



**Clackmannanshire
Council**

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2014 Air Quality Progress Report for Clackmannanshire Council

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

April, 2014

TSI Scotland

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Executive Summary

The Local Air Quality Management process as set out in Part IV of the Environment Act (1995) and the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 requires all local authorities to complete a Progress Report due for submission in April 2014 in accordance with technical guidance LAQM.TG(09) (Ref.1). The progress report is intended to maintain continuity in the Local Air Quality Management (LAQM) process, and fill in the gaps between the three-yearly cycle of Review and Assessment.

This is the 2014 Progress Report for Clackmannanshire Council which identifies all matters regarding impacts to local air quality that are new or have changed since the Progress Report in 2013 and whether further consideration of such changes is required.

The Air Quality Strategy (AQS) details objective concentrations for the following pollutants:

- Benzene
- 1,3-Butadiene
- Carbon Monoxide (CO)
- Lead
- Sulphur Dioxide (SO₂)
- Nitrogen Dioxide (NO₂)
- Particles (PM₁₀)

Examination of the previous 7 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 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. Funding has been granted which has enabled

Clackmannanshire Council to upgrade the TEOM to a reference method sampler. An FDMS analyser has been purchased and is due for installation in the TEOM. It will be commissioned between April and May 2014. The location of the new sampler will be closer to the roadside than the existing groundhog.

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 2013 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.

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 and the other side of the road is quite open. Diffusion tube monitoring was established here mid 2012 and traffic count surveys were undertaken on Auld Brig Road and Clackmannan Road during May/June 2013 in order that a screening assessment of the potential impact of traffic emissions could be undertaken to determine whether or not the automatic monitoring station should be relocated within Alloa to better represent worst case exposure.

The results of the DMRB screening assessment (Ref.2) show that there is 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.

Data from the Transport Planning Department of Clackmannanshire Council and Transport Scotland were obtained in order to give an indication of the traffic growth across the area.

Most sites show a decrease in traffic flow between 2012 and 2013. The only notable increase is 10.9% on the Tullibody Bypass. Traffic numbers have increased gradually as forecast and expected since the opening of the Clackmannanshire Bridge in 2008.

The AADT flows on the trunk roads have decreased on all of the road links monitored by Transport Scotland between 2012 and 2013.

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 Updating and Screening Assessment in April 2015.

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1 Introduction

1.1 Description of Local Authority Area

Clackmannanshire is the smallest local authority area in mainland Scotland with a population of approximately 50,000 people, of which half live in the main town of Alloa. It is a mainly rural 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.

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 Progress 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.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

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 microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (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 mg/m ³	Running 8-hour mean	31.12.2003
Lead	0.50 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
Particulate Matter (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 1.2 summarises the Air Quality Review and Assessment reports submitted by Clackmannanshire Council since 2004 with the most recent reports of 2013 listed first.

Table 1.2 Summary of Previous Air Quality Review and Assessment Reports 2004-2013

Report	Date Completed	Summary and Conclusions
DMRB Screening Assessment at 2 Potential Continuous Monitoring Sites in Alloa (Ref.2)	September 2013	<p>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.</p> <p>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.</p> <p>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</p>
Progress Report 2013 (Ref.3)	May 2013	<p>New monitoring data confirmed that there were no exceedences of the Air Quality Strategy (AQS) objectives for nitrogen dioxide (NO₂) and (PM₁₀) during 2012.</p> <p>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.</p> <p>It was also concluded that there was no risk of exceedences of any other AQS pollutant objectives.</p>

<p>Updating and Screening Assessment 2012 (Ref.4)</p>	<p>July 2012</p>	<p>New monitoring data confirmed that there were no exceedences of the Air Quality Strategy (AQS) objectives for nitrogen dioxide (NO₂) and (PM₁₀) during 2011.</p> <p>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.</p> <p>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.</p> <p>It was also concluded that there was no risk of exceedences of any other AQS pollutant objectives.</p>
<p>Progress Report 2011 (Ref.5)</p>		<p>New monitoring data confirmed that there were no exceedences of the Air Quality Strategy (AQS) objectives for nitrogen dioxide (NO₂) and (PM₁₀) during 2010. Shillinghill/Bridge Terrace and Clackmannanshire Rd in Alloa were identified as having an annual mean concentration of NO₂ of 38ug/m³ (objective level is 40ug/m³). South Ring in Alloa also recorded an annual mean concentration of PM₁₀ of 17ug/m³ compared with the objective of 18ug/m³.</p> <p>5 NO₂ diffusion tube sites were decommissioned at the end of 2010 due to a history of low concentrations.</p> <p>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.</p>

		<p>It was also concluded that there was no risk of exceedences of any other AQS pollutant objectives.</p>
<p>Progress Report 2010 (Ref.6)</p>	<p>July 2010</p>	<p>New monitoring data confirmed that there were no exceedences of the Air Quality Strategy (AQS) objectives for nitrogen dioxide (NO₂) and (PM₁₀) during 2009. However one site, Shillinghill/Bridge Terrace in Alloa was identified as having an annual mean concentration of NO₂ of 39ug/m³ (objective level is 40ug/m³). South Ring in Alloa also recorded an annual mean concentration of PM₁₀ of 17ug/m³ compared with the objective of 18ug/m³. 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.</p> <p>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.</p> <p>It was also concluded that there was no risk of exceedences of any other AQS pollutant objectives.</p>
<p>Updating and Screening Assessment 2009 (Ref.7)</p>	<p>July 2009</p>	<p>New monitoring data confirmed that there were no exceedences of the Air Quality Strategy (AQS) objectives for nitrogen dioxide (NO₂) and (PM₁₀) during 2008. It was also concluded that there was no risk of exceedences of any other AQS pollutant objectives.</p> <p>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 PM₁₀ objectives in an area of relevant exposure.</p>
<p>Progress Report 2008 (Ref.8)</p>	<p>March 2008</p>	<p>New monitoring data confirmed that there were no exceedences of the AQS objectives for NO₂ and during 2007. The PM₁₀ 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</p>

		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.9)	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 objectives.
Updating and Screening Assessment 2006 (Ref.10)	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.11)	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.12)	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 NO₂ and PM₁₀ in Clackmannanshire. During 2013, Clackmannanshire Council monitored NO₂ at six locations using passive diffusion tubes and PM₁₀ at one location using a Tapered Element Oscillating Microbalance (TEOM) automatic analyser.

2.1.1 Automatic Monitoring Sites

The TEOM is located in a Groundhog unit in a car park immediately adjacent to South Ring Road, Alloa. It is a busy road with a pedestrian crossing and housing nearby. It is considered a busy pedestrian thoroughfare. The site is classified as a Roadside site and also records ambient temperature. 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 97% for PM₁₀. Routine calibrations are carried out by Enviro Technology and 6 monthly site audits are carried out by AEA. The QA/QC procedures and data ratification reports are described in more detail in Appendix A.

All TEOM results from 2008-2013 have been corrected using the Volatile Correction Method (VCM) (latest version Ref.13). The VCM calculation for 2013 is included in Appendix A.

