Annual Progress Report (APR)

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

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

June, 2019

now part of

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Executive Summary: Air Quality in Our Area

The following Annual Progress Report (APR) was prepared and written by Peter Brett Associates (PBA), now part of Stantec, 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 Moray Council

There are no existing significant air quality issues identified within the Moray Council administrative area. The Council has examined the 2018 air quality monitoring results in its area and concludes that no new Detailed Assessments are required of any pollutant. Atmospheric nitrogen dioxide (NO_2) 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 annual mean concentrations of NO_2 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_2 concentration of 24.4 µg/m^3 was monitored at Junction East & Maisondieu Road (monitoring site DT2), well below the Scottish Air Quality Standard of 40 µg/m^3. This was an increase of approximately 1.4 µg/m^3 from 2017. No specific reason could be established to explain this increase other than the likely change in the traffic situation complemented by weather conditions, and the loss of data over the summer months when concentrations would be expected to be lower due to atmopsheric chemistry.
- Annual mean NO_2 concentrations at 6 out the 19 monitoring locations show a general improvement compared to 2017.
- Compared to 2017, 13 of the 19 monitoring locations show a worsening in air quality, however 7 of these recorded a change of 1 µg/m^3 or less.

There are no new major emissions sources within the area and no Air Quality Management Areas (AQMAs) were declared in the past year. Other sources of emissions from industry and transport remain unchanged from those reported in the 2018 Annual Progress Report.

Actions to Improve Air Quality

Although there are currently no designated AQMAs within the Moray Council area and thus, no specific planned actions to undertake air quality improvement activities, Moray Council is addressing Air Quality through local policies and plans and works to manage local air quality through a monitoring network within the council area.

The Moray Council Active Travel Strategy 2016-2021 sets out how Moray Council will encourage more non-motorised travel within Moray through a series of programmes of direct measures and behaviour change programmes.

The Elgin Transport Strategy develops ways to help people become more active, walking and cycling more often and promotes more use of public transport.

The second Moray Local Transport Strategy sets out a framework for taking forward transport policy and infrastructure within Moray.

Local Priorities and Challenges

Moray Council has no specific priorities for the coming year for the improvement of air quality in its area, but will continue monitoring at the existing diffusion tube sites in the area to identify future changes in pollutant concentrations.

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. Detailed information on local transport and links to major travel means can be found at:

http://www.moray.gov.uk/moray_standard/page_1677.html

Also, to plan a public transport journey from door to door visit:
www.travelinescotland.com or call 0871 200 22 33[1].

The Local Transport Strategy promotes sustainable forms of travel through activities and initiatives including developing new walking and cycling infrastructure, promoting public transport, car sharing, efficient driving techniques and the use of electric vehicles. More information, including cycle routes and electric vehicle charging point locations within the Moray Council area, is available at:

[1] Calls cost 10p/min from BT landlines. Charges from other providers or mobiles may vary

http://www.moray.gov.uk/moray_standard/page_57100.html

If you have any concerns or require further information on air quality, please contact Environmental Health or visit the Moray Council website at www.moray.gov.uk and search for “Air Quality”.

The previous LAQM reporting, including the 2018 Annual Progress Report is available on the Moray Council website at

http://www.moray.gov.uk/moray_standard/page_1790.html.

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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 (Appendix D, Figure 1). 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.

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 93,300 (2011 census) with the majority of residents living in the towns of Elgin, Forres, Fochabers, Keith, Buckie, Aberlour and Lossiemouth (Ref- 1). 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 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents (Ref- 2, Ref- 3 and Ref- 4).

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 1.1). 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 1.1 – Summary of Air Quality Objectives in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 µg/m^3	Annual mean	31.12.2010
Particulate Matter ($PM_{2.5}$)	10 µg/m^3	Annual mean	31.12.2020
Sulphur dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25 µg/m^3	Running annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg/m^3	Running 8-Hour mean	31.12.2003
Lead	0.25 µg/m^3	Annual Mean	31.12.2008

2. Actions to Improve Air Quality

Moray Council is addressing Air Quality through local policies and plans.

2.1 Local Policies

2.1.1 Moray Local Development Plan

The Moray Local Development Plan 2015, adopted on 31st July 2015, provides a single forward planning document that presents a vision and spatial strategy for directing growth in Moray for the next 10-20 years (Ref- 5). Policy EP 8 on Pollution aims to ensure that new developments do not create pollution which could adversely affect the environment or local amenity. It states:

"Planning applications for developments that may cause significant pollution in term of noise (including RAF aircraft noise), air, water and light emissions will be only approved where detailed assessments report on the levels, character and transmission of the potential pollution is provided by the applicant. The assessment *should also demonstrate how the pollution can be appropriately mitigated."*

Policy EP12 on Air Quality aims to protect air quality and seek to direct sensitive development away from areas of poor air quality and thereby protect human health and the natural environment. It states:

"Development proposals, which, individually or cumulatively, may adversely affect the air quality in an area to a level which could cause harm to human health and wellbeing or the natural environment must be accompanied by appropriate provisions (deemed satisfactory to the Council and Scottish Environment Protection Agency as appropriate) *which demonstrate how such impacts will be mitigated."*

2.1.2 Moray Council Active Travel Strategy 2016-2021

The active travel strategy sets out how Moray Council will encourage more non-motorised travel within Moray through a series of programmes of direct measures and behaviour change programmes (Ref- 6). Delivery will be through the Council's own programme of promoting sustainable and active travel and cross departmental work with other areas of the Council in addition to the ongoing partnership approach with external funders, the community and other interested parties. Active travel includes all forms of non-motorised travel i.e. travel that encourages physical activity and so is beneficial to both health and the environment.

The Active Travel Strategy objectives are:

1. Increase the number of active travel journeys made within Moray.

2. Increase the modal share of both walking and cycling journeys to work and school.

3. Contribute to a reduction in the number of motorised journeys made within Moray.

4. Create and maintain a comprehensive network of safe and user friendly infrastructure for active travel that meets people's needs.

5. Implement a programme of activities designed to encourage more people to travel actively more often.

6. Raise awareness of the active travel network and the benefits of travelling actively.

Details are available at

http://www.moray.gov.uk/downloads/file113437.pdf

2.1.3 Elgin Transport Strategy Aug 2017

The Elgin Transport Strategy was approved by the Council on 9th August 2017 (Ref-7). The Elgin Transport Strategy:

- sets out proposals for improvements to the transport network across the city over the next 13 years including roads, junctions, crossings and cycle routes.
- develops ways to help people become more active, walking and cycling more often and promotes more use of public transport.
- helps to shape the future development of Elgin by contributing to the next review of the Moray Local Development Plan.

Details are available at:

http://www.moray.gov.uk/moray_standard/page_109352.html

2.1.4 Second Moray Local Transport Strategy

The Second Moray Local Transport Strategy (MLTS2) has been prepared in order to help plan for improved transport infrastructure and services within Moray (Ref- 8).

MLTS2 has been split into two parts. Part One provides information on the main strategy, outlines the key and secondary objectives together with action plans and information on committed schemes for each of the seven key topics covered including; Active Travel, Public Transport, Ports and Harbours, Roads, Freight Transport, Travel Behaviour and Traffic Management. Part Two summarises the background information, achievements to date, key issues, linkages with other National, Regional and Local policies guidance and also the relationships with other key agencies.

Details are available at:

http://www.moray.gov.uk/moray_standard/page_75724.html

2.2 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.

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.

2.3 Progress and Impact of Measures to address Air Quality in Moray Council

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 1.1). 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 AQAP and has no planned actions designed explicitly to improve local air quality.

2.4 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 (Ref- 9). 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.

2.4.1 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 Staff 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- 10). The Moray Council Active Travel Strategy 2016-2021 highlighted the need for the Staff Travel Plan to be renewed.

2.4.2 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 draft Climate Change Action Plan in 2011 (Ref- 11). 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 (SEAP) for Moray, Aberdeenshire, Aberdeen City and Angus Councils (Ref- 12). A SEAP is a high level strategic document which covers all areas of sustainable energy across business and commercial, domestic and transport including certain aspects of land use and fuel supply. It provides a baseline for the area in terms of carbon emissions and provides an action plan to meet emission reduction targets whilst providing opportunities for sustainable economic growth.

