

**Annual Progress Report (APR)**



**Clackmannanshire  
Council**

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2017 Air Quality Annual Progress Report (APR) for  
Clackmannanshire Council

In fulfilment of Part IV of the  
Environment Act 1995

Local Air Quality Management

June 2017

**Clackmannanshire Council**

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## **Executive Summary: Air Quality in Our Area**

This report provides an overview of air quality within Clackmannanshire Council during 2016. It provides a review of pollutant monitoring data and atmospheric emissions sources within Clackmannanshire and compares the available monitoring data to national air quality standards in accordance with the guidance in LAQM.TG (16) Technical Guidance.

## **Air Quality in Clackmannanshire Council**

The Council continued to monitor emissions of NO<sub>2</sub> and PM<sub>10</sub> to determine if any air quality objectives were exceeded during 2016. All concentrations were found to be below the permitted limits. Examination of the previous six years of data shows that there was no obvious trend in annual mean NO<sub>2</sub> concentrations across the diffusion tube network until 2014 when the concentrations showed a general decrease at the five comparable sites when compared with 2013. In 2016 there was no increase in NO<sub>2</sub> levels with the exception of a slight increase for annualised data at the automated site in King Street, Alloa.

Results from the FDMS monitor at the automatic monitoring station at King Street, Alloa and those from the previous TEOM sampler have shown the annual mean concentration of particulate matter PM<sub>10</sub> of 13.6 –17 µg/m<sup>3</sup> over the last five years with an overall average of 15.3 µg/m<sup>3</sup>.

During 2016, the automatic NO<sub>x</sub> monitor continued to monitor at the King Street site, alongside the TEOM/FDMS. However, low data was captured for 2016 due to the advice given by Ricardo to the Council to switch off the monitors to protect them during the construction of the new residential flats adjacent to the unit. There is therefore only 8 months of data from this monitor available for this report.

A review of planning applications submitted in 2016 showed there were no new developments likely to have a significant impact and result in any exceedances of the Air Quality Standard (AQS) objectives for any pollutant. Clackmannanshire Council Roads and Transportation confirmed there were no new roads constructed with the potential to result in an exceedance of the AQS objectives. Transport Planning officers have collated data from traffic count sites throughout the area in recent years which is detailed later in this report. Figures were also obtained for vehicular traffic

from Transport Scotland for roads within Clackmannanshire in order to give an indication of the growth across the area.

There were a few unscheduled restrictions to HGVs on the Forth Road Bridge in 2016 which led to temporary increases in traffic on many of the roads in Clackmannanshire as drivers found diversion routes to the Clackmannanshire Bridge.

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

There are currently no Air Quality Management Areas (AQMAs) or action plans in the Clackmannanshire area, however the annual progress report summarises potential increases in emissions which may adversely affect air quality (like new roads or commercial developments). Where potential air pollution 'hotspots' are considered likely, monitoring will be considered for those areas.

During 2016 the Council continued to:

- monitor the ambient concentration of PM<sub>10</sub> and NO<sub>2</sub> in the Alloa area;
- promote sustainable travel alternatives (walking, cycling, and car sharing) through the Local Active Travel Strategy , the creation of new cycle routes, and the introduction of travel plans and cycle/walk to work initiatives and investment in technology to allow video conferencing;
- reduce the number of vehicles in the Council fleet and replace older inefficient vehicles with low emissions alternatives when funding is available;
- promote low emission transport (installation of electric charging points); and
- review and develop policies which impact on air quality.

### **Local Priorities and Challenges for Clackmannanshire Council in 2017/2018**

The Council is committed to continuing the assessment and review of pollutants affecting the air quality in Clackmannanshire. The priority is to continue monitoring emissions primarily of NO<sub>2</sub> and PM<sub>10</sub>, and begin monitoring PM<sub>2.5</sub> and widen the area of coverage of the monitoring network by utilising the AQ Mesh monitor. Due to a successful funding bid new equipment which will monitor PM<sub>10</sub> and PM<sub>2.5</sub> simultaneously will be purchased for installation at the King Street site in 2017.

A screening assessment undertaken in the 2016 APR for dust emissions from Cambusview Poultry Farm demonstrated that there was the potential for exceedance of the 24-hour mean PM<sub>10</sub> objective limit value of 50 µg/m<sup>3</sup> at nearby residential receptors. Consideration was given to a short-term monitoring survey of 3-months duration however Environmental Health staff are in discussion with SEPA (Scottish Environmental Protection Agency) Officers on further assessment of PM<sub>10</sub> levels affecting the residential properties. The AQ Mesh purchased in 2017 has been installed on the A908, Hallpark Road, Alloa where increased traffic levels and congestion have been detected over the last two years. It may be possible to deploy this unit at Cambusview Poultry Farm in the future, should it be determined that monitoring is necessary.

Roads and Transportation will continue with plans for the promotion of low emission transport and sustainable travel alternatives as identified in the Local Transport Strategy.

Continued consideration to be given to the 'Cleaner Air for Scotland Strategy' and the formation of an officer group to identify any required changes to policy and current working practices in relation to Air Quality across the Council.

### **How to Get Involved**

Improving air quality in Clackmannanshire is not only the responsibility of the Council. There are many ways members of the public, local businesses, logistics companies and transport operators can get involved. Choosing to walk or cycle instead of using the car, car sharing, and buying 'hybrid' or lower emission vehicles will all play a part in reducing pollutant levels in the area. Careful consideration should also be given to the installation/use of biomass systems and domestic wood or multi-fuel stoves as they have the potential to contribute to increased concentrations of gases and particulate matter in the air. Further information on such appliances is available at <http://www.clacksweb.org.uk/environment/woodburningstoves/>

The public can engage with the Council's efforts by logging onto the Clacksweb.org.uk website and searching for air quality. Monitoring results for the Clackmannanshire area can be viewed by visiting [www.scottishairquality.co.uk](http://www.scottishairquality.co.uk) and typing in your postcode. On this website, there is also the option to register for air quality alerts using the 'Know and Respond' System.



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## 1. Local Air Quality Management

This report provides an overview of air quality in Clackmannanshire Council during 2016. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Progress Report (APR) summarises the work being undertaken by Clackmannanshire 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 <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

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<b>Pollutant</b>	<b>Air Quality Objective</b>		<b>Date to be achieved by</b>
	<b>Concentration</b>	<b>Measured as</b>	
<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.

Clackmannanshire Council currently does not have any AQMAs. There are no recommendations in this year's report to declare any new AQMAs in the council area.

### **2.2 Progress and Impact of Measures to address Air Quality in Clackmannanshire Council**

Clackmannanshire Council has continued to monitor levels of pollutants related to emissions from transport in 2016 in pursuit of improving local air quality. From February 2015, the authority started to monitor NO<sub>x</sub> levels at its fixed monitoring site on King Street, Alloa, however this was suspended in September 2016 for the protection of the instruments during the adjacent construction work, but recommenced in April 2017. New equipment capable of monitoring PM<sub>10</sub> and PM<sub>2.5</sub> will be purchased in 2017 which will replace the existing TEOM/FDMS monitor at King Street.

Within the wider council, other measures are being taken forward which will have an impact on air quality.

The Council has a Sustainability and Climate Change Strategy adopted in 2010 which includes actions to reduce environmental impacts including reducing car use. The Council has a legal obligation to carry out Strategic Environmental Assessment (SEA) of its plans, programmes and strategies. This should include air quality considerations where the plan is likely to have an impact. SEA was used in the production of the Local Development Plan and potential negative impacts on air quality were identified and either avoided, mitigated or flagged for consideration at the development management stage.

The Development Quality section of the Council are also required to consider the potential impact on Air Quality as part of Environmental Impact Assessments (EIA)

where required for new developments. Where an EIA is not required and it is considered that a development has the potential to be detrimental to the environment, Policy EA11 of the Local Development Plan adopted in 2015 is used by the Council to ensure a developer demonstrates to the satisfaction of the Council that all reasonable measures have been taken to minimise or mitigate any such impacts.