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



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

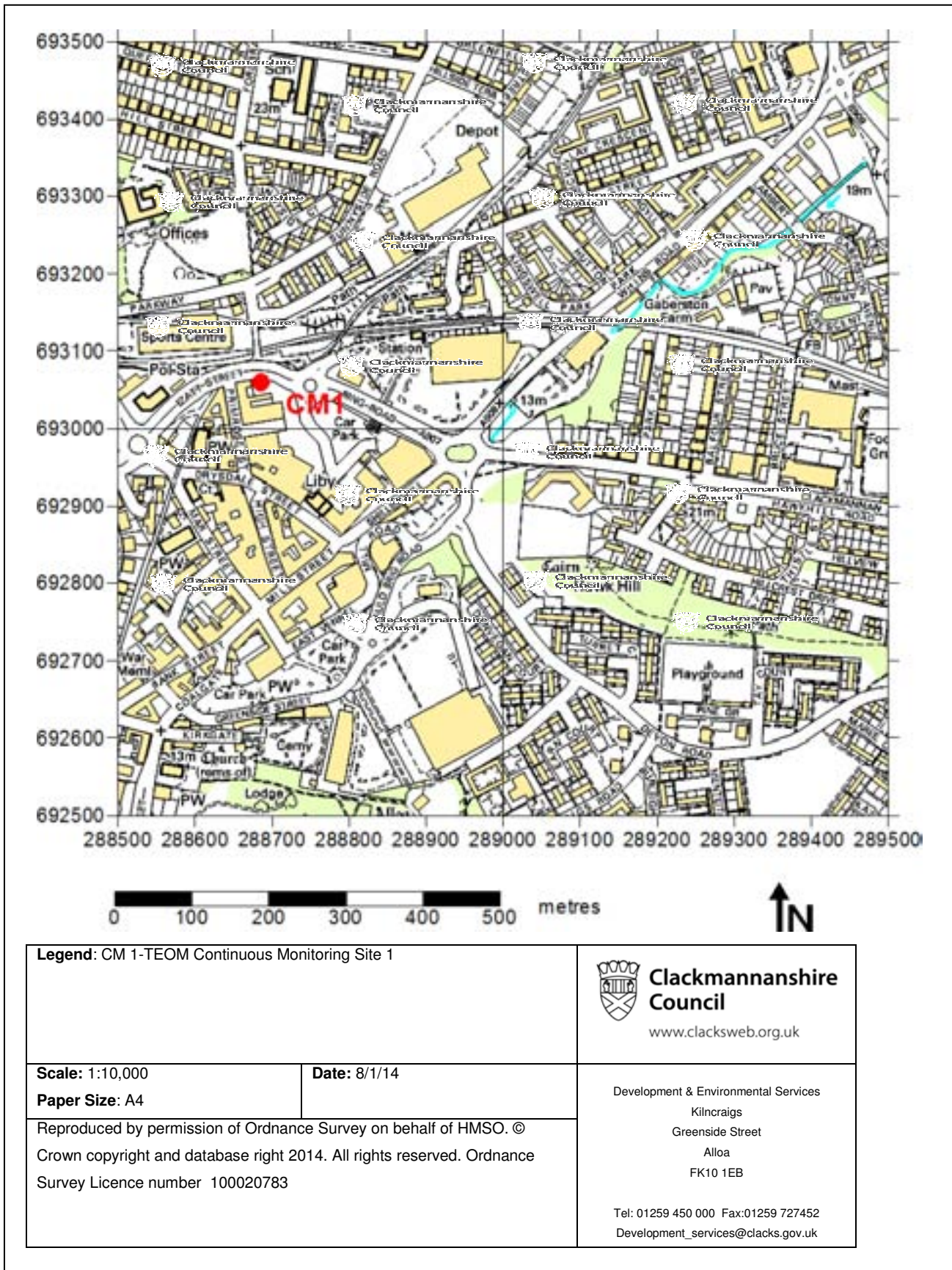


Table 2.1 Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
CM1	South Ring Road, Alloa	Roadside	288685	693060	2.94m	PM ₁₀	N	TEOM	Y (8m)	8.5m	Y

2.1.2 Non-Automatic Monitoring Sites

Non-automatic monitoring of NO₂ was undertaken at 6 locations within Clackmannanshire Council in 2013 using passive diffusion tubes. The location and description of each site is shown in Table 2.2. All sites are classified as kerbside sites except South Ring Road, Alloa, which is a roadside site. Maps showing the locations of the monitoring sites are shown in Figures 2.3 and 2.4.

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 91.6% (11 months) for 5 sites due to a problem with the laboratory in January. The data capture at DT3 Bus Station, Alloa was reduced to 83.3% (10 months) due to a vandalised tube in July. The QA/QC for diffusion tube analysis is included in more detail in Appendix A.

Figure 2.3 Map of Non-Automatic Monitoring Sites

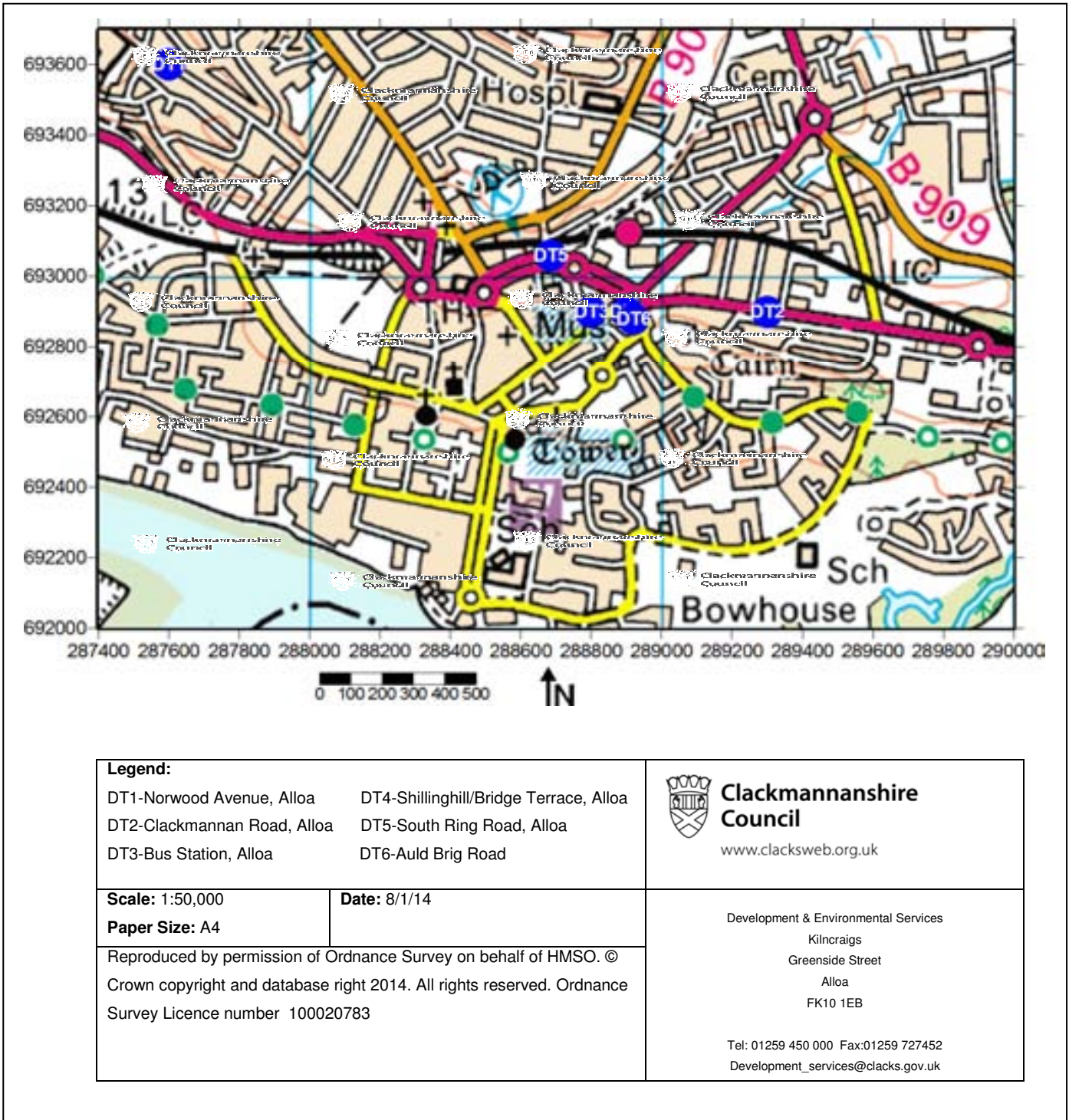
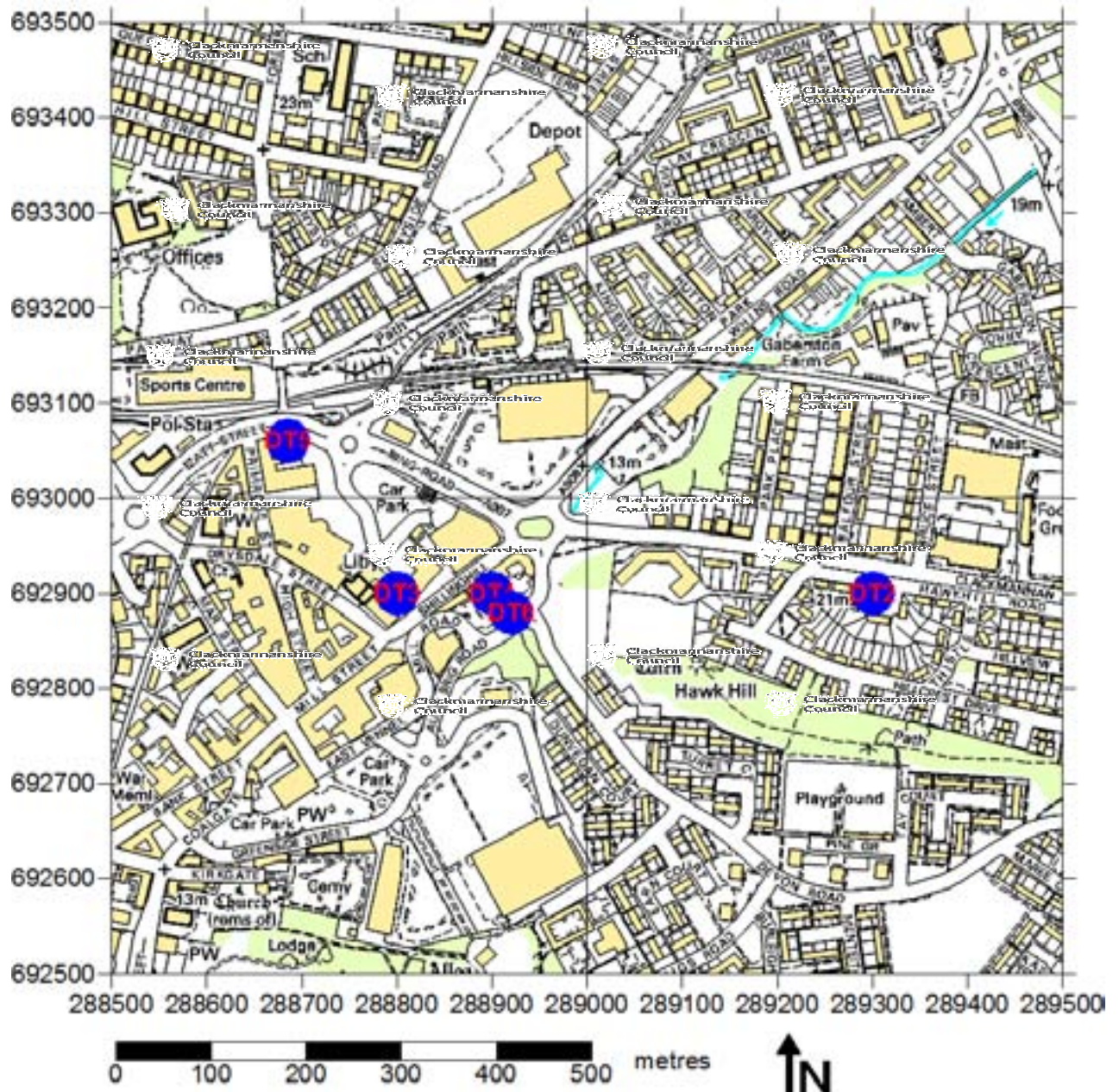


