



2016 Air Quality Annual Status Report (ASR)

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

March 2017

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Executive Summary: Air Quality in Our Area

Air Quality in Eden District Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

Within Eden, the main air quality issue is from nitrogen dioxide levels associated with vehicle emissions within the town centre of Penrith. Eden District Council has monitored nitrogen dioxide levels using diffusion tubes across Penrith and also Eamont Bridge where levels were indicating breaches of the Air Quality Objective (AQO) for nitrogen dioxide.

Penrith town centre has become busier over the years with increased vehicle numbers accessing the amenities. Whilst there have been improvements to emissions from modern engines, the levels within the town centre are staying fairly static. This may be due to increased traffic numbers balancing out the improvements in emissions from vehicle engines. There are 2 specific areas within Penrith where Eden District Council continues to monitor. Victoria Road, a section of the A6 which is the main north south route through the town centre has several busy junctions along this section. There were no failures of the annual mean AQO recorded at any location along this section in 2015.

Castlegate is the only location where breaches of the annual mean AQO for nitrogen dioxide were recorded. This street is one-way, narrow with a busy junction at the top end resulting in standing traffic.

Within Eamont Bridge, there have now been no breaches of the annual mean AQO for the last two years, at any location.

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

² Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Actions to Improve Air Quality

The Council Plan 2015-2019 was approved and adopted on 17 September 2015 following a period of wide consultation. This document is the Council's main policy document. There are four priorities as follows:

- **Decent Homes for All** - Providing access to good quality housing that both reflects local need and supports employment
- **Strong Economy, Rich Environment** - Supporting a strong economy that benefits from and values Eden's rich natural and built
- **Thriving Communities** - Working in partnership, enabling communities to be active, secure, healthy and connected
- **Quality Council** - Delivering accessible, effective and value for money

The Council Plan 2015-2019 (PDF: 1MKb / 16 pages) is monitored every six months to ensure good progress is being made.

Local Priorities and Challenges

In the coming year the priorities for Eden District Council, with regard to air quality, will be to ensure that the relevant policies appear in the Local Plan which is due for publication later in the year.

Eden District Council Local Plan 2014 – 2032 Preferred Options includes Policy ENV8 – Air Pollution and states that:

All major development proposals will be required to assess the likely impacts of the development on air quality and mitigate any negative impacts by:

1. Ensuring the development is located within easy reach of established public transport routes
2. Maximising provision for cycling and pedestrian facilities
3. Encouraging the use of cleaner transport fuels on site, through the inclusion of electric car charging points, and
4. Contributing towards the improvement of the highway network where the development is predicted to result in increased congestion on the highway network.

How to Get Involved

For members of the public wanting to take an active role in improving air quality within the district there are the following action groups:

- Cumbria Action for Sustainability (CAfS) promotes low carbon living, energy saving and reduced use of fossil fuels throughout Cumbria.
- Penrith Action for Community Transition (PACT) is a transition town group started in Cumbria during 2008, and is part of the growing transition network here in the UK and around the world, working to develop community-based responses to the challenges of peak oil, climate change and economic sustainability.

However there are also many simple measures that can be taken by individual members of the public to help improve air quality such as:

- Walking and cycling short journeys rather than taking the car;
- Using public transport wherever possible;
- Lift sharing to work and for the school run;
- Turning off the car engine when stationary;
- Choose a low emission vehicle such as an electric or hybrid car
- Start a 'walking bus' for the journey to school.

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1 Local Air Quality Management

This report provides an overview of air quality in Eden District Council during 2015. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Eden District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of the objectives.

Eden District Council currently does not have any AQMAs. However there is one area at the top of Castlegate in Penrith that is being closely monitored as a possible AQMA.

2.2 Progress and Impact of Measures to address Air Quality in Eden District Council

Eden District Council and its partners have taken forward a number of measures during the current reporting year of 2015 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1.

Table 2.1 – Progress on Measures to Improve Air Quality

Action No	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Progress to date	Estimated completion date	Comments relating to Emission Reductions
Infrastructure Projects Planning and Development Control Measures A1	Cumbria Local Transport Plan	Eden is the most sparsely populated district in England and is the most deprived in terms of ease of access to jobs, services and healthcare. Focus is to strengthen role of Penrith as a service centre and support housing and employment growth. Priority in rural areas to improve access to jobs and services. Work with rail industry to sustain importance of Settle-Carlisle railway line.	Cumbria CC		2011-2026	<ul style="list-style-type: none"> • Increase proportion of short journeys on foot or by cycle • Increase number of journeys made by bus and train. • Air quality improves and respiratory disease reduces. Noise from traffic and transport is reduced and quality of life improves • Carbon consumption and emissions 	<ul style="list-style-type: none"> • Introduction of Rural Wheels scheme • A66 Temple Sowerby by-pass • Innovative rural traffic calming scheme in Clifton • Environmental improvements in Appleby and Kirkby Stephen • Surfaced walk and cycle route from Penrith to University campus at Newton Rigg 	2026	CCC acknowledge that there will be less money available to improve and maintain transport over the years of the plan. They state that they are less able to improve and maintain transport infrastructure, support bus services and promote road safety,