In addition to the North East SEAP there is a Moray specific SEAP which covers the time-period 2015 to 2030. The target within this plan is for Moray to aim to achieve greenhouse gas (GHG) emission reductions of 35% by 2030 compared with the

baseline year (2005). For this to be achieved the Council, public and private sector, energy utilities, transport organisations and the general public will need to take ambitious and meaningful action to reduce energy consumption and resource use and to use cleaner forms of energy to the extent possible.

2.4.3 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- 11).

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

3.1 Summary of Monitoring Undertaken

This section sets out what monitoring has taken place and how local concentrations of the main air pollutants compare with the objectives outlined in Table 1.1.

3.1.1 Automatic Monitoring Sites

Moray Council does not undertake continuous monitoring.

3.1.2 Non-Automatic Monitoring Sites

Moray Council undertook non-automatic (passive) monitoring of NO_2 at 19 sites during 2018. Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D (Figure 2.1 to 2.7). The sites are classified as a mixture of kerbside, roadside and urban background sites. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment of the diffusion tube results are provided 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 A.2 (Appendix A) compares the adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40 µg/m^3.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

There is no automatic NO_2 monitoring carried out within the Moray Council area, and therefore there is no co-location study carried out with which to calculate a local bias adjustment factor; the national bias adjustment factor has therefore been applied to the data. The tubes are provided and analysed by Aberdeen Scientific Services Laboratory (ASSL) using 20% TEA in Water and are changed on a monthly basis by Moray Council personnel.

Concentrations at all 19 sites were well below the annual mean objective in 2017; the highest concentration was 24.4 µg/m^3 measured at DT2 (Elgin 2, located at Junction East & Maisondieu Road). Measured concentrations in 2018 were relatively similar to those measured in 2017, with no significant increases at all monitoring locations. A decrease in concentrations occurred at 6 monitoring locations, whilst concentrations increased at 13 locations in 2018 compared to 2017.

Data capture was 75% for the majority of monitoring sites in 2018, except for DT14 (Keith 1) where data capture was 67%. The 2018 results for DT14 have therefore been annualised in accordance with LAQM TG.16 (Ref-3). Data capture in 2018 was less than in 2017 where the majority of monitoring sites achieved more than 92% data capture. Invalid data between August-September in 2018 could have contributed towards the slight increase in annual concentrations during 2018, as concentrations during the summer months are expected to be lower than the rest of the year as a result of atmospheric chemistry.

Several monitoring periods recorded values that were below the Limit of Detection (LoD, shown as <5 µg/m^3 in Table B.1 in Appendix B) notably DT4 (Elgin 4), DT9 (Elgin 9), DT12 (Fochabers 2), DT16 (Lossie 1) and DT17 (Lossie 2). There is no reference to any specific low limit of detection in LAQM TG.16 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 2018 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 µg/m^3 thus adopting a conservative approach with respect to annual mean concentrations.

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

3.2.2 Particulate Matter (PM_{10})

Moray Council does not undertake monitoring for PM_{10} and does not expect PM_{10} concentrations to exceed air quality objectives. A review of PM_{10} data available from

the urban background Automatic Urban and Rural Network (AURN) in Aberdeen indicatives that the PM_{10} concentrations in the Moray Council area are likely to be low. The measured 2018 annual mean PM_{10} concentration for the Aberdeen urban background station was 14.3 µg/m^3 (Ref- 13). Given that this site is close to urban development the likelihood of concentrations differing markedly to these levels in the Moray administration area will be low. These concentrations are below the standards set out in the AQS(S) (Table1.1).

3.2.3 Particulate Matter ($PM_{2.5}$)

There is no monitoring undertaken by Moray Council for $PM_{2.5}$.

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less) (Ref- 3). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

The main sources of anthropogenic $PM_{2.5}$ 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.

A review of $PM_{2.5}$ data available from the urban background Automatic Urban and Rural Network (AURN) in Aberdeen indicatives that the $PM_{2.5}$ concentrations in the Moray Council area are likely to be low. The measured 2018 annual mean $PM_{2.5}$ concentration for the Aberdeen urban background station was 6.9 µg/m^3 (Ref- 13). Given that this site is 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 1.1).

The Scottish Govermment aims to establish a $PM_{2.5}$ monitoring network as part of the Cleaner Air for Scotland Strategy. Moray Council has no plans in place to install any such monitoring over the coming year.

3.2.4 Sulphur Dioxide (SO_2)

Sulphur dioxide is not monitored within the Moray Council area. It is not expected that existing SO_2 emissions will cause SO_2 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

There have been no new planning applications for local developments in 2018 that require an air quality assessment.

4.1 Road Traffic Sources

A review of traffic data was undertaken in order to establish if there were any significant changes to traffic flows since 2017 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 2018 (as this is an area where development is being proposed). Moray Council operates 13 traffic counters at locations within Elgin and a map showing these count locations is provided in Appendix D, Figure 3.

The data returned for 2014-2018 are summarised in Table 4.1. The data shows increases in the annual average daily traffic at 5 of the 12 traffic count locations operational during 2017 to 2018 and reductions (or no increase) at 7 locations. A significant decrease in traffic flows is evident on the A941 Hay Street (site 7), however, this is considered to be due to poor data capture during 2018. There are no sites with sufficient increases in traffic flow that would require a screening assessment to gauge the likely impact on air quality (Ref- 3).

Table 4.1 - Summary of Council Operated Traffic Counts Elgin 2014-2018

ID	Description	Annual Average Daily Traffic (AADT)					% Change 2016-2017	% Change 2017-2018
		2014	2015	2016	2017	2018		
1	Linkwood Road	8,257	9,235	9,666	9,390	9,361	-3	0
2	Maisondieu Road	7,975	8,386	8,208	7,997	7,839	-3	-2
3	Newmill Road	-	-	10,435	10,840	11,182	-2	3
4	Reiket Lane	8,011	8,799	9,524	9,345	10,322	-2	3
5	Thornhill Drive	6,866	6,851	6,586	7,225	7,399	10	2
6	Wittet Drive	3,772	3,941	4,127	3,886	3,849	-6	0
7	A941 Hay Street	13,100	13,271	13,522	13,736	10,254[a]	2	-25
8	A941 North Street	-	-	15,190	15,739	15,211	4	-3
9	A941 Main Street	10,824	10,652	11,273	11,548	10,701	2	-7
10	A941 Bridge over Railway	19,852	19,203	21,365	21,725	19,596	2	-10
11	Edgar Road	9,140	9,758	9,284	-	-	-	-
12	Thornhill Road Shops	3,373	3,615	3,773	4,033	4,203	7	4
13	Glenmoray Drive	4,644	4,856	5,173	4,963	5,022	-4	1

a New traffic lights installation and counter failure led to large data gaps in 2018.

Thornhill Road (site 12) saw the highest percentage increase from 2017. This variation in traffic on the whole does not raise any specific concerns when compared to the closest monitoring results, and the actual changes in traffic volumes are relatively low. The concentrations are well below the AQS(S) objectives, resulting in no unacceptably high exposure in the local area.

However, with ongoing plans for development along the southern perimeter of Elgin, A941 Main Street, Thornhill Road and Reiket Lane will be important links for new residents accessing the town centre. There is currently no air quality monitoring along this area and Moray Council will consider this as an option for additional monitoring in the future.

The highest traffic flow in 2018 was recorded on the A941 bridge over the railway (site 10). The traffic flow here decreased by 10% between 2017-2018. NO_2 monitoring sites DT5 and DT7 are the closest to this traffic count site and provide an indication as to the air quality impact of these traffic flows. Measured annual mean concentrations of NO_2 in 2018 showed slight increases in the adjusted NO_2 annual mean concentrations (i.e. 15.7 µg/m^3 – 16.2 µg/m^3 and 9.9 µg/m^3 – 11.4 µg/m^3). This is not considered a cause for concern given that these concentrations are well below the annual mean AQS(S) NO_2 objective of 40 µg/m^3.

Traffic count data for 2018 for the main routes through the Moray Council area, the trunk roads A95 and A96 have been obtained from Traffic Scotland. The data for 2014-18 is summarised in Table 4.2, with a map of the locations provided in Appendix D, Figure 4.

