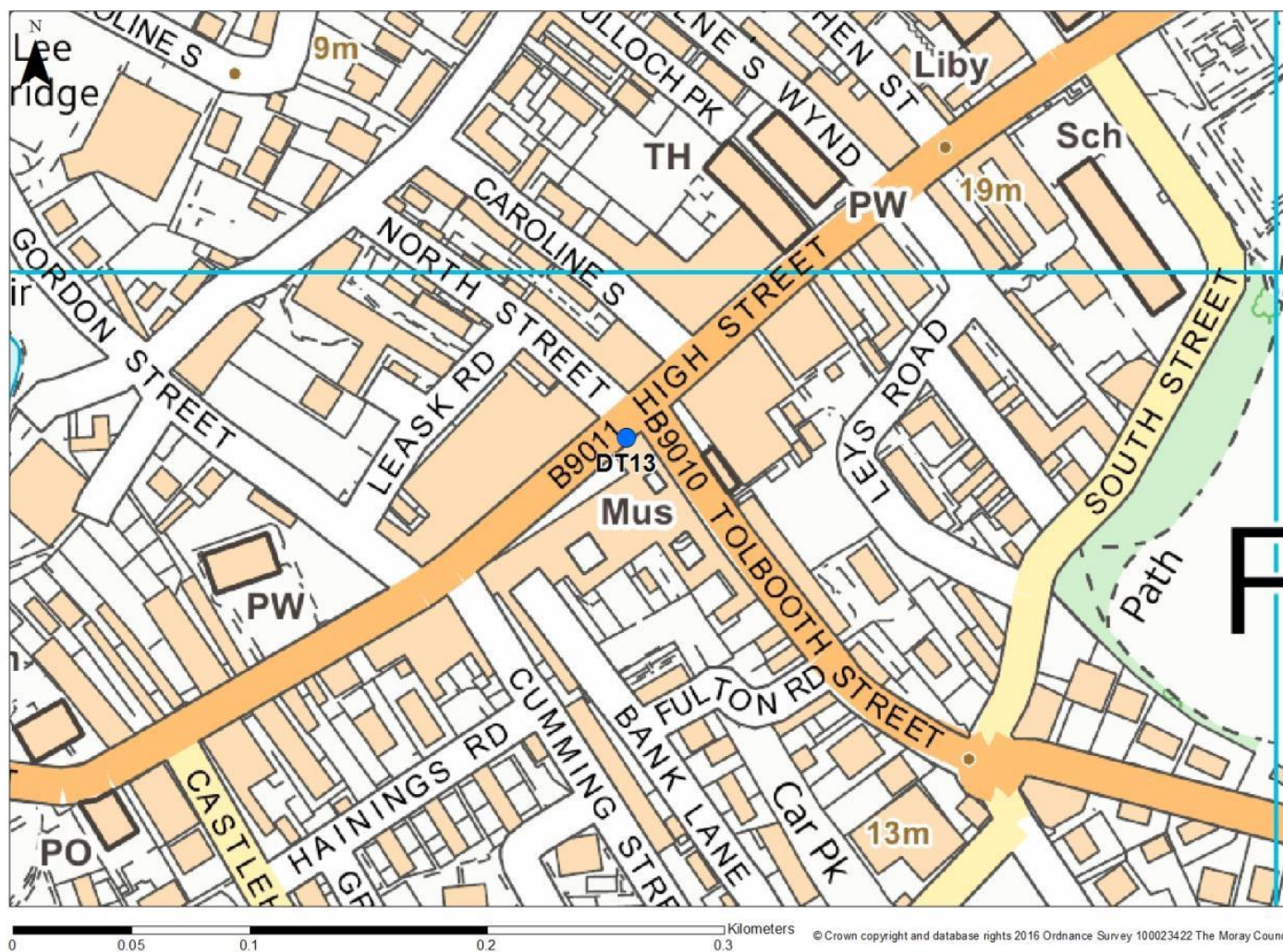


Figure 6 - Forres NO<sub>2</sub> Monitoring Sites

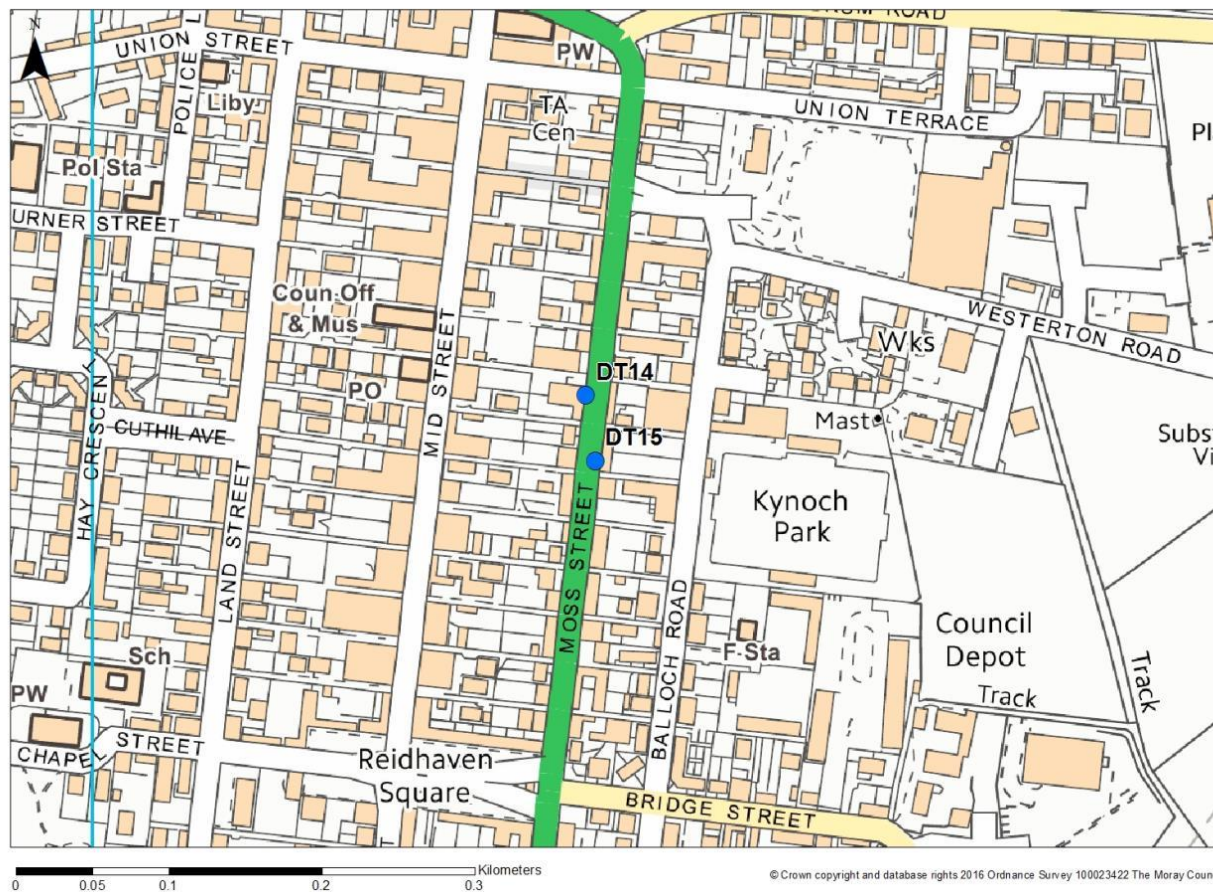


Figure 7 - Keith NO<sub>2</sub> Monitoring Sites

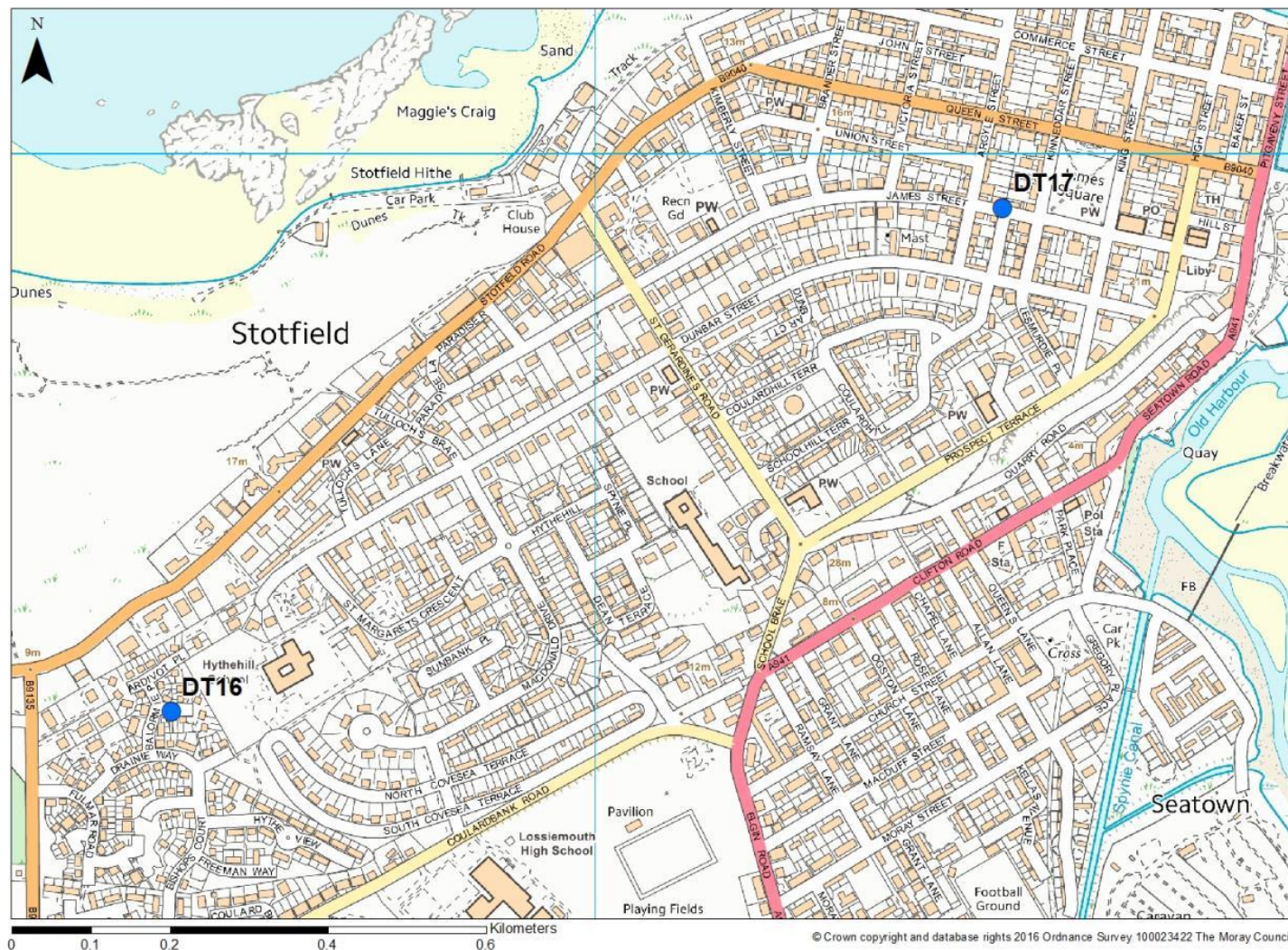


Figure 8 - Lossiemouth NO<sub>2</sub> Monitoring Sites

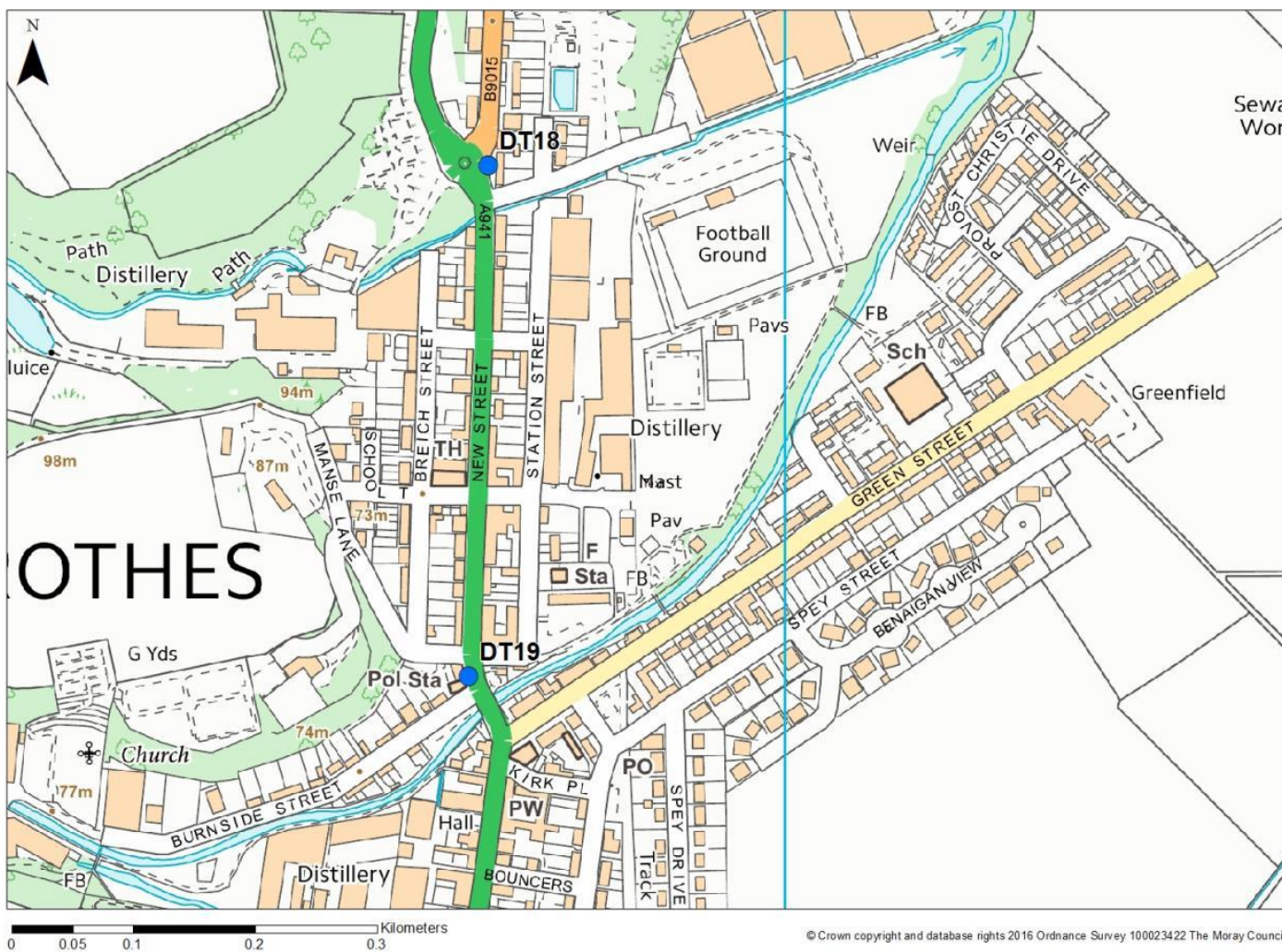


Figure 9 - Rothes NO<sub>2</sub> Monitoring Sites

## Appendix B: Full Monthly Diffusion Tube Results for 2016

Table 6 - NO<sub>2</sub> Monthly Diffusion Tube Results for 2016

Site ID	Local ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
														Raw Data	Bias Adjusted (1)
DT1	Elgin 1	31	32	19	28	26	24	21	15	28	35	35	26	26.7	22.9
DT2	Elgin 2	26	36	31	29	32	31	21	16	29	29	16	29	27.1	23.3
DT3	Elgin 3	17	18	15	16	18	20	5	7	12	13	19	15	14.6	12.5
DT4	Elgin 4	-	14	11	5*	8	8	6	5*	9	17	37	15	12.3	10.6
DT5	Elgin 5	24	24	21	18	18	16	15	12	19	25	32	26	20.8	17.9
DT6	Elgin 6	24	23	24	20	18	18	12	11	16	23	29	26	20.3	17.5
DT7	Elgin 7	11	13	12	13	12	12	7	7	9	15	16	12	11.6	10.0
DT8	Elgin 8	21	21	18	12	10	9	10	8	16	19	30	25	16.6	14.3
DT9	Elgin 9	11	11	11	7	7	8	7	6	8	11	13	10	9.2	7.9
DT10	Elgin 10	21	21	20	15	13	14	13	9	15	20	27	22	17.5	15.1
DT11	Fochabers 1	-	15	17	14	14	15	9	9	12	15	15	14	13.5	11.6
DT12	Fochabers 2	7	6	6	5*	5*	5*	5*	5*	5*	5	8	7	5.8	4.9
DT13	Forres	20	19	17	15	15	13	12	9	17	17	21	19	16.2	13.9
DT14	Keith 1	27	46	38	30	29	24	30	19	32	33	47	39	32.8	28.2
DT15	Keith 2	35	28	35	32	30	28	22	20	31	30	34	34	29.9	25.7