Action No	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Progress to date	Estimated completion date	Comments relating to Emission Reductions
						<p>will be reduced to tackle climate change.</p> <ul style="list-style-type: none"> • Will work with communities to draw Local Sustainable Transport Funding into Cumbria 			walking and cycling. However all contribute to reduction in individual vehicle use
A2	Local Sustainable Transport Fund (LSTF) bid	Package of sustainable transport measures aimed at visitors to the Lake District, to improve walking, cycling & public transport, benefiting the environment, health and the local economy.	CCC / LDNPA	2011	2012-2015	Reduction in visitor travel by car in Lake District.	Bid submitted successfully by CCC / LDNPA partnership. Funding of £6.9m received for LDNPA / CCC / Cumbria Tourism scheme aimed at visitor travel to Lake District. 'Go Lakes' scheme launched 2012; Schemes include bike buses, pay-as-you-drive low emission car hire,	Complete - Initial program: 2015 Gateway project: 2016	Contributes to reduction in individual vehicle use

Action No	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Progress to date	Estimated completion date	Comments relating to Emission Reductions
							bike (including electric bike) hire, smart ticketing, improved travel information, improved cycle network; Electric bike hire network and charging points extended to Penrith in late 2012. Expanding to cover several 'gateways' to the Lake District (principal rail hubs).		
Alternatives to private vehicle use B1	Car sharing schemes	Eden Council is part of Cumbria Car Share Scheme, supported by LiftShare	Eden DC	Staff Travel Survey in 2010	Ongoing	Not quantified	Intranet link	Ongoing	Contributes to reduction in individual vehicle use
B2	Transport guides for Villages	Produced for Temple Sowerby, Long Marton, Kirkby Thore, Appleby, Bolton and Morland	Heart of Eden Development Trust	2009 onwards	2010 onwards	<ul style="list-style-type: none"> • Feasibility Survey completed • New routes for Fellrunner buses • Purchase of 	<ul style="list-style-type: none"> • Feasibility Survey completed • Attendance at a Big Society Event in 2010 • New routes identified • Purchase of new 	Ongoing	Contributes to reduction in individual vehicle use

Action No	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Progress to date	Estimated completion date	Comments relating to Emission Reductions
						new minibus • Promotion/Awareness raising	minibus • Guides published for each village setting out bus and train times and information about alternative transport.		
B3	Rural Wheels Scheme	Transport for people in rural areas. Passengers sharing transport benefit from a reduced rate.	CCC	2015	April 2016	Awaiting information	Awaiting response from CCC on progress to date	Ongoing	Contributes to reduction in individual vehicle use
B4	Village Wheels scheme	Timetabled service for communities to nearest town. Only available in Eden for Greystoke and Newbiggin	CCC	2015	April 2016	Awaiting information	Awaiting response from CCC on progress to date	Ongoing	Contributes to reduction in individual vehicle use
B5	Community Wheels scheme	Demand responsive transport service for residents of Alston Moor Parish. One bus and service is for Alston, the other for Garrigil	CCC	2015	28 July 2015	• Wheelchair accessible community Transport for communities that don't have any scheduled transport.	Scheme set up and leaflet produced. Awaiting response from CCC on progress to date	Ongoing	Contributes to reduction in individual vehicle use
B6	Penrith Cycle Network	Cycle routes in and around Penrith. School links and shopping links. Links to join up existing routes e.g. C2C	CCC	-	2007	None given	• Map of routes produced and available on web • Improvements ongoing to some of the routes	Awaiting response from CCC	Contributes to reduction in individual vehicle use

Eden District Council

Action No	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Progress to date	Estimated completion date	Comments relating to Emission Reductions
B7	Promoting use of electric bike hire	Provision of advice and guidance for developing electric bike hire.	EDC hosting the webpages	2012	Ongoing	Awaiting information	Several bike hire schemes have been set up across district	Ongoing	Contributes to reduction in individual vehicle use
Freight and Delivery Management C1	Strategic routeing strategy for HGVs	HGV ban on A685 between Tebay and Brough, subject to certain exemptions	CCC	Not known	1999 onwards	Only local HGVs with permit are allowed in defined zone	Road was de-trunked and HGV ban brought in.	1998	Positive impact on air quality for town of Kirkby Stephen and villages along A685
Policy Guidance and Development Control D1	Policies in emerging Local Plan	Specific policies for Air Quality and others which will help achieve improvements in Air Quality	Eden DC	2010-2014	Dec 2015	Includes general policies promoting sustainable, healthy development and specific policies on: Air Quality Sustainable Development, Dust	Inquiry due in 2016	Policies in emerging Local Plan	Specific policies for Air Quality and others which will help achieve improvements in Air Quality
Promoting Low Emission Transport E1	Blue collar procurement	New contracts incorporate environmental targets and a requirement to assist Council to reduce Carbon Emissions	Eden DC	2010-2012	2012 onwards	Specific indicators: <ul style="list-style-type: none"> • Achieve 2% year on year reduction in carbon dioxide emissions 	<ul style="list-style-type: none"> • >25% reduction on 2008/9 figures in vehicle emissions (all vehicles operating on behalf of the Council) 	ongoing	