The traffic data indicates little change on the A95 with annual average daily traffic being relatively low (e.g. AADT<=4000). Equally there are no areas of material air quality concern on the A96 which would trigger criteria described in the following sections. The 24% increase on A96 Elgin to Lhanbryde (ATCNE006) is not corroborated by the other count points along the A96 between Elgin and Keith, including A96 Elgin - East Road, A96 Mosstodloch Bypass Middle and A96 North of Keith, which saw a 2% reduction, 1% increase and 24% reduction in traffic respectively. Temporary local factors may be influencing the increase at A96 Elgin to Lhanbryde and this location will be studied further for the 2020 Annual Progress Report.

The 2018 Annual Progress Report reported a 19% increase in traffic between 2016-2017 on the A96 Mosstodloch Bypass Middle, and stated that further consideration would be considered in the 2019 Annual Progress Report. Between 2017-2018 there was a 1% increase in traffic on the A96 Mosstodloch Bypass Middle which confirms that the increase experienced during 2016-2017 was due to temporary local factors and appear to have been resolved. Moray Council recognises the value in continuing to track this data across the region in order to respond to potential air quality concerns.

Table 4.2 - Summary of Trunk Road Traffic Count Data for A95 & A96 2014-2018

ID	Counter ID	Location	Annual Average Daily Traffic (AADT)						% Change 2016-2017	% Change 2017-2018
			2014	2015	2016	2017	2018	2018 days captured		
1	126400	A96 Forres (aka Brodie) (Core 744)	10,393	10,634	10,991	11,319	11,202	265	3	-1
2	126401	A96 Brodie (WiM)	10,503	9,567	9,008	9,528	10,158	265	6	7
3	ATC02038	A96 Forres	11,315	No Data	12,958	12,036	12,784	328	-7	6
4	ATCNE014	A96 Forres to Elgin	5,943	No Data	13,189	12,463	12,395	363	-6	-1
5	ATC00019	A96 Elgin - West Road	15,913	16,382	16,401	17,231	17,038	224	5	-1
6	ATC00020	A96 Elgin - High Street West	12,087	13,192	13,153	13,742	14,271	330	4	4
7	ATC00021	A96 Elgin - Alexandra Road	20,544	21,562	21,111	21,779	20,854	252	3	-4
8	ATC02040	A96 Elgin Town Centre	16,548	16,732	16,403	17,452	17,895	299	6	3
9	ATC00022	A96 Elgin - East Road	24,095	23,222	22,669	23,026	22,680	310	2	-2
10	ATCNE006	A96 Elgin to Lhanbryde	16,830	17,473	16,883	14,393	17,848	229	-15	24
12	ATC00028	A96 Mosstodloch Bypass Middle	13,687	17,104	14,767	17,558	17,779	178	19	1
13	JTC08238	A98 Fochabers	6,663	6,864	7,000	7,456	7,330	205	7	-2
14	ATC02036	A96 North of Keith	6,901	7,256	4,456	3,780	2,782	32	-15	-26
15	ATC02028	A95 West of Keith	1,626	No Data	No Data	1,940	1,938	363	No Data	0
16	ATCNE003	A95 Dowans Brae	2,808	2,733	3,070	3,313	3,241	202	8	-2

ID	Counter ID	Location	Annual Average Daily Traffic (AADT)						% Change 2016-2017	% Change 2017-2018
			2014	2015	2016	2017	2018	2018 days captured		
17	109502	A95 Ballindalloch (Core905)	1,975	1,688	2,377	2,451	2,329	236	3	-5

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 Transport 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- 22) 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. 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)

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. Moray Council confirms that there are no ports or shipping that meet the specified criteria (Ref- 3) within the Moray area.

4.3 Industrial Sources

The Scottish Environment Protection Agency (SEPA Elgin Office) and 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 2018 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

There are no new industrial installations where emissions have increased or exposure has been introduced.

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

There are no new or significantly changed industrial installations with no previous air quality assessment.

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 2000 m^3 of petrol.

4.3.6 Poultry Farms

There have been no newly permitted poultry farms in the Moray Council area.

4.4 Commercial and Domestic Sources

The Environmental Services Department within 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- 14) 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 37 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_{10} 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 4.3 and shown on the map in Figure 5 (Appendix D).

The 2018 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 area. The addition of one newly permitted biomass installation does not cause a significant increase in clustering; therefore, no further Detailed Assessment is required.

Table 4.3 - 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

ID	Application	Description	Easting	Northing	Status
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 bioplant 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 Mannochmore 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
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

ID	Application	Description	Easting	Northing	Status
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 Bruceland 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
34	16/01780/APP	Proposed conversion to form boiler house and installation of wood biomass system and flue. The Whisky Castle and Highland Market, 6 Main Street Tomintoul Ballindalloch Moray AB37 9EX	316972	818687	Permitted

ID	Application	Description	Easting	Northing	Status
35	16/00204/EXT, 16/00288/APP	Erect boiler sheds and install wood pellet boilers, Erect boiler sheds for biomass boilers at 14 And 15 Dailuaine Terrace Carron Aberlour Moray AB38 7RG	323852	841148	Approved, Permitted
36	17/01540/APP	Proposed biomass heating installation within existing building with external pellet store at Scottish Dolphin Centre, Spey Bay, Fochabers IV32 7PJ	334924	865383	Permitted
37	18/01393	Install a biomass boiler at Mains of Moy Farmhouse, Forres Moray IV36 2SP	301667	860147	Permitted

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 500 m 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 has been no new CHP's within the Moray Council area since the 2018 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_2 monitoring across the Moray Council area during 2018 confirm that there are no known exceedances of the AQS(S) objectives for this pollutant. Analysis of NO_2 concentrations between 2014-2018 show NO_2 concentrations follow a general downward trend. The review of new monitoring data available for 2018 confirms that Moray Council does not need to proceed to a Detailed Assessment.

6.2 Conclusions relating to New Local Developments

No new sources have been identified that require any further actions.

6.3 Proposed Actions

Monitoring data from 2018 does not identify any exceedances of the AQS(S) objectives for NO_2. 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_2 and traffic flow monitoring, particularly in Elgin, is planned to continue through 2019. The results of these activities will be included in the Annual Progress Report to be submitted in 2020.

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_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
SEPA	Scottish Environment Protection Agency
SO_2	Sulphur Dioxide
UKAS	United Kingdom Accreditation Service
USA	Updating and Screening Assessment

References

Ref- 1 Scotland's Census. http://www.scotlandscensus.gov.uk/

Ref- 2 Environment Act 1995, Part IV

Ref- 3 Department of the Environment, Food and Rural Affairs (Defra) in partnership with the Scottish Executive, The National Assembly for Wales and the Department of the Environment for Northern Ireland (2016). '*Local Air Quality Management Technical Guidance, LAQM.TG(16)'.* HMSO, London.

Ref- 4 Department of the Environment, Food and Rural Affairs (Defra) in partnership with the Scottish Executive, The National Assembly for Wales and the Department of the Environment for Northern Ireland (2016). '*Local Air Quality Management Policy Guidance, LAQM.PG(16)'.* HMSO, London

Ref- 5 Moray Council (2015). Moray Local Development Plan. http://www.moray.gov.uk/moray_standard/page_51210.html

Ref- 6 Moray Council (2017). Moray Council Active Travel Strategy 2016-2021. http://www.moray.gov.uk/moray_standard/page_75724.html

Ref- 7 Moray Council (2017). Elgin Transport Strategy. http://www.moray.gov.uk/moray_standard/page_109352.html

Ref- 8 Moray Council (2011). Second Moray Local Transport Strategy Part 1 and Part 2.

Ref- 9 The Scottish Government (2015); Cleaner Air for Scotland: The Road to a Healthier Future.

Ref- 10 Staff Travel Plan Report: Moray Council – Area Offices (2009). Updated 18/05/2012 - Appraisal of Existing Conditions and Site Specific Recommendations.

Ref- 11 Moray Council (2011) Draft Climate Change Action Plan (January 2011).

Ref- 12 Moray Council (2018). Policy and Resources Committee on 8 May 2018. Biodiversity Duty Reporting 2015-2017 And Sustainable Energy action Plan. http://www.moray.gov.uk/minutes/data/PR20180508/7.%20Biodiversity%20and%20SEAP.pdf

Ref- 13 Defra (2019). Interactive monitoring networks map: https://uk-air.defra.gov.uk/interactive-map?network=aurn

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

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 The Moray Council (2018); Air Quality Annual Progress Report. The Moray Council. AECOM.