Figure 2.4 Detailed Map of Non-Automatic Monitoring Sites in Alloa




Legend: DT2-Clackmannan Road, Alloa DT5-South Ring Road, Alloa DT3-Bus Station, Alloa DT4-Shillinghill/Bridge Terrace, Alloa DT6-Auld Brig Road		 Clackmannanshire Council www.clacksweb.org.uk
Scale: 1:10,000 Paper Size A4	Date: 8/1/14	
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Table 2.2 Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
DT1	Norwood Avenue	Kerbside	287600	693600	3.2	NO ₂	N	N	Y (2m)	1.7m	Y
DT2	Clackmannan Road	Kerbside	289300	692900	3.4	NO ₂	N	N	Y (2m)	2m	Y
DT3	Bus Station, Alloa	Kerbside	288800	692900	3.4	NO ₂	N	N	Y (2m)	1.3m	Y
DT4	Shillinghill/Bridge Terrace, Alloa	Kerbside	288900	692900	3.1	NO ₂	N	N	Y (2m)	1.4m	Y
DT5	South Ring Road, Alloa	Roadside	288685	693060	3	NO ₂	N	N	Y (8m)	8.5m	Y
DT6	Auld Brig Road	Kerbside	288920	692880	3.25	NO ₂	N	N	Y (3m)	1.8m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO₂)

Diffusion Tube Monitoring Data

A summary of the bias-adjusted annual mean diffusion tube concentrations of NO₂ across the monitoring network for 2013 is shown in Table 2.3. The raw monthly results are included in Appendix A. A summary of data for the last five years is shown in Table 2.4.

A trend graph is shown in Figure 2.5 which illustrates that there is no clear trend but that the annual mean NO₂ concentration has consistently remained below the limit concentration of 40µg/m³ during the last 5 years. There has been an increase at 4 out of 5 comparable sites between 2012 and 2013.

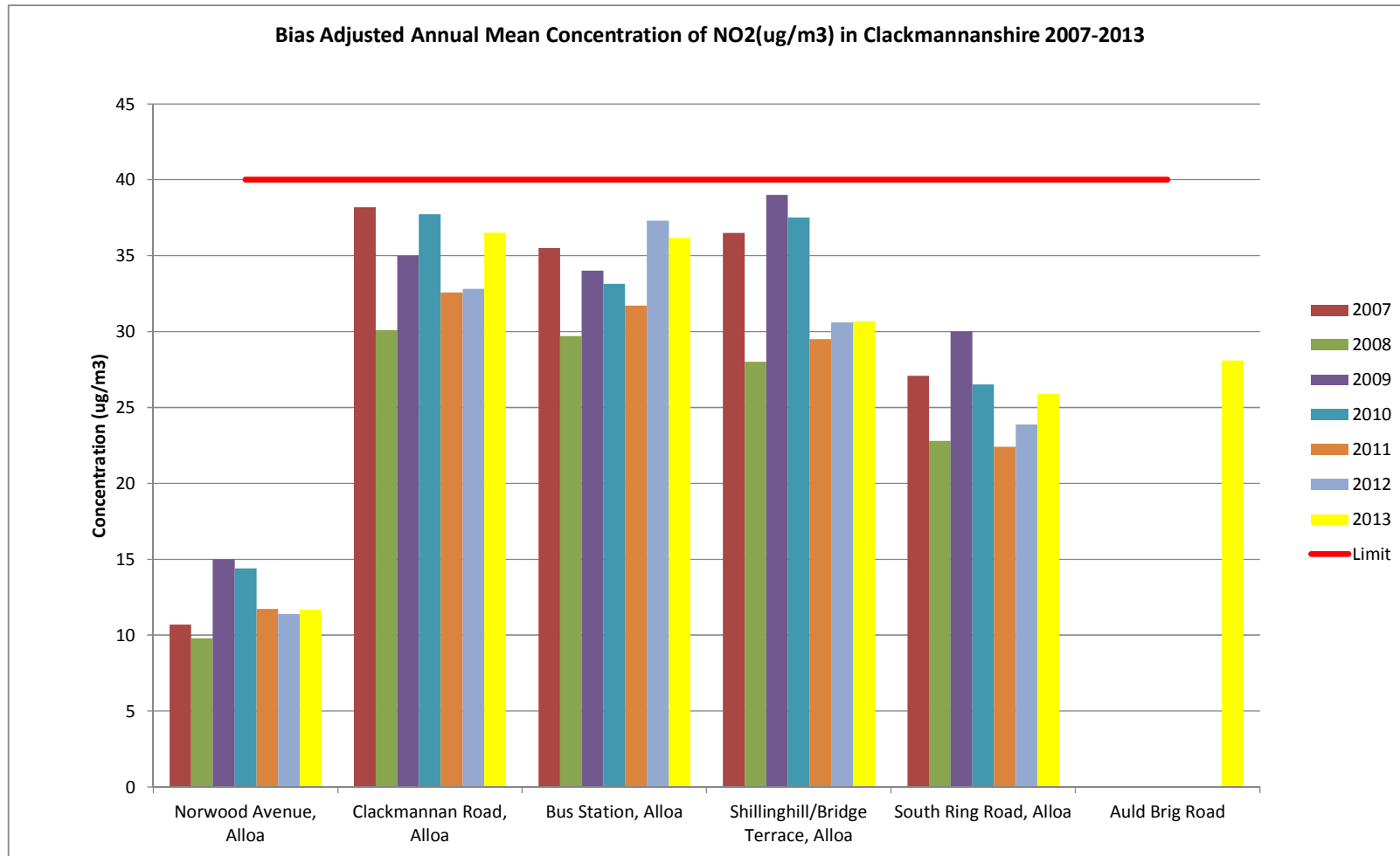
Table 2.3 Results of NO₂ Diffusion Tubes 2013