The Local Transport Strategy is currently being updated and outlines plans for proposed roads and sustainable means of transportation within Clackmannanshire. It recognises the need to consider Air Quality and the health effects of emissions from transport and is expected to be formally adopted in Autumn 2017. Public transport plays an important part in the Council's transport strategy. The Public Transport Unit operates jointly with Stirling Council and undertakes the assessment of need for public transport services and the provision of appropriate infrastructure. The Council continues to work with "Sustrans", "Cycling Scotland" and "Paths for All" to deliver and promote our Active Travel Network.

Details of measures to address air quality and their status are set out in Table 2.1.

**Table 2.1 – Progress on Measures to Improve Air Quality**

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Control of new developments	Policy Guidance and development control	Continue to monitor concentrations of pollutants in the council area	Development and Environment	Ongoing	Ongoing	Monitored emissions	N/A, no AQMAs	Satisfactory	Ongoing	New developments will continue to be monitored and where necessary action will be taken
2	New automatic NO <sub>x</sub> monitor at King Street	Transport planning and infrastructure	NO <sub>x</sub> monitoring	Development and Environment	Feb 2015	Complete	None	N/A, no AQMAs	Ongoing		
3	Install new emissions monitor at King Street to begin measurement of PM <sub>2.5</sub>	Policy Guidance and development control	To comply with legislation requirement	Development and Environment	Funding has been obtained	Summer 2017	None	N/A, no AQMAs	Procurement process being initiated	Autumn 2017	
4	Install a mobile emissions monitor at A908 Hallpark Road, Sauchie where it was identified that traffic levels have increased.	Transport planning and infrastructure	The authority proposes to monitor PM <sub>2.5</sub> and NO <sub>x</sub> levels using this equipment.	Development and Environment	Funding has been awarded	Autumn 2017.	None	N/A, no AQMAs		Completed	

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Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
5	Environmental Health are looking to work more closely with other departments of the council such as roads and transportation, fleet management, development planning, sustainability and planning policy	Policy guidance and development control	Advice set out in the Cleaner Air For Scotland strategy (CAFS)	Development and Environment	Ongoing	Ongoing	None	N/A, no AQMAs	Ongoing upgrades to low emissions vehicles when funding allows and retirement of older stock. Significant reduction in fleet numbers*	Ongoing	
6	Council provides 12 electric pool cars for use by staff	Promoting low emission transport	Electric car charging points	Development and Environment	Complete	Complete	None	N/A, no AQMAs	Additional vehicles when funding allows	Complete	
7	Council provides 10 electric charging bays throughout Clackmannanshire for use by the public.	Promoting low emission transport	Electric car charging points located at Kilncraigs, Greenside Street, Alloa, Dumyat Centre, Menstrie, Murray Square, Tillicoultry, Dollar Community Access Point Office, Dollar, Tron Court, Tullibody.	Development and Environment	Complete	Complete	None	N/A, no AQMAs	Complete	Ongoing	Potential new site at Alva/Sauchie under consideration

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Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
8	Promotion of walking and cycling. Part of this is the Smarter Choices, Smaller Places initiative which is promoted to the public	Alternative to Private vehicle use	Local Active Travel strategy	Development and Environment	Ongoing	Ongoing	None	N/A, no AQMAs	Ongoing	Ongoing	
9	Council utilises a TripShare Clacks website which aims to reduce congestion and pollution by encouraging staff to car share on journeys to and from work;	Promoting travel alternatives	Car sharing	Development and Environment	Ongoing	Ongoing	None	N/A, no AQMAs	Ongoing	Ongoing	
10	New cycle routes and paths have been created/ upgraded	Promoting travel alternatives	New urban cycling routes created between and within Alloa and Tillicoultry, which provides safe off road routes for cycling as an alternative to car use	Development and Environment	Ongoing	Ongoing	None	N/A, no AQMAs	Ongoing	Ongoing	
11	Council has invested in technology in an effort to reduce car journeys for meetings	Promoting travel alternatives	Video and telephone conferencing	Information Technology	Ongoing	Ongoing	None	N/A, no AQMAs	Ongoing	Ongoing	
12	Cycle to work scheme for staff is promoted by the council	Promoting travel alternatives	Cycle to work scheme	Development and Environment (Transportation)	Ongoing	Ongoing	None	N/A, no AQMAs	Ongoing	Ongoing	

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<b>Measure No.</b>	<b>Measure</b>	<b>Category</b>	<b>Focus</b>	<b>Lead Authority</b>	<b>Planning Phase</b>	<b>Implementation Phase</b>	<b>Key Performance Indicator</b>	<b>Target Pollution Reduction in the AQMA</b>	<b>Progress to Date</b>	<b>Estimated Completion Date</b>	<b>Comments</b>
13	Work with SEPA Officers to make assessment of dust levels as part of IPPC Process at Cambusview Poultry Farm	Policy Guidance and development control	To obtain data for this statutory pollutant	Development and Environment	Ongoing	Ongoing	Monitor emissions	N/A	Ongoing	December 2017	
<p>* Over the last 11 months 84 diesel vehicles manufactured before 2008 were removed from the Council fleet. These have been replaced by 54 vehicles with 'Euro '6' engines. This has meant an overall reduction in the fleet numbers of 30 vehicles, and 14 of the newer vehicles are 100% Electric. The Team at Fleet Services have been extremely proactive in terms of procurement and have been considering lower emission and hybrid trucks for refuse collection within the restricted budgets available. Larger electric powered trucks cannot be considered presently as they are currently significantly more expensive.</p>											



### **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 Clackmannanshire Council against relevant actions within this strategy is demonstrated below.

#### **2.3.1 Transport – Avoiding travel – T1**

All local authorities should ensure that they have a corporate travel plan (perhaps within a carbon management plan) which is consistent with any local air quality action plan. Clackmannanshire Council has developed a revised Local Transport Strategy for up to 2019 which is due to be formally adopted in Autumn 2017. Public transport plays an important part in the Council’s transport strategy. The Public Transport Unit operates jointly with Stirling Council and undertakes the assessment of need for public transport services and the provision of appropriate infrastructure. The Council continues to work with “Sustrans”, “Cycling Scotland” and “Paths for All” to deliver and promote out Active Travel Network.

#### **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. Clackmannanshire Council has a Sustainability and Climate Change Strategy and reports on its Public Sector climate change duties in an annual report <http://www.keepsotlandbeautiful.org/media/1557927/clackmannanshire-council-ccr-2016.pdf> which includes replacing vehicles with the latest engine specifications and providing training to reduce fleet vehicle fuel-use through fuel efficient driver training programmes. Additionally, lighting, heating and other electrical upgrades in council buildings are expected to have led to reduced energy consumption and therefore atmospheric emissions. Clackmannanshire Council's greenhouse gas emissions have reduced by 55 tCO<sub>2</sub>e in 2016.

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

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

#### **3.1 Summary of Monitoring Undertaken**

The monitoring undertaken in 2016 was a continuation of the 2015 programme.

Automatic monitoring continued at the site on King Street Alloa as detailed in Section 3.1.1. The portable monitor (AQ Mesh) was purchased and installed on the A908 in June 2017, at Hallpark Road, Alloa, where increased traffic levels were detected.

No new diffusion tube monitoring sites have been introduced in 2016 and 6 sites were monitored in 2016 as detailed in Table A2.

##### **3.1.1 Automatic Monitoring Sites**

Clackmannanshire Council undertook automatic (continuous) monitoring at one site during 2016. Table A.1 in Appendix A shows the details of the site. National monitoring results are available at:

[http://www.scottishairquality.co.uk/latest/site-info?site\\_id=ALO2&view=report](http://www.scottishairquality.co.uk/latest/site-info?site_id=ALO2&view=report)

The monitoring station is situated on King Street, Alloa at a slightly altered location on the pavement outside a new residential development. It is a busy road with a pedestrian crossing, supermarket and housing nearby. The location is classified as a “roadside” site. A photograph of the unit is shown in Figure 3.1.