Ref- 18 The Highland Council for Climate Change Working Group (10 September 2009): Climate Change (Scotland) Act 2009 - Report by Head of Policy and Performance.

Ref- 19 The Scottish Government (2009); Climate Change (Scotland) Act 2009.

Ref- 20 Summary of Laboratory Performance in AIR NO_2 Proficiency Testing Scheme (April 2017 – February 2019). Reports are prepared by LGC for BV/NPL on behalf of Defra and the Devolved Administrations. https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html

Ref- 21 Department for Environment Food and Rural Affairs (Defra) (2019); National Diffusion Tube Bias Adjustment Factor Spreadsheet version Number: 03/19. Available at: http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Ref- 22 Elgin South Draft Masterplan Supplementary Guidance (2016).

http://www.moray.gov.uk/moray_standard/page_104521.html.

Appendix A: Monitoring Results

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

Site ID	Site Name	Location	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Tube height (m)
DT1	Elgin 1	Lamp Post West Park Court	Kerbside	321107	862668	NO_2	N	<5	1	N	3
DT2	Elgin 2	Junction East & Maisondieu Rd	Kerbside	322348	862745	NO_2	N	<2	1	N	3
DT3	Elgin 3	99-101 Maisondieu Road	Roadside	322302	862727	NO_2	N	<5	2	N	3
DT4	Elgin 4	26-28 Priory Place	Urban Background	322249	862630	NO_2	N	<5	N/A	N	3
DT5	Elgin 5	Main street New Elgin	Kerbside	322233	861869	NO_2	N	<5	1	N	3
DT6	Elgin 6	Queen Street Roundabout	Kerbside	322029	862832	NO_2	N	<5	1	N	3
DT7	Elgin 7	Hay Street	Roadside	321615	862307	NO_2	N	<5	1	N	3
DT8	Elgin 8	Newmill Road	Roadside	322492	863309	NO_2	N	<5	2	N	3
DT9	Elgin 9	37 Sandy Road	Kerbside	321775	861115	NO_2	N	5	2	N	3
DT10	Elgin 10	47 Wittet Drive	Kerbside	320641	862291	NO_2	N	5	1	N	3
DT11	Fochabers 1	50A High Street	Kerbside	334634	858726	NO_2	N	<2	2	N	3
DT12	Fochabers 2	Sunndach George Street	Kerbside	334423	858663	NO_2	N	<2	2	N	3
DT13	Forres	Tolbooth, High Street	Urban Background	303726	858931	NO_2	N	<2	N/A	N	3
DT14	Keith 1	106 Moss Street	Roadside	343323	850458	NO_2	N	<5	2	N	3
DT15	Keith 2	87 Moss Street	Kerbside	343329	850415	NO_2	N	<5	2	N	3
DT16	Lossie 1	1 Merryton Court	Kerbside	322463	870293	NO_2	N	<5	2	N	3

Site ID	Site Name	Location	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Tube height (m)
DT17	Lossie 2	7 James Street	Urban Background	323515	870931	NO_2	N	<2	N/A	N	3
DT18	Rothes 1	Police station	Kerbside	327756	849658	NO_2	N	<2	1	N	3
DT19	Rothes 2	New Street	Roadside	327740	849239	NO_2	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 A.2 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
DT1	Kerbside	Diffusion Tube	75.0	75.0	20.9	22.3	22.9	20.7	21.7
DT2	Kerbside	Diffusion Tube	75.0	75.0	19.5	19.8	23.3	23	24.4
DT3	Roadside	Diffusion Tube	75.0	75.0	14.4	12.8	12.5	11	13.0
DT4	Urban Background	Diffusion Tube	75.0	75.0	8.6	7.9	10.6	9.6	8.9
DT5	Kerbside	Diffusion Tube	75.0	75.0	15.6	15.6	17.9	15.7	16.2
DT6	Kerbside	Diffusion Tube	75.0	75.0	14.9	15.8	17.5	15.7	17.2
DT7	Roadside	Diffusion Tube	75.0	75.0	9.3	8.2	10	9.9	11.4
DT8	Roadside	Diffusion Tube	75.0	75.0	12.8	14.1	14.3	13.5	13.4
DT9	Kerbside	Diffusion Tube	75.0	75.0	6.7	6.7	7.9	6.9	7.6
DT10	Kerbside	Diffusion Tube	75.0	75.0	12.3	13.3	15.1	13	13.6
DT11	Kerbside	Diffusion Tube	75.0	75.0	10.4	10.1	11.6	9.9	11.0
DT12	Kerbside	Diffusion Tube	75.0	75.0	4.4	4.9	4.9	4.4	4.8
DT13	Urban Background	Diffusion Tube	75.0	75.0	11.8	13	13.9	12.7	12.4
DT14	Roadside	Diffusion Tube	66.7	66.7	23.8	25.3	28.2	24.8	20.4
DT15	Kerbside	Diffusion Tube	75.0	75.0	20.9	21.3	25.7	21.3	24.2
DT16	Kerbside	Diffusion Tube	75.0	75.0	4.8	5.2	5.9	5.1	5.9
DT17	Urban Background	Diffusion Tube	75.0	75.0	4.8	5.6	5.9	5.1	5.7
DT18	Kerbside	Diffusion Tube	75.0	75.0	15.3	17.1	16.8	14.6	14.0
DT19	Roadside	Diffusion Tube	75.0	75.0	16.3	17.5	19.6	17.4	14.9

Notes: (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.