DT16	Lossie 1	10	8	6	5*	5*	5*	5*	5*	8	7	10	8	6.8	5.9
DT17	Lossie 2	11	8	7	5*	5*	5	5*	5*	6	7	10	9	6.9	5.9
DT18	Rothies 1	23	27	23	18	18	15	14	11	20	18	26	22	19.6	16.8
DT19	Rothies 2	21	30	29	23	23	22	15	14	20	22	32	22	22.8	19.6

(1) See Appendix C for details on bias adjustment

(\*) Raw values were reported as being <5 µg/m<sup>3</sup> or below reasonable limits of detection. Taking the precautionous view annual mean calculations assume 5 µg/m<sup>3</sup>



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

### **Factor from Local Co-location Studies**

There is no co-location study within The Moray Council area.

### **Annualisation of Diffusion Tube Data**

All sites recorded a 100% capture rate apart from sites DT4 and DT11 which had 92%. Filling gaps in the data to provide more robust annualised results were therefore not required.

### **Low limit of detection**

The 2016 APR mentioned that some tubes (e.g. DT4, 12, 16 and 17) had recorded annual mean concentrations below  $5 \mu\text{g}/\text{m}^3$  which is below the limit of reasonable detection. There is no reference to any specific low limit of detection in LAQM-TG16 or guidance offered on this subject by the LAQM helpdesk. The only issue perhaps is that diffusion tubes perform less well at low concentrations and that data should therefore be removed from the analysis and an alternative method applied such as using a background site to