Action No	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Progress to date	Estimated completion date	Comments relating to Emission Reductions
						<ul style="list-style-type: none"> Use of Euro NCAP rating of 5 or more for all new vehicles 	<ul style="list-style-type: none"> Achieved. Successful operators have also carried out route planning assessments and reviews to maximise efficiency and minimise emissions 		
Promoting Travel Alternatives F1	Home Working Policy	Eden DC is committed to promoting flexible working to facilitate effective and efficient working.	Eden DC		2010 onwards	None set	<ul style="list-style-type: none"> Policy published November 2010 Several home-working agreements in place 	Ongoing	Reduction in vehicle miles getting to and from workplace
F2`	Personalised Travel Planning	Allows individual journeys to be planned using public transport	Cumbria CC			None set	Available on website, http://www.cumbria.gov.uk/roads-transport/public-transport-road-safety/transport/publictransport/jplink/planajourney.asp	completed	Where possible allows journeys to be made using public transport
F3	School Travel Plans	Safer Routes to School initiative aims to promote more environmentally sustainable and healthier ways of getting to and from	Cumbria CC		Ongoing	None set	Awaiting information from Cumbria County Council	Ongoing	

Action No	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Progress to date	Estimated completion date	Comments relating to Emission Reductions
		schools							
Traffic Management G1	20mph zones	Cumbria Road Safety Partnership	Cumbria CC		Ongoing	Reduction in number of road casualties	Number of initiatives for young drivers, schools and colleges, older drivers, motorcyclists, winter driving etc Fall in all casualties from 1932 (2014) to 1715 (2015)	Ongoing	Some of the initiatives will have an impact on some aspects of air quality, e.g. reduction of speed

2.3 PM_{2.5} – Local Authority Approach to Reducing Emissions and or Concentrations

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

In 2014 Public Health England published 'Estimating Local Mortality Burdens associated with Particulate Air Pollution'. It is estimated that there were 185 associated life years lost attributable to PM_{2.5} within Eden in 2010. This figure is significantly less than any of the other Cumbrian local authorities and is affected by the total population number.

In order to address PM_{2.5} Eden District Council will be liaising with the Director of Public Health at Cumbria County Council on how air quality can be prioritised within Eden to help reduce the health burden from air pollution. This will include working to include air pollution in Cumbria's Joint Strategic Needs Assessment through the Health and Wellbeing Board.

No monitoring of PM_{2.5} is routinely carried out within Eden.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Eden District Council does not undertake automatic (continuous) monitoring at any locations within its boundaries. National automatic monitoring results are available through the Defra website.

3.1.2 Non-Automatic Monitoring Sites

Eden District Council undertook non- automatic (passive) monitoring of NO₂ at 19 sites during 2015. Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D.

Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

In 2015 Eden District Council undertook a review of the existing monitoring sites across the district in light of previous years' data. This was to ensure that effective data was being collected and remove any points which were considered not to provide any additional information regarding the air quality.

The monitoring points in Eamont Bridge were reduced from 5 locations to 4. Along Castlegate, the monitoring locations were reduced from 5 locations to 3 and along Victoria Road they were reduced from 12 locations to 7. At all of these locations the extent of the area monitored was maintained merely the density of sampling reduced where it was considered no change in conditions or additional sources of air pollution were identified.

Around the wider Penrith area the monitoring locations were also reduced from 19 to 5.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for “annualisation” and bias. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

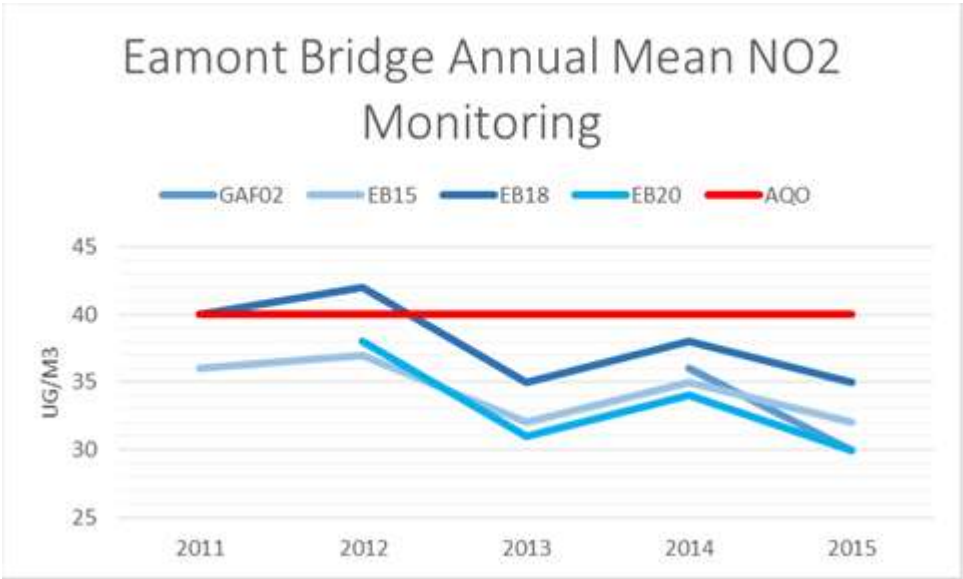
For diffusion tubes, the full 2015 dataset of monthly mean values is provided in Table B1, Appendix B.