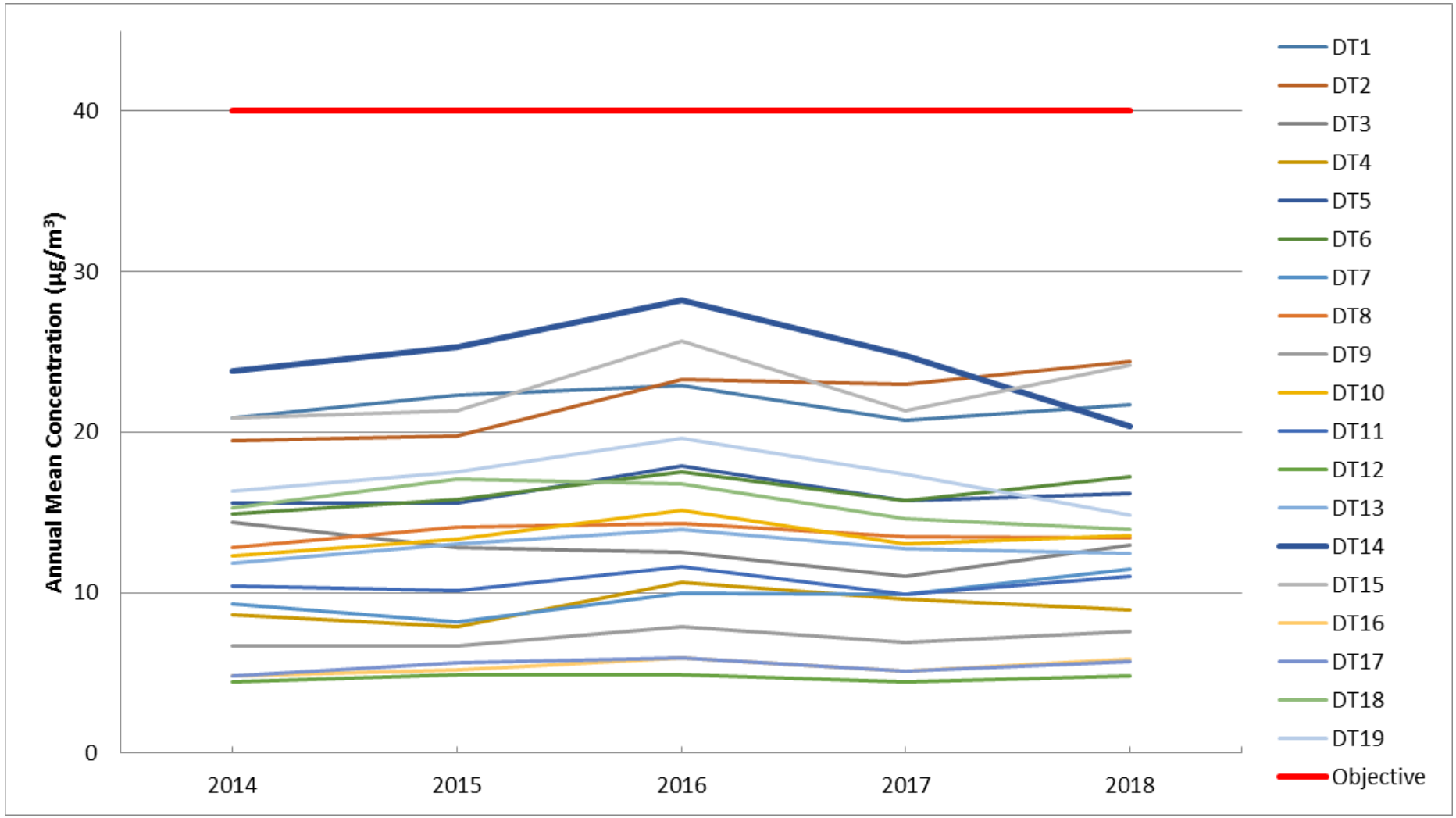


Figure A.1 - Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Sites in Moray Council

(the red line represents the annual mean nitrogen dioxide objective)

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1– NO_2 Monthly Diffusion Tube Results for 2018

Site ID	Local ID	NO_2 Mean Concentrations (µg/m^3)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug [2]	Sep [2]	Oct [2]	Nov	Dec	Annual Mean	
														Raw Data	Bias Adjusted and Annualised [(1)]
DT1	Elgin 1	27	29	30	26	22	21	19	-	-	-	38	29	26.8	21.7
DT2	Elgin 2	30	33	30	25	31	32	21	-	-	-	35	34	30.1	24.4
DT3	Elgin 3	15	21	16	10	17	14	7	-	-	-	24	20	16.0	13.0
DT4	Elgin 4	14	14	11	8	7	5*	5*	-	-	-	18	17	11.0	8.9
DT5	Elgin 5	24	26	19	16	13	11	12	-	-	-	31	28	20.0	16.2
DT6	Elgin 6	23	25	23	17	19	15	13	-	-	-	31	25	21.2	17.2
DT7	Elgin 7	14	20	16	9	11	9	8	-	-	-	22	18	14.1	11.4
DT8	Elgin 8	25	20	15	15	8	7	9	-	-	-	24	26	16.6	13.4
DT9	Elgin 9	11	14	8	7	7	5*	5	-	-	-	16	11	9.3	7.6
DT10	Elgin 10	20	21	16	16	12	11	10	-	-	-	24	21	16.8	13.6
DT11	Fochabers 1	14	18	17	11	12	12	9	-	-	-	17	12	13.6	11.0
DT12	Fochabers 2	7	8	6	5*	5*	5*	5*	-	-	-	7	5	5.9	4.8
DT13	Forres	20	26	16	11	10	8	8	-	-	-	21	18	15.3	12.4
DT14	Keith 1	37	28	27	-	21	18	22	-	-	-	28	30	26.4	20.4
DT15	Keith 2	29	41	28	24	30	28	24	-	-	-	39	26	29.9	24.2
DT16	Lossie 1	10	9	6	5*	5*	5*	5*	-	-	-	10	10	7.2	5.9
DT17	Lossie 2	11	9	7	5*	5*	5*	5*	-	-	-	7	9	7.0	5.7
DT18	Rothes 1	23	20	18	18	13	10	15	-	-	-	21	17	17.2	14.0
DT19	Rothes 2	22	20	21	18	17	12	15	-	-	-	22	18	18.3	14.9

(1) See Appendix C for details on bias adjustment and annualisation;

(2) Diffusion tube exposure time exceeded 5 weeks across these months. In accordance with LAQM.TG (16), results for these months are invalid.

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

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

Factor from Local Co-Location Studies

Moray Council does not operate an automatic analyser, and therefore no co-location study is carried out. It is therefore not possible to calculate a local bias adjustment factor.

Annualisation of Diffusion Tube Data

Where data capture is less than 75% for a full calendar year, the diffusion tube results were 'annualised' following the methodology outlined in LAQM-TG (16) (Ref-1). Annualisation was carried out for one site, DT14 (Keith 1). Continuous monitoring data from the Aberdeen, Dundee Mains Loan, and Fort William sites were used. Details of the annualisation calculations are provided in Table C1 below.

Table C.1 - Short-term to long-term adjustment, DT14 (Keith 1)

Long-term Site	Annual Mean 2018 (AM)	Period Mean 2018 (PM)	Ratio (AM/PM) *
Aberdeen	19.9	21.1	0.94
Dundee Mains Loan	12.1	12.9	0.93
Fort William	8.7	8.9	0.99
Average (R_a)			**0.95**

(*) Based on unrounded numbers

Low limit of 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 2017 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

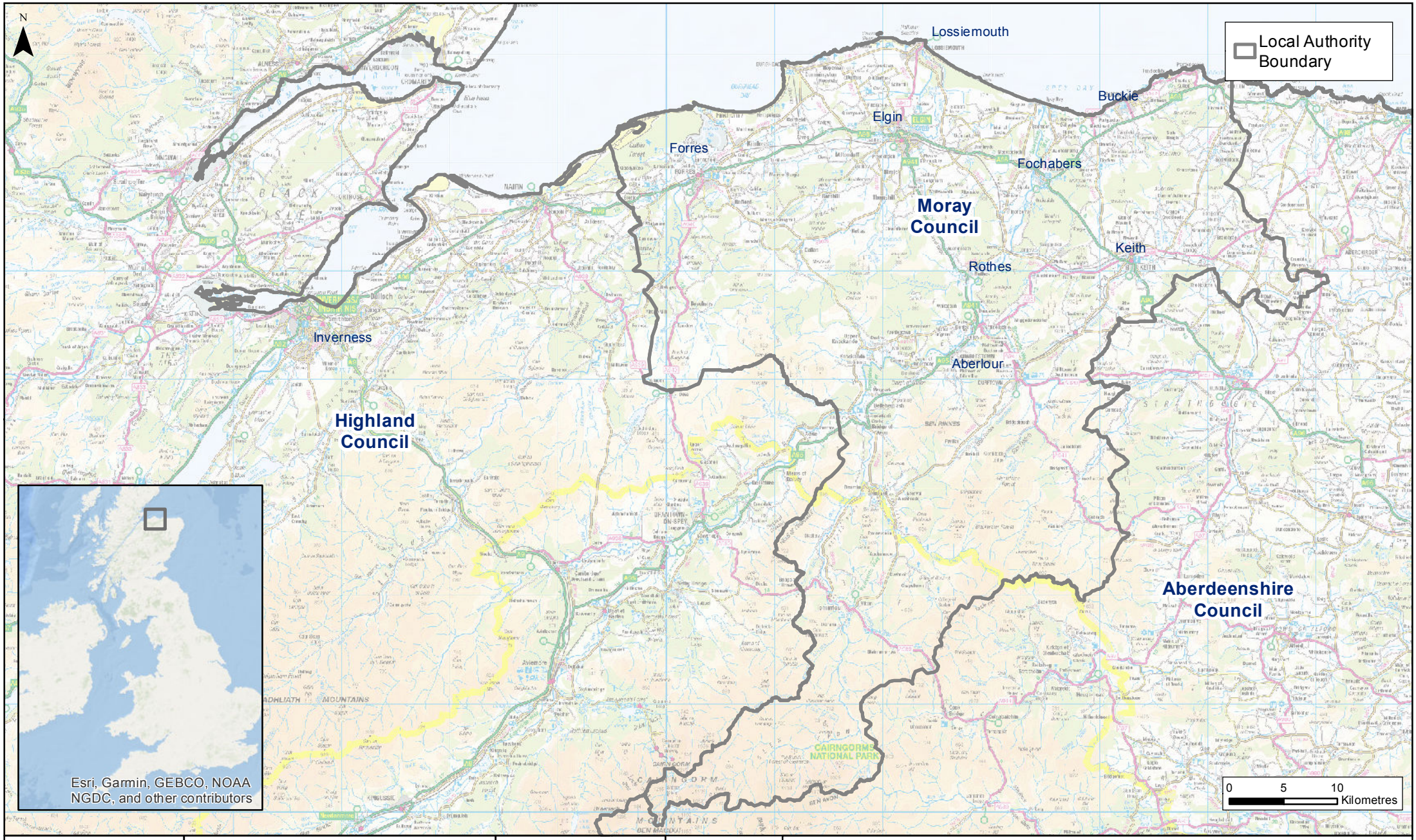
The NO_2 diffusion tubes used by Moray Council were prepared and analysed by the Aberdeen Scientific Services (ASSL), 20% TEA in Water method. The laboratory is United Kingdom Accreditation Service (UKAS) accredited and has good performance in both the LGC Standards Proficiency Testing Scheme (AIR NO_2 PT formerly WASP) (Ref- 20) and National Physical Laboratory (NPL) QA schemes. During 2018, 100% of samples were determined to have been satisfactory (Ref- 20).