estimate an alternative concentration for those questionable periods. However, the very low monthly values recorded in 2016 in the Moray data are in most cases consistent with that particular location (year on year) which suggests that tubes are in fact observing as might be expected.

### **Diffusion Tube Monitoring QA/QC**

The  $\text{NO}_2$  diffusion tubes used by Moray Council were prepared and analysed by the Aberdeen Scientific Services (ASSL). The laboratory is United Kingdom Accreditation Service (UKAS) accredited and has good performance in both the LGC Standards Proficiency Testing Scheme (AIR  $\text{NO}_2$  PT formerly WASP) (Ref- 7) and National Physical Laboratory (NPL) QA schemes.

Participation therefore, in an external proficiency-testing scheme such as AIR PT, represents but one factor in such considerations. Participation in a single round of an external proficiency-testing scheme represents a “snap-shot” in time of a

laboratory’s analytical quality. It is more informative therefore to consider performance over a number of rounds.

Following on from above, therefore over a rolling five round AIR PT window, one would expect that 95 % of laboratory results should be  $\leq \pm 2$ . If this percentage is substantially lower than 95 % for a particular laboratory, within this five round window, then one can conclude that the laboratory in question may have significant systematic sources of bias in their assay.

A summary of the performance, for each laboratory participating in the AIR PT scheme, is provided in Ref- 7(see Table 1). This table shows the percentage of results where the absolute z-score, for each laboratory, was less than or equal to 2, i.e. those results which have been assessed as satisfactory. The laboratory demonstrated satisfactory performance in the past five rounds, returning acceptable Z-Scores. A summary of the results as a percentage of satisfaction is shown in Table 7.

**Table 7 - Aberdeen Scientific Services Laboratory Results in LGC Standards Proficiency Testing Scheme**

<b>AIR NO<sub>2</sub> PT Round Conducted During</b>	<b>Of 4 test samples per round where the absolute Z score in each case was &lt;2 (%)</b>
October-November 2015	100
January-February 2016	100
April-May 2016	100
July-August 2016	100
September-October 2016	100

**Diffusion Tube Bias Adjustment Factor**

The national diffusion tube bias adjustment factor spread sheet was used to calculate the bias adjustment factor applied to the Moray NO<sub>2</sub> diffusion tube data. It’s worth noting that only one ASSL inter-comparison observation is posted on the spread sheet and as such the scaling factor should be applied with caution. However, the Z-scores for the lab in question returned a consistent 100% satisfaction level for each sample tested. The overall survey had good precision and data capture with a bias correction factor of 0.86.

