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2015 Air Quality Updating and Screening Assessment for Clackmannanshire Council

In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management
June 2015

TSI Scotland

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Executive Summary

The 2015 Updating and Screening Assessment Report for Clackmannanshire Council was undertaken by TSI Scotland Ltd in accordance with Local Air Quality Management Technical Guidance LAQM.TG(09) (Ref.1).

New monitoring data for NO_2 and PM_{10} were analysed to determine if any air quality objectives had been exceeded during 2014. All concentrations were found to be below the permitted limits.

Examination of the previous 8 years of data show that there was no obvious trend in annual mean NO_2 concentrations across the diffusion tube network until 2014 when the concentrations showed a general decrease at the 5 comparable sites when compared with 2013. There is a new sampler at the particulate automatic monitoring station at South Ring Road, Alloa and results from this and the previous TEOM sampler have shown an annual mean concentration of 15.8-22µg/m^3 over the last eight years with an average of 17.04µg/m^3. There was a slight decrease between 2013 and 2014 with the latest annual mean concentration of PM_{10} being 16µg/m^3.

New and changed sources of atmospheric emissions were investigated and assessed to determine if any sources would cause an exceedence of air quality objectives for any pollutant.

A review of planning applications submitted in 2014 showed that there were no new developments likely to result in any exceedences of the AQS objectives for any pollutant.

Consultation with SEPA has confirmed that there are no existing or new installations likely to cause an exceedence of the AQS objectives for any pollutant.

Clackmannanshire Council confirmed that there were no new roads constructed with the potential to result in an exceedence of the AQS objectives.

Following the completion of The Forth Valley College in Alloa in 2011, traffic congestion increased on Auld Brig Road leading up to the Shillinghill roundabout. There are residential properties within 3m of the roadside, so a non-automatic NOx diffusion tube
was relocated from Fishcross Primary School to Auld Brig Road in 2012 as emissions there were being recorded at less than half the permitted limit. Results from this new location have been shown to vary between 28.1 µg/m^3 and 22.5 µg/m^3 over the last three years.

The Transport Planning Department of Clackmannanshire Council have collected traffic count data from 22 automatic traffic count sites in their area in recent years. In addition, data are now available for bicycle traffic at nine locations in the Council area. 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.

The AADT flows were analysed on all of the road links between 2013 and 2014. It was noted that two new locations were added at Hilton Road and the A907 Ring Road Eastbound. Flows increased at 11 of the existing locations and reduced at 8. The maximum increase was 17.8% on the A907 Ring Road Westbound, though it should be noted that this was against a history of data capture inconsistencies through 2012 and possibly 2013. The maximum decrease was 11.6% on the A907 at Cambus. It is not expected that there will be any exceedences of the NAQS objectives at nearby receptors due to changes in traffic flow on the trunk roads.

It was determined that there were no other new emission sources, or sources that had not been previously assessed, that could result in air quality objectives being exceeded.

Overall, it was concluded that there is no requirement to proceed to a Detailed Assessment for any pollutant at present. The next report to be completed will be the Progress Report in April 2016.

Table of Contents

Page

List of Tables

List of Figures

Appendices

48

1 Introduction

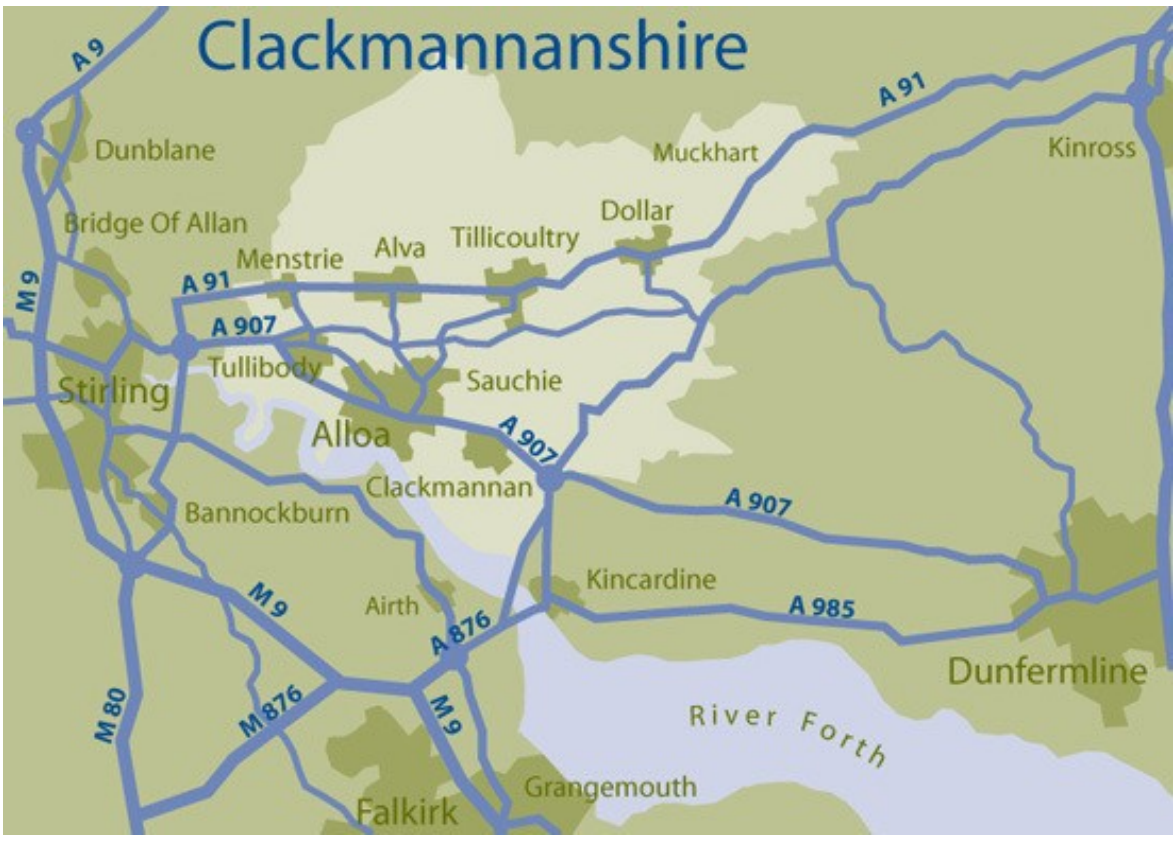
1.1 Description of Local Authority Area

Clackmannanshire has a population of approximately 50,000 people, of whom around half live in the main town of Alloa. It is a mixed rural and urban area and shares borders with Falkirk, Perth and Kinross, Fife and Stirling Council areas. The Ochil Hills form the northern border of Clackmannanshire with the River Forth located on the southern border. O

The majority of industrial and commercial developments are also located within Alloa and the predominant industries are now agriculture and small to medium sized enterprises.

The Clackmannanshire Council boundary is shown in Figure 1.1

Figure 1.1 Map of Clackmannanshire Council Area



1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 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 exceedences are considered likely, the local authority must then 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.

The objective of this Updating and Screening Assessment (USA) is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in **Scotland** are set out in the Air Quality (Scotland) Regulations 2000 (Scottish SI 2000 No 97), the Air Quality (Scotland) (Amendment) Regulations 2002 (Scottish SI 2002 No 297), and are shown in Table

1.1. This table shows the objectives in units of micrograms per cubic metre µg/m^3

(milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	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	0.5 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	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
Particles (PM_{10}) (gravimetric)	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
Sulphur dioxide	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

1.4 Summary of Previous Review and Assessments

Table 1.1 summarises the Air Quality Review and Assessment reports submitted by

Clackmannanshire Council since 2004 with the most recent report of 2013 listed first.

Table 1.2 Summary of Previous Air Quality Review and Assessment Reports 2004-2011

Report	Date Completed	Summary and Conclusions
Progress Report 2014	April 2014	The results of the NO2 monitoring across Clackmannanshire Council during 2013 confirm that there are no exceedences of the AQS objectives for this pollutant. Examination of the previous 5 years of data show that there is no obvious trend in annual mean NO2 concentrations across the diffusion tube network although the concentration has increased at the 4 of the 5 comparable sites between 2012 and 2013. Data from the particulate automatic monitoring station at South Ring Road, Alloa have shown an annual mean concentration of 15.8-17µg/m3 in recent years with an average of 16.4µg/m3. The latest annual mean concentration of PM10 being 17µg/m3. The review of new monitoring data available for 2013 confirms that Clackmannanshire Council does not need to proceed to a Detailed Assessment. any pollutant.