Diffusion Tube Bias Adjustment Factor

The national diffusion tube bias adjustment factor spread sheet version 03/2019 was used to calculate the bias adjustment factor applied to the Moray NO_2 diffusion tube data (Ref- 21). The factor was based in 7 studies, all of which five studies had good precision.

The national diffusion tube bias adjustment factor for ASSL in 2018 is 0.81. This factor has been applied to all 2018 diffusion tube data.

Appendix D: Figures



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Extent of Moray Council Administrative Area

Figure 1 | Rev B | Page 44

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Non-Automatic Monitoring Locations

Figure 2.1 | Rev B | Page 45

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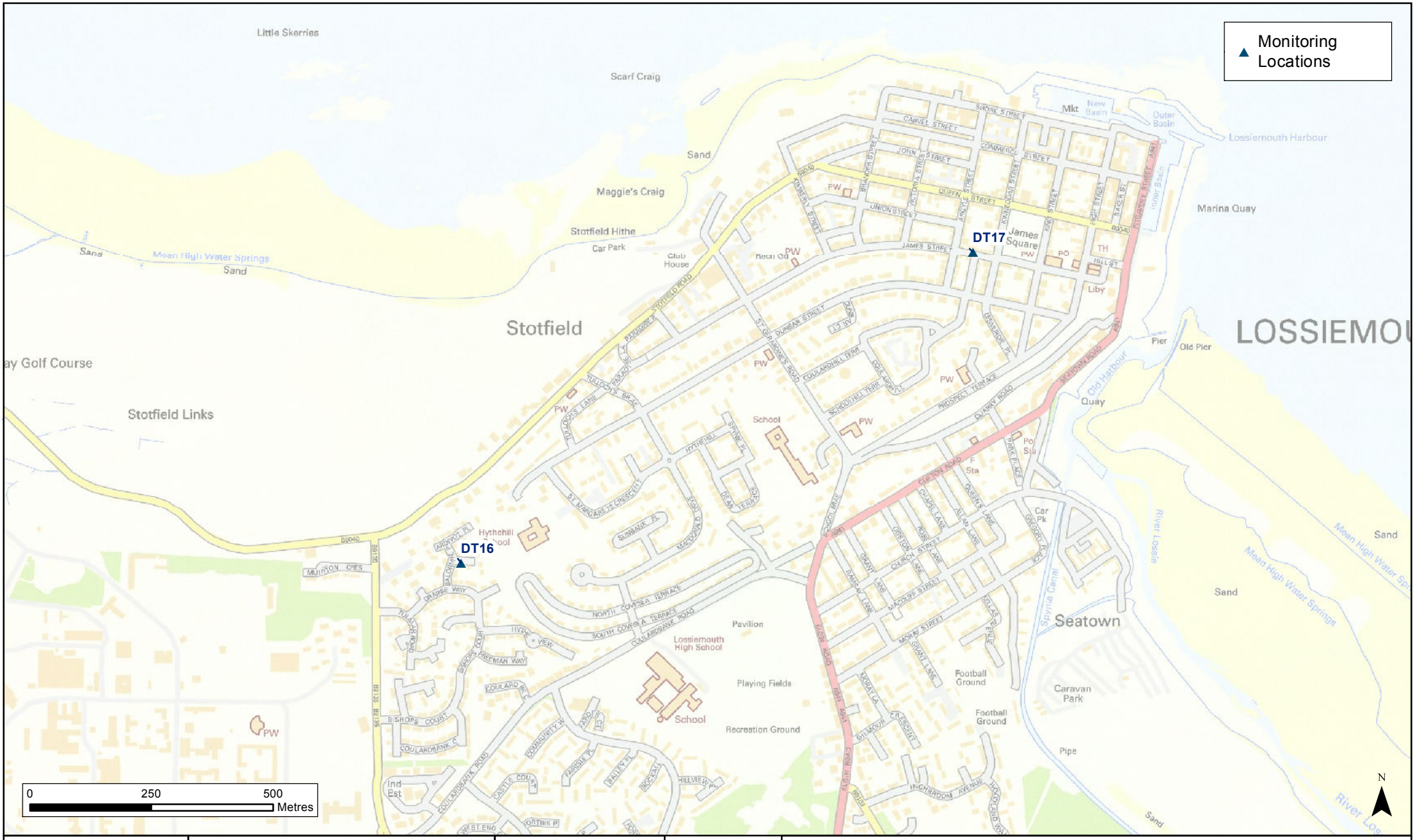

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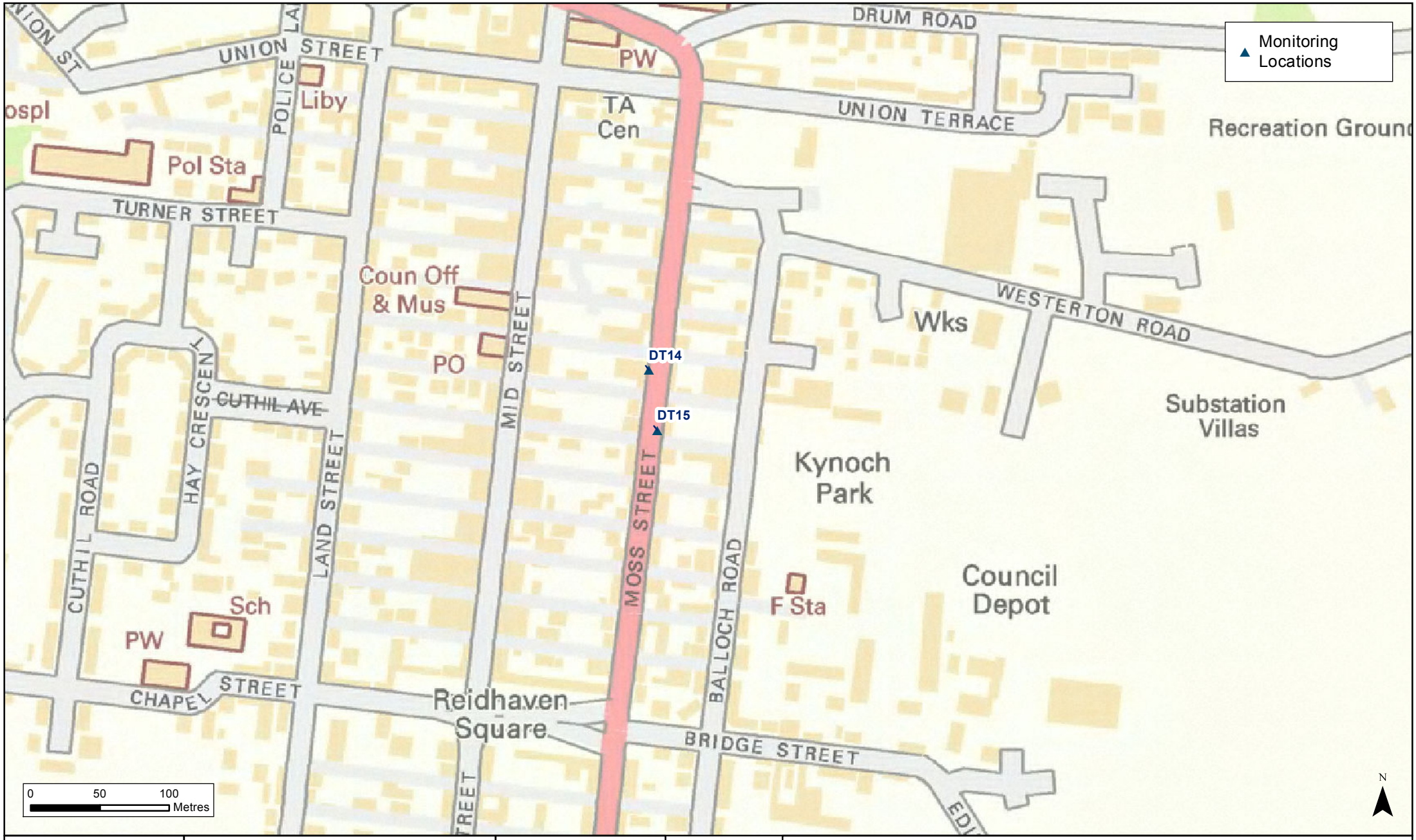
Fochabers Non-Automatic Monitoring Locations