There was an exceedance of the AQO at 2 points along Castlegate, within the stretch where an AQMA has been proposed. Since neither of these monitored annual means' are in excess of 60µg/m³, it is not considered likely that the 1-hour mean objective of 200µg/m³ has been breached at either of these sites. This location has been proposed as an AQMA however the recent monitoring data indicates that the extent of the proposed AQMA should be reconsidered in light of the absence of failures of the annual mean along the bottom of the road. Castlegate is part of the town centre one way system with traffic proceeding up the hill. The middle and upper reaches of the street, where the road canyons and standing traffic is encountered at the roundabout junction at the top of the road, are where the breaches of the AQO have been identified.

Along Victoria Road, where another AQMA was proposed there was no exceedance of the AQO in 2015.

In 2015 the monitored annual mean has not exceeded the AQO in Eamont Bridge. This has been calculated from a full years' data at 3 monitoring locations and 11 months data at the other location. The tube was absent in July following unauthorised removal. This location has previously been identified as a location where an AQMA should be declared and the Council following detailed assessment did start the process of declaring an AQMA however the monitored levels of nitrogen dioxide have been falling in this location such that for the last 3 years there have not been any breaches of the AQO of 40 µg/m³. This can be clearly seen within the trend graph in Figure 3.2.1

Figure 3.2.1 Eamont Bridge Annual Mean NO₂ 2011 – 2015



3.2.2 Other Pollutants

No other pollutants are routinely monitored by the Eden District Council. Eden District Council has not identified any new areas of concern within the district so the current monitoring regime is anticipated to remain with the same monitoring locations for 2016.

Appendix A: Monitoring Results

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
Castlegate										
C30	40 Castlegate	Roadside	351333	530016	NO ₂	N	0	1.5	N	2.5
GAF04	New Vic	Roadside	351363	530046	NO ₂	N	0	1.0	N	2.5
GAF05	Station Hotel	Roadside	351302	529989	NO ₂	N	0	2.5	N	2.5
Victoria Road										
V3	25b Victoria Road	Roadside	351720	529966	NO ₂	N	0	2.0	N	2.5
V5	Langton Cottage	Roadside	351713	529941	NO ₂	N	0	1.0	N	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
V7	Café 15	Roadside	351733	528918	NO ₂	N	0	2.5	N	2.5
GAF15	Abbey House	Roadside	351804	529797	NO ₂	N	0	2.0	N	2.5
GAF16	Landels Court corner	Roadside	351774	529838	NO ₂	N	0	2.0	N	2.5
GAF17	Lamppost 36 Victoria Road	Roadside	351805	529855	NO ₂	N	0	1.0	N	2.5
GAF19	25 Victoria Road	Roadside	351774	529910	NO ₂	N	0	1.5	N	2.5
Other Penrith monitoring locations										
B14	4 Brunswick	Roadside	351394	530344	NO ₂	N	0	2.0	N	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
	Road									
SG27	8 Scotland Road	Roadside	351171	530649	NO ₂	N	0	1.0	N	2.5
31	3 Benson Row	Roadside	351741	530313	NO ₂	N	0	1.0	N	2.5
32	Penrith Nursery	Roadside	351687	530387	NO ₂	N	0	1.0	N	2.5
SG29	The Royal	Roadside	351404	530426	NO ₂	N	0	2.5	N	2.5
Eamont Bridge										
GAF02	4 Old Post Row	Roadside	352272	528642	NO ₂	N	0	1.0	N	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
EB15	Glendale	Roadside	352329	528642	NO ₂	N	0	1.0	N	2.5
EB18	Cherry Cottage	Roadside	352246	528667	NO ₂	N	0	2.5	N	2.5
EB20	2 Kemplay Road	Roadside	352207	528827	NO ₂	N	0	4.0	N	2.5