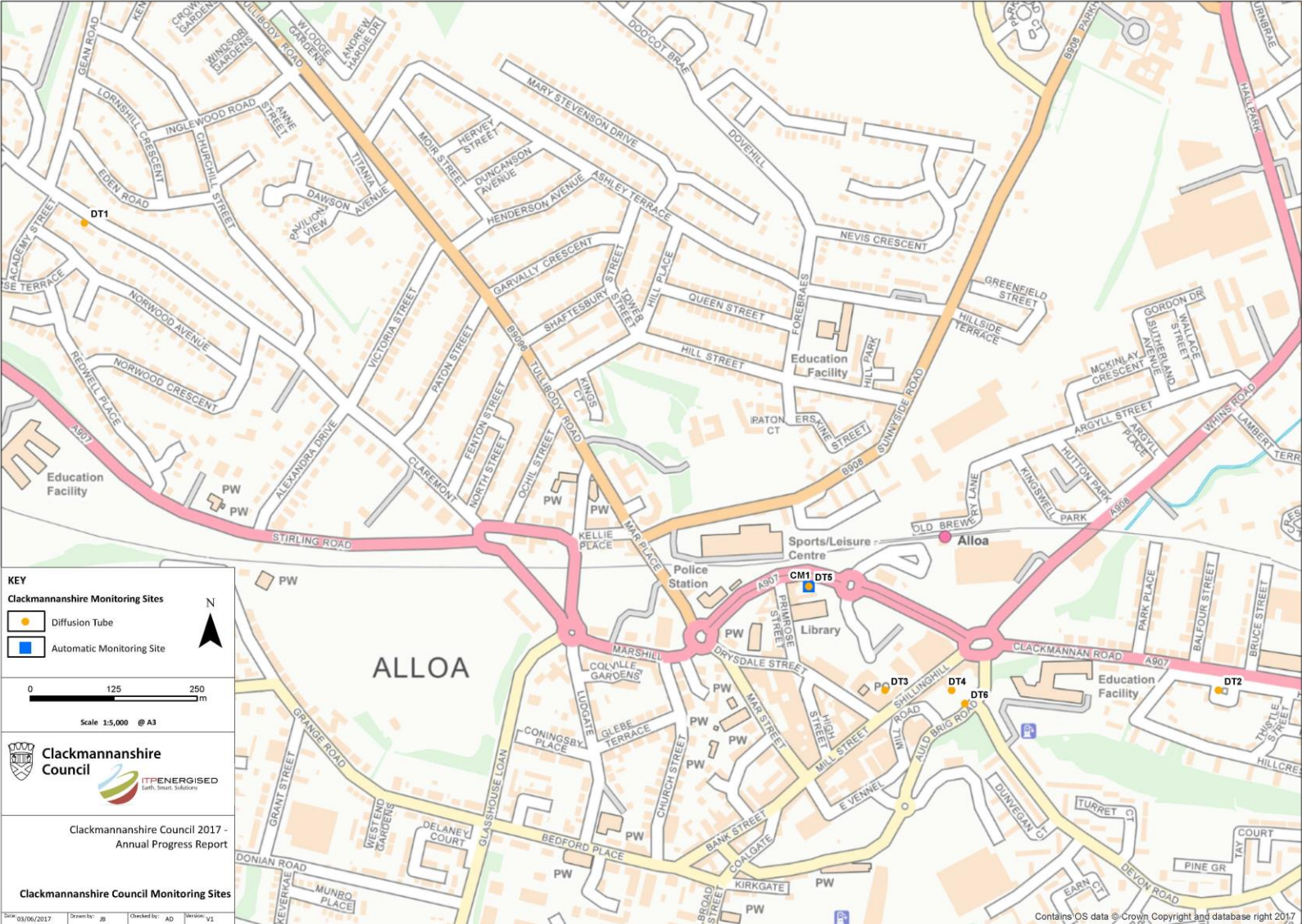
A map showing the location of the monitoring site is provided in Figure 3.2. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

The data capture for the site in 2016 was 68.3% for PM<sub>10</sub> and for NO<sub>2</sub> was 70.1%. Routine calibrations are carried out by Clackmannanshire Council staff and biannual site audits are carried out by Ricardo AEA. The audit report is reproduced in Appendix A. The low data capture for 2016 is due to the decision of the Council to disconnect the units to protect them during the construction of the new residential flats adjacent to the unit.

Figure 3.1 – Automatic Monitoring Site - King Street, Alloa



Figure 3.2 – Location Map of Automatic and Non-Automatic Monitoring Sites



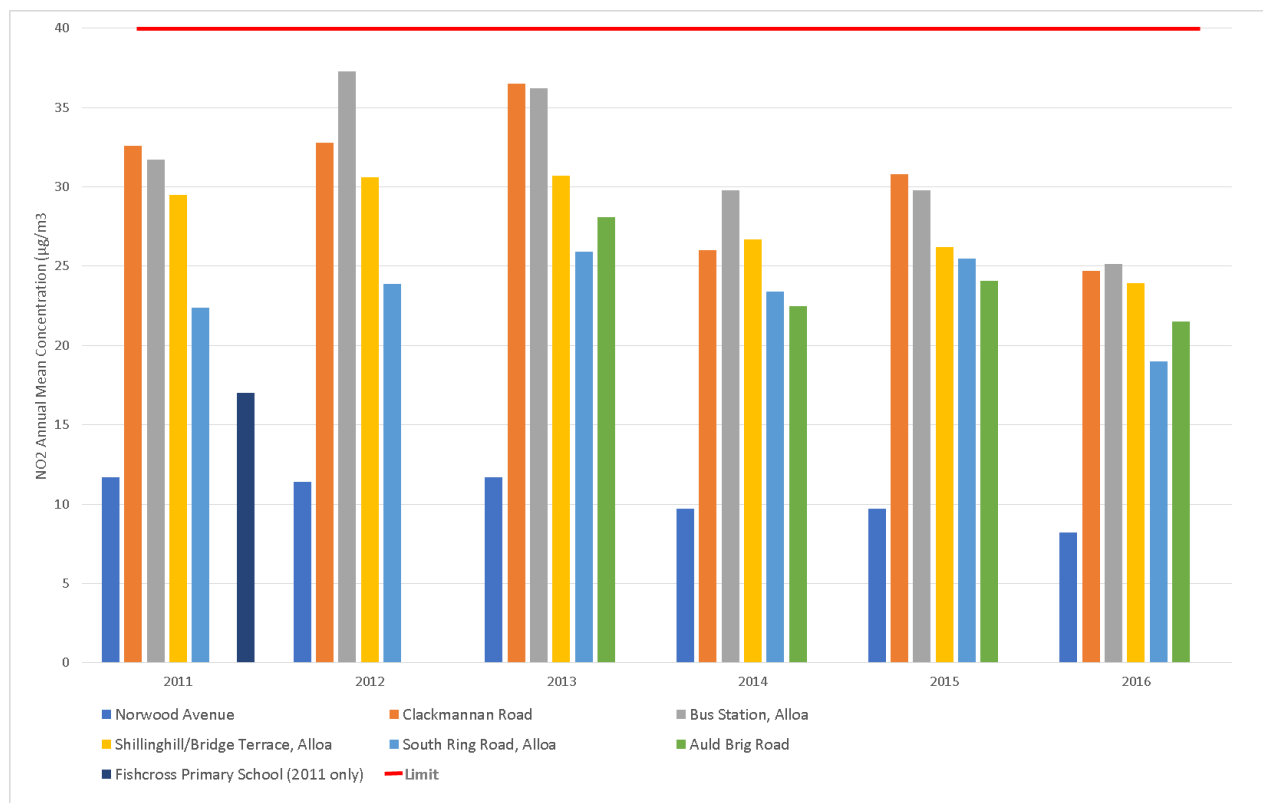


### 3.1.2 Non-Automatic Monitoring Sites

Clackmannanshire Council undertook non- automatic (passive) monitoring of NO<sub>2</sub> at six sites during 2016. Table A.2 in Appendix A shows the details of these sites.

A map showing the location of the monitoring sites is provided in Figure 3.2. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C. Trends in annual mean NO<sub>2</sub> concentrations are shown in Figure 3.3 below.

**Figure 3.3 – Trends in annual Nitrogen Dioxide Concentrations measured at diffusion tube monitoring sites in Clackmannanshire**



## 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 A.3 in Appendix A compares the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past 5 years with the air quality objective of 40µg/m<sup>3</sup>.

There have been no exceedances of the NO<sub>2</sub> annual mean objective in 2016.

For diffusion tubes, the full 2016 dataset of raw monthly mean values is provided in Appendix B, Table B1.