		Further to the findings of traffic surveys and DMRB assessments on Auld Brig Road and Clackmannan Road in 2013, it was concluded that neither location represented a worst case location when compared with the existing continuous monitoring site location at South Ring Road. The Council received funding to improve the monitoring station and have purchased an FMDS analyser due for LAQM Progress Report 2014 for installation and commission between April and May 2014. The upgrade will include a new enclosure and a slight relocation to nearer the roadside on South Ring Road. Diffusion monitoring for NO2 will continue at all 6 locations during 2014.
DMRB Screening Assessment at 2 Potential Continuous Monitoring Sites in Alloa	September 2013	There was no prediction of exceedence of the annual mean objectives at sensitive receptors in either survey location. The existing PM10 annual mean recorded at South Ring Road is already higher than the DMRB predicted level at a sensitive receptor for either of the alternative locations considered. The predicted NO2 annual means at sensitive receptors were similar to the annual mean regularly recorded at the existing South Ring Road site during the preceding 5 years. It was recommended that available funding be used to upgrade the monitoring equipment at the existing South Ring Road location rather than relocate to Auld Brig Road or Clackmannan Road, and diffusion tube monitoring should continue in these locations for NO2

Progress Report 2013	May 2013	New monitoring data confirmed that there were no exceedences of the Air Quality Strategy (AQS) objectives for nitrogen dioxide (NO2) and (PM10) during 2012. Further guidance is awaited regarding the impact on local air quality of intensive poultry farms before deciding to proceed to a Detailed Assessment for Cambusview Poultry Farm. It was also concluded that there was no risk of exceedences of any other AQS pollutant objectives.
Updating and Screening Assessment 2012	July 2012	New monitoring data confirmed that there were no exceedences of the Air Quality Strategy (AQS) objectives for nitrogen dioxide (NO2) and (PM10) during 2011. Since the completion of The Forth Valley College, Alloa in September 2011, traffic congestion has been observed on Auld Brig Road leading up to the Shillinghill Roundabout. There are residential properties within 3m of the roadside. It was concluded that a traffic count survey would be commissioned for Auld Brig Road when staff and equipment resources became available in order that a screening assessment of the potential impact can be undertaken in a future report. The NO2 diffusion tube from Fishcross Primary School was relocated to Auld Brig Road in May 2012 to obtain some air quality data. Further guidance is awaited regarding the impact on local air quality of intensive poultry Assessment for Cambusview Poultry Farm.

		farms before deciding to proceed to a Detailed Assessment for Cambusview Poultry Farm. It was also concluded that there was no risk of exceedences of any other AQS pollutant objectives.
Progress Report 2011		New monitoring data confirmed that there were no exceedences of the Air Quality Strategy (AQS) objectives for nitrogen dioxide (NO_2) and (PM_{10}) during 2010. Shillinghill/Bridge Terrace and Clackmannanshire Rd in Alloa were identified as having an annual mean concentration of NO_2 of 38ug/m^3 (objective level is 40ug/m^3). South Ring in Alloa also recorded an annual mean concentration of PM_{10} of 17ug/m^3 compared with the objective of 18ug/m^3. 5 NO_2 diffusion tube sites were decommissioned at the end of 2010 due to a history of low concentrations. Further guidance is awaited regarding the impact on local air quality of intensive poultry farms before deciding to proceed to a Detailed Assessment for Cambusview Poultry Farm. It was also concluded that there was no risk of exceedences of any other AQS pollutant
Progress Report 2010 (Ref.3)	July 2010	New monitoring data confirmed that there were no exceedences of the Air Quality Strategy (AQS) objectives for nitrogen dioxide (NO_2) and (PM_{10}) during 2009. However one site, Shillinghill/Bridge Terrace in Alloa was identified as having an annual mean concentration of NO_2 of 39ug/m^3 (objective level is 40ug/m^3). South Ring in Alloa also recorded an annual mean concentration of PM_{10} of 17ug/m^3 compared with the objective of 18ug/m^3. The elevated concentrations were recorded during a period of construction close-by in August 2009 so may not be representative. It was recommended that monitoring at these locations should continue.

		Further guidance is awaited regarding the impact on local air quality of intensive poultry farms from monitoring studies carried out elsewhere in the UK, before deciding to proceed to a Detailed Assessment for Cambusview Poultry Farm. It was also concluded that there was no risk of exceedences of any other AQS pollutant objectives.
Updating and Screening Assessment 2009 (Ref.4)	July 2009	New monitoring data confirmed that there were no exceedences of the Air Quality Strategy (AQS) objectives for nitrogen dioxide (NO_2) and (PM_{10}) during 2008. It was also concluded that there was no risk of exceedences of any other AQS pollutant objectives. Intensive poultry farms were added to the updated Technical Guidance LAQM.TG(09) for assessment. One such farm, Cambusview Poultry Farm was identified as being recommended for Detailed Assessment to determine if there was a likelihood of exceedence of the PM_{10} objectives in an area of relevant exposure.
Progress Report 2008 (Ref.5)	March 2008	New monitoring data confirmed that there were no exceedences of the AQS objectives for NO_2 and during 2007. The PM_{10} objectives were exceeded at South Ring, Alloa but were attributed to construction of a new roundabout in the vicinity. Elevated concentrations were clearly identified during the construction period in the latter half of the year. It was recommended that Clackmannanshire Council should continue monitoring PM_{10} at this location for a further year before determining the need for a Detailed Assessment.
Progress Report 2007 (Ref.6)	May 2007	New monitoring data confirmed that there were no exceedences of the AQS objectives for NO_2 and during 2006. The PM_{10} objectives were exceeded at South Ring, Alloa but were attributed to construction work being carried out in the vicinity. It was recommended that Clackmannanshire Council should continue monitoring PM_{10} at this location in order to verify the likelihood of exceedence of the
Updating and Screening Assessment 2006 (Ref.7)	August 2006	New monitoring data confirmed that there were no exceedences of the AQS objectives for NO_2 and PM_{10} during 2005. It was also concluded using the methodology in the technical guidance to project forward that there was no risk of

		exceedence of any of the AQS objectives in future years.
Progress Report 2005 (Ref.8)	April 2005	New monitoring data confirmed that there were no exceedences of the AQS objectives for NO_2 and PM_{10} during 2004. It was also concluded using the methodology in the technical guidance to project forward that that there was no risk of exceedence of any of the AQS objectives in future years.
Progress Report 2004 (Ref.9)	April 2004	New monitoring data confirmed that there were no exceedences of the AQS objectives for NO_2 and PM_{10} during 2003. It was also concluded that there was no risk of exceedences of any of the AQS pollutants in future years based on a 58% data capture.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

Monitoring is carried out for NO_2 and PM_{10} in Clackmannanshire. During 2014, Clackmannanshire Council monitored NO_2 at six locations using passive diffusion tubes and PM_{10} at one location using a Tapered Element Oscillating Microbalance (TEOM) automatic analyser until 31 March 2014. At this time, it was upgraded with a Filter Dynamics Measurement System (FDMS) unit in a new enclosure and the location of the sampler was moved slightly closer to the road.

2.1.1 Automatic Monitoring Sites

The new FDMS sampler is located on the pavement outside a car park immediately adjacent to South Ring Road, Alloa. It is a busy road with a pedestrian crossing and housing nearby. The FDMS site is classified as a "roadside" site. The details of the site are shown in Table 2.1. A photograph of the unit and a map showing the location of the monitoring site are shown in Figures 2.1 and 2.2.

The data capture for the site was 96.4% for PM_{10}. Routine calibrations are carried out by Air Monitors Ltd and 6 monthly site audits are carried out by Ricardo AEA. Details of these and other QA/QC procedures are described in more detail in Appendix A.

Figure 2.1 Photograph of new FDMS Automatic Monitoring Site at South Ring Road, Alloa