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2011	2012	2013	2014	2015
C30	Roadside	Diffusion Tube		92	26	-	35	37	38
GAF04	Roadside	Diffusion Tube		67	-	-	-	48	50
GAF05	Roadside	Diffusion Tube		75	-	-	-	33	45
V3	Roadside	Diffusion Tube		92	33	39	33	33	23
V5	Roadside	Diffusion Tube		100	37	38	32	41	38
V7	Roadside	Diffusion Tube		100	36	48	34	51	36
GAF15	Roadside	Diffusion Tube		100	-	-	-	32	32
GAF16	Roadside	Diffusion Tube		100	-	-	-	28	30
GAF17	Roadside	Diffusion Tube		100	-	-	-	35	29
GAF19	Roadside	Diffusion Tube		100	-	-	-	32	29
B14	Roadside	Diffusion Tube		100	37	38	32	33	31
SG27	Roadside	Diffusion Tube		100	33	37	31	32	31
31	Roadside	Diffusion Tube		100	-	-	28	31	30
32	Roadside	Diffusion Tube		100	28	37	33	39	34
SG29	Roadside	Diffusion Tube		67	32	42	28	-	33
GAF02	Roadside	Diffusion Tube		92	-	-	-	36	30
EB15	Roadside	Diffusion Tube		100	36	37	32	35	32
EB18	Roadside	Diffusion Tube		100	40	42	35	38	35
EB20	Roadside	Diffusion Tube		100	-	38	31	34	30

Notes: Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

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

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Technical Guidance LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Appendix B: Full Monthly Diffusion Tube Results for 2015

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2015

Site ID	NO ₂ Mean Concentrations (µg/m ³)													Annual Mean	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted ⁽¹⁾	
C30	41.3	34.3	44.4	-	28.3	30.5	35.5	36.9	44.4	49.7	86.9	30.2	39.5	37.9	
GAF04	53.6	52.4	-	32.5	50.8	50.8	55.3	57.2	-	-	29.4	-	52.0 ⁽²⁾	50	
GAF05	36.2	34.4	-	25.8	25	-	28.2	25.7	-	74.7	119.8	54.6	47.2	45.3	
V3		25.1	25.1	22.4	19.6	18.8	20	21.5	28.4	36	21.8	25.8	24.1	23.1	
V5	32.5	37.8	35.3	26.3	28.4	31	31.1	35.2	41.6	48.5	33.3	36.9	34.8	33.4	
V7	38.6	39.5	35.2	29.1	31.5	33.7	64.1 ⁽³⁾	39.6	39.8	55.9	35.9	34.6	37.6	36.1	
GAF15	35.5	38.3	30.8	27.7	29.1	31.5	29.3	32.6	39.9	45.6	24	33.1	33.1	31.8	
GAF16	23	28.5	25.9	25.2	23.6	30.8	28.7	34.7	39.9	37.4	36.1	37.2	30.9	29.7	
GAF17	33.5	28.3	34	30.3	17.9	24.1	23.5	25.4	30.8	48.1	29.5	34.4	30	28.8	
GAF19	33.5	29.1	35.6	28.9	22.6	26.1	20.5	32.4	29.9	43	28	30	30	28.8	
B14	39.3	34.6	38.9	32.2	29.6	28.8	31	34	34.4	14.4	40.2	31	32.4	31.1	
SG27	34.6	34	32.3	26.3	18.9	31.4	27.5	33	40.8	43.1	25.3	33.4	31.7	30.5	
31	37.3	34.2	34.1	32.5	24.6	24.1	27	28.3	32.6	42.2	30.1	30.1	31.4	30.2	
32	37.1	41.4	35.7	35.5	27.7	33.1	30.7	32.6	37.3	39.9	39.4	35.7	35.5	34.1	

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
SG29	-	-	-	-	27.2	26.2	30	28.6	30.4	37.6	37.2	31.7	34.5 ⁽²⁾	33.2
GAF02	33.4	27.4	41.1	27.7	20.3	29.3		37.4	39.2	48.5	26.3	10.8	31.0	30.0
EB15	34.3	34	36.1	32.3	28.5	31.6	37.5	37.3	40.6	49.2	29.2	13.9	33.7	32.4
EB18	40.8	39.7	38.6	33.5	34.4	37.2	40	43	37.9	49.3	35.5	10.9	36.7	35.3
EB20	33	31	37.7	34.4	26.5	29.8	27.4	34.3	38.1	45.9	23.7	12	31.2	29.9

(1) See Appendix C for details on bias adjustment

(2) Annualised mean as less than 12 months data, see Appendix C for details

(3) Tube recorded with moisture present in laboratory, data excluded from annual mean.

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

Screening Assessment of New and Modified Sources

It is now recognised that Local Authorities will have assessed all known sources within their Districts through previous rounds of review and assessment. Any new or modified sources will be assessed for their potential impact on air quality through the planning application process.

Any new or modified source is assessed using the tools laid out within LAQM (TG16).

Sources which will be assessed include new developments which could result in an increase in traffic, biomass boilers, and Combined Heat and Power (CHP) plants, new industrial sites or significant changes to existing industrial sites, new or altered road junctions, railways, bus stations together with any uncontrolled or fugitive sources.

Development of 98 houses proposed at land adjacent to Salkeld Road, on the outskirts of Penrith. An air quality assessment has been undertaken as part of planning submission but the results of the assessment are still under discussion and planning has not yet been granted.