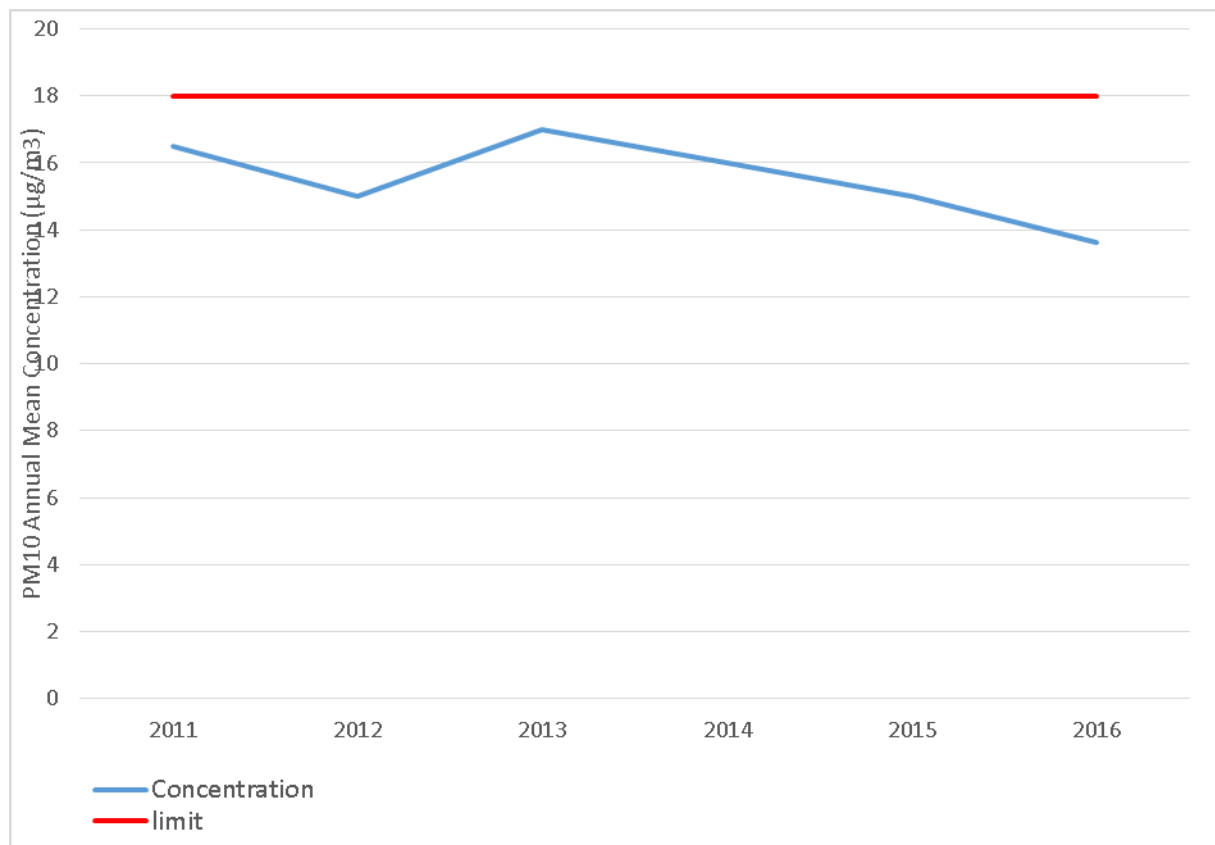
Table A.4 in Appendix A compares the ratified continuous monitored NO<sub>2</sub> hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year. There are no annual means greater than 40ug/m<sup>3</sup>, which would indicate that an exceedance of the 1 hour mean objective is unlikely at these sites. **No Air Quality Management Area requires to be declared with regard to NO<sub>2</sub> levels in Clackmannanshire.**

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

#### Automatic Monitoring Data

Table A.5 in Appendix A compares the ratified and adjusted monitored PM<sub>10</sub> annual mean concentrations for the past 5 years with the air quality objective of 18µg/m<sup>3</sup>. The annual mean concentration of PM<sub>10</sub> over the period 2011 to 2016 lies between 13.62 and 17 µg/m<sup>3</sup> with an average of 15.5 µg/m<sup>3</sup>. A trend graph is shown in Figure 3.4 below.

**Figure 3.4 – Trends in annual PM<sub>10</sub> Concentration**



The annual mean PM<sub>10</sub> concentration recorded at the automatic site was below the annual mean objective in 2016.

There have been no exceedances of the PM<sub>10</sub> annual mean objective in 2016.

Table A.6 in Appendix A compares the ratified continuous monitored PM<sub>10</sub> daily mean concentrations for the past 5 years with the air quality objective of 50µg/m<sup>3</sup>, not to be exceeded more than 7 times per year.

It is noted that there have been three exceedances over 50 µg/m<sup>3</sup> in 2016. These may have been caused by a few accidental events causing temporary closure of the Forth Road Bridge during 2016 resulting in short-term increases in traffic flows on the main routes through Alloa. **No Air Quality Management Area requires to be declared with regard to PM<sub>10</sub> levels in Clackmannanshire.**

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

Concentrations of PM<sub>2.5</sub> are not currently monitored within the Clackmannanshire Council Local Authority boundary. A portable monitor (AQ Mesh) has been purchased and installed on the A908, Hallpark Road, Alloa where increased traffic levels have been detected. Further to a successful funding bid equipment capable of monitoring PM<sub>2.5</sub> will be purchased 2017. PM<sub>2.5</sub> will also be monitored by the AQ Mesh located at Hallpark, Sauchie.

**No Air Quality Management Area currently requires to be declared with regard to PM<sub>2.5</sub> levels in Clackmannanshire.**

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

Concentrations of SO<sub>2</sub> are not monitored in the Clackmannanshire Council area and there are no immediate plans to do so. **No Air Quality Management Area currently requires to be declared with regard to SO<sub>2</sub> levels in Clackmannanshire.**

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

Concentrations of carbon monoxide, lead and 1,3-Butadiene are not monitored in the Clackmannanshire Council area and there are no immediate plans to do so. **No Air Quality Management Area currently requires to be declared with regard to Carbon Monoxide, Lead and 1, 3-Butadiene in Clackmannanshire.**

## 4. New Local Developments

The following section has been completed based on consultation with other relevant Council services including Community Resources Roads & Transport, Planning & Housing as well as local knowledge.

### 4.1 Road Traffic Sources

The Transport Planning Department of Clackmannanshire Council was consulted in order to check if there were any new potential road traffic sources or significantly changed traffic sources within the Council area that could result in exceedances of air quality standards.

The Council operate a number of traffic counters throughout the area. In the network of counters operated by the Council, 12 sites showed an increase in vehicle movements, and ten a decrease or no change. Eight of the increased traffic flows were less than 10%.

Those with an increase greater than 10% were the B9096 Tullibody Road, the B9140 Muirside and the B9140 Sheardale. Figures for 2010 – 2016 are summarised in Table 4.1. A location map of the monitoring sites showing 2016 AADT counts is shown in Figure 4.1.



