



2012 Air Quality Updating and Screening Assessment for

*Northumberland County Council*

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

April 2012

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## Executive Summary

None of the air quality monitoring locations in Northumberland has shown any exceedence of the national Air Quality Objectives (AQO).

The monitoring stations in Blyth town centre and Cowpen Road have not shown 1 hour or annual exceedence on either nitrogen dioxide (NO<sub>2</sub>) or 24 hour or annual exceedence for 10 micron particulate matter (PM<sub>10</sub>) for 2011.

The station (monitoring PM<sub>10</sub> and NO<sub>2</sub>) within the Air Quality Management Area (AQMA) in Blyth town centre has, in particular, not shown any exceedence of either parameter in 2011.

The Newbiggin sulphur dioxide (SO<sub>2</sub>) monitor has also shown no exceedence of the air quality objective.

Data processing and ratification has been carried out by Air Quality Data Management (AQDM).

None of the diffusion tubes measuring NO<sub>2</sub> or benzene have shown any monthly exceedence or an annual mean (or running mean for benzene) above the air quality objectives.

Following the 2011 Detailed Assessment of continuing low NO<sub>2</sub> and PM<sub>10</sub> in Blyth town centre, Defra agreed to the proposal to revoke the Air Quality Management Area Declaration.

No further detailed assessment is required for pollutants within Northumberland.

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# **1 Introduction**

## **1.1 Description of Local Authority Area**

Northumberland covers the area of England from the Tyne Valley and Tyneside to the Scottish borders in the North and North-West and to Cumbria in the West. It is the largest county in England by size at 5025 square kilometres and yet is one of the smallest by population (316,000 persons in the 2011 Census).

The county border with Scotland cuts through the Cheviot Hills to the west at a maximum height of 815 metres, several streams and rivers drain these hills and the moors of the Tyne Valley and enter the North Sea at the coast.

Forty-six per cent of the population live in the former districts of Blyth Valley and Wansbeck which cover only three per cent of the area of Northumberland which gives an urban concentration in the south east area of the County. This area is now within the South East sub-area of Northumberland County Council.

The principal towns of Northumberland are; Berwick, Alnwick, Morpeth, Ashington, Blyth, Cramlington and Hexham.

Several towns have industrial areas which generate various emissions from the completely innocuous to dusts, solvents, combustion fumes & particulates etc. These industrial areas are in the principal towns.

Cramlington and Blyth in particular have large industrial areas which contains a number of processes including a Part A2 which use and emit solvents mostly through printing/painting of final products. Hexham has a major Part A2 LA-IPPC process which also abstracts and discharges from and to the River Tyne. Hexham also has a major foundry. Morpeth and Alnwick both have industrial estates with a number of smaller businesses which will contribute to the air quality of the areas. Berwick/Tweedmouth has a few commercial sources of atmospheric pollutants on its industrial estate.

At present, Northumberland has one coal-fired and co-fuelled biomass power station at Lynemouth.

There are a number of opencast coal sites (OCCS) within the county, currently operating are; Shotton, Delhi/Brenkley, Steadsburn & Potland Burn.

Below is a map showing the Northumberland county area and the location of continuous and non-continuous monitoring sites within the county which are mentioned in the report.



**Figure 1.1. Map of Northumberland County Showing Main Air Quality Monitoring Locations**



## 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 exceedence 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 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 England are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), 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,  $\text{mg}/\text{m}^3$  for carbon monoxide) with the number of exceedence in each year that are permitted (where applicable).

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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 $\text{mg}/\text{m}^3$	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles ( $\text{PM}_{10}$ ) (gravimetric)	50 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

## 1.4 Summary of Previous Review and Assessments

This is the first Updating and Screening Assessment for the unitary Northumberland County Council (formed in April 2009). Previous USAs were prepared by and submitted by the former district and borough councils which were amalgamated into the unitary Northumberland County Council. There have been two previous Progress Reports (2010 & 2011) and a Detailed Assessment (2011). The latter was produced because the 2010 Progress Report identified an exceedance of the annual mean objective for NO<sub>2</sub> at the Cowpen Road AQ station. The detailed assessment concluded that this was anomalous and was not substantiated by previous data at the site or co-located diffusion tubes. As such, no further action was planned although the site would continue to be monitored. The Detailed Assessment also identified that the AQMA declared by the former Blyth Valley Borough Council (see below) should be revoked because of a lack of substantive data, this would be done after consultation. This was agreed by DEFRA in their "Local Air Quality Management: detailed Assessment of Air Quality letter dated 26<sup>th</sup> July 2012.

**Table 1.2 Previous Air Quality Reports for Northumberland**

Progress Report 2011	Date Produced	Outcomes
Northumberland County Council	April 2011	National Air Quality Objectives continue to be met and are likely to be met in the future
Detailed Assessment 2011	Date Produced	Outcomes
Northumberland County Council	April 2011	Previous NO <sub>2</sub> annual mean exceedance at Cowpen appears to be anomalous and that no further action is needed at this site and that Blyth AQMA should be revoked after consultation.
Progress Report 2010	Date Produced	Outcomes
Northumberland County Council	April 2010	Exceedance of the annual mean objective at the Cowpen NO <sub>2</sub> station. No other exceedance or issues with either passive or active monitoring
USA 2009	Date Produced	Outcomes
Alnwick DC	21 <sup>st</sup> August 2009	National Air Quality Objectives continue to be met in and are likely to be met in the future
Berwick DC	2 <sup>nd</sup> October 2009	National Air Quality Objectives continue to be met in and are likely to be met in the future
Blyth Valley BC	September 2009	National Air Quality Objectives continue to be met. Review of AQMA
Castle Morpeth BC	June 2009	Report does not show any exceedance of National Air Quality Objectives
Tynedale DC	July 2009	Results do not show exceedance of National Air Quality Objectives
Wansbeck DC	July 2009	National Air Quality Objectives continue to be met in and are likely to be met in the future
Northumberland County Council	September 2010	Detailed assessment required for Blyth AQMA to review status and exceedance in Cowpen Road area

### Air Quality Management Areas

An Air Quality Management Area (AQMA) was declared in Blyth town by the former Blyth Valley Borough Council on 22 December 2004 for particulates (PM<sub>10</sub>s) as the national air quality objective of PM<sub>10</sub> was being exceeded. The AQMA reference is 211204. The order to revoke this AQMA declaration will come into effect on 29<sup>th</sup> June 2012; Ref: NOU000554 (Appendix E)

**Figure 1.2 Map of the Blyth AQMA**



## **2 New Monitoring Data**

### **2.1 Summary of Monitoring Undertaken**

#### **2.1.1 Automatic Monitoring Sites**

##### **Nitrogen Dioxide**

Northumberland currently operate two in the town of Blyth measuring NO<sub>2</sub>.

The necessity of continuing automatic NO<sub>2</sub> monitoring at both Blyth and Cowpen Road will be reviewed during 2012/13. This is because no exceedence has been recorded, and the instruments are reaching the end of their operational life (with poor data capture rates). The Blyth monitor area is representative of public exposure but is adequately covered by diffusion tubes and current readings are well below AQO's. The Cowpen Road monitor may now not be adequately covering relevant exposure.

Quality assurance and quality control information are included in Appendix A.

##### **Sulphur Dioxide**

The need to continue automatic monitoring of SO<sub>2</sub> at Newbiggin will be reviewed during 2012/13. There has never been an exceedence of the AQO and the Lynemouth coal fired power station is already part co-fuelled with biomass. The power station is scheduled to convert completely to biomass and is required to do so to meet the Large Combustion Plant Directive. The plant has planning permission to undertake this conversion.

##### **Particulates (PM<sub>10</sub>)**

Northumberland currently operate two in the town of Blyth measuring PM<sub>10</sub> co-located with NO<sub>2</sub>

The Bothal PM<sub>10</sub> station has been decommissioned as it continually detected levels well below the national air quality objectives and was, in part, installed to provide baseline data for an opencast coal site. This site is now operational and the operator monitors their particulate generation as part of their planning and PPC permissions.

#### **Figure 2.1 Map(s) of Automatic Monitoring Sites**

Location maps of the automatic monitoring locations are shown in Appendix B.

**Table 2.1 Details of Automatic Monitoring Sites**

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQMA?	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?
Newbiggin Sports Centre	Urban background	X588085	Y430864	SO <sub>2</sub>	CL	N	Y (10m)	30m	Y
Blyth Town Centre	Urban Centre / Roadside	X431536	Y581531	NO <sub>2</sub> , PM <sub>10</sub>	CL, BAM	Y	Y(3m)	3m	Y
Cowpen Road	Roadside	X428817	Y581815	NO <sub>2</sub> , PM <sub>10</sub>	CL, BAM	N	Y(3m)	3m	Y

CL = chemiluminescent

NL = nephelometer

BAM = beta attenuation monitor

All monitors are maintained by SupportingU with a six-monthly service, all are calibrated either automatically or manually at least fortnightly. Data download/capture is done remotely using a mix of Windows HyperTerminal, Teledyne's APIComm and Enviro 2000. Data processing and ratification for this period of data was carried out by Air Quality Data Management.

### **2.1.2 Non-Automatic Monitoring Sites**

The Council operate 37 NO<sub>x</sub> diffusion tubes at 34 locations in Cramlington, Blyth, Morpeth, Ponteland, Alnwick and Berwick. Three locations have duplicate tubes

The Council also have 9 benzene diffusion tubes located mainly in the Cramlington area with a few in Blyth.

All diffusion tubes are prepared and analysed by Environmental Scientifics Group (named as Harwell Scientific Services), details of the laboratory, preparation methods, procedures followed, bias factors, laboratory precision, quality assurance and quality control information (including WASP ratings of the laboratories used) etc. are specified in Appendix A.

A new diffusion tube was sited at Station Road in Cramlington (Trebor) as there was a pre-planning application for a super bus depot near this site which would use this road for access to the depot. It was envisaged that this tube would give us some baseline levels for this road which would be independent to any assessment done by the developer. The developer has since decided not to proceed with the super bus depot.

A number of NO<sub>2</sub> diffusion tubes have been assessed as consistently below the Air Quality objectives and will be de-commissioned from 1<sup>st</sup> April 2012.



List of NO<sub>x</sub> diffusion tubes to be decommissioned on the 1<sup>st</sup> April 2012.

Site Name	Site Type	OS Grid Ref		In AQMA?	Relevant	Distance to kerb of nearest road	Worst-case Location?
					Exposure?	(N/A if not applicable)	
					(Y/N with distance (m) to relevant exposure)		
1N - Northumberland Hall, Alnwick	Roadside	X 418600	Y 613300	N	N – (10m)	5m	Y
7N – Greenwell Lane, Alnwick	Roadside	X 418800	Y 613300	N	N	1m	Y
B6 - Blyth Civic Centre, Blyth	Urban Background	X430949	Y581178	N	N – (40m)	15m	N
B8 - Beaumont Manor, Blyth	Urban Background	X428688	Y581193	N	Y – (16m)	1m	N
B13 - Blyth Health Centre, Blyth	Urban Background	X431105	Y581589	Y	Y – (2m)	2m	N
C9 - Trebor, Cramlington	Roadside(1m)	X424456	Y577173	N	Y - (30m)	3m	Y
5 - Stobhill, Morpeth	Roadside	X 420769	Y 584807	N	Y – (5m)	5m	N
S4 - Station Road, Ashington	Urban Centre	X587746	Y427031	N	Y – (25m)	1m	Y
S7 - Front Street, Newbiggin	Urban Centre	X587918	Y431110	N	Y - (8m)	2m	Y
S11 - North Seaton (B1334)	Roadside	X586492	Y429778	N	Y – (40m)	5m	Y
S15 - Ravensworth Street, Bedlington	Urban Centre	X583137	Y427554	N	Y – (2m)	1m	N
S18 - Half Moon roundabout A196	Roadside	X585691	Y426860	N	Y – (5m)	2M	Y
S20 - Portland Park (LP in Car Park)	Roadside	X587959	Y427442	N	N – (75m)	10M	N

## Figure 2.2 Map(s) of Non-Automatic Monitoring Sites

Location maps of the non-automatic monitoring locations are shown in Appendix B.

**Table 2.2a Details of Non-Automatic Monitoring Sites – NO<sub>x</sub> Diffusion Tubes**

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant	Distance to kerb of nearest road	Worst-case Location?
						Exposure?	(N/A if not applicable)	
						(Y/N with distance (m) to relevant exposure)		
1N - Northumberland Hall, Alnwick	Roadside	X 418600	Y 613300	NO <sub>2</sub>	N	N – (10m)	5m	Y
7N – Greenwell Lane, Alnwick	Roadside	X 418800	Y 613300	NO <sub>2</sub>	N	N	1m	Y
8N – Bondgate Without, Alnwick	Roadside	X 419025	Y 613074	NO <sub>2</sub>	N	N	1m	Y
Ber5 - Main Street, Tweedmouth	Roadside	X 399437	Y 652022	NO <sub>2</sub>	N	Y – (1m)	4m	Y
Ber7 - Castlegate, Berwick	Roadside	X 399595	Y 653170	NO <sub>2</sub>	N	Y – (1m)	2m	Y
B1 - Waterloo Road, Blyth (X2)	Urban Centre	X431537	Y581537	NO <sub>2</sub>	Y	Y – (5m)	1m	Y
B3 - Cowpen Rd. West, Blyth	Roadside(1m)	X428815	Y581813	NO <sub>2</sub>	N	Y – (6m)	1m	Y
B5 - Cowpen Rd. East, Blyth	Roadside(1m)	X429850	Y581947	NO <sub>2</sub>	N	Y – (25m)	1m	Y
B6 - Blyth Civic Centre, Blyth	Urban Background	X430949	Y581178	NO <sub>2</sub>	N	N – (40m)	15m	N
B8 - Beaumont Manor, Blyth	Urban Background	X428688	Y581193	NO <sub>2</sub>	N	Y – (16m)	1m	N
B10 - Park Farm Villas, Blyth	Urban Background	X430287	Y578942	NO <sub>2</sub>	N	Y (3m)	1m	N
B11 - Blyth YMCA, Blyth	Urban Centre	X431160	Y581415	NO <sub>2</sub>	Y	Y - (2m)	1m	Y
B12 - Bridge St, Blyth	Urban Centre	X431612	Y581586	NO2	Y	Y - (1m)	1m	Y
B13 - Blyth Health Centre, Blyth	Urban Background	X431105	Y581589	NO2	Y	Y – (2m)	2m	N
B15 - South Newsham Road	Roadside(1m)	X430552	Y578950	NO2	N	Y (6m)	2m	N
C1 - High Pit Road, Cramlington (X2)	Roadside(1m)	X427593	Y576555	NO2	N	Y – (1m)	1m	Y
C3 - Ruabon Close, Cramlington (X2)	Suburban	X426113	Y575041	NO <sub>2</sub>	N	Y – (15m)	1m	N
C4 - Rochford Gr, Cramlington	Suburban	X426020	Y575057	NO <sub>2</sub>	N	Y – (15m)	1m	N
C6 - Lancastrian Way, Cramlington	Suburban	X426047	Y576139	NO <sub>2</sub>	N	Y – (30m)	1m	N
C7 - Kielder Av, Cramlington	Rural	X424785	Y576728	NO <sub>2</sub>	N	Y – (3m)	1m	N
C8 - Manor Walks, Cramlington	Urban Centre	X426548	Y576990	NO <sub>2</sub>	N	Y – (50m)	1m	Y
C9 - Trebor, Cramlington	Roadside(1m)	X424456	Y577173	NO <sub>2</sub>	N	Y - (30m)	3m	Y
2 - Newgate St, Morpeth	Roadside	X 419525	Y 586380	NO <sub>2</sub>	N	Y – (2m)	2m	Y
3 - Ponteland Rd, Morpeth	Roadside	X 416724	Y 572853	NO <sub>2</sub>	N	Y – (2m)	2m	Y