There have been 2 applications for Peak Power generation plants within the district. These utilise diesel engines however they are anticipated to only run 75 hours a year, they were assessed to not have a significant impact on air quality.

There are 2 poultry farms which may meet the criteria specified within Table 7.3 of TG(16) if they are naturally ventilated. Clarification is being sought from the Environment Agency regarding the type of ventilation used since both are permitted under the IPPC regime by the Environment Agency. Both facilities have also installed biomass boilers in 2015 which will also be assessed when the Council has received the required information.

The other biomass boilers approved in 2015 at Jeldwen, on the industrial estate on the outskirts of Penrith has been assessed for impacts to air and the calculated emissions will not cause any breach of the AQO. All other biomass boilers granted permission have been assessed and should not result in any breach of the AQO for nitrogen dioxide or PM₁₀.

Nitrogen Dioxide Diffusion Tubes QA/QC Data

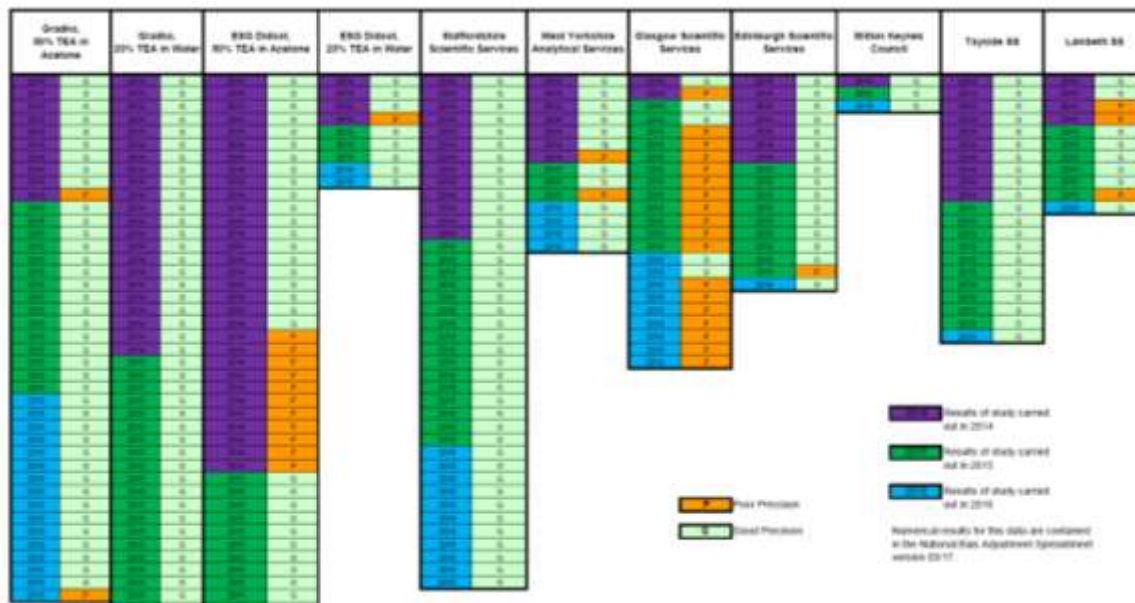
Eden District Council monitors nitrogen dioxide levels through the use of passive diffusion tubes. In 2015 these were supplied and analysed by Gradko using 50% triethylamine (TEA) in acetone which are typically exposed for a week period in accordance with the National NO₂ Network exposure calendar.