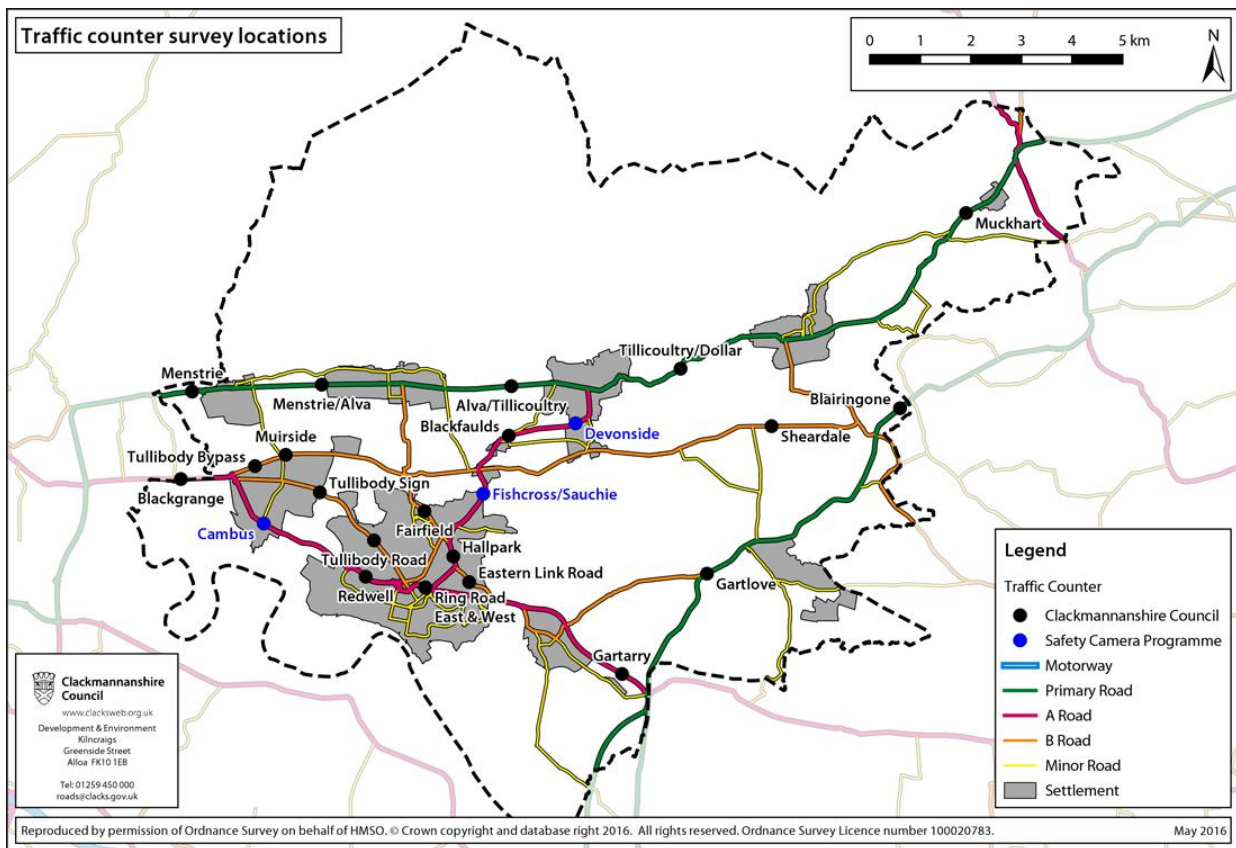
Table 4.1 – Summary of Traffic Survey Data 2010 – 2016

Link	Description	Speed limit (mph)	Annual Average Daily traffic (vehicles per day)							
			2010	2011	2012	2013	2014	2015	2016	% change 2015-2016
49	A977 Gartlove	60	5437	5603	6334	6139	6706	7358	7331	-0.4
287	A907 Blackgrange	60	20407	20036	19945	19478	19522	21238	21100	-0.6
288	A907 Cambus	40	8869	8548	n/a	7750	6851	7993	8175	2.3
289	A907 Redwell Primary School	20/30	-	-	-	-	-	8527	8643	1.4
292	A907 Ring Road Westbound	30	11416	11151	n/a	9768	11503	11341	11199	-1.3
295	A907 Clackmannanshire bypass	60	13302	14672	14617	15050	15024	14820	14848	0.2
299	A908 Hallpark Road	30	-	-	-	-	-	17088	18588	8.8
300	A908 Fishcross Primary School	30	12889	12452	12326	11657	11693	12569	12339	-1.8
301	A908 Blackfaulds	40	9167	9074	8886	9069	9059	-	9142	-
302	A908 Devonside	30	7649	7612	7481	6809	7336	7220	7648	5.9
309	A91 Menstrie Mains	60	9121	8815	8457	8205	8102	8469	-	-
311	A91 Menstrie/Alva	60	9252	9016	8362	8599	8140	8871	8188	-7.7
314	A91 Tillicoultry	30	6513	6734	n/a	n/a	6095	6889	6188	-10.2
317	A91 Tait's Tomb	60	5508	5163	n/a	5178	5429	5444	5398	-0.8
321	A91 Muckhart	60	3346	3098	3123	3267	3014	3334	3205	-3.9
501	A977 Blairingone	60	3957	4904	4759	-	-	5693	5973	4.9
581	B908 Fairfield	30	6341	6368	6547	6696	6834	7384	7194	-2.6
586	B909 Hilton Road	40	9983	-	-	-	-	10811	10908	0.9
589	B9096 Tullibody sign	30	9407	9459	9185	9126	9449	9334	9431	1
590	B9096 Tullibody Road	30	10702	10343	10086	10131	10337	8636	10102	17
625	B9096 Tullibody bypass	60	7668	7789	7815	8668	8310	8191	8956	9.3
626	B9140 Muirside	60	8155	8267	n/a	8487	8821	8278	9264	11.9
634	B9140 Sheardale	60	1677	1492	n/a	1520	1438	1636	2092	27.9
1292	A907 Ring Road Eastbound	30	9810	-	-	-	-	9794	9602	-2
29800000	A908 Whins Road, Alloa @ TA Centre	30	-	-	-	-	-	-	10355	-
62800000	B9140 Collyland @ Engine Green Drive	30	-	-	-	-	-	-	7031	-

Link	Description	Speed limit (mph)	Annual Average Daily traffic (vehicles per day)							
			2010	2011	2012	2013	2014	2015	2016	% change 2015-2016
10420000	Mar Street, Alloa @ Bank of Scotland-	20	-	-	-	-	-	-	3123	-
L972	Branshill Road, Sauchie @ Cottages	20	-	-	-	-	-	-	864	-
L972	Branshill Road, Sauchie @ No. 24	30	-	-	-	-	-	-	1707	-
L972	Branshill Road, Sauchie @ N of Parkhead	30	-	-	-	-	-	-	1325	-
59600001	Riccarton, Clackmannan @ Burnside Crescent	30	-	-	-	-	-	-	807	-
10430000	Denbecan, Alloa @ No.6/8	20	-	-	-	-	-	-	134	-
31100003	A91 Victoria Terrace, Menstrie (100m west)	40	-	-	-	-	-	-	7481	-
31600000	A91 Dollar Road, Tillicoultry @ Parish Church	30	-	-	-	-	-	-	7287	-
89800000	Craigbank, Sauchie @ No. 29	20	-	-	-	-	-	-	223	-
31200001	A91 Stirling Street, Alva W of Grodwell Drive	30	-	-	-	-	-	-	7617	-
31300001	A91 Stirling Street, Alva @ 1 Minto Gardens (May)	30	-	-	-	-	-	-	8156	-
31300001	A91 Stirling Street, Alva @ 1 Minto Gardens (Aug)	30	-	-	-	-	-	-	8026	-
68800002	Victoria Street, Alloa opp No. 24	20	-	-	-	-	-	-	560	-
90700003	Gean Road, Alloa @ No.33	20	-	-	-	-	-	-	463	-
68800001	Alexandra Drive, Alloa @ No.17	20	-	-	-	-	-	-	768	-
10450000	Dunmar Drive, Alloa @ No. 38	20	-	-	-	-	-	-	-	-
92800000	Redwell Place, Alloa @ No. 42	20	-	-	-	-	-	-	773	-
49000002	A977 Forestmill S/W of Fearn's Road	40	-	-	-	-	-	-	6721	-

Links highlighted in green are new sites where traffic counts have commenced in 2016

Figure 4.1 – Location map of Automatic Traffic Counts in Clackmannanshire



On consideration of the information relating to traffic count data and from discussions with the roads and transportation department at the Council, it can be confirmed that:

- There are no new narrow congested streets with residential properties close to the kerb;
- There are no new busy streets where people may spend one hour or more close to traffic;
- There are no new roads with a high flow of buses and/or HGV's;
- There are no new junctions;
- There are no new roads constructed or proposed;
- There are no new roads with significantly changed traffic flows.
- There are no new bus or coach stations.

#### 4.2 Other Transport Sources

Clackmannanshire Council have confirmed that there are none of the following new or significantly changed transport sources:

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

There is one train station within the Clackmannanshire Council area at Alloa which has been assessed in previous rounds of Review and Assessment for the potential impact from stationary trains. There has been no increase in the number of stationary trains with engines running within relevant exposure. No further assessment has been undertaken.