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant	Distance to kerb of nearest road	Worst-case Location?
						Exposure?	(N/A if not applicable)	
						(Y/N with distance (m) to relevant exposure)		
4 - Bridge St, Morpeth	Roadside	X 419947	Y 585937	NO <sub>2</sub>	N	Y – (2m)	2m	Y
5 - Stobhill, Morpeth	Roadside	X 420769	Y 584807	NO <sub>2</sub>	N	Y – (5m)	5m	N
S4 - Station Road, Ashington	Urban Centre	X587746	Y427031	NO <sub>2</sub>	N	Y – (25m)	1m	Y
S7 - Front Street, Newbiggin	Urban Centre	X587918	Y431110	NO <sub>2</sub>	N	Y - (8m)	2m	Y
S11 - North Seaton (B1334)	Roadside	X586492	Y429778	NO <sub>2</sub>	N	Y – (40m)	5m	Y
S15 - Ravensworth Street, Bedlington	Urban Centre	X583137	Y427554	NO <sub>2</sub>	N	Y – (2m)	1m	N
S17 - Front Street, Bedlington	Urban Centre	X581879	Y426014	NO <sub>2</sub>	N	N – (25m)	1m	Y
S18 - Half Moon roundabout A196	Roadside	X585691	Y426860	NO <sub>2</sub>	N	Y – (5m)	2M	Y
S20 - Portland Park (LP in Car Park)	Roadside	X587959	Y427442	NO <sub>2</sub>	N	N – (75m)	10M	N
SD1 - Salvation Army, Seaton Delaval	Roadside(1m)	X430387	Y575433	NO <sub>2</sub>	N	Y – (1m)	1m	Y

**Table 2.2b Details of Non-Automatic Monitoring Sites – Benzene Diffusion Tubes**

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant	Distance to kerb of nearest road	Worst-case Location?
						Exposure?	(N/A if not applicable)	
						(Y/N with distance (m) to relevant exposure)		
V1 - Fisher Lane	Industrial	X 424454	Y 578463	Benzene	N	N	2m	Y
V2 - Opp Avery Dennison	Industrial	X 425584	Y 578166	Benzene	N	N	2m	Y
V4 - Windburgh Dr.	Suburban	x426527	Y575118	Benzene	N	N	40m	N
V5 - Rochester Green	Suburban	x426002	Y575042	Benzene	N	N	1m	N
V6 - Beaumont Manor	Industrial	x428688	Y581193	Benzene	N	N	1m	N
V8 - Sudbury Way	Suburban	x425322	Y576963	Benzene	N	N	1m	N
V9 - Lancastrian Way	Suburban	x426047	Y576139	Benzene	N	N	1m	N
V10 - Northburn Football Club	Industrial	x425955	Y578278	Benzene	N	N	10m	N
V11 - Crow Hall Rd.	Industrial	x425756	Y578376	Benzene	N	N	1m	Y

## 2.2 Comparison of Monitoring Results with AQ Objectives

Data capture for both continuous PM<sub>10</sub> monitors and the Blyth nitrogen dioxide (NO<sub>2</sub>) continuous monitor fell below 90 per cent in 2011. Therefore annualised averages have been calculated for all three of these monitors. However, using the nearest network monitors to perform this resulted in only a 1 µg/m<sup>3</sup> change in the NO<sub>2</sub> annual mean for Blyth and had no impact on either the PM<sub>10</sub> annual means as the ratios were so low.

### 2.2.1 Nitrogen Dioxide

#### Automatic Monitoring Data

Neither monitor indicated any breach of the national air quality objectives for NO<sub>2</sub>. Measured annual means were well within the objective and neither showed any measured exceedance of the 1-hour mean objective of 200 µg/m<sup>3</sup>. Because of data capture below 90 per cent for the Blyth monitor, an annualised mean and 99.8th per centile were calculated. Neither of these was above the relevant objective.

Calculation details of how the annual means were annualised are included in Appendix A. Percentiles were calculated by AQDM.

Both the Blyth and Cowpen air quality stations are sited where they would represent “worst case scenario” being nearer to the pollution sources than receptors. Relevant public exposure, in terms of the proximity of permanent residential occupants is minimal.

**Table 2.3a Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective**

Site ID	Location	Within AQMA?	Data Capture for monitoring period <sup>a</sup> %	Data Capture for full calendar year 2011 <sup>b</sup> %	Annual mean concentrations (µg/m <sup>3</sup> )		
					2009 <sup>c,d</sup>	2010 <sup>c, d</sup>	2011 <sup>c</sup>
	Blyth Library Site	Yes	N/A	82.2	29.6	28	26 (27)
	Cowpen Road Site	No	N/A	96.7	58.6	33	29

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

<sup>c</sup> Means should be “annualised” as in Box 3.2 of TG(09), if monitoring was not carried out for the full year. Displayed in parentheses.

\*Annual mean concentrations for previous years are optional.

**Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective**

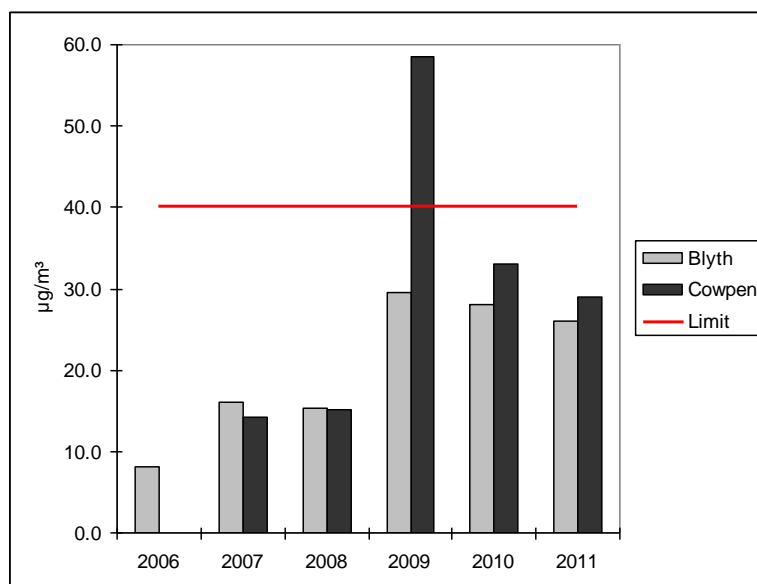
Site ID	Location	Within AQMA?	Data Capture for monitoring period <sup>a</sup> %	Data Capture for full calendar year 2011 <sup>b</sup> %	Number of Exceedence of hourly mean (200 $\mu\text{g}/\text{m}^3$ ) If the period of valid data is less than 90% of a full year, include the 99.8 <sup>th</sup> percentile of hourly means in brackets.		
					2009 <sup>c</sup>	2010 <sup>c</sup>	2011
	Blyth Library Site	Yes	N/A	82.2	0	0 (84*)	0 (90*)
	Cowpen Road Site	No	N/A	96.7	0	0 (126*)	0

\* Below the 90% data capture therefore 99.8<sup>th</sup> Per centile = 90  $\mu\text{g}/\text{m}^3$  (below the 200  $\mu\text{g}/\text{m}^3$  guideline value)

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

<sup>c</sup> Numbers of exceedence for previous years are optional.

**Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Automatic Monitoring Sites – 2006 to 2011**

### **Diffusion Tube Monitoring Data**

Results for all nitrogen dioxide diffusion tube annual averages for 2011 are below the national air quality objective for NO<sub>2</sub>.

A number of diffusion tubes have been previously been removed (reported in the 2011 Progress Report by Northumberland County Council) from the program since they were not representative of public exposure and/or were giving consistent levels well below the national air quality objectives. A further number of diffusion tubes have been assessed as consistently below the Air Quality objectives and will be de-commissioned from 1st April 2012.

The results for one tube with less than nine months data capture have been annualised.

The data has not been distance adjusted as this is not appropriate to many of the tube locations. Therefore, at most sites, the reported value can be considered as a “worst case scenario” for measured NO<sub>2</sub> levels as the majority of sites are kerbside or roadside.

Data capture for one of the benzene diffusion tubes fell below the required 90 per cent, however it was felt unnecessary to annualise this one tube because of the low results given by all the tubes and historically for this one tube.

Two NO<sub>x</sub> diffusion tube monitoring sites were highlighted as being of concern in the 2011 Progress Report; Sites 1 & 4 at Queens Court and Bridge street respectively. The Queens Court result was quoted in error based on three months data, the tube having been decommissioned in 2010 because results were consistently well below the AQO. The Bridge Street tube result has fallen to a much lower level well below the AQO, but will continue to be monitored.



**Table 2.4a Results of Nitrogen Dioxide Diffusion Tubes in 2011**

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 = 0.84) 2011 (µg/m <sup>3</sup> )
1N	Northumberland Hall, Alnwick	Road/Urban	N		100.0	N	N	14
7N	Greenwell Lane, Alnwick	Road/Urban	N		100.0	N	N	22
8N	Bondgate Without, Alnwick	Road/Urban	N		91.7	N	N	33
Ber5	Main Street, Tweedmouth	Road/Urban	N		100.0	N	N	27
Ber7	Castlegate		N		100.0	N	N	26
B1	Waterloo Road, opp bus station LP (X2)	Road/Urban	Y	Y	100.0	N	N	30
B1(2)	Waterloo Road, opp bus station LP (X2)	Road/Urban	Y		100.0	N	N	30
B3	Cowpen Road, west end monitoring station LP	Road/Urban	N	Y	100.0	N	N	28
B5	Cowpen Road, east end nr Lord Tool Hire LP	Road/Urban	N		100.0	N	N	21
B6	Blyth Civic Centre, flagpole LP	Urban Background	N		100.0	N	N	16
B8	Beaumont Manor (ASDA) LP & V6	Residential	N		100.0	N	N	16
B10	Park Farm Villas, Newsham LP	Residential	N		100.0	N	N	17
B11	Blyth YMCA LP	Road/Urban	Y		100.0	N	N	26
B12	Bridge Street, opp Job Centre LP	Road/Urban	Y		100.0	N	N	26
B13	Health Centre car park LP	Urban	Y		100.0	N	N	17
B15	South Newsham Road	Road/Arterial	N		100.0	N	N	19
C1	High Pit Road, Burton House car park LP (X2)	Road/Urban	N		100.0	N	N	25
C1(2)	High Pit Road, Burton House car park LP (X2)	Road/Urban	N		100.0	N	N	24
C3	Ruabon Close, Barns Park LP (X2)	Residential	N		100.0	N	N	15
C3(2)	Ruabon Close, Barns Park LP (X2)	Residential	N		100.0	N	N	16
C4	Rochford Grove, Barns Park & V5	Residential	N		100.0	N	N	15
C6	Lancastrian Drive, dead end & V9	Residential	N		100.0	N	N	15
C7	Kielder Avenue, Beacon Lane LP	Residential	N		83.3	Y	N	14
C8	Manor Walks, BT Sainsbury's and Travellers	Road/Urban	N		100.0	N	N	19
C9	Trebor, A1172 Station Road, Cramlington	Road/Arterial	N		33.3	N	N	27

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 = 0.84) 2011 (µg/m³)
2	Newgate Street/Bullers Green, Morpeth	Road/Urban	N		91.7	N	N	19
3	Police Station, Ponteland	Road/Urban	N		100.0	N	N	28
4	Northern Rock, Bridge Street, Morpeth	Road/Urban	N		100.0	N	N	25
5	Stobhill Social Club, Morpeth	Road/Arterial	N		100.0	N	N	14
4	Station Road, Ashington (LP D127 outside of Heron Garage)	Road/Urban	N		100.0	N	N	21
7	Front St, Newbiggin (LP on steps next to Methodist Church)	Road/Urban	N		100.0	N	N	17
11	North Seaton Roundabout (Sign post off roundabout B1334)	Road/Arterial	N		91.7	N	N	23
15	Ravensworth Car Park, Bedlington (LP on opposite site of the road)		N		100.0	N	N	20
17	Front Street East, Bedlington (LP next to shelter at junction of Church Ave)	Road/Urban	N		100.0	N	N	27
18	Wansbeck Bridge (LP on roundabout)		N		100.0	N	N	22
20	Portland Park (LP in Car Park)		N		100.0	N	N	21
SD1	Seaton Delaval, Salvation Army LP	Road/Urban	N		100.0	N	N	33

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

<sup>c</sup> Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

\*Annual mean concentrations for previous years are optional.