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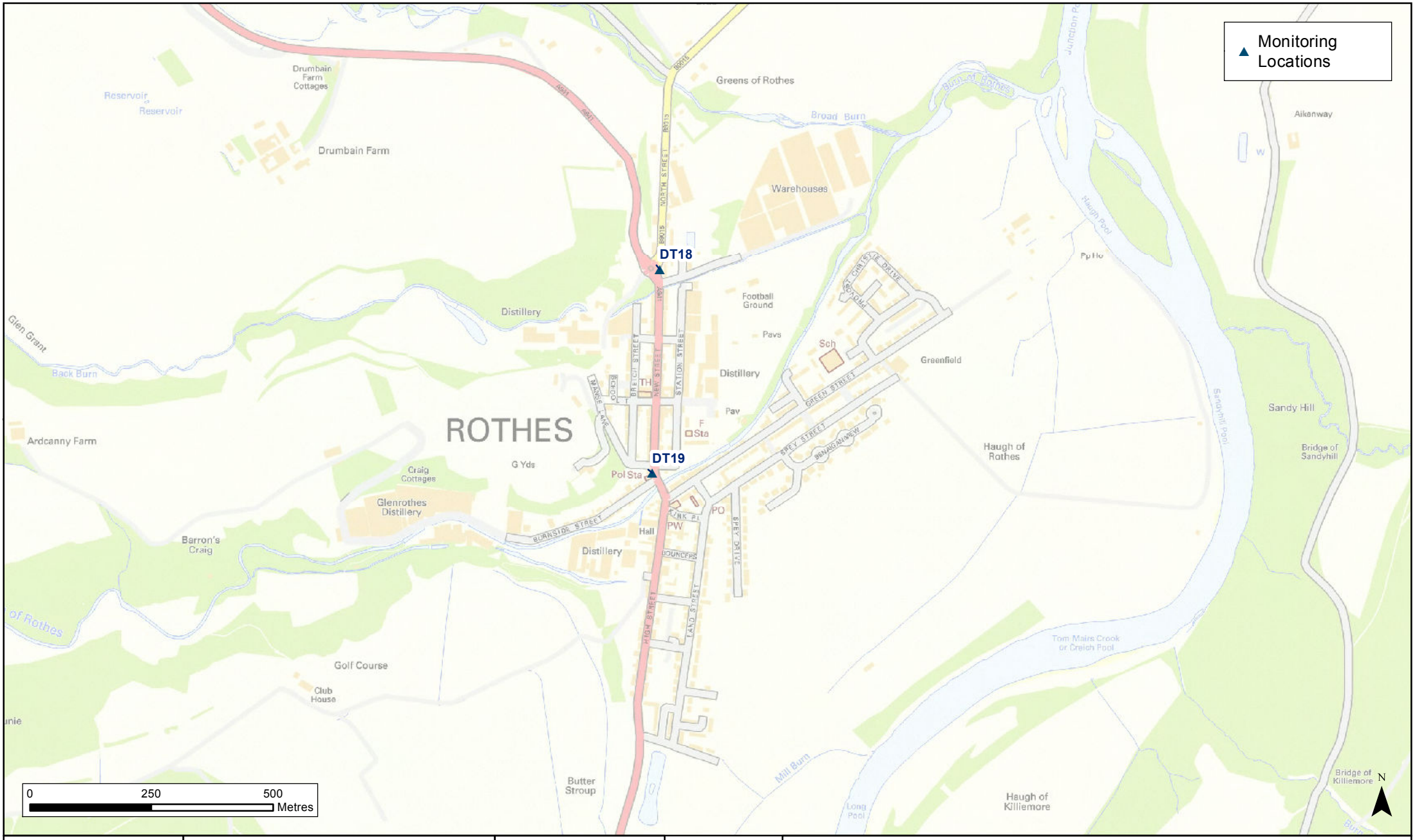
Keith Non-Automatic Monitoring Locations



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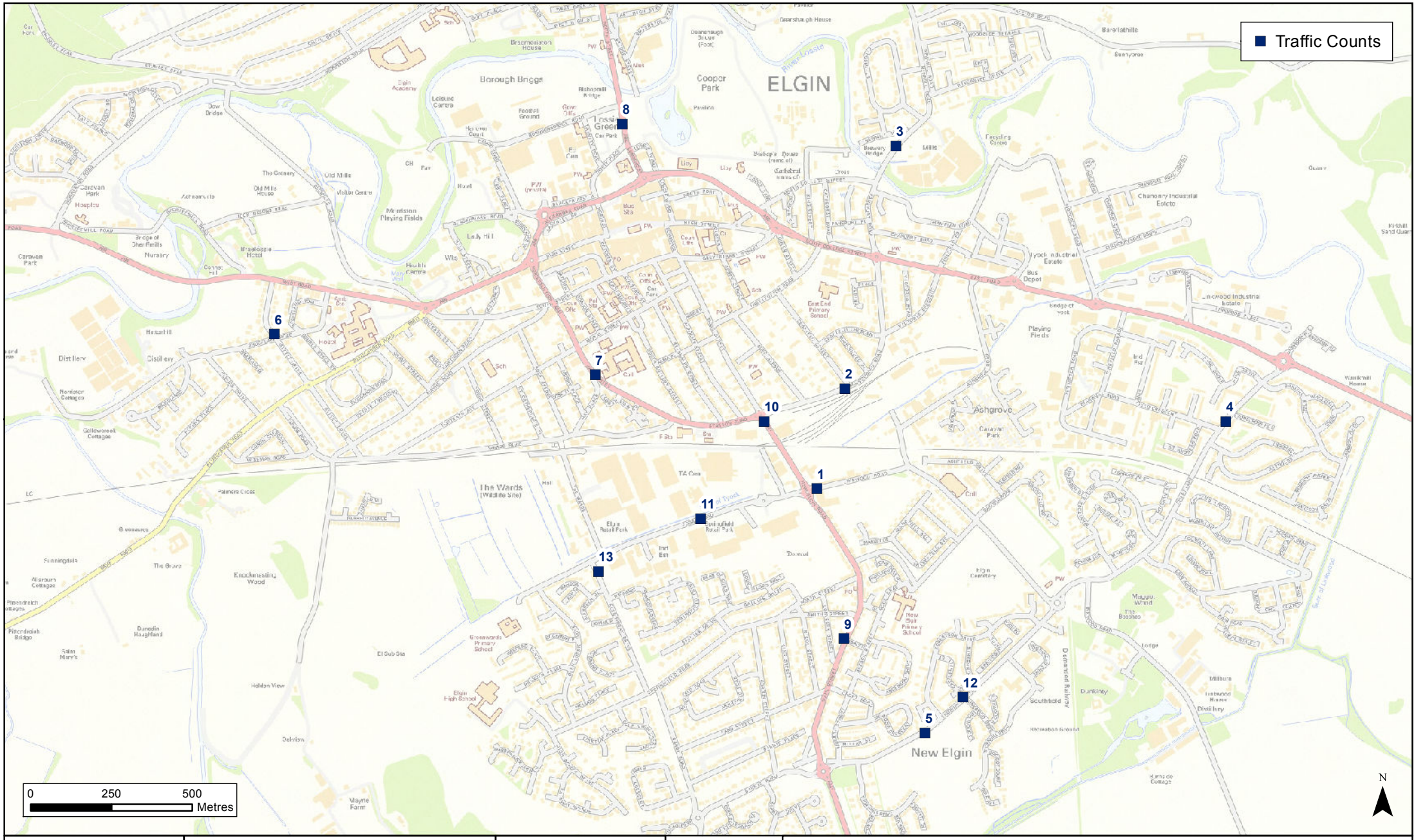