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months or %)	2013 Annual Mean Concentration (µg/m³) - Bias Adjustment factor = 0.99
DT1	Norwood Avenue	Kerbside	N	N	11	11.7
DT2	Clackmannan Road	Kerbside	N	N	11	36.5
DT3	Bus Station, Alloa	Kerbside	N	N	10	36.2
DT4	Shillinghill/Bridge Terrace, Alloa	Kerbside	N	N	11	30.7
DT5	South Ring Road, Alloa	Roadside	N	N	11	25.9
DT6	Auld Brig Road	Kerbside	N	N	11	28.1

Table 2.4 Results of NO₂ Diffusion Tubes (2008 to 2013)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m ³) - Adjusted for Bias					
			2008 (Bias Adjustment Factor = 0.97)	2009 (Bias Adjustment Factor = 1.23)	2010 (Bias Adjustment Factor = 1.1)	2011 (Bias Adjustment Factor = 0.94)	2012 (Bias Adjustment Factor = 0.95)	2013 (Bias Adjustment Factor = 0.99)
DT1	Kerbside	N	10.7	9.8	15	11.7	11.4	11.7
DT2	Kerbside	N	38.2	30.1	30.1	32.6	32.8	36.5
DT3	Kerbside	N	35.5	29.7	34	31.7	37.3	36.2
DT4	Kerbside	N	36.5	28	39	29.5	30.6	30.7
DT5	Roadside	N	27.1	22.8	30	22.4	23.9	25.9
DT6	Kerbside	N	-	-	-	-	-	28.1

Figure 2.5 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites 2007-2013



2.2.2 Particulate Matter (PM₁₀)

Automatic Monitoring Data

A summary of the ratified monitoring data for PM₁₀ at the automatic site at South Ring Road, Alloa is shown in Tables 2.5 and 2.6.

A trend graph is shown in Figure 2.6. The annual mean concentration of PM₁₀ over the period 2008-2013 has ranged between 15.8-17µg/m³ with an average of 16.4µg/m³.

The Gravimetric adjustment factor of 1.3 was applied to TEOM results up to 2007. All results from 2008-2013 have been corrected using the Volatile Correction Method (VCM).

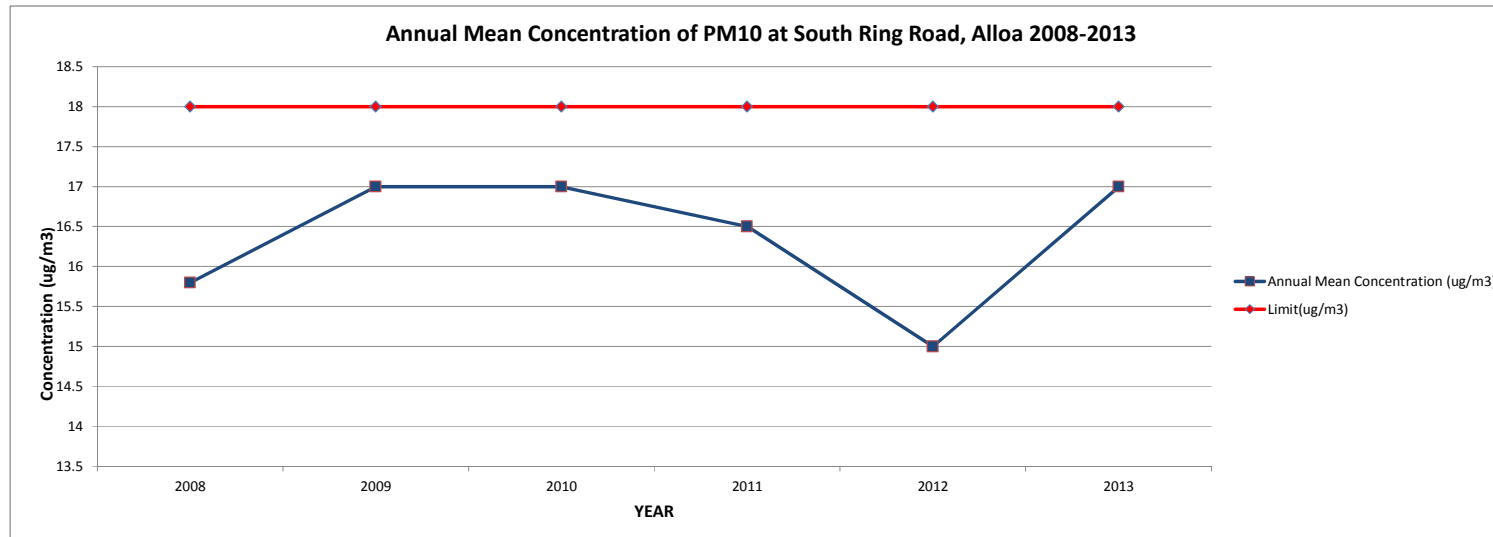
Table 2.5 Results of Automatic Monitoring for PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2013 %	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m ³)					
						2008	2009	2010	2011	2012	2013
CM1	Roadside	N	97	97	Y	15.8	17	17	16.5	15	17

Table 2.6 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2013 %	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m ³					
						2008	2009	2010	2011	2012	2013
CM1	Roadside	N	97	97	Y	0	3	1	2	1	0

Figure 2.6 Trends in Annual Mean PM₁₀ Concentrations



2.2.3 Summary of Compliance with AQS Objectives

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

3 New Local Developments

This section examines any local development changes that have taken place since the last Progress Report (Ref.4) which may affect air quality. The items included are:

- Road Traffic Sources;
- Other Transport Sources;
- Industrial Sources;
- Biomass Sources
- Commercial and Domestic Sources; and
- Fugitive and Uncontrolled Sources.

3.1 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 Clackmannanshire Council area that could result in exceedences of air quality standards.

Data have been collected from 21 automatic traffic count sites in the Council area in recent years. The figures for 2008-2013 are summarised in Table 3.1. A location map of the monitoring sites is shown in Figure 3.1.