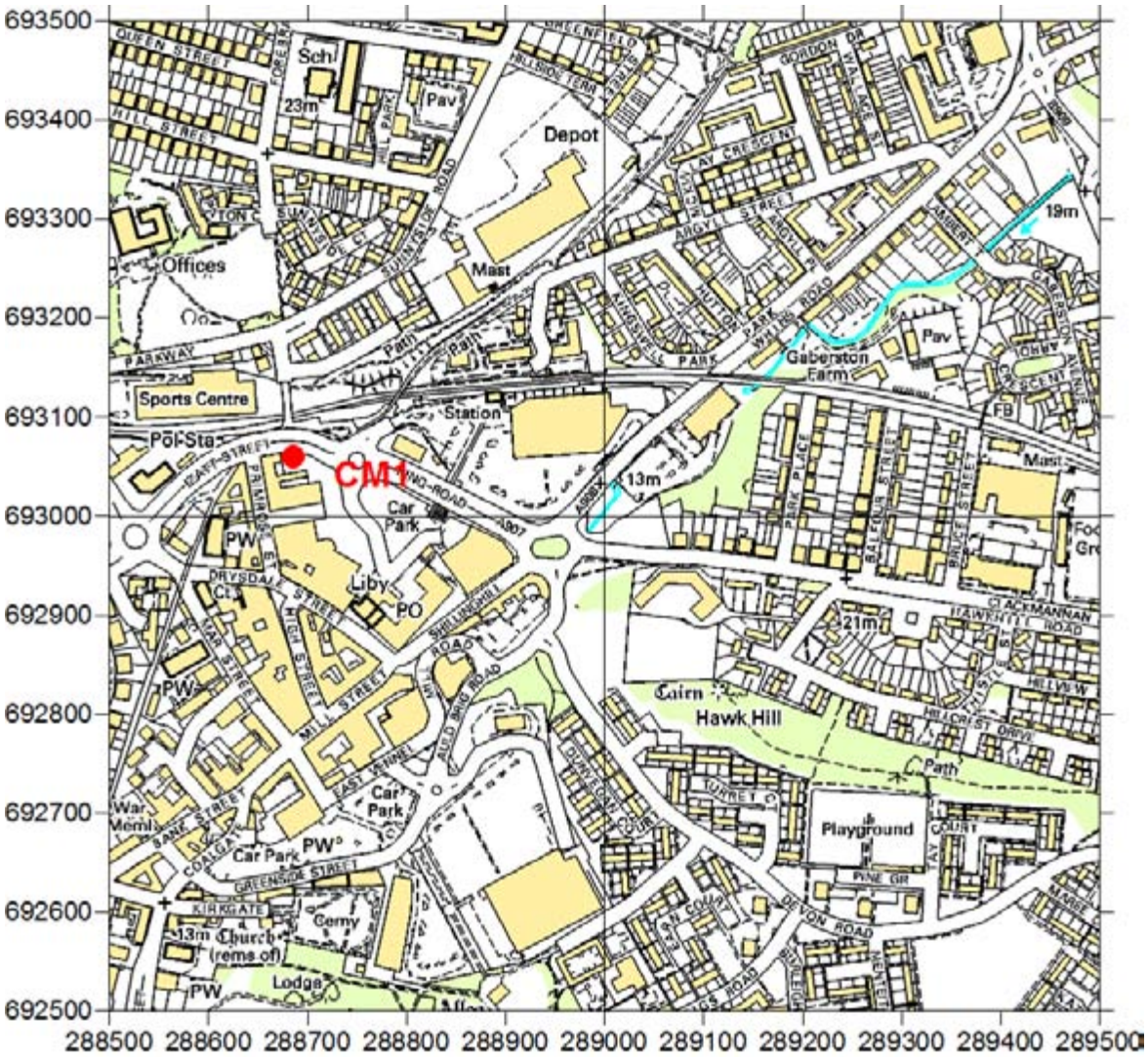


Figure 2.2 Location Map of Automatic Monitoring Site at South Ring Road, Alloa

Table 2.1 Details of South Ring Road, Alloa New FDMS Automatic Monitoring Site

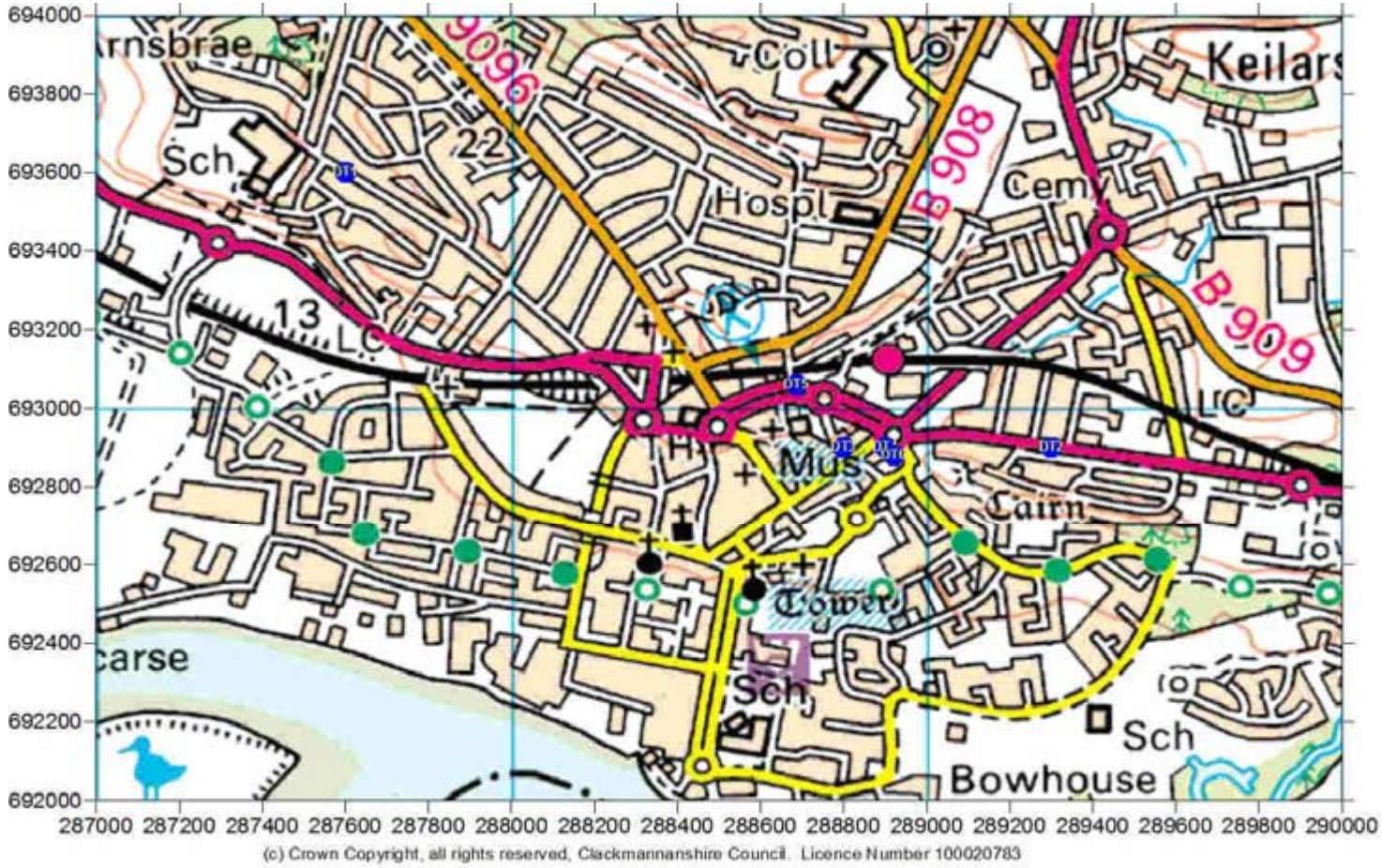
Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
South Ring Road, Alloa	Roadside	288686	693056	PM_{10}	N	FDMS	Y (4m)	3m	Y

2.1.2 Non-Automatic Monitoring Sites

Non-automatic monitoring of NO_2 was undertaken at 6 locations within Clackmannanshire Council in 2014 using passive diffusion tubes. The location and description of each site are shown in Table 2.2. All sites are classified as kerbside sites except South Ring Road, Alloa, which is a roadside site. A map showing the locations of the monitoring sites is shown in Figure 2.3.

The tubes are provided and analysed by Glasgow Scientific Services using 20% TEA in Acetone and are changed on a monthly basis by Clackmannanshire Council personnel. The data capture was 100% for all sites except Clackmannan Road, where data was missing for one month, resulting in a data capture figure of 91.7%. The QA/QC for diffusion tube analysis is included in more detail in Appendix A. This shows a bias-correction factor of 0.83.

Figure 2.3 Map of Non-Automatic Monitoring Sites



DT1-Norwood Avenue, Alloa
DT2-Clackmannan Road, Alloa
DT3-Bus Station, Alloa
DT4-Shillinghill/Bridge Terrace, Alloa
DT5-South Ring Road, Alloa
DT6-Auld Brig Road, Alloa

Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m)	Does this location represent worst-case exposure?
Norwood Avenue	Kerbside	287600	693600	NO_2	N	N	Y (2m)	1.7	Y
Clackmannan Road	Kerbside	289300	692900	NO_2	N	N	Y (2m)	2m	Y
Bus Station, Alloa	Kerbside	288800	692900	NO_2	N	N	Y (2m)	1.3m	Y
Shillinghill/Bridge Terrace, Alloa	Kerbside	288900	692900	NO_2	N	N	Y (2m)	1.4m	Y
South Ring Road, Alloa	Roadside	288686	693056	NO_2	N	N	Y (8m)	3m	Y
Auld Brig Road	Kerbside	288920	692880	NO_2	N	N	Y (3m)	1.8	Y

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

Diffusion Tube Monitoring Data

A summary of the bias-adjusted annual mean diffusion tube concentrations of NO_2 across the monitoring network for 2014 is shown in Table 2.3. The raw monthly results are included in Appendix A1. A summary of data for the last eight years is shown in Table 2.4.

A trend graph is shown in Figure 2.4 which illustrates that there was no clear trend until 2013, then for 2014, a distinct downward trend was observed at all comparable sites with the annual means being around 20% lower. There is no obvious reason for this as traffic levels generally across the district are unchanged, though a 17.8% increase was recorded at the South Ring Road counter. Clackmannanshire Council Roads Department were consulted on the reason for this departure from trends at the other locations, but did not have a view. It should be pointed out that the figures for the previous two years at this location showed inconsistencies, so the 2014 figure may be showing an element of "catching up" with current levels. NO_2 concentration has consistently remained below the limit concentration of 40µg/m^3 during the last 8 years at all sites.

The council has since installed to add an automatic NO_2 sampler at the FDMS location on South Ring Road. This was carried out in 25 February 2015 and now allows co-location to take place with a new diffusion tube beside the new sampler.

Since the last Updating and Screening Assessment, the council have stopped NO_2 monitoring at the Fishcross Primary location. The diffusion tube was relocated from this site to Auld Brig Road in 2011.

Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes in 2014

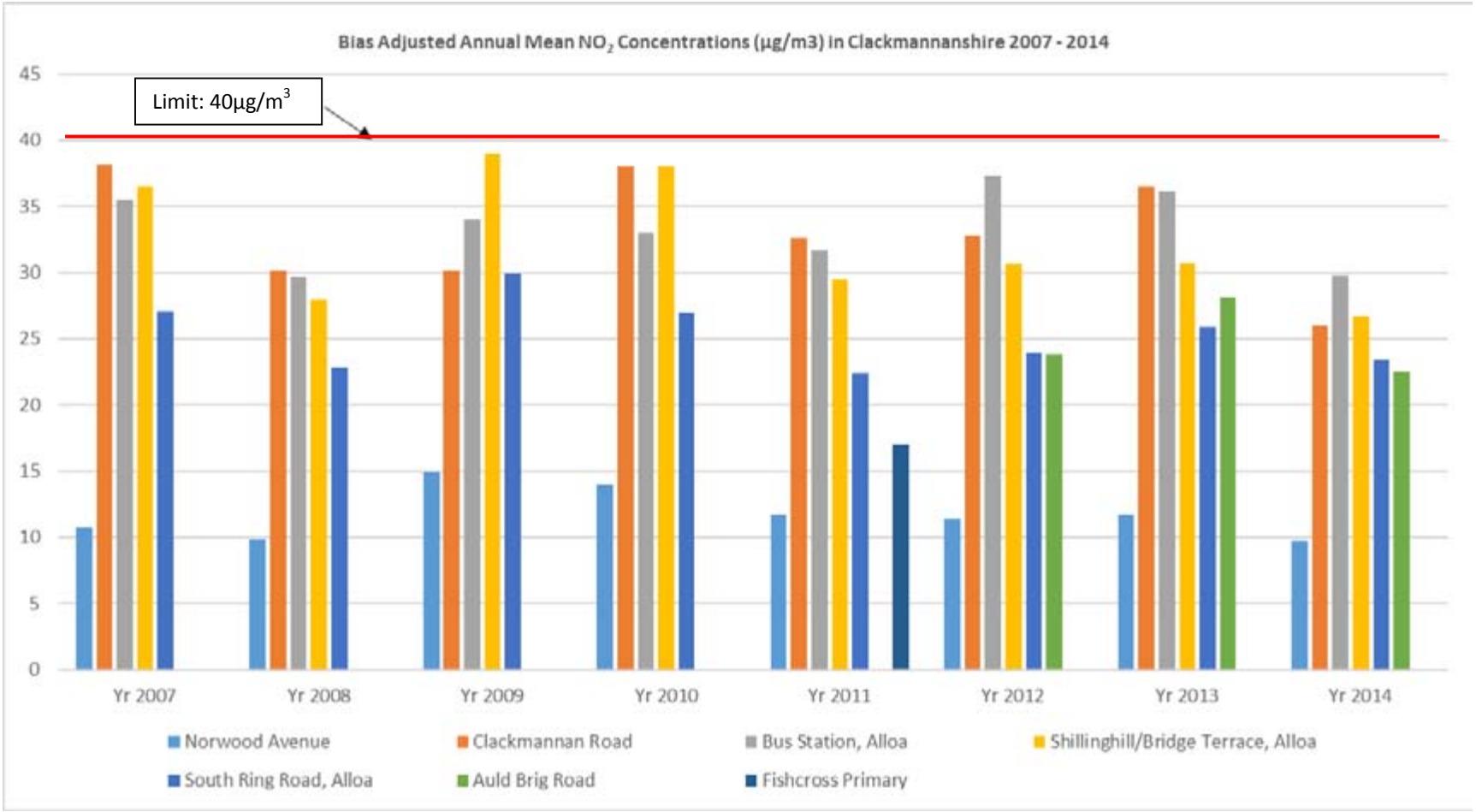
Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment Factor = 0.83) 2014 (μg/m^3)
1	Norwood Avenue	Kerbside	N	N	100	N	N	9.7
2	Clackmannan Road	Kerbside	N	N	91.7	N	N	26.0
3	Bus Station, Alloa	Kerbside	N	N	100	N	N	29.8
4	Shillinghill/Bridge Terrace, Alloa	Kerbside	N	N	100	N	N	26.7
5	South Ring Road, Alloa	Roadside	N	N	100	N	N	23.4
6	Auld Brig Road	Kerbside	N	N	100	N	N	22.5

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2014)

Site ID		Annual mean concentration (adjusted for bias) µgm^3 – limit is 40 µgm^3							
	Year	2007	2008	2009	2010	2011	2012	2013	2014
	Bias Adj Factor	1.09	0.97	1.23	1.1	0.94	0.95	0.99	0.83
1 – Norwood Avenue		10.7	9.8	15.0	14.0	11.7	11.4	11.7	9.7
2 – Clackmannan Road		38.2	30.1	30.1	38	32.6	32.8	36.5	26.0
3 – Bus Station, Alloa		35.5	29.7	34.0	33.0	31.7	37.3	36.2	29.8
4 – Shillinghill/Bridge Terrace, Alloa		36.5	28.0	39.0	38.0	29.5	30.6	37.0	26.7
5 – South Ring Road, Alloa		27.1	22.8	30.0	27.0	22.4	23.9	25.9	23.4
6 – Fishcross Primary School (for 2011 only)		-	-	-	-	17.0*	-	-	-
6 – Auld Brig Road (from 2012)		-	-	-	-	-	23.8	28.1	22.5

* Annualised Mean if less than 9 months. Uses method in Box 3.2 in TG(09) (Ref.1) although not all sites are background sites. These are the closest sites using the same laboratory and method for analysis for which data capture is above 90%

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites



2.2.2 PM_{10}

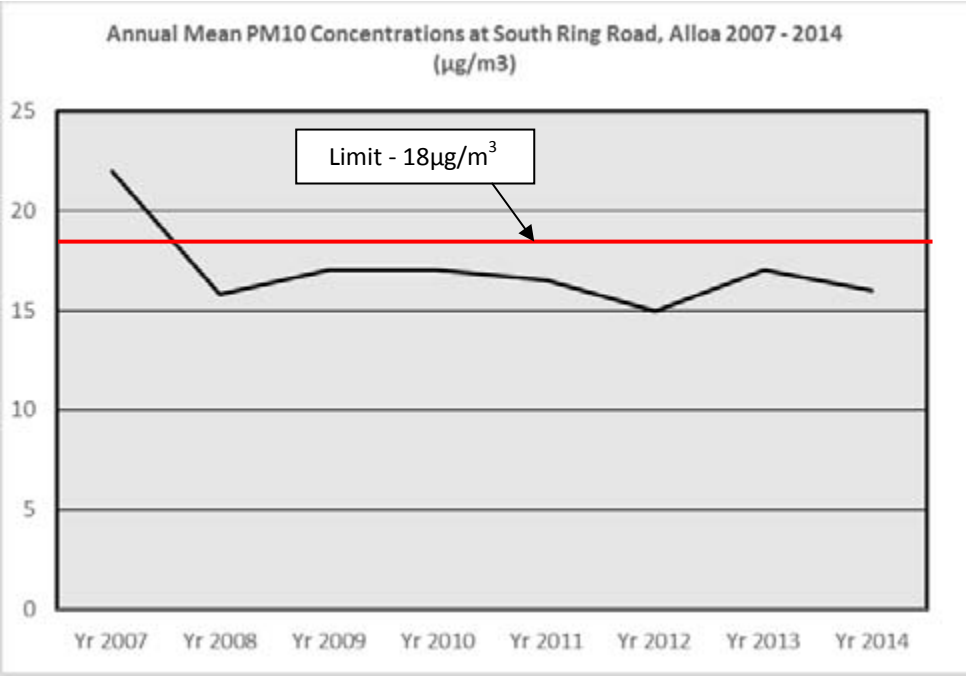
Automatic Monitoring Data

A summary of the ratified monitoring data for PM_{10} at the automatic site at South Ring Road, Alloa is shown in Tables 2.5 and 2.6.

The automatic monitor was upgraded on 31st March 2014 and a new FDMS monitor was installed in it. The location moved approximately 4m further north of the existing location. The Air Pollution Report in Appendix A shows a sharp spike for a very short time and it is expected that this was associated with the changeover. Despite the interruption for the installation exercise, data capture was 96.4% for the year.

A trend graph is shown in Figure 2.5. The annual mean concentration of PM_{10} over the period 2007 – 2014 lies between 15.8 and 22µg/m^3 with an average of 17.04µg/m^3. There was a decrease between 2013 and 2014 with latest annual mean falling to 16µg/m^3.

Figure 2.5 Trends in Annual Mean PM_{10} Concentration



The site audit was carried out by Ricardo AEA on behalf of the Scottish Government on 14 August 2014 and is reproduced in Appendix A.

Table 2.5 Results of Automatic Monitoring of PM_{10}: Comparison with Annual Mean Objective of 18µg/m^3

Site ID	Site Type	Valid Data Capture 2014 %	Annual Mean Concentration µg/m^3 *							
			2007	2008	2009	2010	2011	2012	2013	2014
South Ring Rd, Alloa	Roadside	96.4	22	15.8	17	17	16.5	15	17	16

* PM10 in gravimetric units

Table 2.6 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour mean Objective

Site ID	Site Type	Valid Data Capture 2014 %	Number of exceedences of 24-hour mean (> 50µg/m^3)							
			2007	2008	2009	2010	2011	2012	2013	2014
South Ring Rd, Alloa	Roadside	96.4	9	0	8	1	2	1	0	0

Note: there are no Air Quality Management Areas in Clackmannanshire.

2.2.3 Other Pollutants

There is no monitoring for any other pollutants within the Clackmannanshire Council area

2.2.4 Summary of Compliance with AQS Objectives

Clackmannanshire Council has examined the results from monitoring in the Council area. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 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 changes traffic sources within the Clackmannanshire Council area that could result in exceedences of air quality standards. Data have been collected from 22 automatic traffic count sites in the Council area in recent years. There are two additions to the traffic counter inventory this year. One at Hilton Road is a new location, the other at Ring Road Eastbound is not new, but has been out of use for the last few years. Furthermore, the counter at Blairingone has been unreliable since before 2012 and is still not recording properly, so there is a gap in traffic data there. The figures for 2008-2014 are summarised in Table 3.1. A location map of the monitoring sites showing 2014 AADT counts is shown in Figure 3.1.