**Table 2.4b Results of Nitrogen Dioxide Diffusion Tubes - 2009 to 2011**

Site ID	Location	Type	Within AQMA?	Data Capture for monitoring period <sup>a</sup> %	Data Capture for full calendar year 2011 <sup>b</sup> %	Annual mean concentrations (mg/m <sup>3</sup> )		
						2009 <sup>c</sup>	2010	2011
1N	Northumberland Hall, Alnwick	Road/Urban	N		100.0	13 (14)	17	14
7N	Greenwell Lane, Alnwick	Road/Urban	N		100.0	21 (23)	25	22
8N	Bondgate Without, Alnwick	Road/Urban	N		91.7	28 (22)	36	33
Ber5	Main Street, Tweedmouth	Road/Urban	N		100.0	27	30	27
Ber7	Castlegate	Road/Urban	N		100.0	25	29	26
B1	Waterloo Road, opp bus station LP (X2)	Road/Urban	Y		100.0	34	35	30
B1(2)	Waterloo Road, opp bus station LP (X2)	Road/Urban	Y		100.0	35	34	30
B3	Cowpen Road, west end monitoring station LP	Road/Urban	N		100.0	35	35	28
B5	Cowpen Road, east end nr Lord Tool Hire LP	Road/Urban	N		100.0	23	23	21
B6	Blyth Civic Centre, flagpole LP	Other	N		100.0	21	22	16
B8	Beaumont Manor (ASDA) LP & V6	Residential	N		100.0	19	21	16
B10	Park Farm Villas, Newsham LP	Residential	N		100.0	22	22	17
B11	Blyth YMCA LP	Road/Urban	Y		100.0	33	30	26
B12	Bridge Street, opp Job Centre LP	Road/Urban	Y		100.0	31	32	26
B13	Health Centre car park LP	Urban	Y		100.0	20	20	17
B15	South Newsham Road	Road/Arterial	N		100.0	N/A	N/A	19
C1	High Pit Road, Burton House car park LP (X2)	Road/Urban	N		100.0	29	32	25
C1(2)	High Pit Road, Burton House car park LP (X2)	Road/Urban	N		100.0	30	29	24
C3	Ruabon Close, Barns Park LP (X2)	Residential	N		100.0	20	19	15
C3(2)	Ruabon Close, Barns Park LP (X2)	Residential	N		100.0	21	18	16
C4	Rochford Grove, Barns Park & V5	Residential	N		100.0	17	18	15
C6	Lancastrian Drive, dead end & V9	Residential	N		100.0	20	19	15
C7	Kielder Avenue, Beacon Lane LP	Residential	N		83.3	19	19	14 (14)
C8	Manor Walks, BT Sainsbury's and Travellers	Road/Urban	N		100.0	24	23	19
C9	Trebor, A1172 Station Road, Cramlington	Road/Arterial	N	100.0	33.3	N/A	N/A	27
2	Newgate Street/Bullers Green, Morpeth	Road/Urban	N		91.7	17 (16)	20	19
3	Police Station, Ponteland	Road/Urban	N		100.0	32 (30)	25	28
4	Northern Rock, Bridge Street, Morpeth	Road/Urban	N		100.0	36.3 (33.0)	40	25

5	Stobhill Social Club, Morpeth	Road/Arterial	N		100.0	18 (16)	14	14
4	Station Road, Ashington (LP D127 outside of Heron Garage)	Road/Urban	N		100.0	22	23	21
7	Front St, Newbiggin (LP on steps next to Methodist Church)	Road/Urban	N		100.0	19	20	17
11	North Seaton Roundabout (Sign post off roundabout B1334)	Road/Arterial	N		91.7	24	28	23
15	Ravensworth Car Park, Bedlington (LP on opposite site of the road)		N		100.0	22	25	20
17	Front Street East, Bedlington (LP next to shelter at junction of Church Ave)	Road/Urban	N		100.0	22	30	27
18	Wansbeck Bridge (LP on roundabout)		N		100.0	23	28	22
20	Portland Park (LP in Car Park)		N		100.0	24	21	21
SD1	Seaton Delaval, Salvation Army LP	Road/Urban	N		100.0	28	32	33

Diffusion Tube Biases; 2009 = 1.03, 2010 = 1.08, 2011 = 0.84

Annualised averages are presented in parentheses

### 2.2.2 PM<sub>10</sub>

Neither the Blyth nor Cowpen monitor indicated any breach of the national air quality objectives for PM<sub>10</sub>. Measured annual means were well within the objective and neither showed any measured exceedence of the daily mean objective of 50 µg/m<sup>3</sup>. Because of data capture below 90 per cent for the Blyth and Cowpen monitors, an annualised mean and 90th per centile were calculated. Neither of these was above the relevant objective. The annualised mean values were identical to the measured ones.

Calculation details of how the annual means were annualised are included in Appendix A. Percentiles were calculated by AQDM.

Both the Blyth and Cowpen air quality stations are sited where they would represent “worst case scenario” being nearer to the pollution sources than receptors. Relevant public exposure, in terms of the proximity of permanent residential occupants is marginal.

**Table 2.5a Results of Automatic Monitoring of PM<sub>10</sub>: Comparison with Annual Mean Objective**

Site ID	Location	Within AQMA?	Data Capture for monitoring period <sup>a</sup> %	Data Capture for full calendar year 2011 <sup>b</sup> %	Annual mean concentrations (µg/m <sup>3</sup> )		
					2009 <sup>c,d</sup>	2010 <sup>c, d</sup>	2011 <sup>c</sup>
	Blyth Library Site	Yes	N/A	82.9	23.5	25	30 (30)
	Cowpen Road Site	No	N/A	77.2	17.6	17	19 (19)

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

<sup>c</sup> Means should be “annualised” as in Box 3.2 of TG(09), if monitoring was not carried out for the full year. Displayed in parentheses.

\* Optional

**Table 2.5b Results of Automatic Monitoring for PM<sub>10</sub>: Comparison with 24-hour mean Objective**

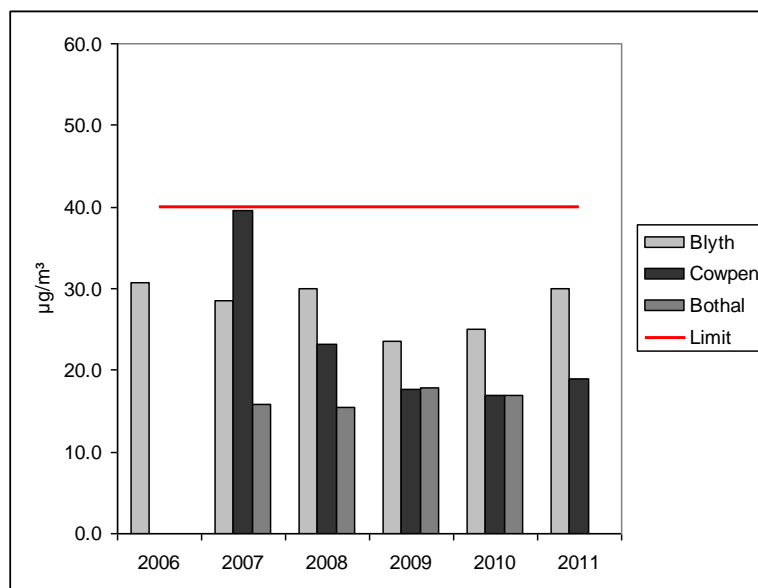
Site ID	Location	Within AQMA?	Data Capture for monitoring period <sup>a</sup> %	Data Capture 2011 <sup>b</sup> %	Number of Exceedence of daily mean objective (50 µg/m <sup>3</sup> ) If data capture < 90%, include the 90 <sup>th</sup> per centile of daily means in brackets.		
					2009 <sup>c</sup>	2010 <sup>c</sup>	2011
	Blyth Library Site	Yes	N/A	82.9	6	3 (38*)	24 (49)
	Cowpen Road Site	No	N/A	77.2	8	0 (28*)	4 (32)

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

<sup>c</sup> if data capture is less than 90%, include the 90<sup>th</sup> per centile of 24-hour means in brackets

\* Optional

**Figure 2.4 Trends in Annual Mean PM<sub>10</sub> Concentrations Measured at Automatic Monitoring Sites – 2006 to 2011**



### 2.2.3 Sulphur Dioxide

Data capture from the SO<sub>2</sub> site is below the recommended 90 per cent. Therefore the following per centiles have been calculated; 99.9<sup>th</sup> = 15 minute mean, 99.7<sup>th</sup> = 1 hour mean & 99.2<sup>nd</sup> = 24 hour mean. There have been no exceedence in this year in any of the three monitoring objectives indicated by either the actual averages or the per centiles.

Calculation details of how the annual mean was annualised are included in Appendix A. Percentiles were calculated by AQDM.

The monitoring site is located in an urban area and is operated alongside monitoring carried out by the operators of Lynemouth coal-fired power station to assess any impacts of their emissions upon local air quality.

**Table 2.6a Results of Automatic Monitoring of SO<sub>2</sub>: Comparison with Annual Mean Objective**

Site ID	Location	Within AQMA?	Data Capture for monitoring period <sup>a</sup> %	Data Capture for full calendar year 2011 <sup>b</sup> %	Annual mean concentrations (µg/m <sup>3</sup> )		
					2009 <sup>c,d</sup>	2010 <sup>c, d</sup>	2011 <sup>c</sup>
	Newbiggin Sports Centre	No	N/A	66.1	1	7	5 (5)

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

<sup>c</sup> Means should be “annualised” as in Box 3.2 of TG(09), if monitoring was not carried out for the full year. Displayed in parentheses.

<sup>\*</sup> Optional

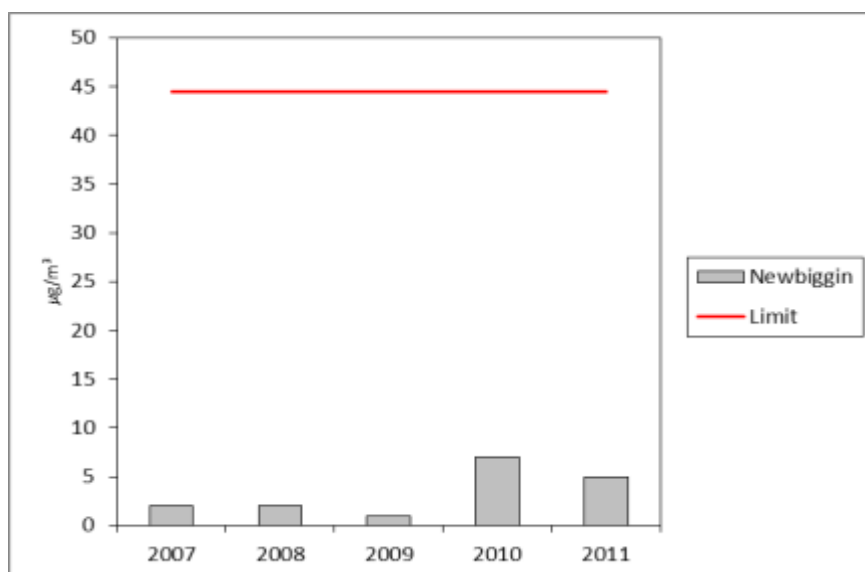
**Table 2.6b Results of SO<sub>2</sub> Automatic Monitoring: Comparison with 15-minute, 1-hour & 24-hour Objectives**

Site	Location	Within AQMA	Data Capture for monitoring period <sup>a</sup> %	Data Capture 2011 <sup>b</sup> %	Number of Exceedence of: (µg/m <sup>3</sup> )		
					15-minute Objective (266 µg/m <sup>3</sup> )	1-hour Objective (350 µg/m <sup>3</sup> )	24-hour Objective (125 µg/m <sup>3</sup> )
	Newbiggin Sports Centre	No	N/A	66.1	0 (48)	0 (40)	0 (24)

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

<sup>b</sup> This column shows data capture for the full calendar year – e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.

NB Relevant per centiles are in parentheses

**Figure 2.5 Trends in SO<sub>2</sub> Concentration Measured at Automatic Monitoring Site – 2007 to 2011**

## 2.2.4 Benzene

**Table 2.7a Results of Benzene Diffusion Tubes - Running Mean (3 year)**

Site ID	Location	Within AQMA?	Data Capture for monitoring period <sup>a</sup> %	Data Capture for full calendar year 2011 <sup>b</sup> %	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ )		
					2009 <sup>c,d</sup>	2010 <sup>c, d</sup>	2011 <sup>c</sup>
V1	Fisher Lane, lamp post south of bus stop LP	No	N/A	91.7	2.6	2.5	1.8
V2	Opposite Avery Dennison factory on LP	No	N/A	91.7	2.2	2.1	1.6
V4	Windburgh Drive, last cul-de-sac grass area LP	No	N/A	91.7	1.9	1.8	1.7
V5	Rochester Green, Barns Park LP	No	N/A	91.7	2.3	2.2	1.2
V6	Beaumont Manor (ASDA) LP	No	N/A	91.7	2.0	2.0	1.2
V8	Sudbury Way, Beaconhill Estate LP	No	N/A	83.3	2.1	2.0	1.2
V9	Lancastrian Road, dead end LP	No	N/A	91.7	2.3	2.2	1.3
V10	Northburn Football Club car park LP	No	N/A	83.3	3.1	3.1	1.6
V11	Crow Hall Rd opp CMP Factory LP	No	N/A	91.7	3.3	3.2	1.7

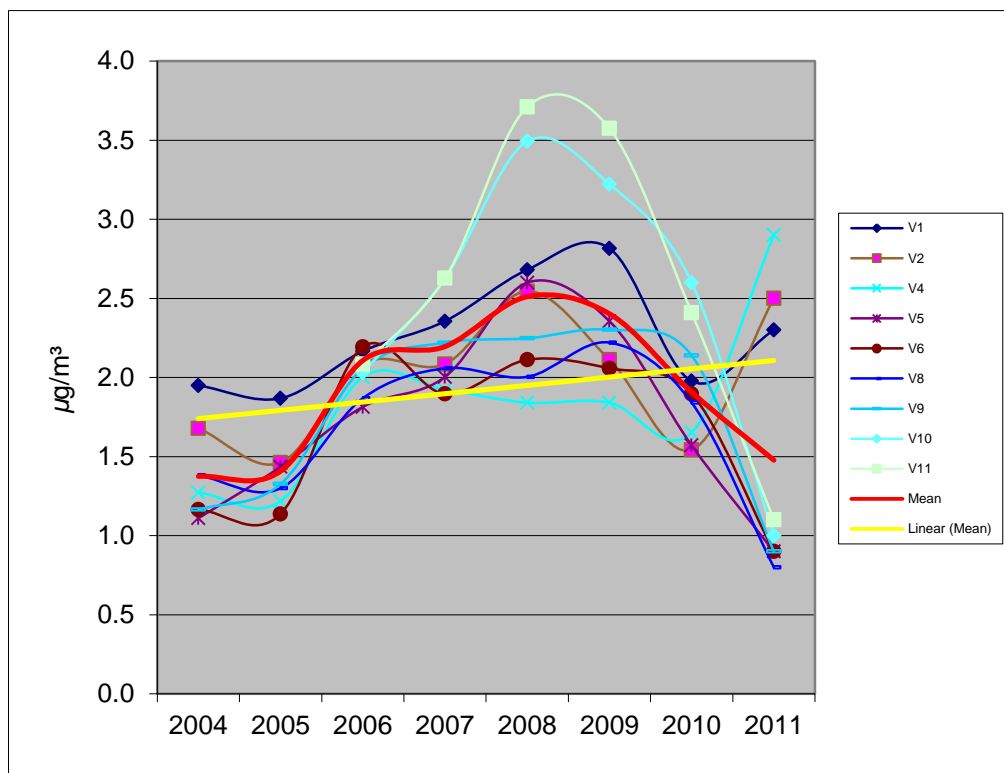
**Table 2.7b Results of Benzene Diffusion Tubes - Annual Means**

Site ID	Location	Within AQMA?	Data Capture for monitoring period <sup>a</sup> %	Data Capture for full calendar year 2011 <sup>b</sup> %	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ )		
					2009 <sup>c,d</sup>	2010 <sup>c</sup>	2011
V1	Fisher Lane, lamp post south of bus stop LP	No	N/A	91.7	2.8	2.0	2.3
V2	Opposite Avery Dennison factory on LP	No	N/A	91.7	2.1	1.5	2.5
V4	Windburgh Drive, last cul-de-sac grass area LP	No	N/A	91.7	1.8	1.7	2.9
V5	Rochester Green, Barns Park LP	No	N/A	91.7	2.4	1.6	0.9
V6	Beaumont Manor (ASDA) LP	No	N/A	91.7	2.1	1.9	0.9
V8	Sudbury Way, Beaconhill Estate LP	No	N/A	83.3	2.2	1.8	0.8
V9	Lancastrian Road, dead end LP	No	N/A	91.7	2.3	2.1	0.9
V10	Northburn Football Club car park LP	No	N/A	83.3	3.2	2.6	1.0
V11	Crow Hall Rd opp CMP Factory LP	No	N/A	91.7	3.6	3.2	1.1

\* Tube has been discontinued as of 31 March 2010

There continues to be no exceedence of the 5.0  $\mu\text{g}/\text{m}^3$  national air quality objective for benzene (2010 objective) or the previous 16.25  $\mu\text{g}/\text{m}^3$  objective (2003 objective) at all the monitoring sites.