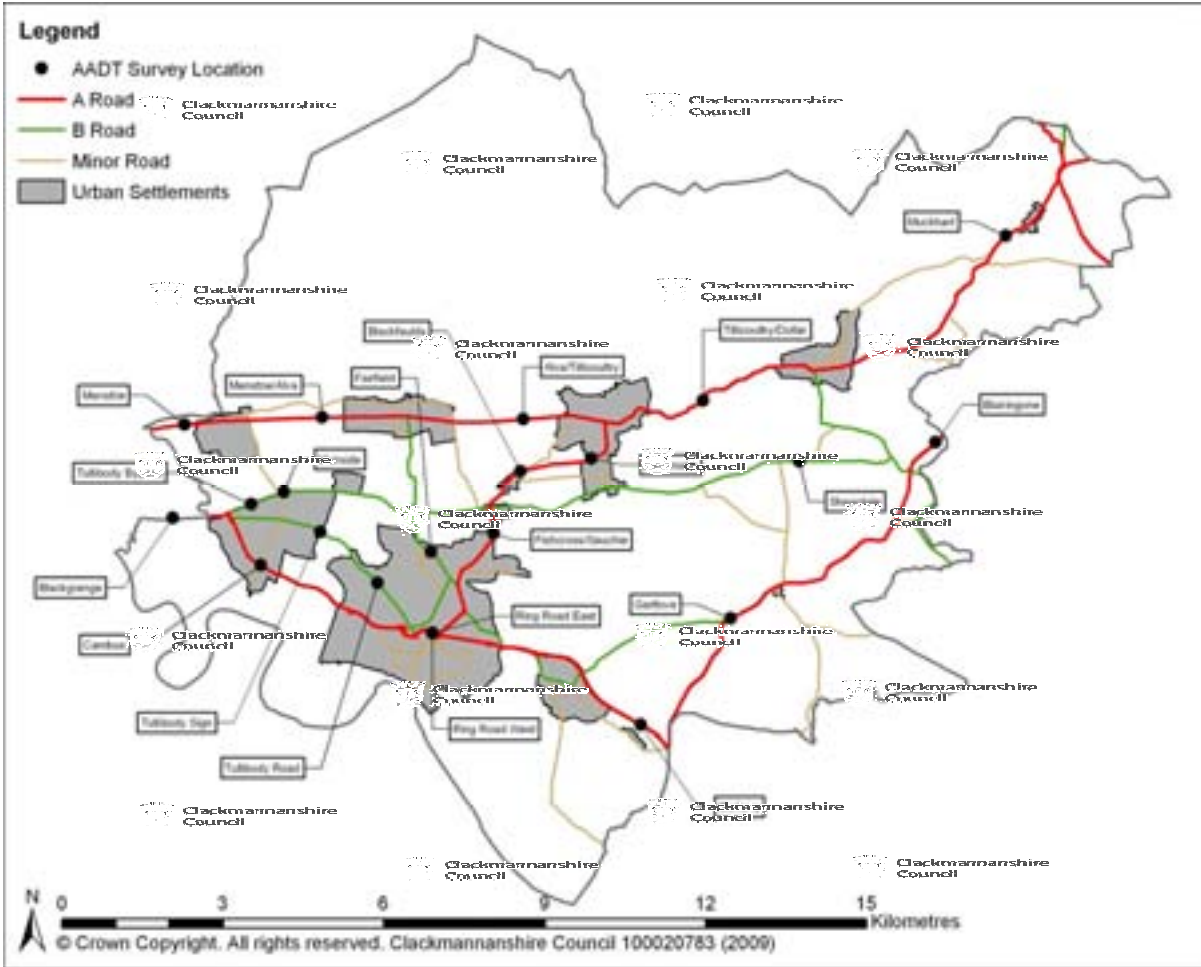
**Table 3.1 Summary of Traffic Survey Data for Clackmannanshire Council
2008-2013**

ID	Description	Speed	AADT							% Change 2012-2013
			2008	2009	2010	2011	2012	2013		
49	A977 Gartlove	60	5325	5949	5437	5603	6334	6139	-3.1	
287	A907 Blackgrange	60	22896	20768	20407	20036	19945	19478	-2.3	
288	A907 Cambus	40	10182	9027	8869	8548	N/A	7750	-12.6*	
292	A907 Ring Road Westbound	30	12259	11915	11416	11151	N/A	9768	-14.4*	
295	A907 Clackmannanshire Bypass	60	12431	14395	13302	14672	14617	15050	3.0	
300	A908 Fishcross Primary School	30	12204	12341	12889	12452	12326	11657	-5.4	
301	A908 Blackfaulds	40	8574	9061	9167	9074	8886	9069	2.1	
302	A908 Devonside	30	7274	7388	7649	7612	7481	6809	-9.0	
309	A91 Menstrie/Alva	60	10559	9758	9121	8815	8457	8205	-3.0	
311	A91 Menstrie Mains	60	10458	9760	9252	9016	8362	8599	2.8	
314	A91 Tillicoultry	30	7641	7225	6513	6734	N/A	N/a		
321	A91 Muckhart	60	3543	3545	3346	3098	3123	3267	4.6	
50	A977 Blairingone	60	4631	5355	3957	4904	4759	n/a		
581	B908 Fairfield	30	5699	6178	6341	6368	6547	6696	2.3	
589	B9096 Tullibody Sign	30	10291	9517	9407	9459	9185	9126	-0.6	
590	B9096 Tullibody Road	30	11048	10746	10702	10343	10086	10131	0.4	
625	B9096 Tullibody Bypass	60	8435	7567	7668	7789	7815	8668	10.9	
626	B9140 Muirside	60	8116	7739	8155	8267	N/A	8487	4.1*	
634	B9140 Sheardale	60	1874	1639	1677	1492	N/A	1520	-9.4*	
317	A91 Tillicoultry/Dollar	60	5977	5652	5508	5163	N/A	5178	-6.0*	

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

It can be seen that most sites show a decrease in traffic flow between 2012 and 2013. The only notable increase is 10.9% on the Tullibody Bypass. Traffic numbers have increased gradually as forecast and expected since the opening of the Clackmannanshire Bridge in 2008.

Figure 3.1 Clackmannanshire Council Traffic Survey Sites



In addition to data collected by Clackmannanshire Council, data were also obtained from Transport Scotland for the trunk roads monitored within the Clackmannanshire Council area. A map showing the count locations is shown in Figure 3.2 and the data for 2009-2013 are summarised in Table 3.2.

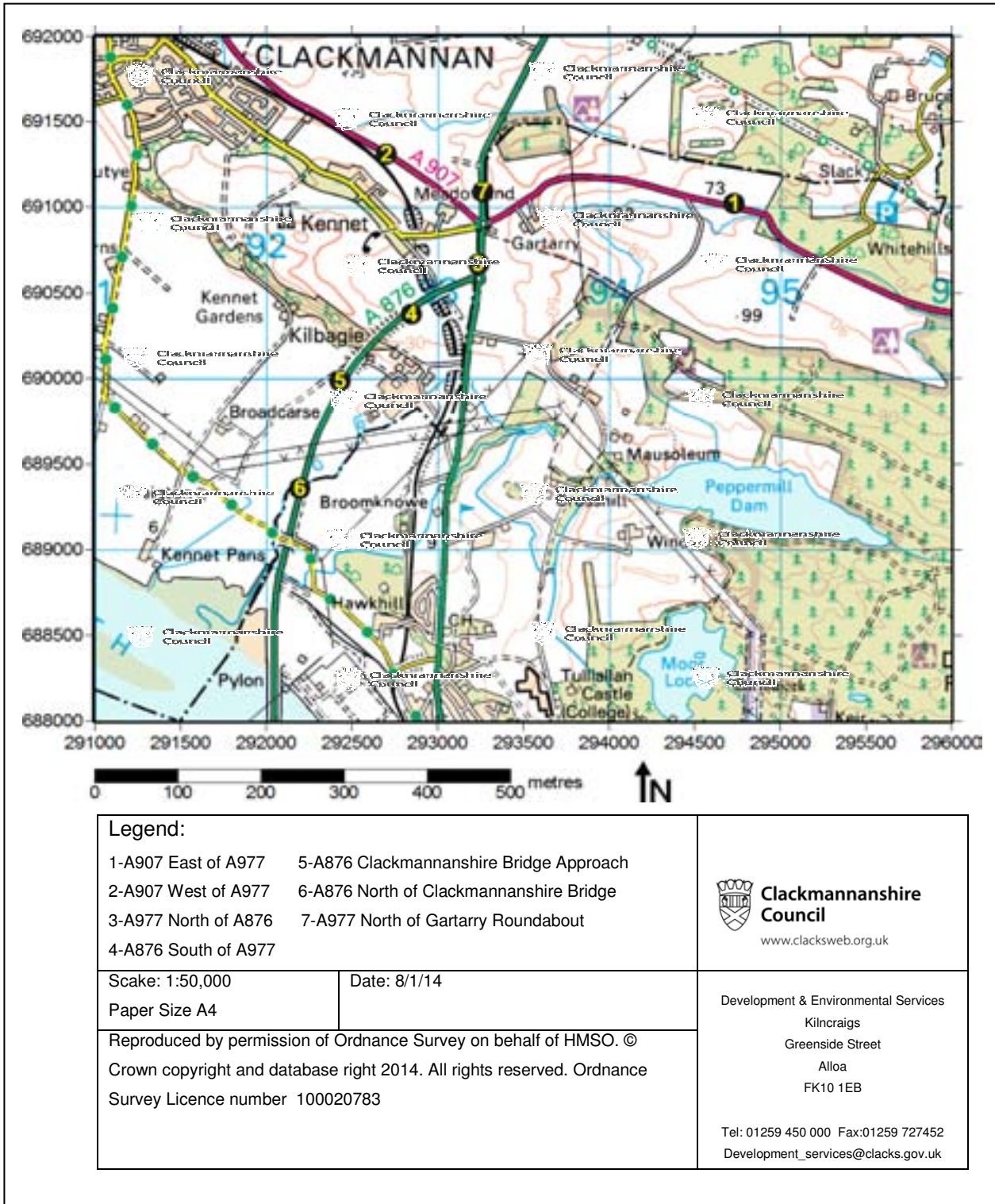
Table 3.2 Summary of Transport Scotland Trunk Road Traffic Count Data for Clackmannanshire 2009-2013