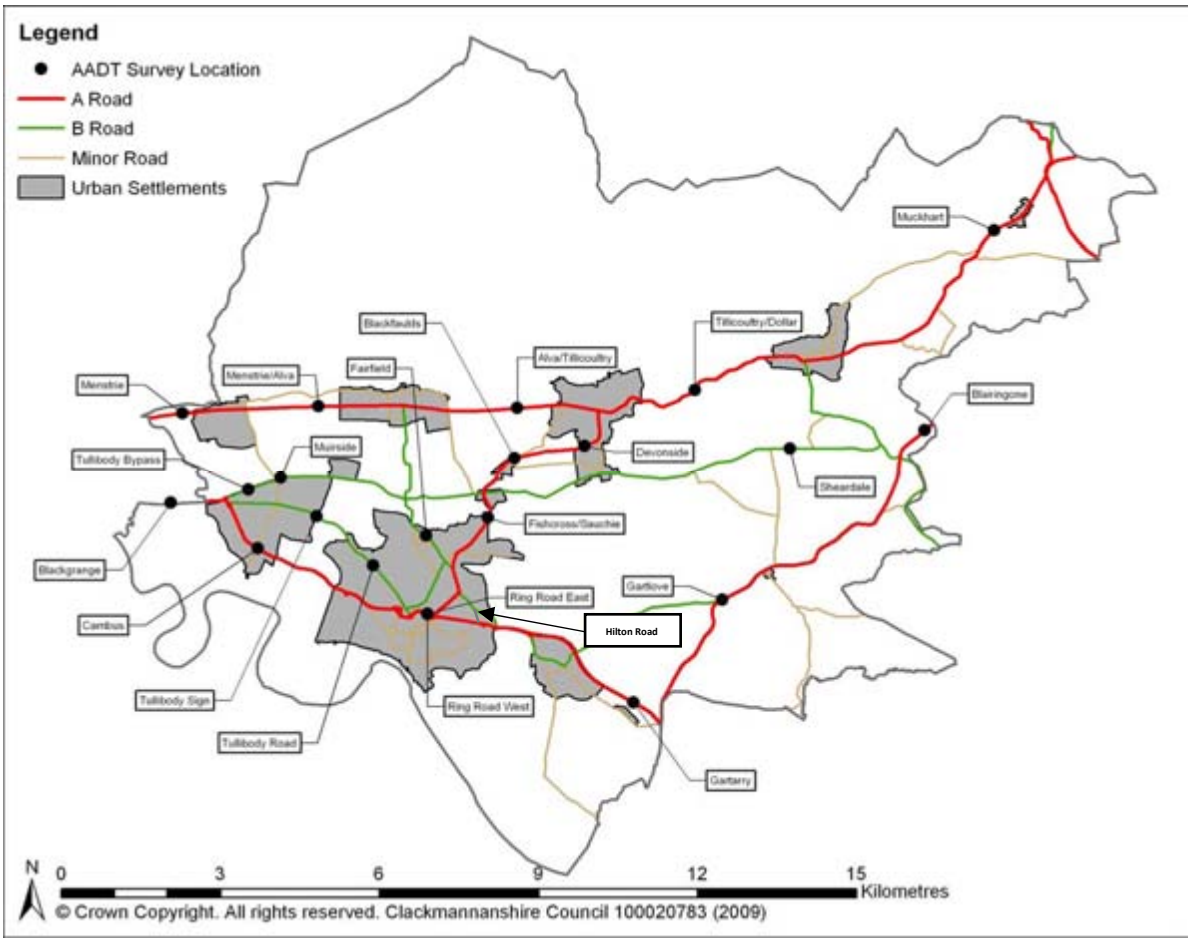
Table 3.1 Summary of Traffic Survey Data 2008-2014

Link	Description	Speed limit (mph)	Annual Average Daily Traffic (vehicles per day)							
			2008	2009	2010	2011	2012	2013	2014	% Change 2013-2014
49	A977 Gartlove	60	5325	5949	5437	5603	6334	6139	6706	9.2
287	A907 Black-grange	60	22896	20768	20407	20036	19945	19478	19522	0.2
288	A907 Cambus	40	10182	9027	8869	8548	N/A	7750	6851	-11.6
292	A907 Ring Road Westbound	30	12259	11915	11416	11151	N/A	9768	11503	17.8
295	A907 Clackmann-anshire Bypass	60	12431	14395	13302	14672	14617	15050	15024	-0.2
300	A908 Fishcross Primary School	30	12204	12341	12889	12452	12326	11657	11693	0.3
301	A908 Blackfaulds	40	8574	9061	9167	9074	8886	9069	9059	-0.1
302	A908 Devonside	30	7274	7388	7649	7612	7481	6809	7336	7.7
309	A91 Menstrie Mains	60	10559	9758	9121	8815	8457	8205	8102	-1.3

311	A91 Menstrie/ Alva	60	10458	9760	9252	9016	8362	8599	8140	-5.3
314	A91 Tillicoultry	30	7641	7225	6513	6734	N/A	N/A	6095	-9.5*
321	A91 Muckhart	60	3543	3545	3346	3098	3123	3267	3014	-7.7
50	A977 Blairingone	60	4631	5355	3957	4904	4759	-	-	N/A
581	B908 Fairfield	30	5699	6178	6341	6368	6547	6696	6834	2.1
586	B909 Hilton Road		New location, no previous data						9983	-
589	B9096 Tullibody Sign	30	10291	9517	9407	9459	9185	9126	9449	3.5
590	B9096 Tullibody Road	30	11048	10746	10702	10343	10086	10131	10337	2.0
625	B9096 Tullibody Bypass	60	8435	7567	7668	7789	7815	8668	8310	-4.1
626	B9140 Muirside	60	8116	7739	8155	8267	N/A	8487	8821	3.9
634	B9140 Sheardale	60	1874	1639	1677	1492	N/A	1520	1438	- 5.4
317	A91 Taits Tomb	60	5977	5652	5508	5163	N/A	5178	5429	4.8
292	A907 Ring Road Eastbound		New location, no previous data						9810	-

*Percentage change is from 2011-2014 due to unavailable data in 2012 or 2013

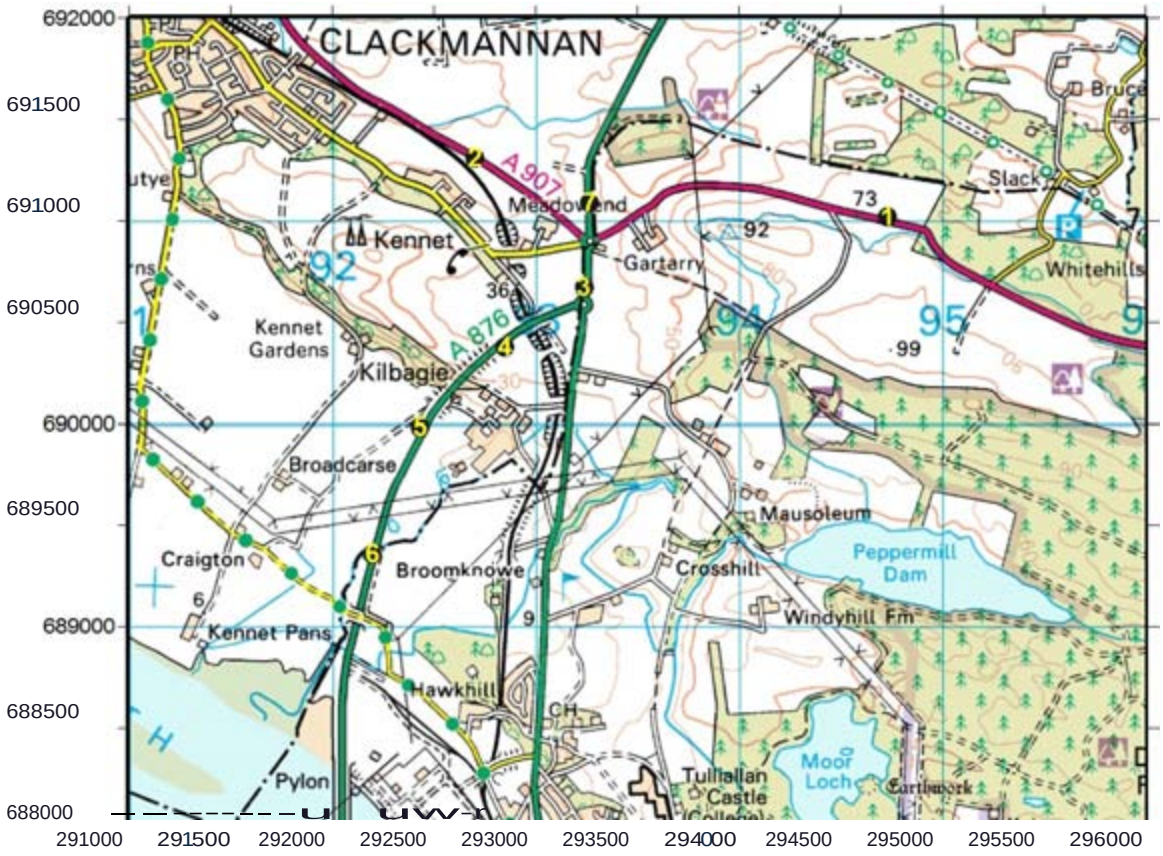
Figure 3.1 Location Map of Automatic Traffic Counts in Clackmannanshire



Across the network of counters operated by the Council, eleven sites showed an increase and eight a decrease. With two exceptions, all changes were less than 10%. The two exceptions were a 17.8% increase at Alloa Ring Road Westbound and an 11% decrease at Cambus Road. It should be noted however that there was some inconsistency in the traffic figures for 2012 and 2013, so the 17.8% increase may be less significant than it appears. Concentrations of NO_2 are currently recorded by the diffusion tube on the South Ring Road and show concentrations well below the limit. At Gartlove on the A977, a 9.2% increase was recorded, however as this is a rural location there is no immediate recommendation to measure NO_2 here.