Appendix D: Traffic Monitoring Locations within Moray

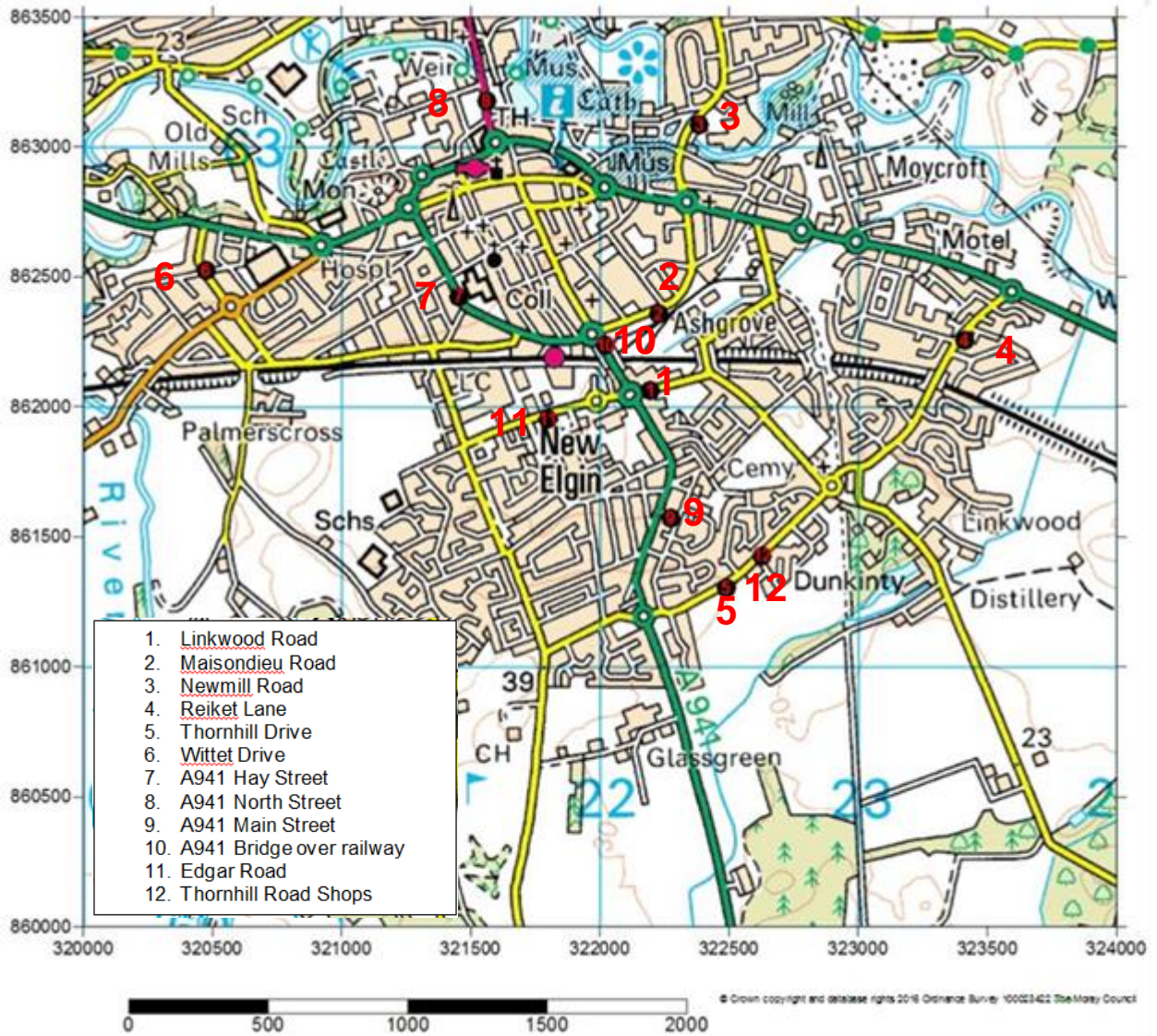


Figure 10 – Moray Council Traffic Monitoring Locations

## The Moray Council

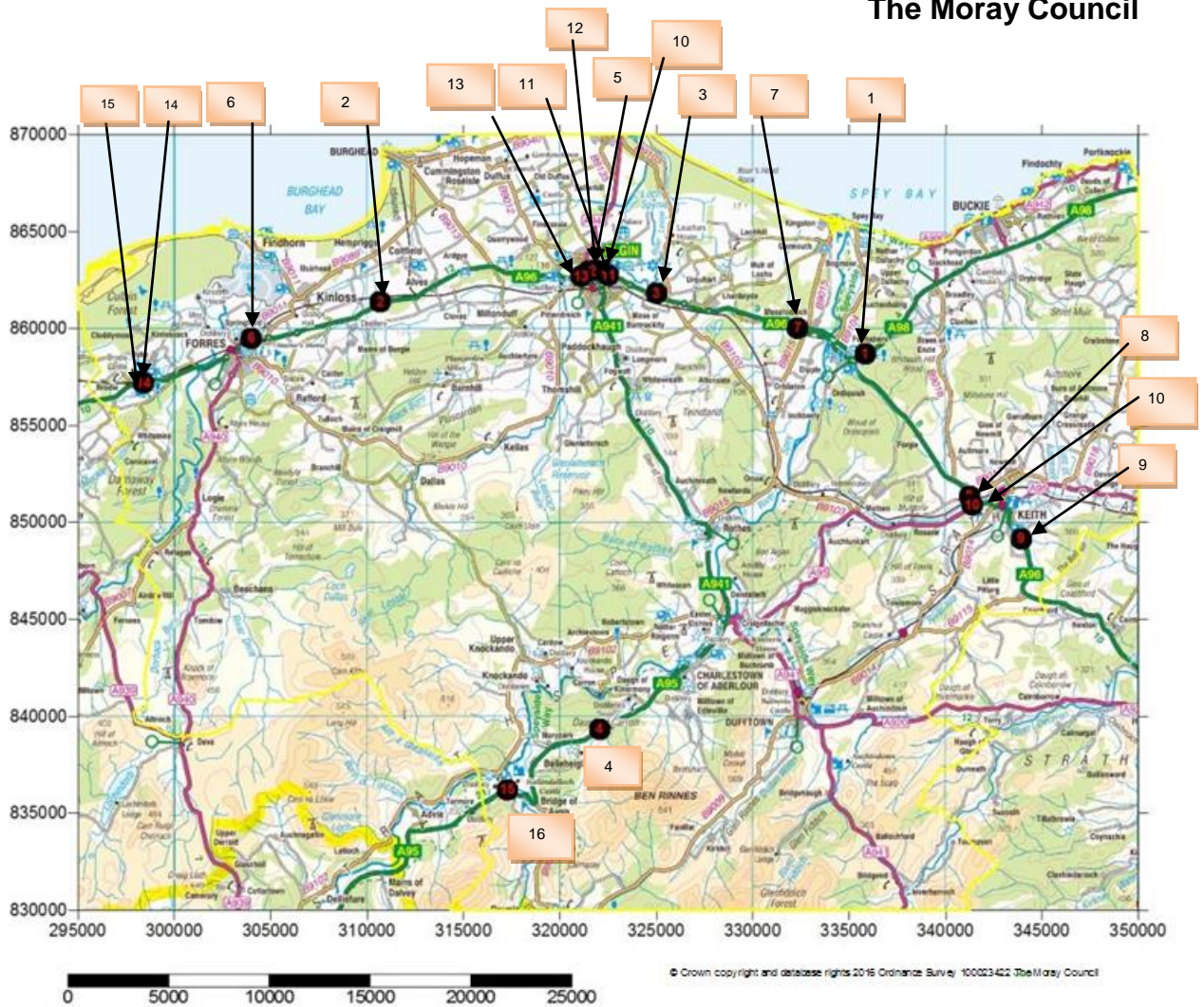


Figure 11 - Transport Scotland Traffic Monitoring Locations

1. A98 Fochabers
2. A96 Forres to Elgin
3. A96 Elgin to Lhanbryde
4. A95 Dowans Brae
5. A96 Elgin Town Centre
6. A96 Forres
7. A96 Mosstodloch
8. A96 North of Keith
9. A95 West of Keith
10. A96 Elgin - East Road
11. A96 Elgin - Alexandra Road
12. A96 Elgin - High Street West
13. A96 Elgin - West Road
14. A96 Forres (aka Brodie) (Core 744)
15. A96 Brodie (VIM)
16. A95 Ballindalloch (Core 905)