During 2016, there was no change in the number of diesel passenger trains on the main train lines throughout the Clackmannanshire Council area since the last round of Review and Assessment. The line also handled freight trains delivering coal to Longannet Power Station (and sometimes from it). Since the closure of Longannet Power Station in early 2016, this line does not currently handle regular freight trains. Additionally, as part of the Edinburgh Glasgow Improvement Programme (EGIP) Network Rail is committed to the electrification of the Stirling/Alloa/Dunblane lines which is expected to be completed by December 2018. No further assessment of rail emissions was therefore undertaken.

#### **4.3 Industrial Sources**

The Scottish Environment Protection Agency, (SEPA) was contacted to obtain up-to-date information on regulated industrial processes within the Clackmannanshire Council area. They were unaware of any applications or plans for new or increased sources of atmospheric emissions in the Council area.

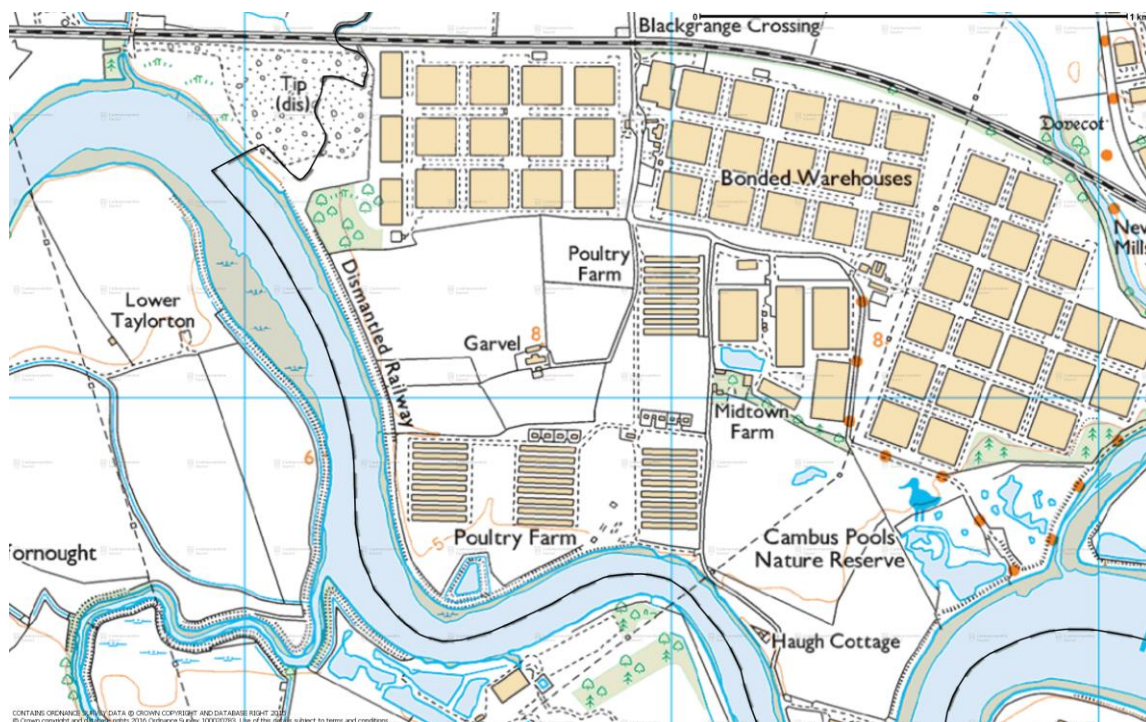
With regard to existing industrial sources, SEPA has previously confirmed to the Council that there are two Poultry Farms within the area which could have the potential for fugitive emissions of particulate matter:

- Cambusview Poultry Farm; and
- Helensfield Poultry Farm.

According to the guidance in LAQM TG(16), poultry farms which house in excess of 400,000 birds (if mechanically ventilated) and in excess of 200,000 (if naturally ventilated) with exposure within 100m from the poultry units are required to be considered in a screening assessment.

Cambusview Poultry Farm (see location map at Figure 4.2) is a Part A process regulated by SEPA under the Pollution Prevention and Control (Scotland) Regulations 2012 (PPC) (permit ref: PPC/A/1016782).

**Figure 4.2 – Map showing the location of Cambusview Poultry Farm**



It has been identified in previous air quality assessments as having the potential to cause an adverse impact on air quality at a number of residential properties, some occupied by the poultry farm workers, close to the units. The screening assessment undertaken in the 2016 APR demonstrated that there was the potential for exceedance of the 24-hour mean PM<sub>10</sub> objective limit value of 50 µg/m<sup>3</sup> at nearby residential receptors, however, there is no record of any complaints from local residents in relation to air quality in the vicinity of the site. Discussions are ongoing with SEPA regarding a way forward with this matter.

The other poultry farm within the Council area (Helensfield Poultry Farm (permit ref: PPC/A/1017511)) is located near to the town of Clackmannan. The Council does not

intend to further investigate the poultry farm at Helensfield. According to the farm PPC permit, the units are described as:

*' 10 poultry housing units with a capacity...of 133,000 places for poultry'... with a `ventilation system comprising of fans which expel air through vents located in the side walls of each housing unit and adjustable louvers located in the roof.'*

The site has less than 400,000 birds therefore it does not fall under the criteria required to undertake a screening assessment. There is no history of complaints of dust nuisance from this site and it will not be assessed further.

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

There are no new commercial energy centre installations or Combined Heat and Power (CHP) plants.

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

The Council has previously received some complaints regarding smoke from small, domestic wood burning stoves which are investigated on a case-by-case basis. Such installations do not always require planning permission and it is therefore difficult to track their numbers within the Council area. However, it is the intention of Clackmannanshire Council to log all units as they become aware of them. Enquiries relating to advice on woodburning stoves are recorded on Environmental Health Database.

New applications, especially biomass boilers are considered in Section 5.

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

Clackmannanshire Council confirms that there are none of the following new or significantly changed fugitive or uncontrolled sources:

- Landfill sites.
- Quarries.
- Unmade haulage roads on industrial sites.

- Waste transfer stations, etc.
- Other potential sources of fugitive particulate matter emissions.

## 5. Planning Applications

The Development Quality section of the Council was consulted with regard to major planning applications during 2016 which might affect air quality.

The Applications and outcomes are summarised in Table 5.1.

**Table 5.1– Details of Planning Applications Requiring Air Quality Assessments or Screening Assessments by Clackmannanshire Council**

Name of Establishment	Data Submitted by Applicant	Screening Assessment by Clackmannanshire Council	Outcome
<b>16/00223/FULL – 2 Dollarfield Farm Steading, Dollar, FK147LX</b> Installation of wood burning stove with external flue.	Granted planning permission in November 2016.	None	The council stated that: <i>‘The position and height of the flue to the west side of the roof, coupled with the neighbouring landuse, means that the general amenity of the surrounding area will not be compromised.’</i>
<b>14/00250/MSC Land to South and East of A977, Forrestmill</b> Erection of 250 houses with associated roads, footpaths and landscaping.	An Environmental Statement was submitted by the developer in 2006 which concluded that the impact of the development on local air quality was not significant.	Council requested a review and update of AQ assessment to confirm compliance with new legislation due to time elapsed since original EIA	Granted planning permission in June 2016.
<b>Midtown Farm Blackgrange Road Cambus</b>	Pre-application 2015-065 Proposal for Binder 1 MW biomass boiler to burn poultry litter/waste, to heat poultry sheds.	None	Enquiry into Air Quality Standards prior to installation of biomass boiler with relevance to the UK’s reusable heat incentive. Advisory response given with suggestion that air quality assessment is carried out in accordance with air quality objectives and IPPC Scotland Regulations 2012.

There were two new enquiries for small domestic woodburning stoves received in 2016 and added to the register.



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

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

During 2016, Clackmannanshire Council undertook monitoring of NO<sub>2</sub> and PM<sub>10</sub> concentrations at locations detailed in the report. The results indicate that concentrations at all monitoring locations comply with the air quality objectives. Three exceedances of the 24-hour mean for PM<sub>10</sub> were noted in 2016 compared with the objective level of seven. There are no existing AQMAs within the Council area and based on the monitoring data obtained during 2016, it is concluded that no AQMAs are required to be declared.