In the absence of traffic count data from the Council network of automatic monitoring sites for 2011, data were obtained from Transport Scotland for the trunk roads monitored within Clackmannanshire Council. A map showing the count locations is shown in Figure 3.2 and the data for 2009-2014 are summarised in Table 3.2.

Figure 3.2 Location Map of Transport Scotland Automatic Traffic Counts in Clackmannanshire



1-A907 East of A977
2-A907 West of A977
3-A977 North of A876
4-A876 South of A977
5-A876 Clackmannanshire Bridge Approach
6-A876 North of Clackmannanshire Bridge
7-A977 North of Gartany Roundabout

Table 3.2 Summary of Transport Scotland Trunk Road Traffic Count Data for Clackmannanshire 2009-2011

ID	Counter Location	Annual Average Daily Traffic (Vehicles per day)						% Change 2013-2014
		2009	2010	2011	2012	2013	2014	
1*	A907 East of A977	3082	2874	3075	-	3082	-	N/A
2	A907 West of A977	14247	13934	14507	14683	14247	15,666	10
3	A977 North of A876	17620	17795	18573	19762	17620	20,932	19
4	A876 South of A977	14359	14281	14839	17762	14359	13,829	-4
5	A876 Clackmannanshire Bridge Approach	14387	14228	14598	14609	14387	14,375	0
6	A876 North of Clackmannanshire Bridge	14228	14133	15349	15901	14319	13,058	-9
7*	A977 North of Gartarry Roundabout	6009	5459	5475	6167	4074	-	N/A

* Figures were not available for these two locations for 2014.

The above table shows the Annual Average Daily Traffic recorded by Transport Scotland for the trunk roads to the north of the Kincardine and Clackmannanshire Bridges over the years 2009 to 2014. Though two of the counters showed significant increases from 2013 to 2014, there is no obvious trend in the group over the six year period. In fact, over that period, two of them show decreases.

There is therefore no specific recommendation for action relating to traffic

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Clackmannanshire Council confirms that 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.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Clackmannanshire Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

Clackmannanshire Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

Auld Brig Road in Alloa was observed to have significantly changed traffic flow patterns in 2011 following the construction and opening of Forth Valley College. This is discussed in more detail in Section 3.6. At the time, NO_2 diffusion tube monitoring was proposed and has been carried out. The results, summarised in table 2.4 above show that NO_2 concentrations in 2014 averaged just over half the permitted limit.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

Clackmannanshire Council confirms that there are no new/proposed roads meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

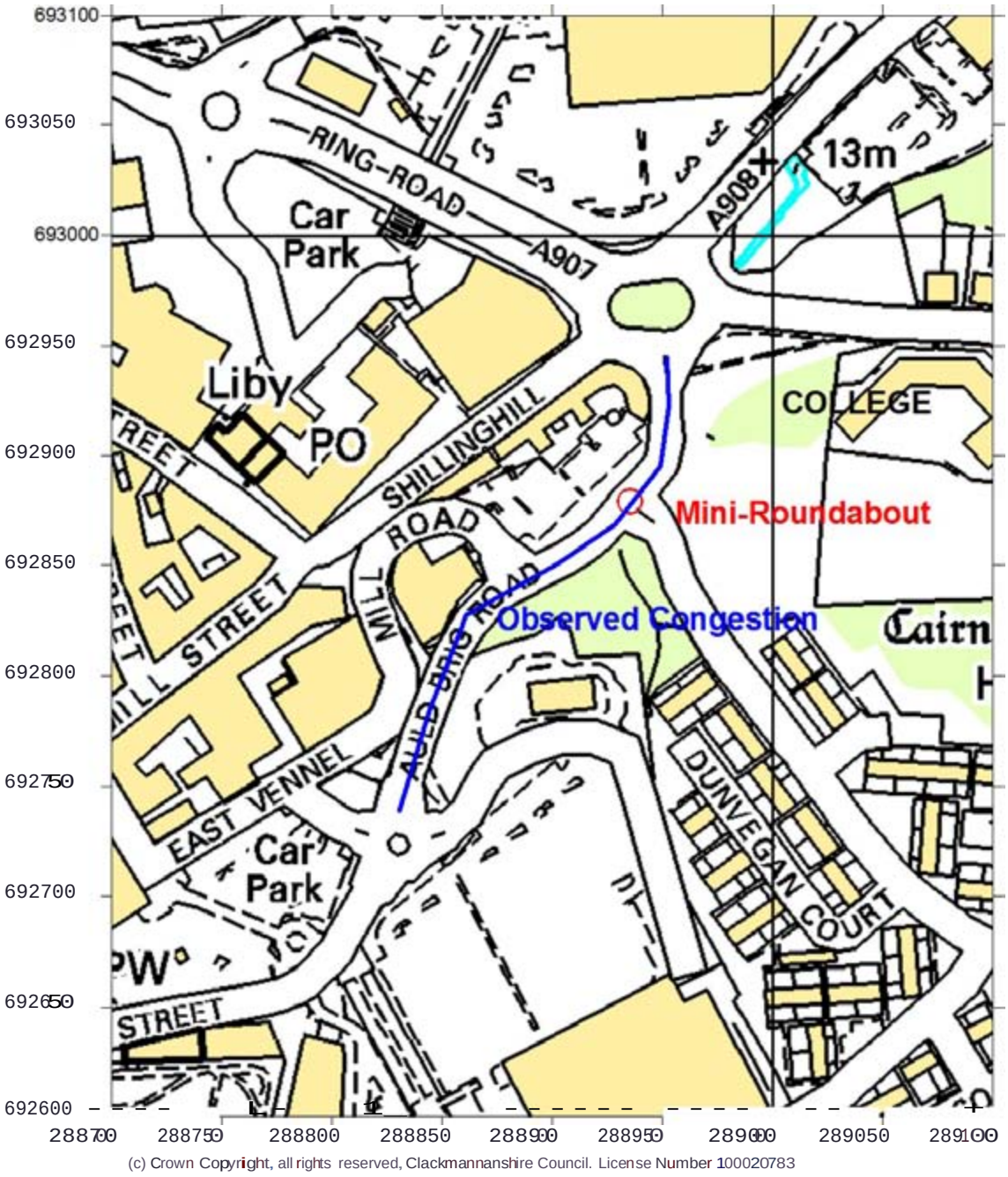
3.6 Roads with Significantly Changed Traffic Flows

The Forth Valley College, Alloa Campus was completed and opened in September 2011. It is located on the corner of Clackmannan Road and Auld Brig Road at Shillinghill roundabout in Alloa. At the time of the previous Updating and Screening Assessment in 2012, traffic congestion had been observed on Auld Brig Road leading up to the roundabout. A mini-roundabout controls flow to and from the College car park which is accessed via Devon Road. There are residential properties within 3m of the roadside, however the other side of the road is quite open. A detailed view of this location is shown in Figure 3.3.

In 2013, a DMRB (Design Manual for Roads and Bridges) assessment was carried out to consider whether there was any benefit in relocating the PM_{10} monitor from South Ring Road to Auld Brig Road. The exercise showed that predicted traffic volumes did not warrant such aa move.

In the period since then, NO_2 monitoring has been carried out using diffusion tubes. The results, summarised in table 2.4 above show that NO_2 concentrations in 2014 averaged just over half the permitted limit. It is recommended that monitoring of NO_2 concentrations is continued, using diffusion tubes. It is concluded that it will not be necessary to proceed to a Detailed Assessment at this time.

Figure 3.3 Location Map of Congested Road Near Forth Valley College, Alloa



3.7 Bus and Coach Stations

There are two bus stations within the Council area, one in Alloa and the other in Tillicoultry. However, bus movements at both locations are substantially below the 2,500 criterion for assessment. In addition, NO_2 concentrations are monitored using diffusion tubes at Alloa bus station and the monitoring results are well below the annual mean NO_2 objective of 40µg/m^3.

It is concluded that it is unlikely that NO_2 objectives will be exceeded due to bus movements within the Clackmannanshire Council area.

Clackmannanshire Council confirms that there are no relevant bus stations in the Local Authority area that require Detailed Assessment.

4 Other Transport Sources

4.1 Airports

There are no Airports within the Clackmannanshire Council area.

Clackmannanshire Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel)

There is one train station within Clackmannanshire Council 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 was therefore undertaken.

There has been 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. No further assessment was therefore undertaken.

The line also handles freight trains delivering coal to Longannet Power Station (and sometimes from it). There have been occasional complaints regarding dust emissions from property owners along the route of the line, however these complaints have not been substantiated as yet. It is not thought that the freight trains remain stationary for long periods of time.

In addition, there is a strong possibility that the planned closure of Longannet Power Station in Fife will be brought forward to next year. In that event, there will be a reduction in the number of trains carrying coal to the power station which will reduce emissions beside the railway through Clackmannanshire.

Clackmannanshire Council confirms that there are no locations where diesel trains are regularly stationary for periods long enough to be of significance to local air quality, with potential for relevant exposure within 15m.

Clackmannanshire Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

There are no ports within the Clackmannanshire Council area.

Clackmannanshire Council confirms that there are no ports or shipping within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

The Scottish Environment Protection Agency (SEPA) and The Planning Department of the Council were contacted to obtain up to date information on industrial processes within the Clackmannanshire Council area. It was confirmed that there are no new or proposed installations for which an Air Quality Assessment has been carried out.