## Appendix E: Details of Biomass Installations within the Moray Council Area

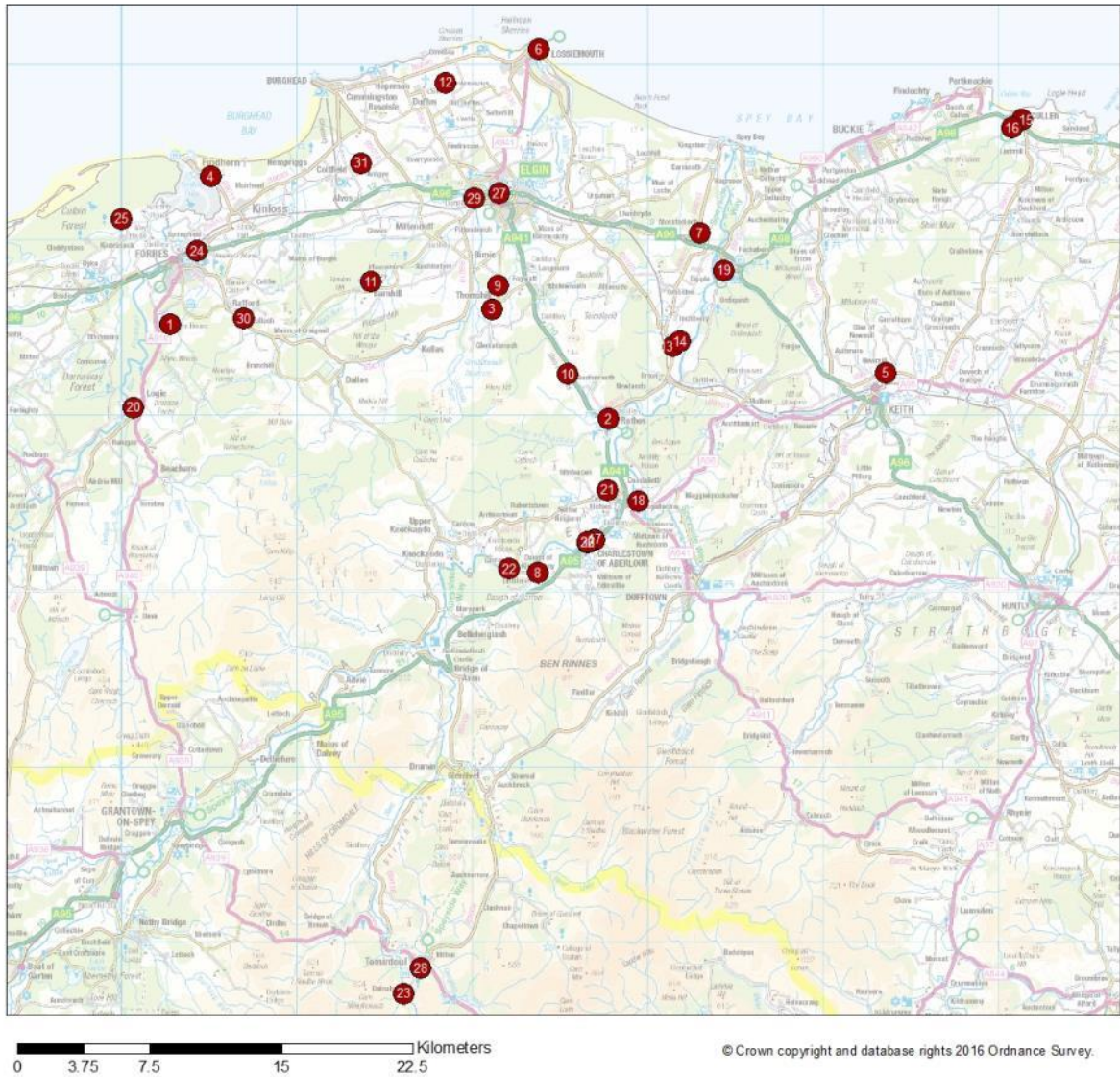


Figure 12- Location Map of Biomass Installations in Moray: 33 installations

**Table 8 - Biomass Installations in the Moray Council Area**

ID	Application	Description	Easting	Northing	Status
1	07/02684/FUL	Erect a combined heat and power biomass boiler building at Blairs Farm Steading Forres Moray IV36 2SH	302803	855196	Permitted
2	08/00577/FUL	Construct a 7.2MWe combined heat and power plant at Combination Of Rothes Distillers North Street Rothes Aberlour Moray AB38 7BW	327778	849808	Permitted
3	08/02135/FUL	Convert existing steadings to form 5 dwellings incorporating games room biomass boiler and biodisc treatment plant at Easterton Farm Birnie Elgin Moray IV30 8SP	321110	856059	Permitted
4	09/02255/APP	Installation of a biomass (woodchip) boiler at The Park Findhorn Forres Moray	305084	863636	Permitted
5	10/00958/APP	Erect biomass boiler shed at Newmill Public Hall South Street Newmill Moray	343580	852448	Permitted
6	10/01903/APP	Proposed biomass heating system and external hopper and flue at Town Hall High Street Lossiemouth Moray IV31 6AA	323764	870894	Permitted
7	11/00173/APP	Erect boiler house and associated timber and biomass wood fuel storage facility and install 2.9mw wood fuel boiler for providing hot water for sawmill process at Mosstodloch Sawmill Garmouth Road Mosstodloch Fochabers Moray IV32 7LH	332975	860409	Permitted
8	11/01004/APP	Demolition of a redundant process building and tanks with construction of a new biopant facility in their location at Dailuaine Distillery Carron Aberlour Moray AB38 7RE	323712	841027	Permitted
9	11/01383/APP	Construction of a new biomass plant within the existing site at Glenlossie and Mannochemore Distillery and Dark Grains Site Glenlossie Road Birnie Elgin Moray IV30 8SS	321458	857413	Permitted
10	11/01433/APP	Replace oil fired boiler with biomass heating system and solar panels with associated accumulator tank at Brylach Rothes Aberlour Moray AB38 7AQ	325431	852363	Permitted
11	11/01508/APP	Erect a 195kW biomass boiler installation including boiler house and wood chip store at Pluscarden Abbey Pluscarden Elgin Moray IV30 8UA	314200	857630	Permitted
12	11/01981/APP	Replacement of existing boiler with new biomass boiler and hopper feed system at Gordonstoun School Duffus Elgin Moray IV30 5RF	318440	868990	Permitted
13	11/02010/APP	Erection of biomass heating cabin serving Orton House and adjoining buildings at Orton House Orton Fochabers Moray IV32 7QE	331421	853941	Permitted
14	11/02011/APP	Erection of biomass heating cabin serving Mains Of Orton Orton Fochabers Moray IV32 7QE	331860	854237	Permitted
15	12/00193/APP	Erection of biomass heating cabin at Seafield Estate Office York Place Cullen Buckie Moray AB56 4UW	351296	866871	Permitted
16	12/00266/APP	Installation of biomass heating plant and ancillary wood chip store to serve Old Cullen House and The Stable Block Cullen Buckie Moray AB56 4XW	350736	866411	Permitted
17	12/00457/APP	Erection of biomass boiler room storage container and access road at Speyside High School Mary Avenue Aberlour Moray AB38 9QU	326973	842941	Permitted
18	12/01142/APP	External biomass boiler enclosure at Viewfield Heights Craigellachie Moray	329450	845152	Permitted