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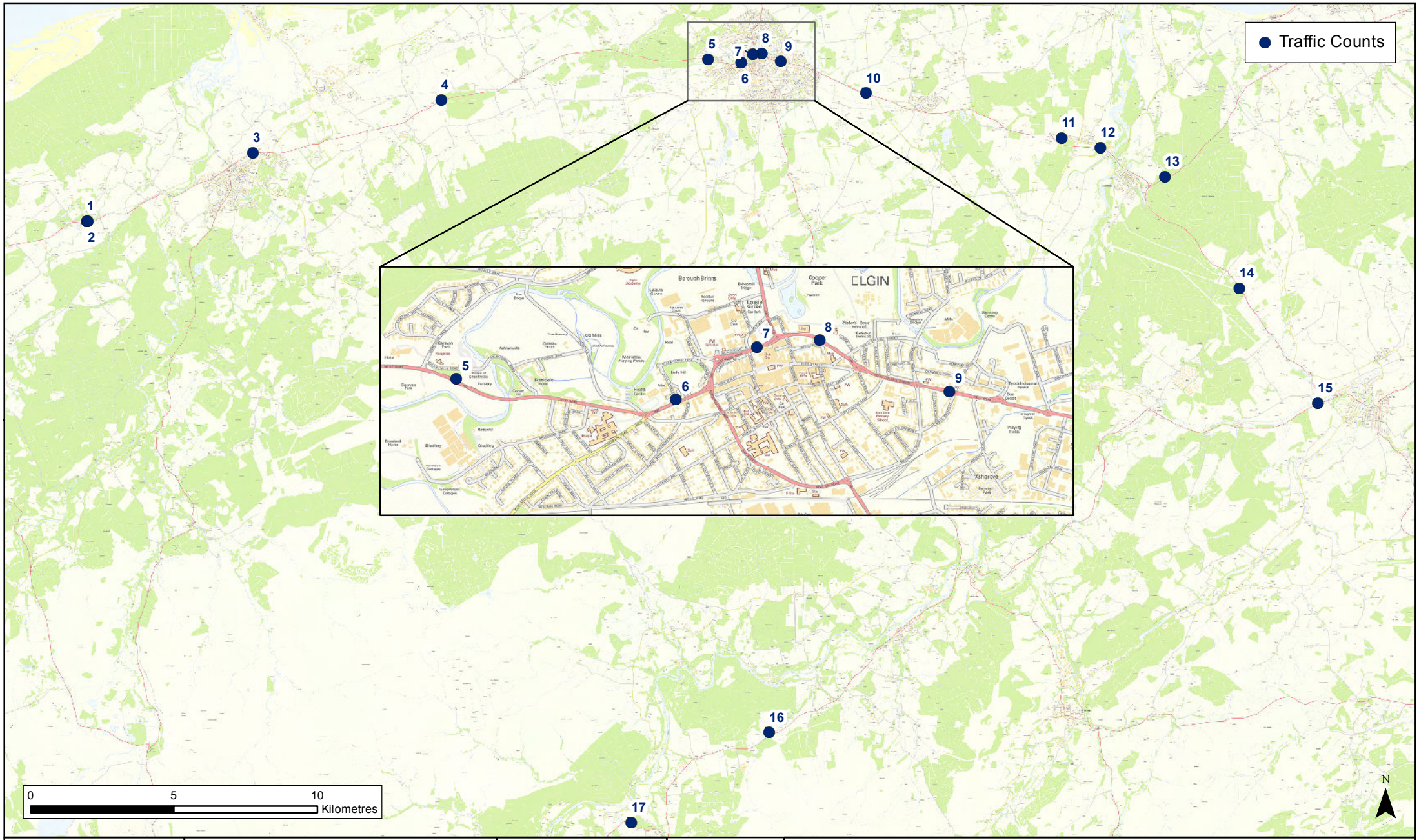
Moray Council Traffic Monitoring Locations



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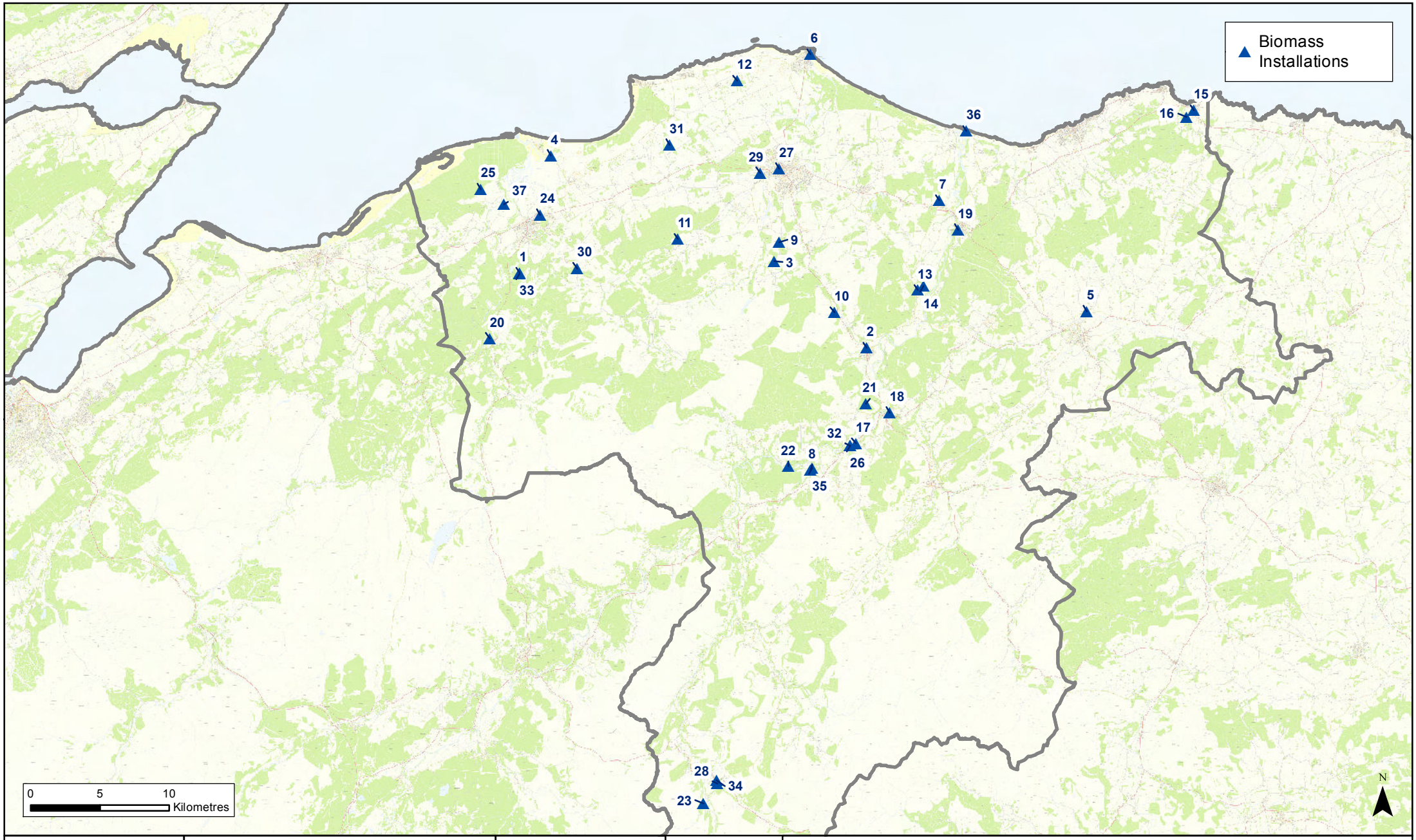
Transport Scotland Traffic Monitoring Locations



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Biomass Installations within the Moray Council Area