Clackmannanshire Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

SEPA was contacted to obtain up to date information on regulated industrial processes within the Clackmannanshire Council area. SEPA were unaware of any applications or plans for new or increased sources of atmospheric emissions in the Clackmannanshire area.

Clackmannanshire Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

After consultation with SEPA, it was confirmed that there are no new or significantly changed industrial installations and no previous air quality assessments within the Clackmannanshire Council area.

Clackmannanshire Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

There are no new petrol stations with annual throughput of over 2000m^3 of petrol.

Clackmannanshire Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

Cambusview Poultry Farm 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 close to the unit. The Scottish Government has been consulted regarding the availability of new guidance from DEFRA for the assessment of such installations. DEFRA were contacted again this year through the LAQM Helpdesk for an update on the current position and it was stated that guidance is still not available for poultry farms. The impact of poultry farms will be assessed when such guidance becomes available. There is no record of any complaints from local residents related to air quality in the vicinity of the site.

Clackmannanshire Council confirms Cambusview Poultry Farm has been identified in all recent air quality assessments as having the potential to cause an adverse impact on air quality at a number of residential properties close to the unit.
However, guidance is still not available for assessment of poultry farms.
Air quality will be assessed in a future report when such guidance becomes available.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

There are two known biomass installations within the Clackmannanshire Council area. One is at Redwell Primary School and the other at Muckhart Golf Club. The school boiler is rated at 220kW and at the golf club the installed capacity is 70kW. Both of these are therefore small in terms of output when compared with other sources of emissions.

At this size, they are at the bottom end of the range considered by TG(09) which only gives a methodology for calculating absolute volumes rather specific volumes. In addition, biomass boilers have to have an emissions certificate in order to qualify for support under the Renewable Heat Incentive. This restricts their flue emissions to acceptable limits for NOx and PM_{10}.

Clackmannanshire Council confirms that there have been no new Biomass installations within the Council area in 2014 and that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

There are no biomass installations within the Clackmannanshire Council area.

Clackmannanshire Council confirms that there are no new Biomass installations within the Council area and that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

Previous reports concluded that there were no areas of domestic solid-fuel burning with a density greater than 100 houses in 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 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.

Clackmannanshire Council confirms that there are no areas of significant domestic biomass or solid fuel use in the Local Authority area.

6.4 Future Developments

Planning permission for a development at Forestmill Village remains extant. It is likely that the development will proceed at some future point, but to date it has not been progressed. 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.

7 Fugitive or Uncontrolled Sources

Clackmannanshire Council confirms that there are no new potential sources of fugitive emissions that have not been previously assessed within the local authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

During 2014, Clackmannanshire Council undertook monitoring of NO_2 and PM_{10} concentrations at various locations. The results indicate that the NO_2 and PM_{10} air quality objectives were met during 2014 at all monitoring locations. There are no existing AQMAs within the Council area and based on monitoring data, it is concluded that no Detailed Assessment is required.

8.2 Conclusions from Assessment of Sources

The assessment has been conducted in accordance with the TG09 Technical Guidance. Updated information on road, rail, industrial, domestic and fugitive emissions sources including biomass installations has been obtained and compared against the criteria and conditions described in the Guidance. It was determined that there is no need to proceed to a Detailed Assessment for any of the emissions sources.

Cambusview Poultry Farm will be assessed when formal guidance has been published.

8.3 Proposed Actions

Clackmannanshire Council plan to maintain the monitoring network throughout 2015. There are no planned changes to monitoring locations with the exception of the location of the new FDMS sampler at the South Ring Road where a new automatic NO_Xsampler was installed on 31 March 2015 within the existing PM_{10} sampler housing.

There is an increase of 17.8% in traffic count at the Westbound Ring Road in Alloa without a corresponding increase in NO_2 concentration there. However, given that there was some inconsistency with the figures at this location for 2012 and 2013, this may well explain the increase. It is fortuitous that the new automatic NOx sampler will offer the opportunity to compare measured concentrations from diffusion tubes with an alternative method. It will also offer the council a co-location facility which will permit more in-depth analysis of diffusion tube results.

In addition, as the traffic count at Gartlove has been reported by Transport Scotland to have increased by 9.2% in the last year, a watching brief should be maintained on this, firstly to identify a reason for this increase and secondly to establish whether this is a trend which is likely to continue on a road which will potentially see significant growth should the proposed Forestmill project proceed.

The next report to be submitted is the 2016 Progress Report.

9 References

Ref.1 Local Air Quality Management Technical Guidance LAQM.TG(09), Department for Environment, Food and Rural Affairs, 2009

Ref.2 2011 Air Quality Progress Report for Clackmannanshire Council, TSI Scotland Ltd, CLA-001-03-03, April 2011

Ref.3 2010 Air Quality Progress Report for Clackmannanshire Council, AEA Technology plc, AEAT/ENV/R/3044/Issue1, 1st July 2010

Ref.4 2009 Air Quality Updating and Screening Assessment for Clackmannanshire Council, BMT Cordah Ltd, G_CLA_019,July 2009

Ref.5 LAQM Progress Report 2008, BMT Cordah Ltd, G_CLA_018/04-02-01, 31st March 2008

Ref.6 Clackmannanshire Council LAQM Progress Report 2006/7, AEA, AEAT/ENV/R/2458/Issue 2, 6th July 2007

Ref.7 LAQM Updating and Screening Assessment 2006, BMT Cordah Ltd, E_CLA_015, 31st August 2006

Ref.8 LAQM Progress Report 2005, BMT Cordah Ltd, E_CLA_013, 28th April 2005

Ref.9 LAQM Progress Report 2004, BMT Cordah Ltd, April 2004

Ref.10 Volatile Correction Model, Environmental Research Group, King's College London, SE1 9NH – 5http://www.volatile-correction-model.info/

Ref.11 http://laqm.defra.gov.uk/documents/Diffusion_Tube_Factors_v04_11_v6.xls

Appendices

Appendix A: QA/QC Data

Appendix A: QA:QC Data

The raw monthly average NO_2 diffusion tube results are summarised in Table A1

Table A1: Raw Unadjusted Monthly Diffusion Tube NO_2 Concentrations

ID	SITE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	Data Capture %
1	Norwood Avenue	19.1	14.9	13.3	7.5	8.6	8.6	8.0	6.6	10.7	14.9	11.5	16.5	11.7	100.0
2	Clackmannan Road	34.8	38.2	38.8	23.6	N/R	24.3	29.5	33.6	35.6	40.4	29.8	51.0	31.3	91.7
3	Bus Station, Alloa	44.7	48.1	42.8	17.3	36.9	25.4	30.5	33.0	38.1	45.3	24.7	44.5	35.9	100.0
4	Shillinghill/Bridge Terrace, Alloa	40.1	39.1	35.9	27.2	31.7	30.6	25.4	20.7	31.0	37.1	29.7	37.6	32.2	100.0
5	South Ring Road, Alloa	31.2	26.4	25.5	17.2	29.5	26.1	23.6	28.1	19.8	37.2	31.6	41.8	28.2	100.0
6	Auld Brig Road	42.8	33.5	33.8	21.5	21.6	20.6	19.4	18.7	28.3	27.9	29.1	28.3	27.1	100.0

Factor from Local Co-location Studies (if available)

There is no co-location study within Clackmannanshire Council.

Diffusion Tube Bias Adjustment Factors

The national bias adjustment factor spreadsheet v03_15 (http://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html) (Ref.11) was used to derive the national bias adjustment factor for diffusion tubes analysed by Glasgow Scientific Services during 2014. The factor was found to be 0.83.

PM Monitoring Adjustment

AEA has been funded by The Scottish Government to provide Volatile Correction Model (VCM) corrected TEOM (Tapered Element Oscillating Microbalance) data to Local Authorities under the Scottish Air Quality Database and Website (SAQD) project.

The VCM uses purge (volatile) particulate matter measurements provided by FDMS (Filter Dynamics Measurement System) instruments located within 130 km of the TEOM in question to assess the loss of particulate matter (PM_{10}) from the TEOM. The TEOM measurements are then corrected to ambient pressure and temperature using meteorological data from met monitoring sites within 260 km of the TEOM. The volatile fraction is then added back onto the TEOM measurements to give Gravimetric Equivalent mass concentrations. Hourly average purge measurements from all Scottish FDMS monitoring sites within the Scottish Government-run network (SAQD) and the national network (AURN) were used for the correction.

The VCM method (Ref.11) was used to correct data from the Alloa site and is ratified by AEA.

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, Brockeridge Park, Twyning, Tewkesbury, Glos, GL20 6FF. Available reports are shown below.

Air Pollution Report

Produced by Ricardo-AEA on behalf of the Scottish Government

ALLOA
1st January to 31st December 2014

These data have been fully ratified by Ricardo-AEA

POLLUTANT	PM_{10}+
Maximum hourly mean	145 µg m^{-3}
Maximum daily mean	48 µg m^{-3}
Average	16 µg m^{-3}
Data capture	96.4 %

* PM_{10} in gravimetric units µg m^{-3}
+ PM_{10} instruments:
FDMS from 1 April 2014
TEOM from 1 January 2014 to 31 March 2014
All gaseous pollutant mass units are at 20°C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure.