The monitoring points are not directly measurements of public exposure but were installed in the area of several large industrial VOC sources for monitoring purposes. The relevance of these sites has been reviewed as they have never shown any exceedence for benzene. The benzene diffusion tube monitoring will cease from the 1<sup>st</sup> April 2012.

**Figure 2.7 Trends in Benzene Concentrations Measured at Diffusion Tube Monitoring Sites – 2004 to 2011**

### 2.2.5 Other pollutants monitored

The Council does not routinely monitor any other pollutants.

## **2.2.6 Summary of Compliance with AQS Objectives**

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

# **3 Road Traffic Sources**

A DMRB was carried out for the 2011 Detailed Assessment for Cowpen Road in Blyth, identified as road which is known to have heavy traffic loads and relevant receptors. It is expected that traffic conditions have altered little since this date and no new receptors are present, therefore a further DMRB assessment was not considered necessary at this time.

## **3.1 Narrow Congested Streets with Residential Properties Close to the Kerb**

Northumberland County 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**

Northumberland County 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.**

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

## **3.4 Junctions**

Northumberland County Council confirms that there are no new/newly identified busy junctions/busy roads.

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

Northumberland County Council confirms that there are no new/proposed roads.

### **3.6 Roads with Significantly Changed Traffic Flows**

Northumberland County Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

### **3.7 Bus and Coach Stations**

Northumberland County Council confirms that there are no relevant bus stations in the Local Authority area.

## **4 Other Transport Sources**

### **4.1 Airports**

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

### **4.2 Railways (Diesel and Steam Trains)**

#### **4.2.1 Stationary Trains**

Northumberland County Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

#### **4.2.2 Moving Trains**

Northumberland County 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)**

Northumberland County Council confirms that there are no ports or shipping that meet the specified criteria 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**

Northumberland County 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**

Northumberland County 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**

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

## **5.2 Major Fuel (Petrol) Storage Depots**

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

## **5.3 Petrol Stations**

Northumberland County Council confirms that there are no petrol stations meeting the specified criteria.

## **5.4 Poultry Farms**

Northumberland County Council confirms that there are no poultry farms meeting the specified criteria.

## **6 Commercial and Domestic Sources**

### **6.1 Biomass Combustion – Individual Installations**

Proposed Paint Manufacturing Plant at Oakwood Way, Ashwood Business Park, Ashington (within a Smoke Control Area); Planning Ref: 11/03008/FULES. The applicant has done an assessment of air quality as part of the application submission for a 500kW biomass plant. This is judged against the national air quality objectives within the context of the national air quality strategy. The area has not been declared as an Air Quality Management Area (AQMA), and the application has been evaluated to ensure that this situation is not altered.

Proposed Emergency Care Hospital at "Land East Of A189 And South Of Lanercost Park", A189 Spine Road Moor Farm To Kitty Brewster Bridge, Cramlington, Northumberland; Planning Ref: 11/00129/CCMEIA. The applicant has done an assessment of air quality as part of the application submission for a 450kW biomass plant. This is judged against the national air quality objectives within the context of the national air quality strategy.

Northumberland County Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

### **6.2 Biomass Combustion – Combined Impacts**

Northumberland County Council confirms that there are no biomass combustion plant in the Local Authority area.

### **6.3 Domestic Solid-Fuel Burning**

Northumberland County Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

## **7 Fugitive or Uncontrolled Sources**

Northumberland County Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

## **8 Conclusions and Proposed Actions**

### **8.1 Conclusions from New Monitoring Data**

Monitoring from the three real time stations show continued measured levels below the National Air Quality Objectives. New monitoring data for particulates confirms that the Blyth Air Quality Management Area revocation is appropriate.

### **8.2 Conclusions from Assessment of Sources**

All sources have been assessed against guidance and no potential or actual exceedence of Air Quality Objectives has been identified.

### **8.3 Proposed Actions**

The Updating and Screening Assessment has not identified any need to proceed to a Detailed Assessment for any pollutant.

The Updating and Screening Assessment has identified a need for changes to the existing monitoring programme; re-evaluation of automatic monitoring stations for both location and parameters at Blyth and Cowpen Road.

The Blyth AQMA declaration will be revoked from 29 June 2012 following stakeholder consultation.

A further review of NO<sub>x</sub> diffusion tubes will take place to look at compliance, location and relevant receptors.

Northumberland County Council plan to discontinue the VOC (benzene) tubes from the monitoring programme.

Northumberland County Council will look to submit a Progress Report in 2013.

## 9 References

AEA Energy & Environment Document “Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: Practical Guidance for Laboratories and Users.” Ref: ED48673043, Issue 1a, February 2008. Available:  
[http://laqm.defra.gov.uk/documents/0802141004\\_NO2\\_WG\\_PracticalGuidance\\_Isue1a.pdf](http://laqm.defra.gov.uk/documents/0802141004_NO2_WG_PracticalGuidance_Isue1a.pdf)

“Local Air Quality Management,” Technical Guidance LAQM.TG(09), Defra, February 2009. Available:  
<http://www.defra.gov.uk/publications/files/pb13081-tech-guidance-laqm-tg-09-090218.pdf>

Spreadsheet of Bias Adjustment Factors (v.03/12). Available:  
[http://laqm.defra.gov.uk/documents/Diffusion\\_Tube\\_Bias\\_Factors-v03\\_12.xls](http://laqm.defra.gov.uk/documents/Diffusion_Tube_Bias_Factors-v03_12.xls)  
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Summary of Laboratory Performance in WASP NO<sub>2</sub> Proficiency Testing Scheme for Rounds 108-115 (January 2010 – December 2011). Available:  
[http://laqm.defra.gov.uk/documents/WASP-Rounds-108-115-\(January-2010-December-2011\).pdf](http://laqm.defra.gov.uk/documents/WASP-Rounds-108-115-(January-2010-December-2011).pdf)  
Last accessed 28/05/2012

## **Appendices**

Appendix A: QA/QC Information

Appendix B: Location Maps of Air Quality Monitoring Locations

Appendix C: Full Monthly NO<sub>x</sub> Diffusion Tube dataset 2011

Appendix D: Ratified Data Summaries and Time Series Plots from AQDM

## Appendix A: QA/QC Information

### Factor from Local Co-location Studies (if available)

No co-location studies were carried out using the Northumberland County Council AQ data

### Diffusion Tube Bias Adjustment Factors

The tubes are prepared and analysed by Environmental Scientifics Group (recorded as Harwell Scientific Services in the bias adjustment spreadsheet) . The method used involves the reaction of gaseous nitrogen dioxide with 50% triethanolamine contained on grids within the diffusion tubes. This is then reacted with reagents to produce a stable coloured complex, which can then be compared to standards prepared from sodium nitrite and analysed using visible spectroscopy.

The ESG laboratory follows the procedures set out in the Harmonisation Practical Guidance.

Northumberland County Council has not compared the diffusion tubes with the reference method in a co-location study.

The bias factor is calculated by the using data from the DEFRA Website:

<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

National Diffusion Tube Bias Adjustment Spreadsheet Version Number: 03/12.

The bias factor was calculated to be 0.84 for ESG.

The Results of laboratory precision and WASP scheme are included below; the Environmental Scientifics Group showing a 100 per cent performance for 2010/11. This is using the new z-score system of rating the laboratories

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/12						
<p>Follow the steps below <b>in the correct order</b> to show the results of <b>relevant</b> co-location studies</p> <p>Data 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 September 2012</p> <p><a href="http://www.bureauveritas.co.uk">www.bureauveritas.co.uk</a></p>						
<p>The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.</p>							<p>Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.</p>						
<b>Step 1:</b>		<b>Step 2:</b>		<b>Step 3:</b>		<b>Step 4:</b>							
<p>Select the Laboratory that Analyses Your Tubes from the Drop-Down List:</p> <p>If a laboratory is not chosen, we have no data for this laboratory.</p>		<p>Select a Preparation Method from the Drop-Down List:</p> <p>If a preparation method is not chosen, we have no data for this method at this laboratory.</p>		<p>Select a Year from the Drop-Down List:</p> <p>If a year is not chosen, we have no data.</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<sup>2</sup> shown in blue at the foot of the final column.</p> <p>If you have your own co-location study then see footnote<sup>4</sup>. If uncertain what to do then contact the Local Air Quality Management Helpdesk at <a href="mailto:LAQMHelpdesk@uk.bureauveritas.com">LAQMHelpdesk@uk.bureauveritas.com</a> or 0800 0327953</p>							
<b>Analysed By<sup>1</sup></b>		<b>Method<sup>3</sup></b> <small>To make your selection, choose (M) from the page on List</small>		<b>Year<sup>5</sup></b> <small>To make your selection, choose (M)</small>		<b>Site Type</b>	<b>Local Authority</b>	<b>Length of Study (months)</b>	<b>Diffusion Tube Mean Conc. (Dm) (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Automatic Monitor Mean Conc. (Cm) (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Bias (B)</b>	<b>Tube Precision<sup>6</sup></b>	<b>Bias Adjustment Factor (A) (Cm/Dm)</b>
Harwell Scientific Services		50% TEA in acetone		2011		B	Stockton on Tees	12	27	25	6.6%	G	<b>0.94</b>
Harwell Scientific Services		50% TEA in acetone		2011		R	Stockton on Tees	12	20	18	9.7%	G	<b>0.91</b>
Harwell Scientific Services		50% TEA in Acetone		2011		R	Vale of White Horse DC	12	35	32	10.8%	G	<b>0.90</b>
Harwell Scientific Services		50% TEA in Acetone		2011		R	Falkirk Council	10	35	26	31.1%	G	<b>0.76</b>
Harwell Scientific Services		50% TEA in Acetone		2011		UB	Falkirk Council	12	26	21	19.5%	G	<b>0.84</b>
Harwell Scientific Services		50% TEA in acetone		2011		R	Hambleton District Council	12	26	20	27.4%	G	<b>0.78</b>
Harwell Scientific Services		50% TEA in acetone		2011		R	Swale Borough Council	12	43	29	49.6%	G	<b>0.67</b>
Harwell Scientific Services		50% TEA in acetone		2011		R	Swale Borough Council	12	43	29	49.6%	S	<b>0.67</b>
Harwell Scientific Services		50% TEA in acetone		2011		K	Marglebone Road Intercomparison	11	125	99	26.3%	G	<b>0.79</b>
Harwell Scientific Services		50% TEA in acetone		2011		R	Maidstone Borough Council	12	48	53	-9.3%	G	<b>1.10</b>
Harwell Scientific Services		50% TEA in acetone		2011		B	Maidstone Borough Council	12	17	13	37.2%	G	<b>0.73</b>
Harwell Scientific Services		50% TEA in acetone		2011		UB	CITY OF YORK COUNCIL	12	27	25	8.1%	G	<b>0.93</b>
Harwell Scientific Services		50% TEA in acetone		2011		R	CITY OF YORK COUNCIL	11	38	30	25.2%	G	<b>0.80</b>
Harwell Scientific Services		50% TEA in acetone		2011		R	CITY OF YORK COUNCIL	11	35	29	23.6%	G	<b>0.81</b>
Harwell Scientific Services		50% TEA in acetone		2011		R	CITY OF YORK COUNCIL	12	45	50	-10.5%	G	<b>1.12</b>
Harwell Scientific Services		50% TEA in acetone		2011		R	Cambridge City Council	11	47	40	17.2%	G	<b>0.85</b>
Harwell Scientific Services		50% TEA in acetone		2011		UB	Gravesham Borough Council	12	30	25	20.2%	G	<b>0.83</b>
Harwell Scientific Services		50% TEA in acetone		2011		R	Gravesham Borough Council	12	43	34	27.5%	S	<b>0.78</b>
Harwell Scientific Services		50% TEA in acetone		2011		<b>Overall Factor<sup>2</sup> (18 studies)</b>					<b>Use</b>	<b>0.84</b>	

<sup>1</sup> For Casella Stanger/Bureau Veritas (NOT Bureau Veritas Labs) use Gradko 50% TEA in Acetone.

For Casella Seal/GMSS/Casella CRE/Bureau Veritas Labs/Eurofins use Environmental Scientific Groups.

For Staffordshire CC SS/Staffordshire County Analyst use Staffordshire Scientific Services.

For Bodycote Health Sciences and Clyde Analytical Laboratories use Exova.

For Rotherham MBC use South Yorkshire Labs.

For Dundee CC use TagSide SS.

For Leicester Scientific Services use Staffordshire Scientific Services.

For South Yorkshire Air Quality Samplers use South Yorkshire Labs. As of January 2010 sampler body changed. As of April 2010 sampler cap changed.