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

This assessment has been conducted in accordance with the TG(16) Technical Guidance. Updated information has been obtained on road, rail, industrial, domestic and fugitive emission sources and compared to criteria and conditions described in the Guidance. It was concluded that there are no new local developments that require further assessment.

### **6.3 Proposed Actions**

Clackmannanshire Council plans to maintain the monitoring network throughout 2017. There are no planned changes to existing monitoring locations.

Funding was granted to the Council in 2016/2017, which allowed the purchase of a portable type monitor (AQ Mesh) which is installed on the A908 Hallpark Road and which monitor NO<sub>2</sub> and PM<sub>2.5</sub>. It may be possible to deploy this unit at Cambusview Poultry Farm in the future, should it be determined that monitoring is necessary.

There was an increase in traffic flow greater than 10% on the B9096, Tullibody Road, the B9140 Muirside and the B9140 Sheardale. Automatic traffic monitoring will continue at these locations during 2017 and consideration will be given to undertaking monitoring along these links using either the AQ Mesh portable unit or additional diffusion tubes in 2018.

The next report to be published is the 2018 Annual Progress Report.

**Appendix A: Monitoring Results**

**Table A.1 – Details of Automatic Monitoring Sites**

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m)	Distance to kerb of nearest road (m)	Inlet Height (m)
CM1	King Street Alloa	Roadside	288686	693056	PM <sub>10</sub> ; NO <sub>2</sub>	N	PM <sub>10</sub> Chemiluminescent; NO <sub>2</sub> TEOM/FDMS	8	3	2.6

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m)	Distance to kerb of nearest road (m)	Tube collocated with a Continuous Analyser?
DT1	Norwood Avenue, Alloa	Kerbside	287600	693600	NO <sub>2</sub>	N	2	1.7	N
DT2	Clackmannan Road, Alloa	Kerbside	289300	692900	NO <sub>2</sub>	N	2	2	N
DT3	Bus Station, Alloa	Kerbside	288800	692900	NO <sub>2</sub>	N	2	1.3	N
DT4	Shillinghill/Bridge Terrace, Alloa	Kerbside	288900	692900	NO <sub>2</sub>	N	2	1.4	N
DT5	King Street, Alloa	Kerbside	288686	693056	NO <sub>2</sub>	N	8	2	Y
DT6	Auld Brig Road, Alloa	Kerbside	288920	692880	NO <sub>2</sub>	N	3	1.8	N

Table A.3 – Annual Mean NO<sub>2</sub> Monitoring Results – 2012-2016

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
CM1	Roadside	Automatic	N/A	70.1	-	-	-	28	27.6 (29.3) <sup>(4)</sup>
DT1	Kerbside	Diffusion tube	100	100	11.4	11.7	9.7	9.7	8.2
DT2	Kerbside	Diffusion tube	100	100	32.8	36.5	26.0	30.8	24.7
DT3	Kerbside	Diffusion tube	100	100	37.3	36.2	29.8	29.8	25.1
DT4	Kerbside	Diffusion tube	100	100	30.6	30.7	26.7	26.2	23.9
DT5	Kerbside	Diffusion tube	87.5	58.3	23.9	25.9	23.4	25.5	19 (20) <sup>(4)</sup>
DT6	Kerbside	Diffusion tube	100	100	-	28.1	22.5	24.1	21.5

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 exceedence 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) Annual mean concentrations for diffusion tubes have been corrected for bias.

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

Table A.4 – 1-Hour 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> 1-Hour Means > 200µg/m <sup>3</sup> <sup>(3)</sup>				
					2012	2013	2014	2015	2016
CM1	Roadside	Automatic	N/A	70.1%	-	-	-	0 (90)	0 (96)

Notes: Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

Table A.5 – Annual Mean PM<sub>10</sub> Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2016 (%) <sup>(2)</sup>	PM <sub>10</sub> Annual Mean Concentration (µg/m <sup>3</sup> )				
				2012	2013	2014	2015	2016
CM1	Roadside	N/A	68.3	15	17	16	15	13.3 (13.6) <sup>(3)</sup>

Notes: Exceedances of the PM<sub>10</sub> annual mean objective of 18µg/m<sup>3</sup> are shown in **bold**.

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

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

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

Table A.6 – 24-Hour Mean PM<sub>10</sub> Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2016 (%) (2)	PM <sub>10</sub> 24-Hour Means > 50µg/m <sup>3</sup> (3)				
				2012	2013	2014	2015	2016
CM1	Roadside	N/A	68.3	1	0	0	2	3

Notes: Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> not to be exceeded more than 7 times/year) are shown in **bold**.

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

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

(3) If the period of valid data is less than 85%, the 90.4<sup>th</sup> percentile of 24-hour means is provided in bracket

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

Table B.1 – NO<sub>2</sub> Monthly Diffusion Tube Results for 2016

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )												Annual Mean	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (Bias = 0.97) <sup>(1)</sup>
DT1	11.7	7.6	9.8	5.4	2.1	5.1	4.3	2.1	10.3	11.6	17.7	13.9	8.5	8.2
DT2	36.5	22.9	29.3	26.5	13.4	14.6	19.9	2.1	26.5	31.8	40.7	41.3	25.5	24.7
DT3	32	16.6	24.8	31.4	17.3	9.8	18.3	25.5	25.9	33.5	36	39.8	25.9	25.1
DT4	32.9	28.9	26.1	22.2	13.1	16.1	13.7	22.1	26.9	25	35	33.8	24.7	23.9
DT5	29.7	24.6	21.8	NR <sup>(2)</sup>	8.8	7.5	19.7	25	-	-	-	-	19.6	19 (20) <sup>(3)</sup>
DT6	30.2	19.9	21.9	17.5	12.3	13.1	12.7	20.4	21.8	28.2	31.8	36.4	22.2	21.5

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) See Appendix C for details on bias adjustment

(2) NR: No Return

(3) Annualised data



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

### Factor from local Co-location Studies

There is no co-location study within Clackmannanshire Council.

### Diffusion Tube Bias Adjustment Figures

The National bias adjustment factor spreadsheet 03/17 V2 was used to derive the national bias adjustment factor for diffusion tubes analysed by Glasgow Scientific Services during 2016. The factor was found to be 0.97. See Figure C.1 below.

**Figure C.1 Glasgow Scientific Services – National average bias adjustment factor 2016**

National Diffusion Tube Bias Adjustment Factor Spreadsheet				Spreadsheet Version Number: 03/17 V2						
Follow the steps below in the correct order to show the results of relevant co-location studies				This spreadsheet will be updated at the end of June 2017						
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods				LAQM Helpdesk Website						
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet				Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.						
This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.										
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.										
Step 1:	Step 2:	Step 3:	Step 4:							
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor shown in blue at the foot of the final column.							
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data	If you have your own co-location study then see footnote 4. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953							
Analysed By	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m <sup>3</sup> )	Automatic Monitor Mean Conc. (Cm) (µg/m <sup>3</sup> )	Bias (B)	Tube Precision	Bias Adjustment Factor (A) (Cm/Dm)
Glasgow Scientific Services	20% TEA in water	2016	KS	Glasgow City Council	12	60	65	-7.5%	P	1.08
Glasgow Scientific Services	20% TEA in water	2016	R	Glasgow City Council	11	36	33	8.8%	P	0.92
Glasgow Scientific Services	20% TEA in water	2016	R	Glasgow City Council	12	40	36	10.7%	P	0.90
Glasgow Scientific Services	20% TEA in water	2016	UB	Glasgow City Council	12	29	26	9.8%	P	0.91
Glasgow Scientific Services	20% TEA in water	2016	R	East Dunbartonshire Council	11	34	37	-8.8%	P	1.10
Glasgow Scientific Services	20% TEA in water	2016	R	East Dunbartonshire Council	12	35	36	-2.6%	G	1.03
Glasgow Scientific Services	20% TEA in water	2016	R	East Dunbartonshire Council	12	28	27	6.0%	P	0.94
Glasgow Scientific Services	20% TEA in water	2016	R	East Dunbartonshire Council	12	24	24	-2.7%	P	1.03
Glasgow Scientific Services	20% TEA in water	2016	KS	Marylebone Road Intercomparison	12	93	79	17.4%	G	0.85
Overall Factor <sup>4</sup> (9 studies)								Use	0.97	

### PM Monitoring Adjustment

All PM<sub>10</sub> measurements were made using an FDMS unit. The measurements are therefore gravimetric and no adjustments have been applied to the data.