Figure C1 National Diffusion Tube Bias Adjustment Factor 2015

National Diffusion Tube Bias Adjustment Factor Spreadsheet						Spreadsheet Version Number: 09/16				
<p>Follow the steps below in the correct order to show the results of relevant on-location studies.</p> <p>Date only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods.</p> <p>Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet.</p> <p>This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.</p>						<p>This spreadsheet will be updated at the end of March 2017</p>				
<p>The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Boreas Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.</p>						<p>Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.</p>				
Step 1:		Step 2:		Step 3:		Step 4:				
<p>Select the Location, the Analysis, the Tubes from the Data-Down List</p>		<p>Select a Method, Method from the Data-Down List</p>		<p>Select a Year, Year from the Data-Down List</p>		<p>Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor* shown in blue at the foot of the final column.</p>				
<p>If a Method is not shown, we have no data for that laboratory.</p>		<p>Preparation methods should be used to check the prep method at the laboratory.</p>		<p>If you have your own on-location study, then use 'In-house'. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQM-Helpdesk@A.QC.gov.uk or 0800 027951</p>						
Analyzed By	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dn) (µg/m ³)	Automatic Monitor Mean Conc. (Dn) (µg/m ³)	Bias (%)	Tube Precision (%)	Bias Adjustment Factor (A) (Dn/Dm)
Gradko	50% TEA in acetone	2015	R	Bedford Borough Council	12	35	33	-6.4%	5	0.94
Gradko	50% TEA in acetone	2015	LR	Hereford City Council	3	12	12	-3.3%	5	1.03
Gradko	50% TEA in acetone	2015	R	West Berkshire Council	11	38	36	-5.3%	5	0.98
Gradko	50% TEA in acetone	2015	R	East Hampshire District Council	11	22	20	-9.1%	5	0.91
Gradko	50% TEA in acetone	2015	R/S	London Borough of Croydon	12	54	52	-4.7%	5	0.96
Gradko	50% TEA in acetone	2015	B	London Borough of Richmond upon Thames	12	21	21	0.0%	5	1.00
Gradko	50% TEA in acetone	2015	R	London Borough of Richmond upon Thames	12	36	33	-8.3%	5	0.92
Gradko	50% TEA in acetone	2015	R/S	Marisham Road Intercomparison	12	86	81	-6.4%	5	0.94
Gradko	50% TEA in acetone	2015	LR	Middlesbrough	11	6	6	0.0%	5	0.94
Gradko	50% TEA in acetone	2015	S	Parkes & Cleveland	12	12	12	0.0%	5	1.00
Gradko	50% TEA in acetone	2015	R	West Dorset District Council	12	12	11	-8.3%	5	0.87
Gradko	50% TEA in acetone	2015	R	Weymouth Borough Council	11	42	37	-11.9%	5	0.87
Gradko	50% TEA in acetone	2015	R	Royal Borough of Windsor and Maidenhead	12	34	37	9.4%	5	1.09
Gradko	50% TEA in acetone	2015	R	Royal Borough of Windsor and Maidenhead	12	40	38	-4.3%	5	0.96
Gradko	50% TEA in acetone	2015	R	LD Newton	11	39	38	-2.6%	5	1.01
Gradko	50% TEA in acetone	2015		Overall Factor* (15 studies)					Use	0.96

In 2015 the national diffusion tube bias adjustment factor used for the calculation of the annual mean was based on 15 studies undertaken by the Gradko laboratory and was calculated to be 0.96.

Figure C2 - 2014 – 2016 Summary of Precision Results for Nitrogen Dioxide Diffusion Tube Collocation Studies, by laboratory



In 2015 Gradko were classified as having ‘good’ precision for the analysis undertaken.

Table C.1 Annualised data calculations

For the 2 monitoring locations with less than 9 months data the annual mean has been annualised in accordance with TG16

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	Period Mean	Am/Pm	Annualised Mean	Bias Adj 0.96
Blackpool	19.96	20.98	19.56	15.94	8.59	9.51	9.72	10.13	14.73	22.61	17.33	17.88	15.58				
Eskdalemuir	2.33	3.44	2.57	2.21	1.71	1.40	1.37	1.51	2.00	3.18	3.01	2.14	2.24				
Peebles	6.88	9.49	5.91	5.40	3.04	3.36	3.27	4.00	6.29	9.78	6.74	5.65	5.82				
GAF04	53.60	52.40		32.50	50.80	50.80	55.30	57.20			29.40		47.75			52.04	50.0
Blackpool	19.96	20.98		15.94	8.59	9.51	9.72	10.13			17.33			14.0195	1.111181		
Eskdalemuir	2.33	3.44		2.21	1.71	1.40	1.37	1.51			3.01			2.1234	1.05498		
Peebles	6.88	9.49		5.40	3.04	3.36	3.27	4.00			6.74			5.27278	1.103294		
														Average	1.089818		
SG29					27.20	26.20	30.00	28.60	30.40	37.60	37.20	31.70	31.11			34.54	33.2
Blackpool					8.59	9.51	9.72	10.13	14.73	22.61	17.33	17.88		13.8113	1.127934		
Eskdalemuir					1.71	1.40	1.37	1.51	2.00	3.18	3.01	2.14		2.04105	1.097542		
Peebles					3.04	3.36	3.27	4.00	6.29	9.78	6.74	5.65		5.26589	1.104737		
														Average	1.110071		