Lancashire County Analysts withdrew from the Field intercomparison at the end of 2010. No submissions were supplied in 2011.

Walsall MBC closed in March 2011.

<sup>2</sup> In this situation it would be reasonable to use data from the nearest year.



Changes to Diffusion Tube Bias Adjustment Factors with 03/12 Issue of the Spreadsheet							
Laboratory	Method	Year	Previous Number of Studies	New (03/12) Update			
				No. Studies Added	Total No. of Studies	Factor	Change in Factor
Edinburgh Scientific Services	50% TEA in Acetone	2010	2	4	6	0.9	-0.12
Aberdeen CC	20% TEA in water	2011	0	1	1	0.85	
Bristol Scientific Services	20% TEA in water	2011	0	8	8	0.83	
Bristol Scientific Services	50% TEA in acetone	2011	0	1	1	0.71	
Cardiff Scientific Services	50% TEA in acetone	2011	0	3	3	0.82	
Edinburgh Scientific Services	50% TEA in acetone	2011	0	2	2	1.01	
Environmental Scientific Groups	20% TEA in water	2011	0	5	5	0.82	
Environmental Scientific Groups	50% TEA in acetone	2011	0	22	22	0.88	
Exova	20% TEA in water	2011	0	1	1	0.78	
Glasgow Scientific Services	20% TEA in water	2011	0	7	7	0.94	
Gradko	20% TEA in water	2011	0	26	26	0.89	
Gradko	50% TEA in acetone	2011	0	20	20	0.94	
Harwell Scientific Services	20% TEA in water	2011	0	1	1	0.77	
Harwell Scientific Services	50% TEA in acetone	2011	0	18	18	0.84	
Kent Scientific Services	20% TEA in water	2011	0	1	1	0.77	
Kirklees Council	50% TEA in acetone	2011	0	5	5	0.75	
Lambeth Scientific Services	50% TEA in acetone	2011	0	6	6	1.06	
Milton Keynes Council	20% TEA in water	2011	0	1	1	0.82	
Northampton BC	20% TEA in water	2011	0	3	3	0.71	
South Yorkshire Air Quality Sample	50% TEA in acetone	2011	0	4	4	0.79	
Staffordshire Scientific Services	20% TEA in water	2011	0	11	11	0.88	
Tayside Scientific Services	20% TEA in water	2011	0	8	8	0.78	
West Yorkshire Analytical Services	50% TEA in acetone	2011	0	12	12	0.84	
Number of Studies Included			2	170	172		

Note:

The National Diffusion Tube Bias Adjustment Factor Spreadsheet will be updated at the end of June 2012

#### Local Air Quality Management Helpdesk

Telephone: 0800 0327953  
E-mail: [LAQMHelpdesk@uk.bureauveritas.com](mailto:LAQMHelpdesk@uk.bureauveritas.com)

#### Previous Revisions Record:

Changes to Diffusion Tube Bias Adjustment Factors with 09/11 Issue of the Spreadsheet							
Laboratory	Method	Year	Previous Number of Studies	New (09/11) Update			
				No. Studies Added	Total No. of Studies	Factor	Change in Factor
Aberdeen CC	20% TEA in Water	2010	1	4	5	0.88	0.06
Bristol Scientific Services	20% TEA in Water	2010	7	0	7	0.85	-
Cardiff Scientific Services	50% TEA in Acetone	2010	4	0	4	0.85	-
Edinburgh Scientific Services	50% TEA in Acetone	2010	2	0	2	1.02	-
Environmental Scientific Groups	20% TEA in Water	2010	10	0	10	0.84	-
Environmental Scientific Groups	50% TEA in Acetone	2010	4	0	4	0.75	-
Glasgow Scientific Services	20% TEA in Water	2010	6	0	6	1.12	-
Gradko	20% TEA in Water	2010	41	1	42	0.85	-0.07
Gradko	50% TEA in Acetone	2010	16	0	16	1.03	-
Harwell Scientific Services	50% TEA in Acetone	2010	19	1	20	0.85	0.00
Harwell Scientific Services	20% TEA in Water	2010	1	0	1	0.77	-
Kent Scientific Services	20% TEA in Water	2010	1	0	1	0.78	-
Kirklees Council Scientific Services	50% TEA in Acetone	2010	1	0	1	0.78	-
Lambeth Scientific Services	50% TEA in Acetone	2010	4	0	4	1.06	-

## Discussion of Choice of Factor to Use

Local bias adjustment factors were not calculated, therefore national factors were used.

## PM<sub>10</sub> Monitoring Adjustment

PM<sub>10</sub> measurements by the BAM units had a factor of 0.83<sup>\*</sup> applied to give gravimetric equivalent concentrations.

## Short-term to Long-term Data adjustment

Estimation of annual mean concentrations for short-term monitoring data

Following the methodology in Box 3.2 of LAQM.TG(09), the following site with short-term monitoring data had its annual mean estimated using data from the three nearest monitoring sites in the AURN network (Newcastle City, Newcastle Cradlewell and Sunderland Silksworth) and one of our local stations which has been audited by AEA previously (the inclusion or exclusion of this station only changes the combined ratio by 0.01):

<b>C7 – Kielder Avenue, Beacon Lane, Cramlington</b>			
Long Term Site	Annual Mean 2011 (AM)	Period Mean 2011 (PM)	Ratio (AM/PM)
Cowpen Road	29.0	29.1	1.00
Newcastle Centre	32.9	33.5	0.98
Newcastle Cradlewell	38.1	39.2	0.97
Sunderland Silksworth	15.5	15.7	0.99
		Average (Ra)	<b>0.99</b>

The period mean is for ten months (83.3 per cent data capture) and the two “missing” months are July and October 2011. Therefore the period mean is for 1<sup>st</sup> January to 30<sup>th</sup> June, 1<sup>st</sup> August to 31<sup>st</sup> September and 1<sup>st</sup> November to 31<sup>st</sup> December.

Both continuous PM10 monitors fell below 90 per cent data capture and presented below are the ratio calculations.

<b>Blyth</b>			
Long Term Site	Annual Mean 2011 (AM)	Period Mean 2011 (PM)	Ratio (AM/PM)
Newcastle TEOM	19.6	19.9	0.9849
Shotton TEOM	13.9	13.9	1.0000
Middlesbrough	19.3	19.8	0.9747
		Average (Ra)	<b>0.99</b>

<b>Cowpen</b>			
Long Term Site	Annual Mean 2011 (AM)	Period Mean 2011 (PM)	Ratio (AM/PM)
Newcastle TEOM	19.6	19.4	1.0103
Shotton TEOM	13.9	14.0	0.9929
Middlesbrough	19.3	18.9	1.0212
		Average (Ra)	<b>1.01</b>

The Blyth NO<sub>x</sub> continuous monitor fell below 90 per cent data capture and presented below is the ratio calculation for this site.

<b>Blyth</b>			
Long Term Site	Annual Mean 2011 (AM)	Period Mean 2011 (PM)	Ratio (AM/PM)
Sunderland Silksworth	15.7	15.4	1.0195
Newcastle Centre	13.9	13.9	1.0000
Middlesbrough	18.3	17	1.0765
		Average (Ra)	<b>1.03</b>

The Newbiggin SO<sub>2</sub> continuous monitor fell below 90 per cent data capture and presented below is the ratio calculation for this site.

<b>Newbiggin</b>			
Long Term Site	Annual Mean 2011 (AM)	Period Mean 2011 (PM)	Ratio (AM/PM)
Sunderland Silksworth	4.6	4.7	0.9787
Newcastle Centre	3.9	3.8	1.0263

Middlesbrough	5.5	5.1	1.0784
		Average (Ra)	<b>1.03</b>

The data for the AURN stations was obtained from the UK-Air website ([http://uk-air.defra.gov.uk/data/data\\_selector](http://uk-air.defra.gov.uk/data/data_selector)).

## QA/QC of Continuous Monitoring Equipment

It is recognised that any monitoring survey must be subject to quality assurance and quality control (QA/QC) to ensure the integrity of the data and to guarantee that the measurements fully comply with the requirements of the air quality review and assessment and are, therefore, fit for purpose. Therefore:

- data should be representative of ambient concentrations existing in the area under investigation.
- measurements need to be sufficiently accurate and precise to meet the defined monitoring requirements. Data must be inter-comparable and reproducible. Results from multi-site networks need to be internally consistent and comparable with national, international or other acceptable standards.
- measurements should be consistent over time, particularly if long-term trend analysis is to be undertaken.

QA/QC procedures were applied to both passive samplers and automatic monitoring data throughout the monitoring period. QA/QC procedures are involved in all aspects of the monitoring exercise from purchase of equipment to the data presentation. The following information summarizes the QA/QC practice applied for the purpose of this report.

### Routine Site Visits

Regular site visits were carried out to:

- carry out site checks on equipment, sampling systems, safety and security.
- perform manual calibrations.

The following operations are carried out on site to maximise data integrity and capture rate:

- ensuring the proper running of equipment.
- performing instrument calibrations and diagnostic checks.
- minimising instruments down-time as much as possible, by anticipating problems prior to them becoming serious or fatal.
- carrying out essential routine functions such as particle filter changes and BAM tape replacement
- performing checks of the automatic calibration systems
- ensuring that initial siting criteria are still fulfilled i.e. that the surrounding environment has not changed in any way that prejudices the monitoring objectives.

A Site Manual is displayed in the MAQU, which provides the facility to document visits made to the site by operating personnel.

### Calibration Procedure

Proper calibration of automatic monitoring equipment is essential for obtaining accurate and reproducible air quality data. Electrical response signals are generated by the M200E analyser that corresponds to the concentrations of NO<sub>x</sub> and NO in the air. In order to correctly scale the analyser response, it is necessary to calibrate it using a gas mixture of known concentration from a gas cylinder.

Calibrations are conducted at a number of levels

- daily automatic calibration by the analyser
- frequent (fortnightly) manual calibration (performed by qualified Northumberland County Council staff)
- periodic (6 monthly) reference calibrations (performed by SupportingU engineers)

The fortnightly calibrations are carried out according to procedures contained in the Site Manual and blank forms are provided to assist in performing and documenting the calibrations. Copies of the completed forms during the monitoring period are available on request.

#### Equipment Service Maintenance

An on-going service and maintenance contract is in place with SupportingU for the mobile unit. The contract provides the following cover:

- routine six monthly service visits in accordance with the manufacturer's and warranty conditions
- guaranteed breakdown call out response of forty eight hours (normal working time)
- written reports showing work carried out and status of instrumentation
- all work and documentation carried out in accordance with BS ISO 9002 accredited system
- dedicated telephone support (Technical Support Engineer) in normal working hours

#### Data Capture

The following methods are employed to maximise data capture rates.

- regular and frequent site visits
- automatic daily data collection using dedicated software
- M200E and BAM in-built data storage capability
- rapid, service, maintenance and repair
- comprehensive and documented site operational protocols
- experienced site operator

#### Data Processing

The data stored on each of the analyser's in-built loggers is then downloaded via a modem and mobile telephone line to a computer at the Council Offices or by direct download from data loggers.

The raw values are then converted using calibration factors obtained from manual calibrations performed every fortnight. There is always a gradual decline in the sensitivity of the analyser between each full 6-monthly service. It is this decline in sensitivity that the manual calibration conversion factors are intended to scale against.

The conversion is achieved using zero and span "calibration factors" achieved from the fortnightly calibrations. The two-point calibration will quantify the analysers "zero" and "span" response.

The zero response,  $V_z$ , is the response in measurements units of the analyser when the pollutant species being measured is not present in the sample air stream.

The span response,  $V_s$ , is the response of the analyser to an accurate known concentration,  $c$ , of the pollutant species. Instrument zero and span factors are then calculated using these data as follows:

Instrument zero =  $V_z$

Instrument span,  $F = c/(V_s - V_z)$

Ambient pollution data are then calculated by applying these factors to logged output signals as follows:

Pollutant concentration (ppb) =  $F(V_s - V_z)$

Where  $V_a$  is the recorded signal from the analyser sampling ambient air.

The list of calibration factors applied to the raw data can be provided upon request.

#### Data Validation and Ratification

All data collected was thoroughly scrutinised by visual examination to ensure that there was no spurious and unusual measurements. The dedicated software used for handling the data allows data to be edited but ensures that a raw data set is always maintained.

Through ratification of the data was carried out at the end, and during, the monitoring period. Steps in the ratification process included:

- examination of the calibration records to ensure correct application of calibration factors
- examination of simultaneously monitored pollutants PM10 and NO<sub>2</sub> data monitored at the MAQU is scrutinised to ensure that there are no anomalies in either of the measured concentrations.

The data for 2011 from the automatic monitors was also ratified by AEA.

The automatic monitors were QA/QC audited by AEA during 2010/11 to the AURN standard.

Ratified Data Summaries and Time Series Plots from the automatic monitors were undertaken by Air Quality Data Management as shown in Appendix D.

#### **QA/QC of diffusion tube monitoring**

#### **Summary of Laboratory Performance in WASP NO<sub>2</sub> Proficiency Testing Scheme for Rounds 108-115.**

March 2011

**Summary of Laboratory Performance in WASP NO<sub>2</sub> Proficiency Testing Scheme for Rounds 108-115.**

*Reports are prepared by HSL for BVINPL on behalf of Defra and the Devolved Administrations.*

**Background**

The Workplace Analysis Scheme for Proficiency (WASP) is an independent analytical proficiency-testing (PT) scheme, operated by the Health and Safety Laboratory (HSL). WASP offers a number of test samples designed to test the proficiency of laboratories undertaking analysis of chemical pollutants in workplace and ambient air. One such sample is the WASP NO<sub>2</sub> test sample type that is distributed to participants in a quarterly basis.

WASP NO<sub>2</sub> PT forms an integral part of the UK NO<sub>2</sub> Network's QA/QC, and is a useful tool in assessing the analytical performance of laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). With consent from the participating laboratories, HSL provides summary proficiency testing data to the LAQM Helpdesk for hosting on the web-pages at <http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>

The WASP scheme is operated independently by HSL. The cost of operating the WASP is borne by the laboratories, which pay an annual fee to HSL.

Defra and the Devolved Administrations advise that diffusion tubes used for Local Air Quality Management should be obtained from laboratories that have demonstrated satisfactory performance in the WASP scheme.

For this reason, although WASP remains an independent proficiency-testing scheme, laboratory performance in WASP is also assessed by NPL in conjunction with separate data from the Field Intercomparison Exercise carried out at Marylebone Road, central London. The information is used to help the laboratories to identify if they have problems and may assist devising measures to improve their performance. This forms part of work for Defra and the Devolved Administrations under the Local Air Quality Management Services Contract.