All FDMS data were fully ratified by Ricardo Energy and Environment to AURN standards. The certificates of ratified data are included in Figure C.2.

### QA/QC of automatic monitoring

The automatic monitoring equipment is audited every 6 months by Ricardo AEA, 18, Blythswood Square, Glasgow, G2 4AD. It is serviced and calibrated by Air Monitors Ltd., Unit 2 Bredon Court, Brockridge Park, Twynning, Tewksbury, Gloucestershire, GL20 6FF.

## Figure C.2 Ratified Data from Ricardo Energy and Environment for King Street Alloa

### Air Pollution Report

1st January to 31st December 2016



### Alloa A907 (Site ID: ALO2)

These data have been **fully ratified**

Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

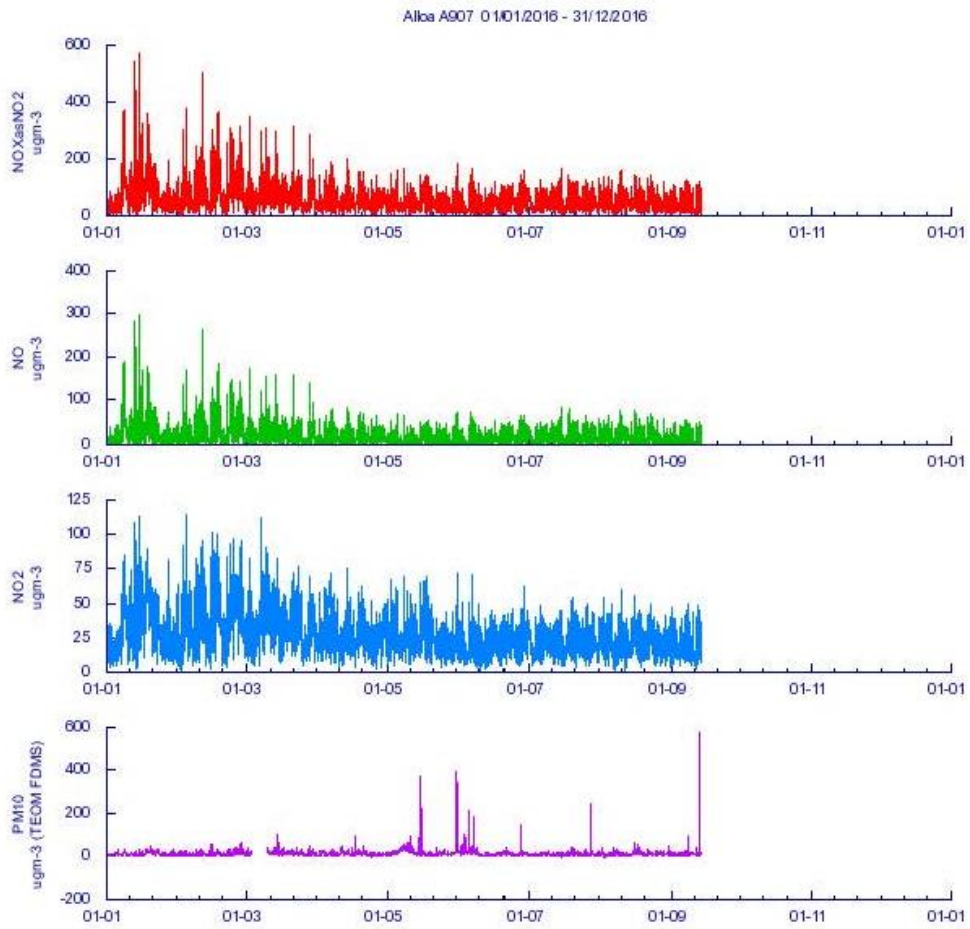
Pollutant	NO µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> asNO <sub>2</sub> µg/m <sup>3</sup>	PM <sub>10</sub> µg/m <sup>3</sup>
Number Days Low	-	258	-	246
Number Days Moderate	-	0	-	3
Number Days High	-	0	-	0
Number Days Very High	-	0	-	0
Max Daily Mean	99	61	213	69
Annual Max	298	114	570	574
Annual Mean	21	27	60	15
98th Percentile of daily mean	-	-	-	40
90th Percentile of daily mean	-	-	-	24
99.8th Percentile of hourly mean	-	96	-	-
98th Percentile of hourly mean	82	70	194	42
95th Percentile of hourly mean	58	58	143	32
50th Percentile of hourly mean	16	24	50	12
<b>% Annual data capture</b>	<b>70.15%</b>	<b>70.10%</b>	<b>70.10%</b>	<b>68.29%</b>

All gaseous pollutant mass units are at 20°C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure. NO<sub>x</sub> mass units are NO<sub>x</sub> as NO<sub>2</sub> µg m<sup>-3</sup>

**Note: For a strict comparison against the objectives there must be a data capture of 85% or greater throughout the calendar year.**

Pollutant	Air Quality Standards (Scotland) Regulations 2010	Exceedances	Days
PM10 particulate matter (Hourly measured)	daily mean > 50 microgrammes per metre cubed	3	3
PM10 particulate matter (Hourly measured)	Annual mean > 18 microgrammes per metre cubed	0	-
Nitrogen dioxide	Hourly Mean > 200 microgrammes per metre cubed	0	0
Nitrogen dioxide	Annual Mean > 40 microgrammes per metre cubed	0	-

### Annual Graph



### QA/QC of Diffusion Tube Monitoring

NO<sub>2</sub> diffusion tubes are supplied and analysed by Glasgow Scientific Services using a preparation mixture of 20 triethanolamine (TEA) in water. Glasgow Scientific Services is a UKAS accredited laboratory with documented Quality Assurance/Quality Control (QA/QC) procedures for diffusion tube analysis. The laboratory prepares the diffusion tubes using the 20 triethanolamine (TEA) in water method.

Glasgow Scientific Services have participated in recent AIR NO<sub>2</sub> PT rounds and the percentage (%) of results submitted which were subsequently determined to be satisfactory during the previous five rounds in 2016 and 2017 based upon a z-score of  $<\pm 2$  were as follows:

- January to February 2016: 75
- April to May 2016: 100
- July to August 2016: 100
- October to November 2016: 100
- January to February 2017: 100

Over a rolling five round WASP window, it is expected that 95 of laboratory results should be  $\leq +2$ . 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. In this case the average percentage over the last five rounds up to the end of 2016 is 100.

## Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
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
SO <sub>2</sub>	Sulphur Dioxide

## References

1. Local Air Quality Management Guidance LAQM.TG(16), Department for Environment, Food and Rural Affairs (DEFRA), 2009
2. 2015 LAQM Air Quality Updating and Screening Assessment, TSI Scotland Limited, TSI/CLA.006-04-04, 24 July 2015
3. 2014 Air Quality Progress Report for Clackmannanshire Council, TSI Scotland Limited, TSI/CLA.005-04-01, April 2014
4. 2013 Air Quality Progress Report for Clackmannanshire Council, TSI Scotland Limited, TSI/CLA.003-04-02, May 2013
5. 2012 LAQM Air Quality Updating and Screening Assessment, TSI Scotland Limited, TSI/CLA.003-04-02, 24 July 2012
6. 2011 Air Quality Progress Report for Clackmannanshire Council, TSI Scotland Limited, CLA-001-03-03, April 2011
7. LAQM TG(16), Page 7 to 14, Box 7.2
8. [https://ukair.defra.gov.uk/assets/documents/reports/cat07/15111444\\_AQ0926\\_Report\\_PM\\_Emissions\\_from\\_Poultry\\_Farms\\_BV\\_AECOM\\_Nov\\_2012.pdf](https://ukair.defra.gov.uk/assets/documents/reports/cat07/15111444_AQ0926_Report_PM_Emissions_from_Poultry_Farms_BV_AECOM_Nov_2012.pdf)
9. The Clackmannanshire Sustainability and Climate Change Strategy, 2010
10. Clackmannanshire Local Development Plan, 2015