ID	Description	AADT					% Change 2012-2013
		2009	2010	2011	2012	2013	
1	A907 East of A977	3082	2874	3075	-	3082	0.2*
2	A907 West of A977	14247	13934	14507	14683	14247	-3.0
3	A977 North of A876	17620	17795	18573	19762	17620	-10.8
4	A876 South of A977	14359	14281	14839	17762	14359	-19.2
5	A876 Clackmannanshire Bridge Approach	14387	14228	14598	14609	14387	-1.5
6	A876 North of Clackmannanshire Bridge	14428	14133	15349	15901	14319	-9.9
7	A977 North of Gartarry Roundabout	6009	5459	5475	6167	4074	-33.9

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

The AADT flows have decreased on all of the road links between 2012 and 2013 with the exception of a small increase of 0.2% between 2011 and 2013 on the A907 East of A977.

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



3.2 Other Transport Sources

Clackmannanshire Council confirms that there are no new or newly identified transport sources which are likely to have an impact on air quality within the Local Authority area.

3.3 Industrial Sources

Clackmannanshire Council confirms that there are no new, planned or significantly changed industrial developments which may have an impact on air quality within the Local Authority area.

Clackmannanshire Council confirms Cambusview Poultry Farm was identified in the 2009 USA as having the potential to cause an adverse impact on air quality at a number of residential properties close to the unit. The LAQM helpdesk was consulted in April 2013 and again in January 2014 regarding the availability of new guidance for the assessment of such installations. It is understood that Detailed Assessments have been carried out at several Local Authorities in England to inform such guidance. Some of these studies are still in progress and the Council was advised that this installation should be assessed in the appropriate manner once UK-wide guidance is issued. This will be included in a future report. To date there have been no complaints regarding air quality in the vicinity of this site.

3.4 Commercial and Domestic Sources

The Council approved 2 applications for biomass installations during 2013 as detailed in Table 3.3.

Table 3.3 Planning Applications Permitted for Biomass Developments in 2013

Application Reference	Description	Grid Reference	Date Permitted
13/00029/FULL	220kW Broag pellet boiler at Primary School in Redwell, Alloa	E287471 N693281	11/4/2013
13/00151/FULL	Erection of Biomass Heating Cabin at Muckhart Golf Club*	E300317 N700140	31/8/13

*Boiler details were requested by Environmental Health in order that a biomass screening assessment could be undertaken, however the planning permission was granted by the Planning Department without the assessment taking place.

The Council has been in receipt of 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 new, planned or significantly changed commercial or domestic developments which are expected to have an impact on air quality within the Local Authority area.

3.5 New Developments with Fugitive or Uncontrolled Sources

Clackmannanshire Council confirms that there are no new or newly identified local developments with fugitive or uncontrolled sources which may have an impact on air quality within the Local Authority area.

4 Planning Applications

Clackmannanshire Council can confirm that there are no approved planning applications for development that could have an impact on local air quality. Planning permission for a development of 500 houses at Forestmill Village remain extant but the development but this is unlikely to progress for some years due to the economic climate. 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.

5 Local Transport Plans and Strategies

The Clackmannanshire Council Local Transport Strategy (LTS) 2010-2014 (Ref.15) sets out how the Council intends to reconcile international, national, regional and local objectives at the local level and outlines actions which will achieve these objectives. It contains a series of aims, objectives, policies and actions supporting the overall vision to meet the transport needs of all within Clackmannanshire.

As part of the preparation of the LTS, a Strategic Environmental Assessment (SEA) was undertaken identifying key environmental problems within Clackmannanshire and the relationship with other plans, policies and strategies.

The study recognised the environmental impact to all media of a number of proposed options for the LTS. Key environmental baseline information was gathered for the report. The baseline air quality data was obtained from the air quality monitoring carried out by the Council and was considered good as all pollutants are below the AQS objectives.

It was recognised that transport plays a key part in air quality and without the LTS, opportunities to improve air quality could be missed. Some of the key issues in the LTS related to air quality are summarised in Table 5.1.

The options that were accepted for inclusion in the LTS were deemed to have the most benefit for all considerations including the environment. It is recognised that as a result of the preferred strategy there may be negative impacts for noise and vibration as result of traffic management measures and increased use of the bus and rail network, however secondary and cumulative positive impacts have been identified for air quality and health by reducing the need to travel, promoting active and sustainable travel and removing transport from sensitive areas.

The LTS will go out to consultation during 2014 with the aim of providing an updated plan to run from 2015.

Table 5.1 Air Quality Considerations in the LTS

Environmental Issues	Implications for the LTS
Possibility of reduced air quality due to increasing traffic volumes and congestion	<p>Behavioural change is required to reduce the reliance on cars in favour of sustainable modes of transport.</p> <p>Integration with land use planning and improved public transport facilities are required. Improved management of town centre car parks and the introduction of the maximum parking standards. Implementation of travel plans in new and existing developments.</p> <p>Encouragement of walking and cycling as a mode of transport is required to improve physical health and air quality. May require infrastructure to facilitate.</p>
Greenhouse gas emissions contributing to Climate Change	Requires road traffic reduction and greater availability of sustainable transport choices.
Increase in air pollution due to traffic using unsuitable roads due to avoidance of declining conditions on main roads	Maintenance of the road network to a high standard

6 Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

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 4 of the 5 comparable sites between 2012 and 2013.

Data from the particulate automatic monitoring station at South Ring Road, Alloa have shown annual mean concentrations from 15.8-17µg/m³ in recent years (2008 to 2013) with an average of 16.4µg/m³. The annual mean concentration of PM₁₀ for 2013 was 17µg/m³.

The review of new monitoring data available for 2013 confirms that Clackmannanshire Council does not need to proceed to a Detailed Assessment for any pollutant.

6.2 Conclusions relating to New Local Developments

Clackmannanshire Council confirm that there are no new local developments that will require more detailed consideration in the next Updating and Screening Assessment.