This information will be updated on a quarterly basis following completion of each WASP PT round. The posting of reports to schedule is dependent on the laboratories sending their results promptly to HSL.

**WASP NO<sub>2</sub> PT Scheme overview****Purpose of scheme**

The WASP performance testing scheme uses artificially spiked Palmes type diffusion tubes to test each participating laboratory's analytical performance on a quarterly basis. Such tubes are not designed to test other parts of the measurement system e.g. sampling. Every quarter, roughly January, April, July and October each year, each laboratory receives four diffusion tubes doped with an amount of nitrite, known to HSL, but not the participants. At least two of the tubes are usually duplicates, which enables precision, as well as accuracy, to be assessed. The masses of nitrite on the spiked tubes are different each quarter, and reflect the typical analytical range encountered in actual NO<sub>2</sub> ambient monitoring in the UK when using such diffusion tubes.



**Preparation of test samples**

Diffusion tubes are spiked using a working nitrite solution prepared from a stock solution. The concentration of this stock solution is initially assayed using a titrimetric procedure. All steps in the subsequent test sample production process, involving gravimetric and volumetric considerations, are undertaken using calibrated instruments employing traceable standards. As an additional cross check, 12 spiked Palmes tubes are picked at random from each spike loading level and submitted to a third party laboratory which is accredited to ISO 17025 to undertake this analysis using an ion chromatographic procedure.

In summary, the tube spiking precision is calculated to be better than 0.5 %, expressed as a standard deviation, and this is derived from repeat gravimetric checking of the pipette device used to spike the test samples. The calculated spike values, derived from titrimetric, gravimetric and volumetric considerations, are found to be typically within  $\pm 3$  % of results obtained by the third party laboratory using an ion chromatographic analytical procedure.

**Scheme operation**

The participants analyse the test samples and report the results to HSL. HSL assign a performance score to each laboratory's result, based on how far their results deviate from the reference values for each test samples. The reference values are best estimates of the levels of nitrite doped onto the test sample tubes. At the completion of the round, laboratories receive a report detailing how they have performed and how their results relate to those of their peers.

**Performance scoring**Changes to Scoring System as reported on the LAQM website

The z-score system is used by HSL to assess the performance of laboratories participating in the WASP NO<sub>2</sub> scheme. Information on the interpretation of the z-score is provided below.

It was proposed however that HSL would migrate to an alternative scoring scheme, which is commonly used elsewhere in their WASP scheme for other PT services. In anticipation of this proposed migration, laboratory summary performance, previously reported on the LAQM website, has been based upon this WASP scoring system.

HSL has decided, upon review, to maintain the z-score system, primarily due to the fact that it is a more readily understandable scoring system when viewed by a wider audience. Hence, going forward, laboratory summary performance, to be reported on the LAQM website, will be based upon this z-score system.

Key changes to the scoring system include:

- All monthly performance scores are reported and the previous WASP scoring system, which allowed the lowest performing round result (best 4 out of 5) to be dropped, is no longer used.

## LAQM Helpdesk – March 2011

## QA-QC Framework

- The use of the z-score allows new entrants or those leaving the WASP scheme to be assessed as the score is not based on a rolling performance indicator.
- All results from UK laboratories participating in the WASP scheme are now reported (previously laboratories that did not demonstrate satisfactory performance were not included).

Z-Score performance

Performance scores are currently based upon the z-score statistic, a widely used scoring system employed in chemical proficiency testing. More detailed information is available at <http://www.hsl.gov.uk/centres-of-excellence/proficiency-testing-schemes/wasp.aspx> where the latest version of the WASP participant handbook (May 2011) can be downloaded.

The z-score,  $z_{score}$ , may be defined as:

$$z_{score} = \frac{(x_{lab} - \bar{x}_{ref})}{\sigma_{ref}}$$

where;

$x_{lab}$  = participant result from a laboratory

$\bar{x}_{ref}$  = reference result (here it is the calculated nitrite spike value)

$\sigma_{ref}$  = reference standard deviation (currently set at 7.5 % of  $\bar{x}_{ref}$ )

**Performance score interpretation**

A  $z_{score}$  may be interpreted as:

$z_{score} < \pm 2$  – satisfactory laboratory result

$z_{score} \geq \pm 2$  and  $< \pm 3$  – questionable (warning) laboratory result

$z_{score} \geq \pm 3$  – unsatisfactory laboratory result

As a general rule of thumb, provided that a laboratory does not have systematic sources of bias in their laboratory measurement system, then on average, 19 out of every 20 z-scores should be  $< \pm 2$ . In this scheme each laboratory receives 4 test samples per round and therefore submits 4 z-scores per round. Hence over 5 rounds laboratories would receive 20 test samples and report 20 z-scores.

Therefore over a five round window, one would expect that 95 % of results should be  $< \pm 2$ . If this percentage is substantially lower than 95 %, within this five round window, then one can conclude that the laboratory in question may have significant systematic sources of bias in their assay.

A summary of the WASP performance for each laboratory participating in the scheme is provided in Table 1. This table provides the percentage of results where the z-score was between -2 and +2 which is deemed to be a satisfactory z-score.



**LAQM Helpdesk – March 2011****QA-QC Framework****Contacts for HSL WASP scheme**

Further **specific** information on the WASP NO<sub>2</sub> PT scheme is available from HSL by contacting the proficiency testing team at [proficiency.testing@hsl.gov.uk](mailto:proficiency.testing@hsl.gov.uk) or at 01246 218553.

For **general** questions about the scheme within the context of LAQM activities please contact Nick Martin at NPL on 0208 943 7088 or [nick.martin@npl.co.uk](mailto:nick.martin@npl.co.uk).

**Table 1: Laboratory summary performance for WASP NO<sub>2</sub> PT rounds 108 - 115**

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent HSL WASP NO<sub>2</sub> PT rounds and the percentage (%) of results submitted which were subsequently determined to be **satisfactory** based upon a z-score of  $< \pm 2$  as defined above.

WASP Round	WASP R108	WASP R109	WASP R110	WASP R111	WASP R112	WASP R113	WASP R114	WASP R115
Round conducted in the period	Jan – March 2010	April – June 2010	June – August 2010	Oct – Dec 2010	Jan – March 2011	April – June 2011	July – Sept 2011	October – December 2011
Aberdeen Public Analysts	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Bristol City Council	75 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Cardiff Scientific Services	100 %	50 %	100 %	75 %	100 %	100 %	100 %	75 %
Edinburgh City Council	100 %	100 %	75 %	100 %	100 %	100 %	100 %	0 %
Environmental Services Group, Didcot (formerly Bureau Veritas Laboratories, Glasgow and Harwell Scientific) [1] [2]	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Exova (formerly Clyde Analytical)	100 %	50 %	50 %	100 %	100 %	100 %	0 %	75 %
Glasgow Scientific Services	50 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Gradko International [2]	100 %	87.5 %	100 %	100 %	100 %	100 %	100 %	37.5 %
Kent Scientific Services	100 %	100 %	100 %	100 %	50 %	100 %	100 %	75 %
Kirklees MBC	100 %	100 %	100 %	0 %	100 %	0 %	0 %	50 %
Lambeth Scientific Services	50 %	100 %	100 %	100 %	50 %	25 %	100 %	25 %
Lancashire County Analysts [3]	100 %	75 %	50 %	100 %	75 %	-	-	-
Milton Keynes Council	100 %	25 %	50 %	100 %	100 %	75 %	100 %	100 %
Northampton Borough Council	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Somerset Council [4]	-	-	-	-	-	-	-	100 %
South Yorkshire Council Laboratory [5]	25 %	-	-	-	-	-	-	-
South Yorkshire Air Quality Samplers [5]	-	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Staffordshire County Council	100 %	100 %	50 %	100 %	100 %	100 %	100 %	100 %
Tayside (formerly Dundee CC)	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Walsall MBC [7]	-	100 %	100 %	100 %	-	-	-	-
West Yorkshire Analytical Services	100 %	100 %	100 %	100 %	75 %	75 %	100 %	100 %

[1] Bureau Veritas laboratory and Harwell Scientific now part of ESG Group.

[2] Participant subscribes to two sets of test samples (2 x 4 test samples) in each WASP PT round.

[3] No longer involved in NO<sub>2</sub> diffusion tube measurements from R113.

[4] New participant from R115.

[5] No longer involved in NO<sub>2</sub> diffusion tube measurements from R109.

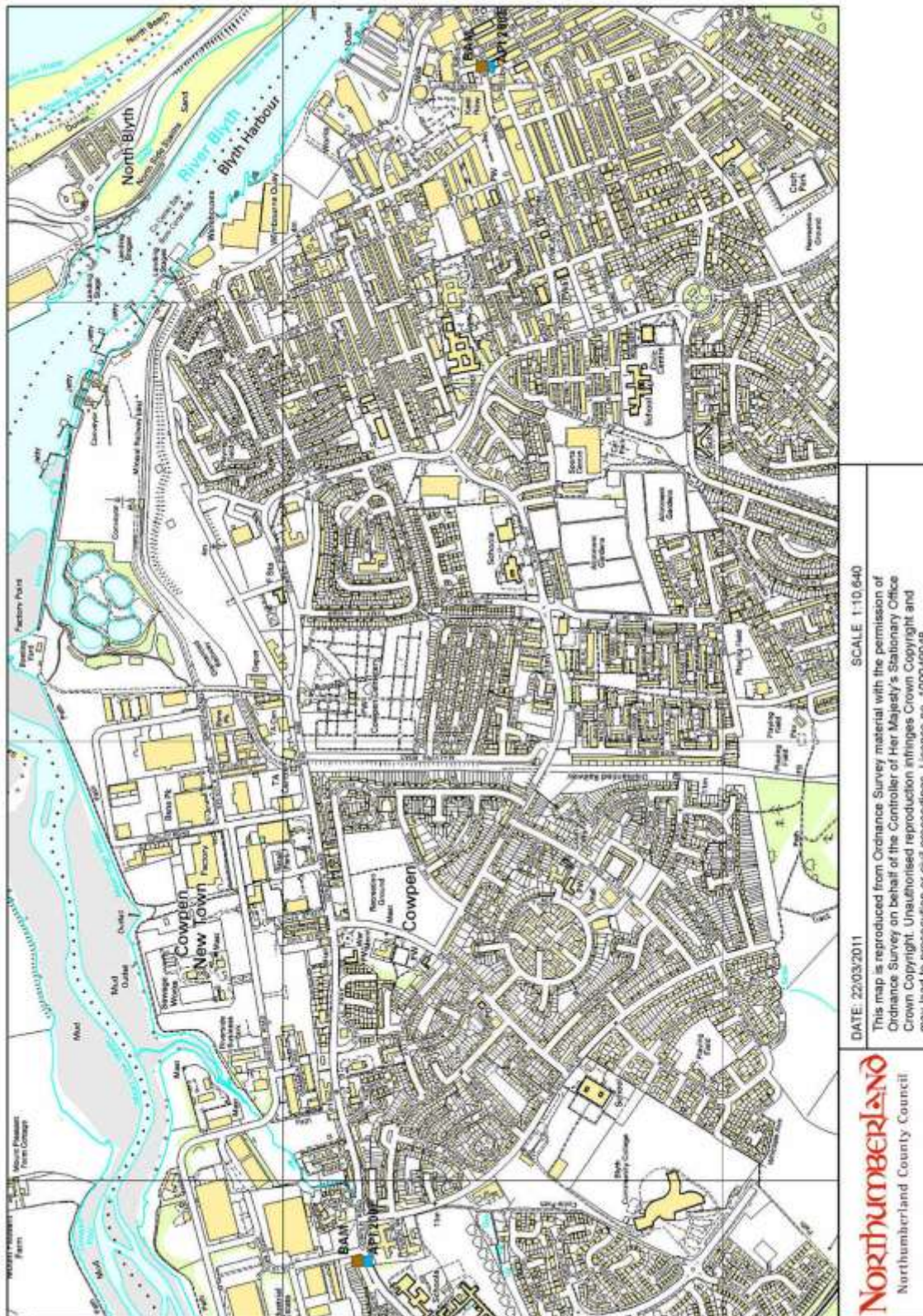
[6] New participant from R109.

[7] Results for WASP R107, R108 and R112 not submitted. No longer involved in NO<sub>2</sub> diffusion tube measurements from R113.



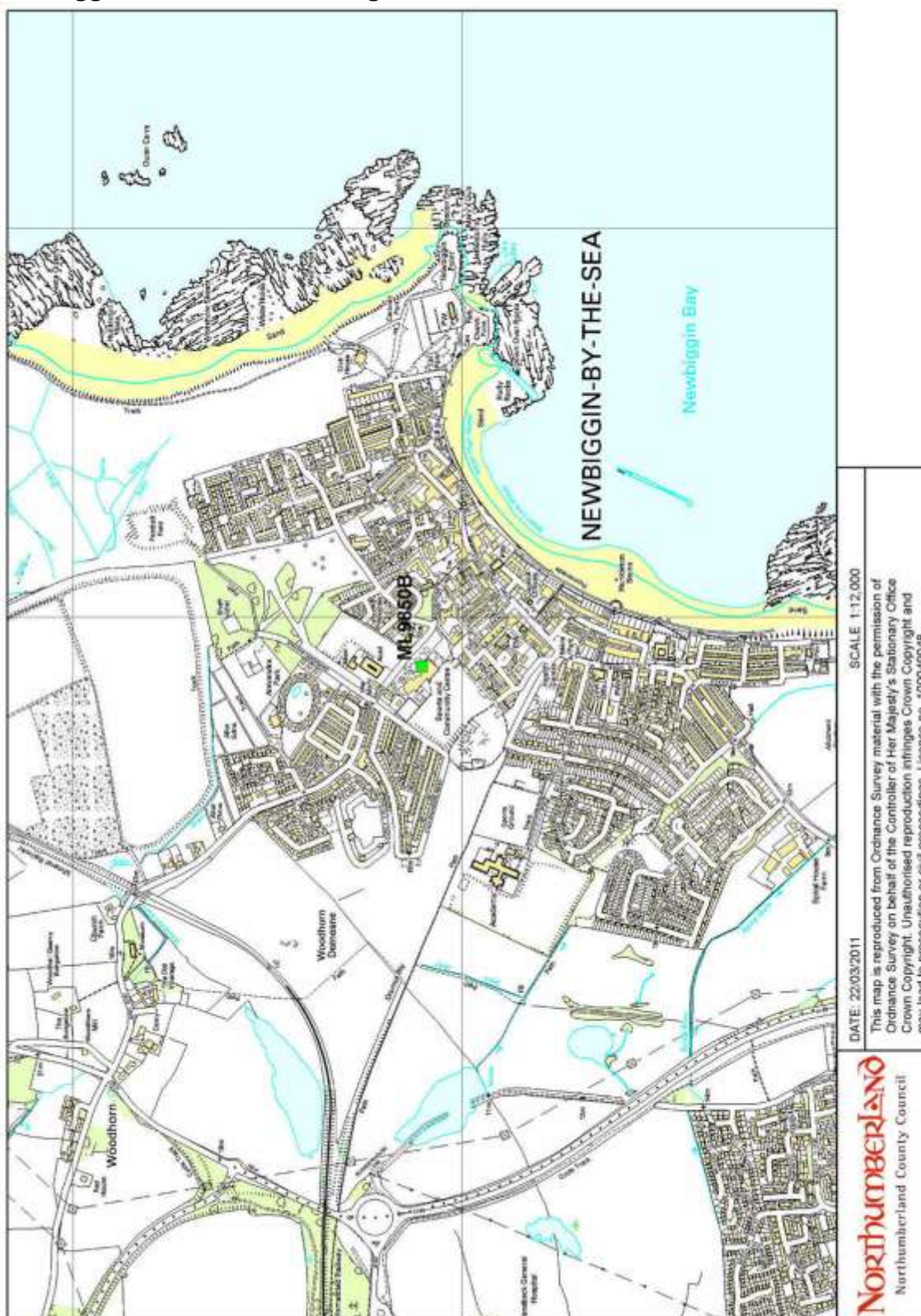
## Appendix B: Location Maps of Air Quality Monitoring Locations