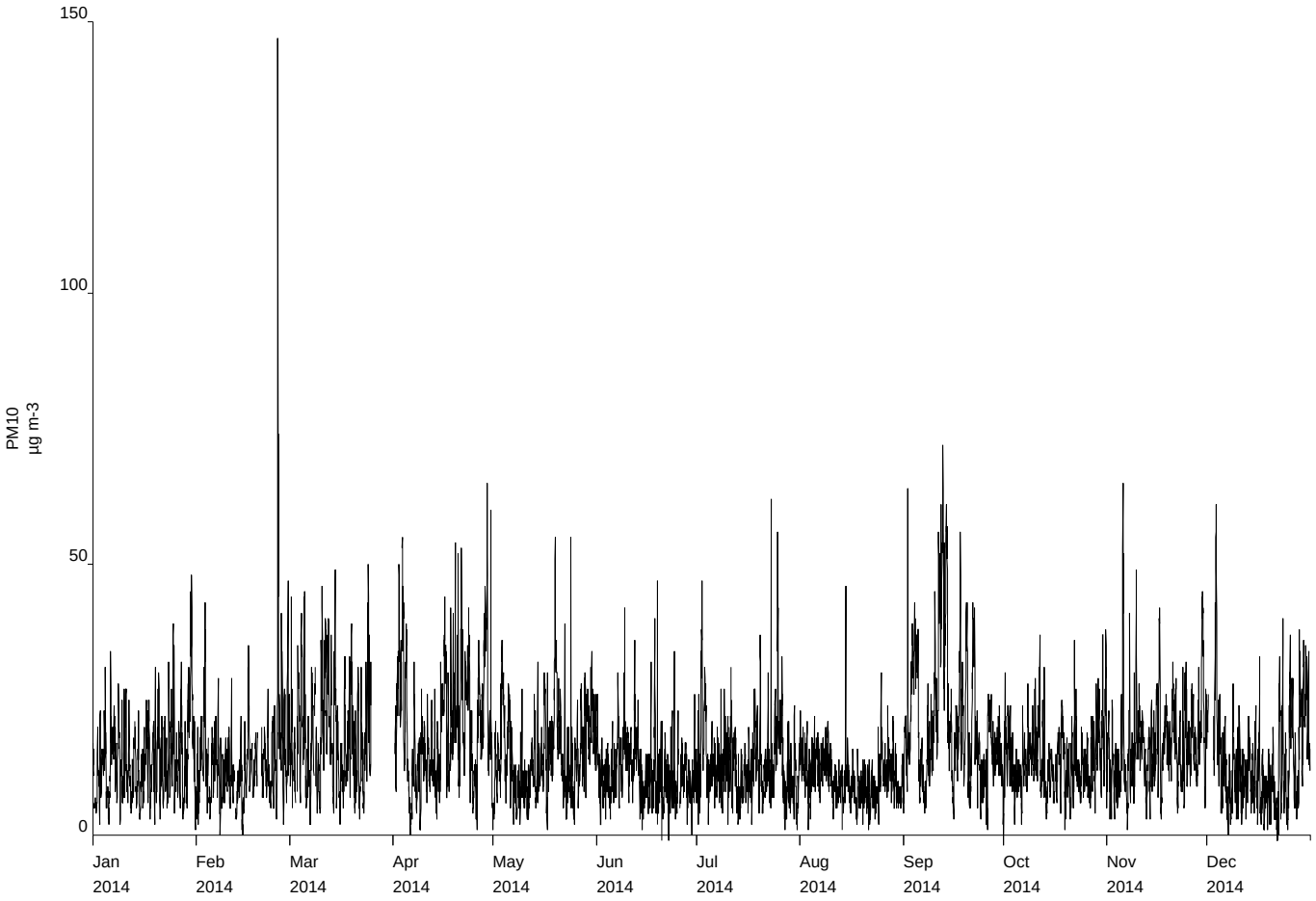
Pollutant	Air Quality Regulations (2000) and Air Quality (Scotland) Amendment Regulations 2002	Exceedences	Days
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	0	0
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 18 µg m^{-3}	0	-

Note: For a strict comparison against the objectives there must be a data capture of >90% throughout the calendar year

Clackmannanshire Council

Produced by Ricardo-AEA on behalf of the Scottish Government

Alloa
Hourly Mean Data for 1st January to 31st December 2014



Date Created: 01/04/2015

Clackmannanshire Council

FDMS PM10 Data Sheet

Job Report No:	RJM010414		
Serial No 140AB:	12791	**Serial No FDMS 8500:**	?
			Show C, CB, B, BB type

	Pre Statistics			**Post Statistics**	
Time:	10:30		**Time:**	12:00	
Main Flow:	3.09	lpm	**Main Flow:**	3	lpm
Aux Flow:	14.57	lpm	**Aux Flow:**	13.67	lpm
Total Flow:	17.66	lpm	**Total Flow:**	16.67	lpm
L/check Main:	PASS	lpm	**L/check Main:**	PASS	lpm
Leak check Aux:	PASS	lpm	**Leak check Aux:**	PASS	lpm
No Pump Main:	N/A	lpm	**No Pump Main:**	N/A	lpm
No Pump Aux:	N/A	lpm	**No Pump Aux:**	N/A	lpm
Flow Adj Main:	1		**Flow Adj Main:**	0.97	
Flow Adj Aux:	1		**Flow Adj Aux:**	0.94	
Pump Vacuum:	25	"Hg	**Pump Vacuum:**	25	"Hg
Cooler Temp:	N/A		**Cooler Temp:**	N/A	
DP in:	N/A		**DP in:**	N/A	
DP out:	N/A		**DP out:**	N/A	
RH in:	N/A		**RH in:**	N/A	
RH out:	N/A		**RH out:**	N/A	
Temp in:	N/A		**Temp in:**	N/A	
Temp out:	N/A		**Temp out:**	N/A	
Instrument KO:	13244		**Instrument KO:**	13244	
Audit KO:	N/A		**Audit KO:**	N/A	
F1:	N/A		**F1:**	N/A	
F2:	N/A		**F2:**	N/A	
			K0 Result % Diff:	N/A	

QA/QC of diffusion tube monitoring

The NO_2 diffusion tubes used by Clackmannanshire Council were prepared and analysed by the Glasgow Council Scientific Services Laboratory (GSS) The Laboratory is UKAS accredited and has good performance in both WASP and NPL QA schemes. The laboratory demonstrated satisfactory performance in the Workplace Analysis Scheme for Proficiency (WASP) over the past four quarterly rounds with Z scores between -1.9 and 0.9.

WASP (4 tubes)

Round 112	Z-Scores	0.2	0.5	0.3	0.4
Round 113	Z-Scores	-0.7	-1.0	-1.4	-1.9
Round 114	Z-Scores	0.6	0.9	0.1	0.9
Round 115	Z-Scores	-0.2	0.0	-0.1	-0.2

The general classification of a Z-Score is: Z

< ± 2	Satisfactory
Z > ± 2 and < ± 3	Warning
Z > ± 3	Unsatisfactory

The results of the NPL Intercomparison Study are shown below. The overall survey had good precision and data capture with a bias correction factor of 0.86.

RICARDO-AEA

0401

CERTIFICATE OF CALIBRATION

18 Blythswood Square, Glasgow, G2 4AD
Telephone 01235 753642

Approved Signatories: D. Hector S. Stratton

Signed:

Date of Issue: 1st April 2015

Certificate Number: 3090

Customer Name and Address: Scottish Government
Water, Air, Soils and Flooding Division
Environmental Quality Directorate
Scottish Government
Victoria Quay
Edinburgh
EH6 6QQ

Description: Calibration factors for Clackmannanshire Council's Alloa air monitoring station.

Site / Date Test Carried Out	Species	Analyser Serial No.	Parameter	Specified Value	Measured Value	Deviation %	Uncertainty %
Alloa 18th August 2014	TEOM FDMS PM_{10}	12791	Main Flow[4]	3.00	3.00	0.0	±2.2
			Aux Flow[4]	13.67			±2.2
			Total Flow	16.67	16.47	-1.2	±2.2
			k_0[5]	13244	13141	-0.8	±1.0

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Diffusion Tube Bias Adjustment Factors 03/15 Issue of the Spreadsheet

Laboratory	Method	Year	New (03/15) Factor	
			No. of Studies	Factor
Aberdeen Scientific Services	20% TEA in water	2014	1	0.75
Edinburgh Scientific Services	50% TEA in acetone	2014	1	0.78
ESG Didcot	20% TEA in water	2014	5	0.79
ESG Didcot	50% TEA in acetone	2014	22	0.81
ESG Glasgow	20% TEA in water	2014	1	0.70
ESG Glasgow	50% TEA in acetone	2014	1	0..76
Glasgow Scientific Services	20% TEA in water	2014	2	0.83
Gradko	20% TEA in water	2014	16	0.91
Gradko	50% TEA in acetone	2014	9	0.97
Kirklees Council	50% TEA in acetone	2014	1	0.74
Lambeth Scientific Services	50% TEA in acetone	2014	1	0.80
Milton Keynes Council	20% TEA in water	2014	1	0.75
Northampton BC	20% TEA in water	2014	3	0.77
Somerset County Council	20% TEA in water	2014	8	0.89
South Yorkshire Air Quality Samplers	50% TEA in acetone	2014	1	0.67
Staffordshire Scientific Services	20% TEA in water	2014	15	0.83
Tayside Scientific Services	20% TEA in water	2014	5	0.77
West Yorkshire Analytical Services	50% TEA in acetone	2014	8	0.75
		Number of Studies Included	**101**	

The National Diffusion Tube Bias Adjustment Factor Spreadsheet will be next updated at the end of June 2015

Local Air Quality Management Helpdesk
Telephone: 0800 0327953
E-mail: LAQMHelpdesk@uk.bureauveritas.con