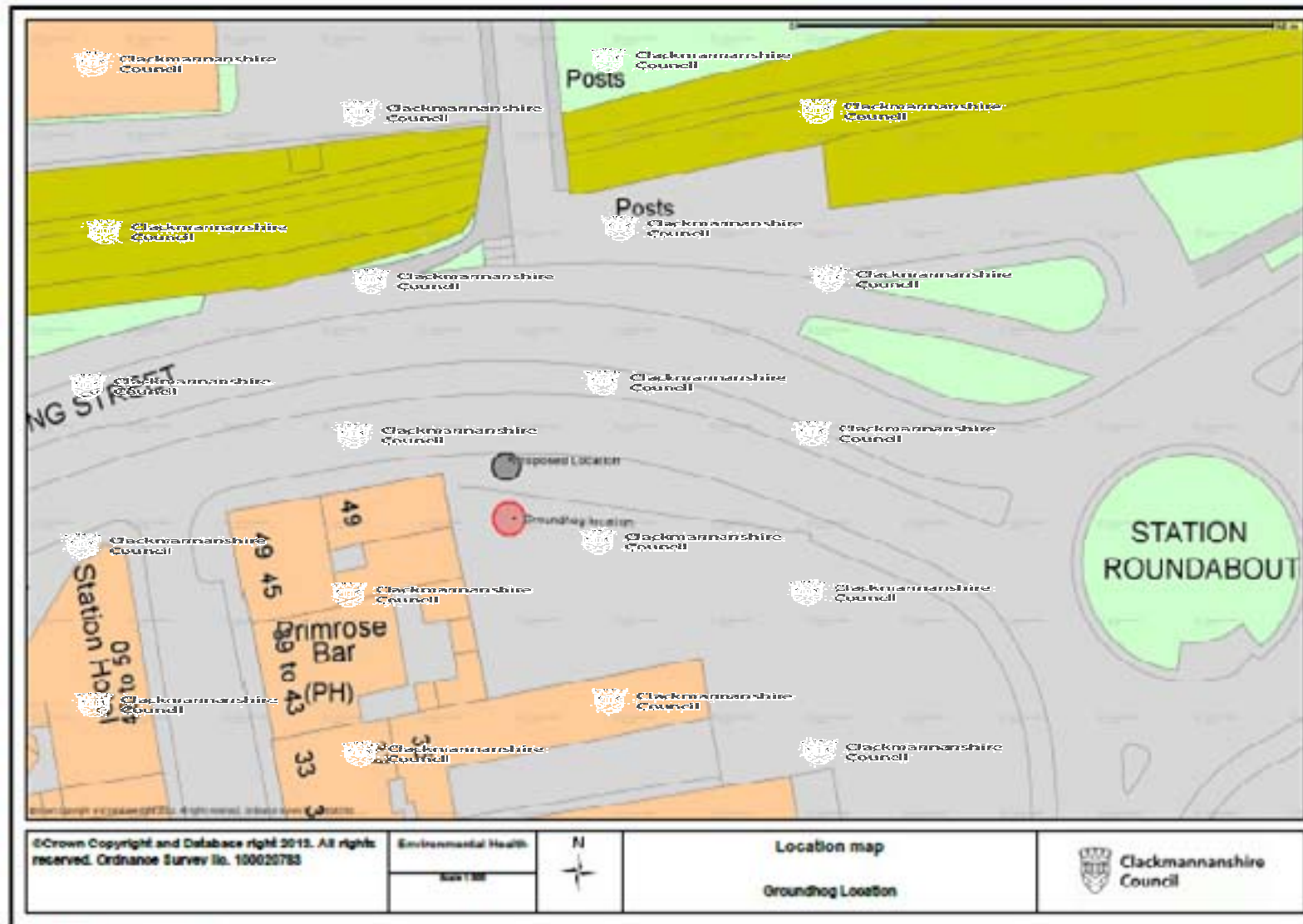
6.3 Proposed Actions

Further to the findings of traffic surveys and DMRB assessments on Auld Brig Road and Clackamannan Road in 2013 (Ref.2), 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

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. A map of the current and proposed future location is shown in Figure 6.1.

Diffusion monitoring for NO₂ will continue at all 6 locations during 2014.

Figure 6.1 Proposed Location of Upgraded Monitoring Site in Alloa



7 References

- Ref.1 Local Air Quality Management Technical Guidance LAQM.TG(09),
Department for Environment, Food and Rural Affairs, 2009
- Ref.2 DMRB Assessment of Road Traffic Emissions at 2 Potential Automatic
Monitoring Sites in Alloa, TSI Scotland Ltd, CLA-004-04-02, September 2013
- Ref.3 2013 Progress Report for Clackmannanshire Council, TSI Scotland Ltd, CLA-
004-04-02
- Ref.4 2012 Air Quality Updating and Screening Assessment Report for
Clackmannanshire Council, TSI Scotland Ltd, CLA-003-04-02
- Ref.5 2011 Air Quality Progress Report for Clackmannanshire Council, TSI Scotland
Ltd, CLA-001-03-03, April 2011
- Ref.6 2010 Air Quality Progress Report for Clackmannanshire Council, AEA
Technology plc, AEAT/ENV/R/3044/Issue1, 1st July 2010
- Ref.7 2009 Air Quality Updating and Screening Assessment for Clackmannanshire
Council, BMT Cordah Ltd, G_CLA_019, July 2009
- Ref.8 LAQM Progress Report 2008, BMT Cordah Ltd, G_CLA_018/04-02-01, 31st
March 2008
- Ref.9 Clackmannanshire Council LAQM Progress Report 2006/7, AEA,
AEAT/ENV/R/2458/Issue 2, 6th July 2007
- Ref.10 LAQM Updating and Screening Assessment 2006, BMT Cordah Ltd,
E_CLA_015, 31st August 2006
- Ref.11 LAQM Progress Report 2005, BMT Cordah Ltd, E_CLA_013, 28th April 2005
- Ref.12 LAQM Progress Report 2004, BMT Cordah Ltd, April 2004
- Ref.13 Volatile Correction Model, Environmental Research Group, King's College
London, SE1 9NH – <http://www.volatile-correction-model.info/>
- Ref.14 http://laqm.defra.gov.uk/documents/Diffusion_Tube_Factors_v03-14

Appendices

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Appendix A: QA:QC Data

Table A1: Raw Unadjusted Monthly Diffusion Tube NO₂ Concentrations

ID	SITE	JAN ¹	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	Data Capture %
DT1	Norwood Avenue	-	18.5	10	10.1	6.2	8.3	8.2	6.8	9.3	11.4	21.4	19.5	11.8	91.6
DT2	Clackmannan Road	-	50.5	31.4	33.8	32.4	32.4	28	32	29.3	39.8	52.4	43.8	36.9	91.6
DT3	Bus Station, Alloa	-	35.3	29.4	28	40.7	31.9	NR	27.9	33.5	37.4	53.5	47.8	36.5	83.3
DT4	Shillinghill/Bridge Terrace, Alloa	-	34.4	34.3	29.1	30.4	25.5	25.6	20.6	26.1	33.8	41.4	39.7	31.0	91.6
DT5	South Ring Road, Alloa	-	32.3	23.3	26	22.7	20.8	21.1	18.4	21.7	27.3	37.9	36.3	26.2	91.6
DT6	Auld Brig Road	-	32.7	31.1	29.6	20.1	20.9	22.3	17.2	20.7	44.3	40.9	32.6	28.4	66.6

NR = Non Return (Vandalism)

¹ The January results were not accredited by the laboratory and have therefore been discounted.

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_14 (<http://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html>) (Ref.14) was used to calculate the national bias adjustment factor for diffusion tubes analysed by Glasgow Scientific Services during 2013. The laboratory uses the method 20% TEA in Acetone. The bias adjustment factor was found to be 0.99.

PM Monitoring Adjustment

The VCM method (Ref.13) was used to correct data from the Alloa site and is ratified by AEA.

Produced by Ricardo-AEA on behalf of the Scottish Government

ALLOA 1st January to 31st December 2013

These data have been fully ratified by AEA

POLLUTANT	PM ₁₀₊
Maximum hourly mean	120 µg m ⁻³
Maximum daily mean	49 µg m ⁻³
Average	16 µg m ⁻³
Data capture	97 %

+ PM₁₀ measured by a TEOM and using the Volatile Correction Model for Gravimetric Equivalent mass concentrations.