### Blyth and Cowpen Automatic Monitoring Station Locations





**Newbiggin Automatic Monitoring Station Locations**





**Alnwick NO<sub>x</sub> Diffusion Tube Monitoring Locations**

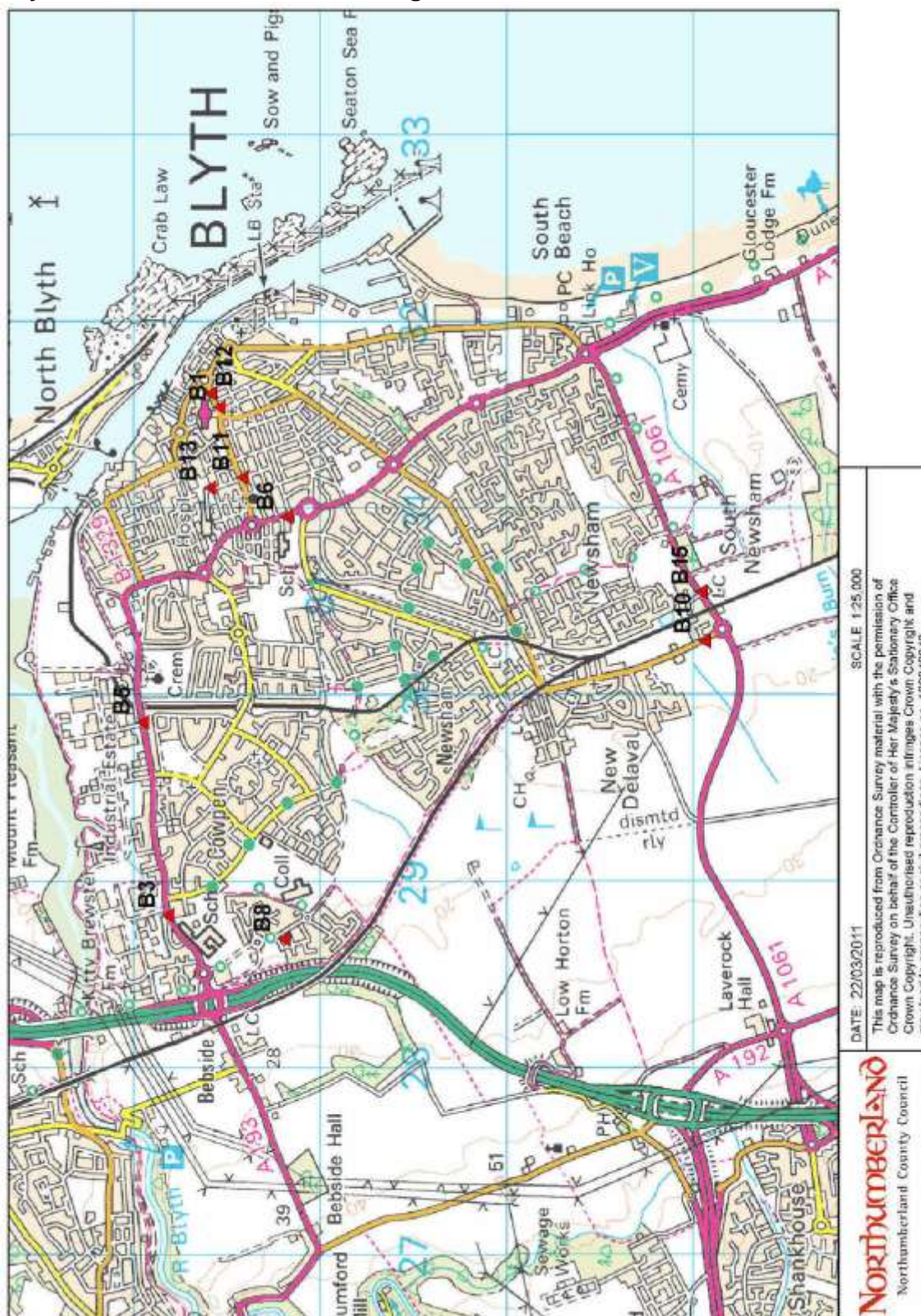


**Berwick NO<sub>x</sub> Diffusion Tube Monitoring Locations**

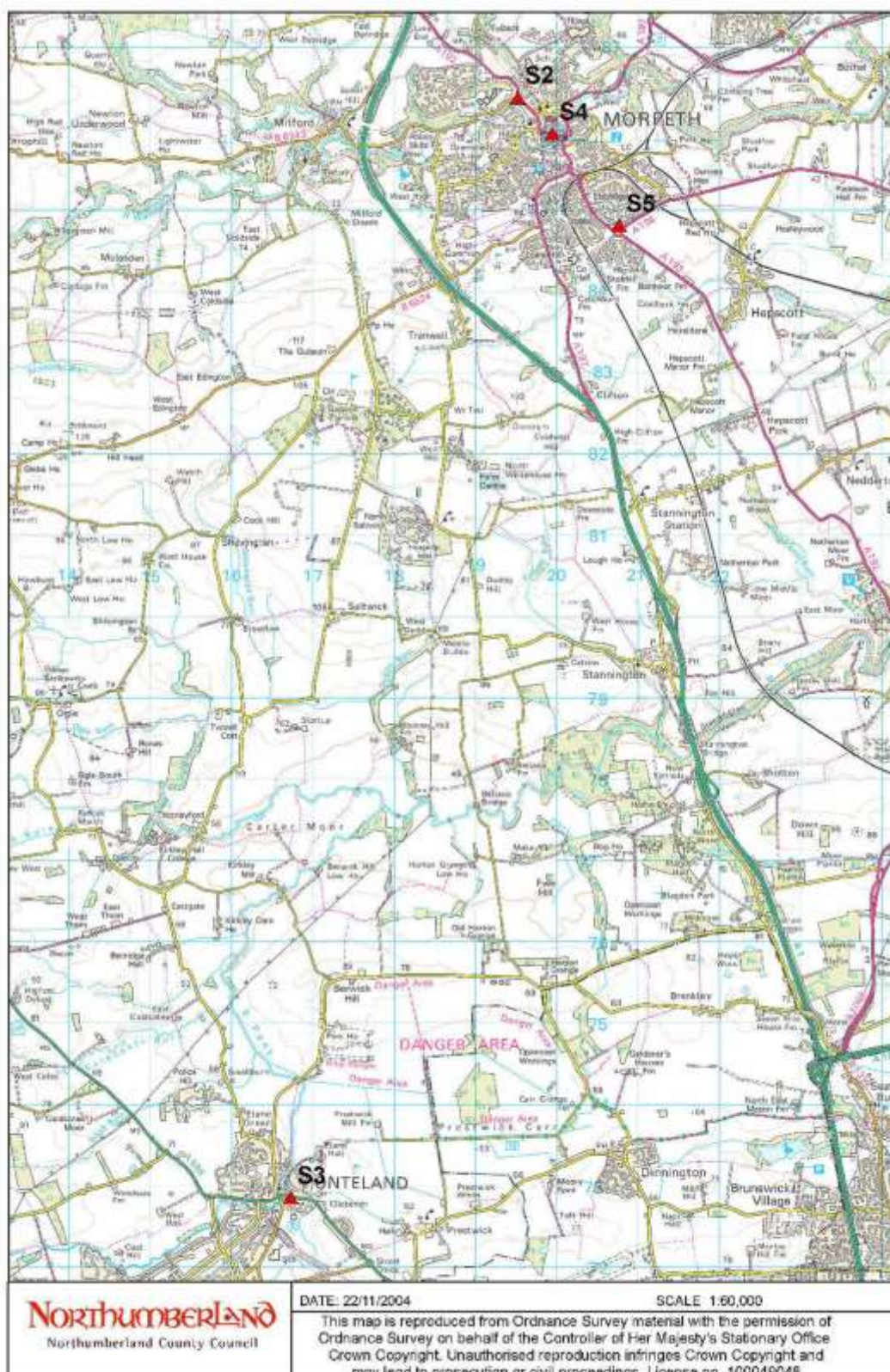




**Blyth NO<sub>x</sub> Diffusion Tube Monitoring Locations**

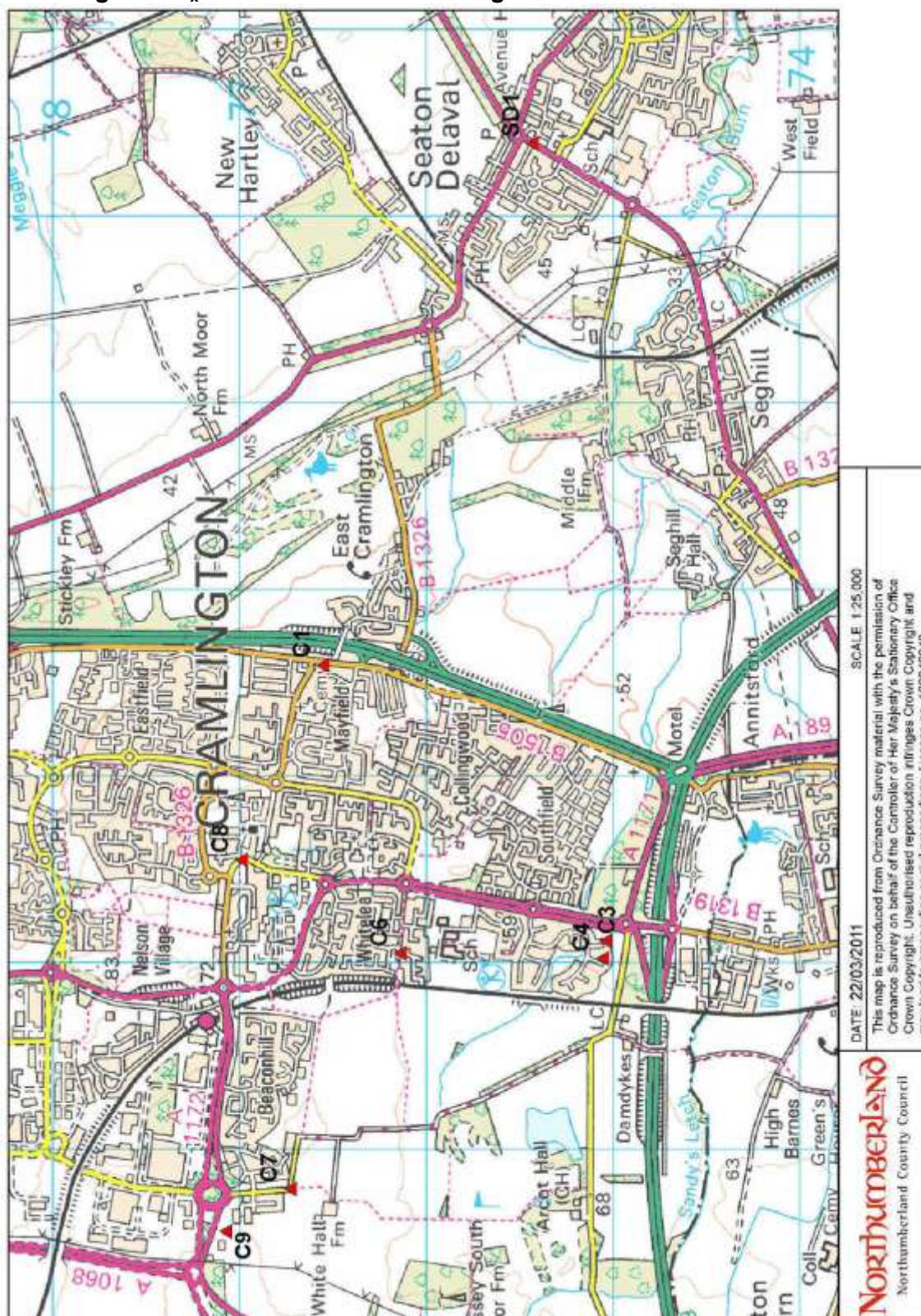




**Morpeth and Ponteland NO<sub>x</sub> Diffusion Tube Monitoring Locations**

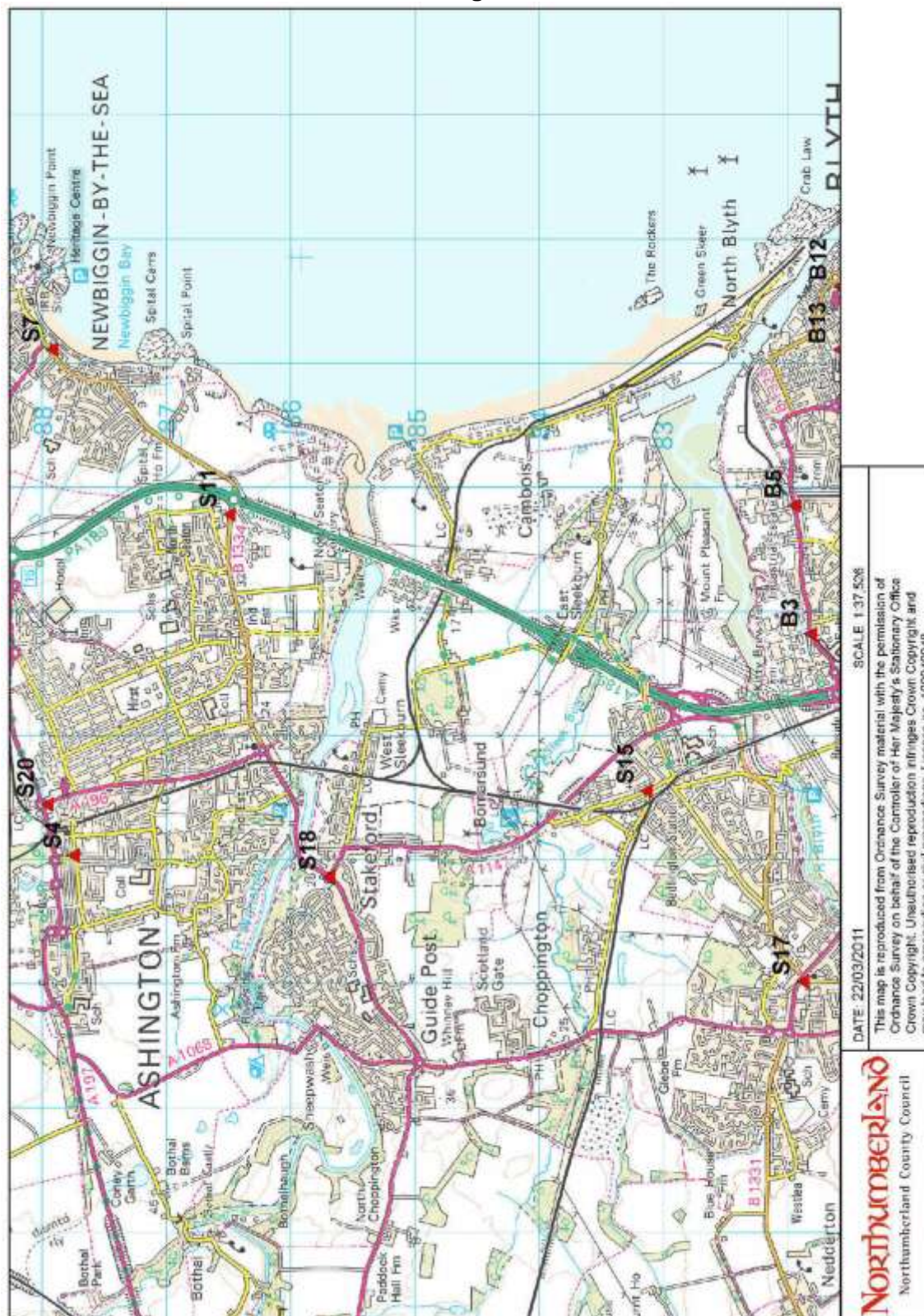


### Cramlington NO<sub>x</sub> Diffusion Tube Monitoring Locations





**Wansbeck NO<sub>x</sub> Diffusion Tube Monitoring Locations**





**VOC/Benzene Diffusion Tube Monitoring Locations**

**Appendix C: Full Monthly NO<sub>x</sub> Diffusion Tube Dataset 2011**

Site ID	Location	Type	x	y	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Bias Factor	Bias Adjusted Average	Data Capture
1N	Northumberland Hall, Alnwick	Roadside	418670	613286	21	25	17	20	11	15	13	11	11	21	22	16	17	0.84	14	100
7N	Bondgate Without, Alnwick	Roadside	418890	613210	22	29	26	40	18	30	22	18	20	33	34	18	26	0.84	22	100
8N	Bondgate Without, Alnwick	Roadside	419025	613070	38		34	48	36	43	33	32	35	51	42	39	39	0.84	33	91.7
Ber5	Main Street, Tweedmouth	Roadside	399437	652022	35	38	30	34	28	28	23	20	33	37	37	40	32	0.84	27	100
Ber7	Castlegate	Roadside	399595	653170	32	38	22	28	26	31	30	20	32	44	37	30	31	0.84	26	100
B1	Waterloo Road, opp bus station LP (X2)	Roadside	431537	581537	47	29	40	34	34	22	22	26	36	45	51	46	36	0.84	30	100
B1(2)	Waterloo Road, opp bus station LP (X2)	Roadside	431537	581537	42	26	30	33	35	25	28	30	36	43	52	45	35	0.84	30	100
B3	Cowpen Road, west end monitoring station LP	Roadside	428815	581813	42	19	28	38	31	31	14	17	37	50	55	36	33	0.84	28	100
B5	Cowpen Road, east end nr Lord Tool Hire LP	Roadside	429850	581947	31	20	20	24	13	14	28	32	20	35	44	26	26	0.84	21	100
B6	Blyth Civic Centre, flagpole LP	Roadside	430949	581178	21	21	19	19	15	11	17	14	17	23	41	14	19	0.84	16	100
B8	Beaumont Manor (ASDA) LP & V6	Urban Background	428688	581193	20	19	21	16	12	12	13	13	17	27	35	18	19	0.84	16	100
B10	Park Farm Villas, Newsham LP	Roadside	430287	578942	25	21	20	18	13	13	10	14	21	31	37	21	20	0.84	17	100
B11	Blyth YMCA LP	Roadside	431160	581415	36	15	33	33	29	27	21	26	33	40	42	39	31	0.84	26	100
B12	Bridge Street, opp Job Centre LP	Roadside	431612	581586	41	24	28	33	24	19	23	24	30	34	51	41	31	0.84	26	100
B13	Health Centre car park LP	Urban Background	431105	581589	32	22	22	19	15	9	12	13	19	32	32	23	21	0.84	17	100
B15	South Newsham Road	Roadside	430552	578950	29	21	23	21	16	16	18	18	25	33	37	22	23	0.84	19	100
C1	High Pit Road, Burton House car park LP (X2)	Roadside	427593	576555	39	31	29	29	21	19	24	24	24	32	62	23	30	0.84	25	100
C1(2)	High Pit Road, Burton House car park LP (X2)	Roadside	427593	576555	37	26	29	29	22	14	22	11	30	50	47	27	29	0.84	24	100
C3	Ruabon Close, Barns Park LP (X2)	Urban Background	426113	575041	21	23	18	15	11	9	12	12	14	28	35	18	18	0.84	15	100
C3(2)	Ruabon Close, Barns Park LP (X2)	Urban Background	426113	575041	22	17	22	17	11	10	11	24	16	28	37	14	19	0.84	16	100
C4	Rochford Grove, Barns Park & V5	Urban Background	426020	575057	23	23	21	14	11	10	11	12	16	28	34	18	18	0.84	15	100
C6	Lancastrian Drive, dead end & V9	Urban Background	426047	576139	26	20	20	15	11	9	10	12	16	28	36	15	18	0.84	15	100
C7	Kielder Avenue, Beacon Lane LP	Urban Background	424785	576728	23	20	17	15	12	7		11	15		37	10	17	0.84	14	83.3
C8	Manor Walks, BT Sainsbury's and Travellers	Roadside	426548	576990	32	22	22	21	17	13	16	15	20	34	42	24	23	0.84	19	100