Appendix D: Map(s) of Monitoring Locations

Figure D1: Castlegate and Wider Penrith Monitoring Points

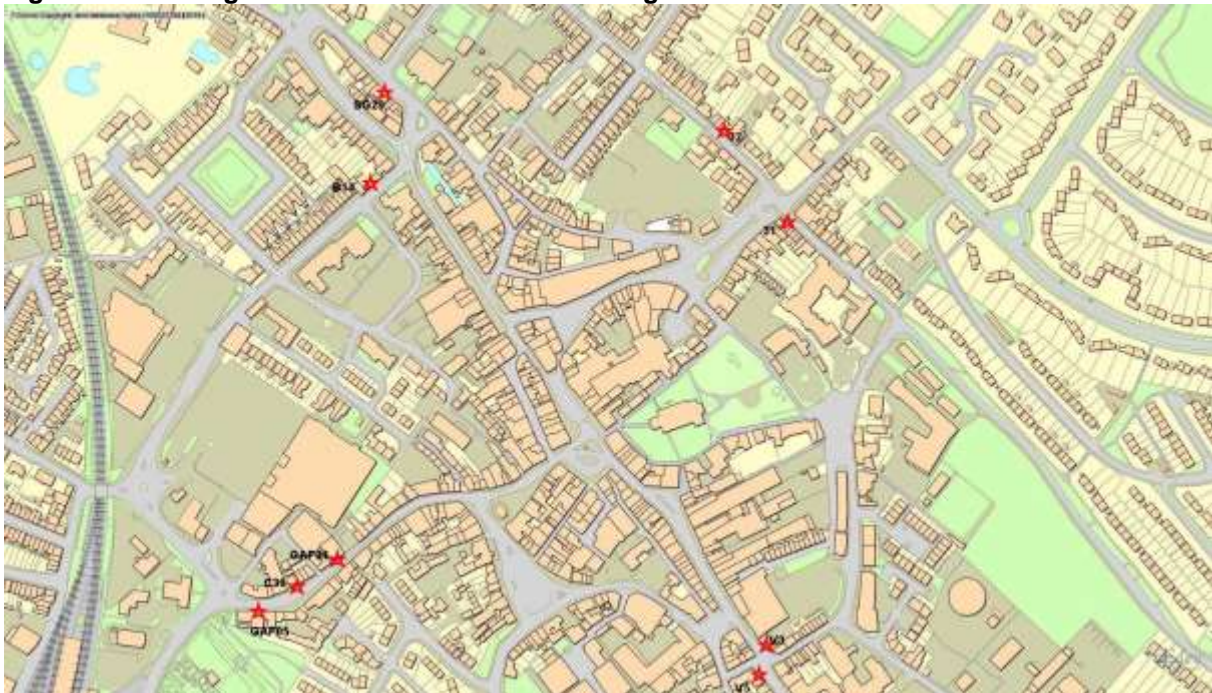


Figure D2: Victoria Road and Castlegate Monitoring Points

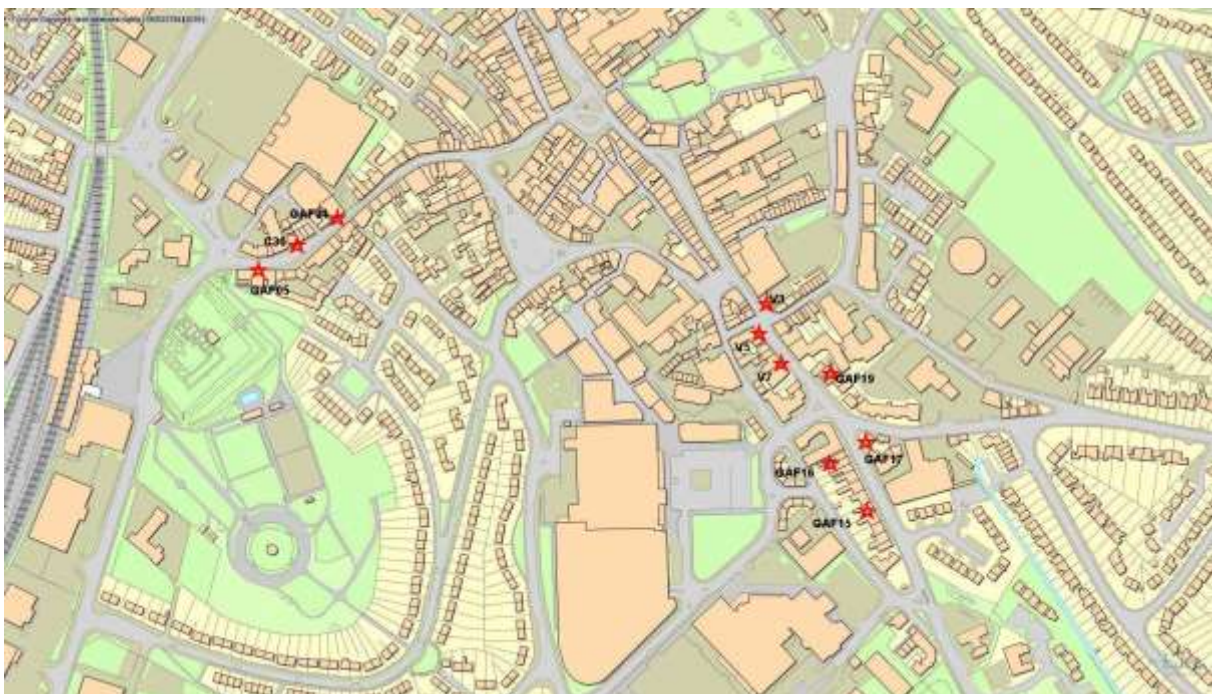


Figure D3: Eamont Bridge Monitoring Points



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide
...	...

References

Defra. LAQM TG16, 2016

Public Health England. Estimating Local Mortality Burdens Associated with Particulate Air Pollution, 2014

Eden District Council, Draft Local Plan 2014 – 2032, 2014