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

QA/QC of Automatic Monitoring

The automatic monitoring equipment is audited and calibrated every 6 months by Ricardo AEA, Glengarnock Technology Centre, Lochshore Business Park, Glengarnock.



CERTIFICATE OF CALIBRATION

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

0401

Approved Signatories: D. Hector* S. Stratton

Signed: *[Signature]*

Date of Issue:

Certificate Number: 2055

Page 1 of 2

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 20 August 2013	TEOM PM ₁₀	22458	Main Flow ^a	3.00	2.96	-1.4	±2.2
			Aux Flow ^a	13.67			±2.2
			Total Flow	16.67	16.02	-3.9	±2.2
			k ₂ ^a	12791	12564	-1.8	±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.

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 Registered in England No: 03202014. VAT No: 264 55 19 02. T: 5

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NO_x analysers only) by documented methods. The factors have been calculated using certified gas standards. The particulate analysers listed above have been tested for sample flow rates and k₀ (where appropriate) by documented methods. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are given in ppb (parts per billion) mole fractions or ppm (parts per million) mole fractions.

¹ The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

² The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (ppb for NO, NO_x, SO₂, O₃ and ppm for CO. Where 1 ppm = 1000 ppb). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F (Output - Zero Response)

Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

³ Converter eff. is the measured efficiency of the NO₂ to NO converter within the oxides of nitrogen analyser under test.

⁴ The measured main flow rate (where applicable) is the flow rate through the sensor unit of the TEOM particulate analyser under test. The measured aux flow rate (where applicable) is the flow rate through the bypass tubing of the TEOM particulate analyser under test. The measured total flow rate is the total flow rate through the particulate analyser under test. Units of flow are l.min⁻¹. Where flow rates are highlighted in bold, it indicates that measurements were not made at the analyser sample inlet. These measurements therefore may not accurately reflect analyser performance in normal operation.

⁵ The calculated k₀ value (TEOM analysers only) is the calculated k₀ spring constant based on tests undertaken with filters of known weight. The % deviation indicates the closeness of the calculated result to the manufacturer's specified k₀ value.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.



CERTIFICATE OF CALIBRATION

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

0401

Approved Signatories:

D. Hector*

S. Stratton

Signed:

Date of Issue: 4th April 2014

Certificate Number: 2942

Page 1 of 2

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 12 th February 2014	TEOM PM ₁₀	22468	Main Flow ^a	3.00	3.02	-1.9	±2.2
			Aux Flow ^a	13.67	12.28	-1.9	±2.2
			Total Flow	16.67	15.30	-8.2	±2.2
			k ₀ ^b	12791	12932	1.1	±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.

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The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NO_x analysers only) by documented methods. The factors have been calculated using certified gas standards. The particulate analysers listed above have been tested for sample flow rates and k₀ (where appropriate) by documented methods. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are given in ppb (parts per billion) mole fractions or ppm (parts per million) mole fractions.

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Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

³ Converter eff. is the measured efficiency of the NO₂ to NO converter within the oxides of nitrogen analyser under test.

⁴ The measured main flow rate (where applicable) is the flow rate through the sensor unit of the TEOM particulate analyser under test. The measured aux flow rate (where applicable) is the flow rate through the bypass tubing of the TEOM particulate analyser under test. The measured total flow rate is the total flow rate through the particulate analyser under test. Units of flow are l.min⁻¹. Where flow rates are highlighted in bold, it indicates that measurements were not made at the analyser sample inlet. These measurements therefore may not accurately reflect analyser performance in normal operation.

⁵ The calculated k₀ value (TEOM analysers only) is the calculated k₀ spring constant based on tests undertaken with filters of known weight. The % deviation indicates the closeness of the calculated result to the manufacturer's specified k₀ value.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

QA/QC of Diffusion Tube Monitoring

The NO₂ 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 overall satisfactory performance in the Workplace Analysis Scheme for Proficiency (WASP) over the past three rounds with Z scores between -0.19 and 1.171 for all measurements.

WASP (4 tubes)

Round 121	Z-Scores	0.816	0.961	1.171	0.832
Round 122	Z-Scores	0.78	0.95	0.82	1.24
Round 123	Z-Scores	0.18	-0.19	0.11	0.3


The general classification of a Z-Score is:

$Z < \pm 2$	Satisfactory
$Z > \pm 2$ and $< \pm 3$	Warning
$Z > \pm 3$	Unsatisfactory

The results of the NPL Intercomparison Study are shown below. The overall survey had good precision and data capture.

Results of NPL Inter Comparison Study for GSS 2013

Checking Precision and Accuracy of Triplicate Tubes



From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	02/01/2013	30/01/2013	97.1	98.3	110.0	102	7.1	7	17.7
2	30/01/2013	27/02/2013	89.2	91.0	86.7	89	2.2	2	5.4
3	27/02/2013	27/03/2013	69.9	82.9	82.5	78	7.4	9	18.4
4	27/03/2013	01/05/2013	78.1	70.9	68.3	72	5.1	7	12.6
5	01/05/2013	30/05/2013	79.8	90.3	76.4	82	7.2	9	18.0
6	30/05/2013	26/06/2013	88.1	96.9	86.0	90	5.8	6	14.4
7	26/06/2013	31/07/2013	103.0	112.0	105.0	107	4.7	4	11.7
8	31/07/2013	04/09/2013	111.0	109.0	89.4	103	11.9	12	29.6
9	04/09/2013	02/10/2013	101.0	118.0	105.0	108	8.9	8	22.1
10	02/10/2013	30/10/2013	83.2	103.0	104.0	97	11.7	12	29.1
11	30/10/2013	04/12/2013	96.4	86.4	107.0	97	10.3	11	25.6
12	04/12/2013	08/01/2014	112.0	121.0	104.0	112	8.5	8	21.1
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

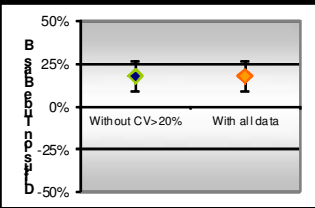
Automatic Method		Data Quality Check		
Period	Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
84		96.7	Good	Good
74		94.1	Good	Good
74		97.7	Good	Good
77		97.6	Good	Good
83		97.6	Good	Good
73		97.6	Good	Good
89		94.3	Good	Good
84		92.0	Good	Good
84		97.7	Good	Good
89		97.5	Good	Good
77		97.3	Good	Good
80		97.6	Good	Good

Overall survey -->	Good precision	Good Overall DC
------------------------------	----------------	-----------------

(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Marylebone Road	Precision 12 out of 12 periods have a CV smaller than 20%
---------------------------------------	--

Accuracy (with 95% confidence interval) without periods with CV larger than 20% Bias calculated using 12 periods of data Bias factor A 0.85 (0.79 - 0.92) Bias B 18% (9% - 26%) <hr style="border: 1px dashed white;"/> Diffusion Tubes Mean: 95 μgm^{-3} Mean CV (Precision): 8 <hr style="border: 1px dashed white;"/> Automatic Mean: 81 μgm^{-3} Data Capture for periods used: 96% <hr style="border: 1px dashed white;"/> Adjusted Tubes Mean: 81 (75 - 87) μgm^{-3}	Accuracy (with 95% confidence interval) WITH ALL DATA Bias calculated using 12 periods of data Bias factor A 0.85 (0.79 - 0.92) Bias B 18% (9% - 26%) <hr style="border: 1px dashed black;"/> Diffusion Tubes Mean: 95 μgm^{-3} Mean CV (Precision): 8 <hr style="border: 1px dashed black;"/> Automatic Mean: 81 μgm^{-3} Data Capture for periods used: 96% <hr style="border: 1px dashed black;"/> Adjusted Tubes Mean: 81 (75 - 87) μgm^{-3}
---	---



Jaume Targa, for AEA
Version 04 - February 2011

If you have any enquiries about this spreadsheet please contact the LAQM Helpdesk at: LAQMHelpdesk@uk.bureauveritas.com