## The Moray Council

ID	Application	Description	Easting	Northing	Status
19	12/01282/APP	Create a biomass boiler and fuel silo house at Milnes High School West Street Fochabers Moray IV32 7DJ	334355	858291	Permitted
20	12/01395/APP	Siting a biomass boiler heat cabin at Logie Steading Logie Forres Moray IV36 2QN	300664	850475	Permitted
21	12/01490/APP	Biomass combined heat and power plant (located approximately 820 metres north of The Macallan Distillery) providing electricity to the grid and heat to The Macallan Distillery at site at Craigellachie Wood Craigellachie Moray	327717	845763	Permitted
22	12/02060/APP	Construction of new distillery with associate plant (including evaporator and bio plant buildings) and landscaping on site of former distillery at Imperial Distillery Carron Aberlour Moray AB38 7QP	322118	841262	Permitted
23	12/02082/APP	Erect outbuilding to house biomass boiler and woodchip storage at Delnabo House Tomintoul Ballindalloch Moray AB37 9HT	316059	817043	Permitted
24	13/00691/APP	Site a 160kw biomass boiler at Ramnee Hotel Victoria Road Forres Moray IV36 3BN	304319	859384	Permitted
25	13/01388/APP	Install two boiler biomass heating units at Wellhill Farm House Kintessack Forres Moray IV36 2TG	300023	861223	Permitted
26	13/01479/APP	Erection of biomass boiler container at Aberlour Primary School Mary Avenue Aberlour Moray AB38 9PN	326587	842773	Permitted
27	14/01006/APP	Demolish storage building and construct building to accommodate biomass boiler at Glenmoray Distillery Bruce Land Road Elgin Moray IV30 1YE	321509	862682	Permitted
28	14/00362/APP	Erect biomass boiler house including the installation of biomass boiler and wood pellet storage internal refurbishments to the toilets and the erection of boundary fence and change of use of adjacent land to occasional overnight camping in association with the hostel at Tomintoul Youth Hostel Main Street Tomintoul Ballindalloch Moray AB37 9EX	317039	818474	Permitted
29	14/00072/APP	Installation of new biomass system at Heather Glen Guest House 1 North Guildry Street Elgin Moray IV30 1JR	320098	862383	Permitted
30	15/00008/APP	Erect a biomass plant building and a separate wood chip store building at Blervie House, Rafford, Forres, Moray.	306940	855536	Permitted
31	15/01159/APP	Conversion of steading buildings to workshop facility office and biomass boiler and form new site access at Bruntlands Farm, Alves, Elgin, Moray.	313627	864402	Permitted
32	15/01666/APP	Install new biomass boiler system within existing boiler house at Aberlour Primary School Mary Avenue, Aberlour, Moray.	326561	842780	Permitted
33	15/02186/APP	Erect a biomass plant at Blairs Home Farm, Forres, Moray.	302810	855167	Permitted

## Glossary of Terms

Abbreviation	Description
AADT	Annual Average Daily Traffic
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 <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SEPA	Scottish Environment Protection Agency
SO <sub>2</sub>	Sulphur Dioxide
UKAS	United Kingdom Accreditation Service
USA	Updating and Screening Assessment



## References

- Ref- 1 The Moray Council (2015); Air Quality Annual Progress Report. The Moray Council. AECOM.
- Ref- 2 The Moray Council (2011); Environmental Report. Local Transport Strategy: Strategic Environmental Assessment (SEA) Statement.
- Ref- 3 The Highland Council for Climate Change Working Group (10 September 2009): Climate Change (Scotland) Act 2009 - Report by Head of Policy and Performance.
- Ref- 4 The Scottish Government (2009); Climate Change (Scotland) Act 2009.
- Ref- 5 Staff Travel Plan Report: Moray Council – Area Offices (2009). Updated 18/05/2012 - Appraisal of Existing Conditions and Site Specific Recommendations.
- Ref- 6 Moray Council (2011) Draft Climate Change Action Plan (January 2011).
- Ref- 7 Summary of Laboratory Performance in AIR NO<sub>2</sub> Proficiency Testing Scheme (January 2015 – November 2016). Reports are prepared by LGC for BV/NPL on behalf of Defra and the Devolved Administrations.  
[https://laqm.defra.gov.uk/documents/AIR-PT-Rounds-6-to-16-\(Jan-2015---Oct-2016\).pdf](https://laqm.defra.gov.uk/documents/AIR-PT-Rounds-6-to-16-(Jan-2015---Oct-2016).pdf)
- Ref- 8 Department for Environment Food and Rural Affairs (Defra) (2017); National Diffusion Tube Bias Adjustment Factor Spreadsheet version Number: 03/17v2. Available at: <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>
- Ref- 9 Defra (2017). Data Archive: UK-AIR database. [https://uk-air.defra.gov.uk/data/data\\_selector?q=795753&s=s&o=n&l=1#mid](https://uk-air.defra.gov.uk/data/data_selector?q=795753&s=s&o=n&l=1#mid)
- Ref- 10 The Scottish Government (2015); Cleaner Air for Scotland: The Road to a Healthier Future.
- Ref- 11 Elgin South Draft Masterplan Supplementary Guidance (2016).  
[http://www.moray.gov.uk/moray\\_standard/page\\_104521.html](http://www.moray.gov.uk/moray_standard/page_104521.html)
- Ref- 12 Springfield Properties (2016) Elgin South – Phase 1 - Air Quality Assessment. Ove Arup and Partners Limited (Arup). Issued 24 August 2016
- Ref- 13 Department for Environment Food and Rural Affairs (2016a); Local Air Quality Management Technical Guidance 2016 LAQM.TG(16).
- Ref- 14 BMT Cordah Ltd, (2004); Air Quality Study in the Vicinity of RAF Lossiemouth and RAF Kinloss, Report Ref: MOR\_007.
- Ref- 15 Environmental Protection UK (2009); Biomass and Air Quality Guidance for Scottish Local Authorities. Available at: [www.environmental-protection.org.uk/biomass](http://www.environmental-protection.org.uk/biomass)
- Ref- 16 Department for Environment Food and Rural Affairs LAQM Support Website (2016): <http://laqm.defra.gov.uk/review-and-assessment/tools/emissions.html>
- Ref- 17 Department for Environment Food and Rural Affairs (2014); 2011 based Urban Background Maps, UK-AIR. [Accessed April 2016]. Available at: <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>.
- Ref- 18 Environmental Protection UK (2009); Biomass and Air Quality Guidance for Scottish Local Authorities. Available at: [www.environmental-protection.org.uk/biomass](http://www.environmental-protection.org.uk/biomass)
- Ref- 19 Cycling Scotland (2016); Annual Cycling Monitoring Report. Available at: <http://www.cyclingscotland.org/policy/monitoring>
- Ref- 20 Moray Council Planning Application: 16/01244/APP - Phase 1 of Elgin LONG2 South.