C9	Trebor, Station Road	Roadside	424456	577173									21	34	32	18	26	0.84	27	100
2	Newgate Street/Bullers Green, Morpeth	Roadside	419525	586380	24	21	27	23	18	21	25	21	20	38		18	23	0.84	19	91.7
3	Police Station, Ponteland	Roadside	416724	572853	27	27	30	39	31	23	26	29	35	43	50	34	33	0.84	28	100
4	Northern Rock, Bridge Street, Morpeth	Roadside	419947	585937	24	24	38	35	24	26	37	33	24	33	45	22	30	0.84	25	100
5	Stobhill Social Club, Morpeth	Roadside	420769	584807	24	16	19	15	13	10	12	12	16	23	30	15	17	0.84	14	100
4	Station Road, Ashington (LP D127 outside of Heron Garage)	Roadside	427031	587746	33	24	28	25	20	15	18	29	20	29	37	23	25	0.84	21	100

## Northumberland County Council – England

April 2012

7	Front St, Newbiggin (LP on steps next to Methodist Church)	Roadside	431110	587918	29	19	24	18	15	13	12	24	16	21	27	20	20	0.84	17	100
11	North Seaton Roundabout (Sign post off roundabout B1334)	Road/Arterial	429778	586492	28	27	34		15	24	18	31	22	33	46	24	27	0.84	23	91.7
15	Ravensworth Car Park, Bedlington (LP on opposite site of the road)	Urban Background	427554	583137	29	23	25	23	18	16	17	28	21	28	40	18	24	0.84	20	100
17	Front Street East, Bedlington (LP next to shelter at junction of Church Ave)	Roadside	426014	581879	36	26	33	33	28	21	21	37	29	42	45	32	32	0.84	27	100
18	Wansbeck Bridge (LP on roundabout next to the care home)	Roadside	426860	585691	28	28	28	25	17	20	21	30	20	31	47	22	26	0.84	22	100
20	Portland Park (LP in Car Park)	Urban Background	427442	587959	25	26	26	23	19	12	14	29	22	36	42	22	25	0.84	21	100
SD1	Seaton Delaval, Salvation Army LP	Roadside	430387	575433	40	20	35	35	23	23	23	25	32	45	51	37	32	1.03	33	100

**Appendix D: Ratified Data Summaries and Time Series Plots from AQDM****Blyth AQ Monitoring Station**

# Air Quality Report

**Produced by AQD on behalf of Northumberland****BLYTH TOWN CENTRE 2011**

These data have been fully ratified by AQD to LAQ TG(09) standards

**Site Description**

Bridge Street, Blyth

**Air Quality Statistics**

Pollutant	PM <sub>10</sub> †	NO	NO <sub>2</sub>	NO <sub>x</sub>	PM <sub>10</sub> *‡
Number Very High #	0	-	0	-	-
Number High #	3	-	0	-	-
Number Moderate #	23	-	0	-	-
Number Low #	269	-	7200	-	-
Maximum 15-minute mean	-	561 µg m <sup>-3</sup>	372 µg m <sup>-3</sup>	1209 µg m <sup>-3</sup>	-
Maximum hourly mean	212 µg m <sup>-3</sup>	219 µg m <sup>-3</sup>	195 µg m <sup>-3</sup>	529 µg m <sup>-3</sup>	255 µg m <sup>-3</sup>
Maximum running 8-hour mean	114 µg m <sup>-3</sup>	101 µg m <sup>-3</sup>	93 µg m <sup>-3</sup>	225 µg m <sup>-3</sup>	137 µg m <sup>-3</sup>
Maximum running 24-hour mean	99 µg m <sup>-3</sup>	71 µg m <sup>-3</sup>	84 µg m <sup>-3</sup>	169 µg m <sup>-3</sup>	119 µg m <sup>-3</sup>
Maximum daily mean	95 µg m <sup>-3</sup>	67 µg m <sup>-3</sup>	76 µg m <sup>-3</sup>	162 µg m <sup>-3</sup>	114 µg m <sup>-3</sup>
99.8th percentile of hourly means	-	-	90 µg m <sup>-3</sup>	-	-
90th percentile of daily means	49 µg m <sup>-3</sup>	-	-	-	-
98.08th percentile of daily means	63 µg m <sup>-3</sup>	-	-	-	-
Average	30 µg m <sup>-3</sup>	19 µg m <sup>-3</sup>	26 µg m <sup>-3</sup>	55 µg m <sup>-3</sup>	36 µg m <sup>-3</sup>
Data capture	82.9 %	82.2 %	82.2 %	82.2 %	82.9 %

# Daily Air Quality Index (DAQI) as defined by COMEAP 1st January 2012

† PM<sub>10</sub> as measured by a BAM using a gravimetric factor of 0.83333 for Indicative Gravimetric Equivalent\* PM<sub>10</sub> as measured by a BAM

Mass units for the gases are at 20°C and 1013mb

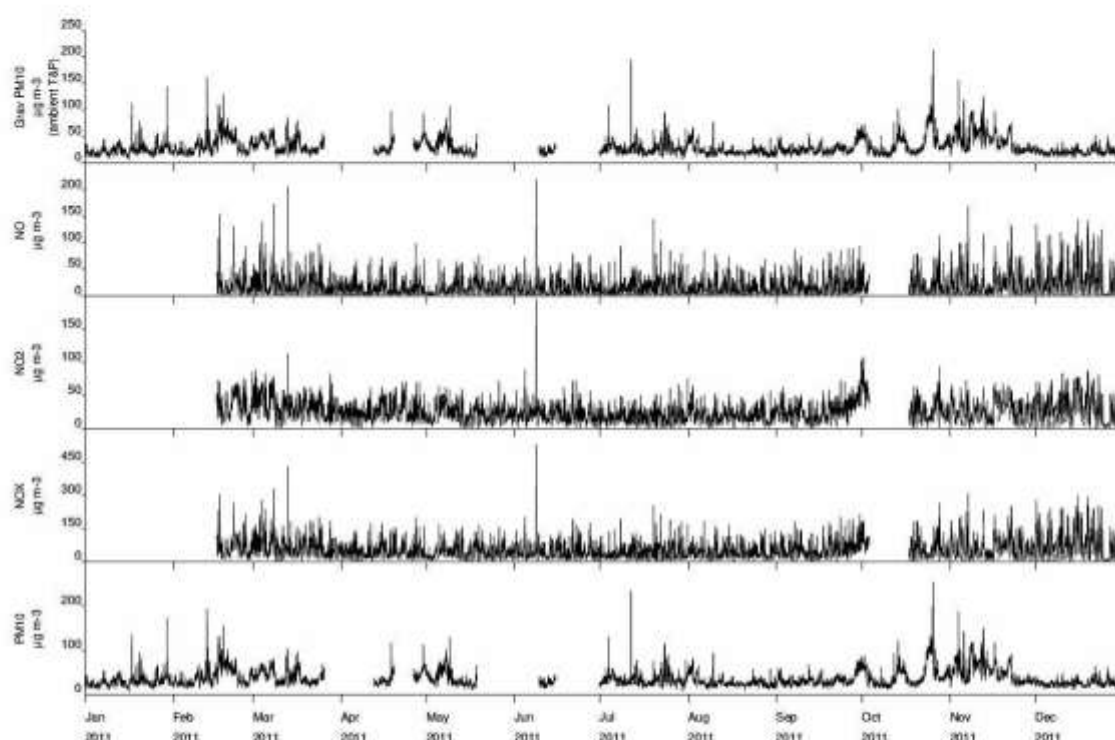
NO<sub>x</sub> mass units are NO<sub>x</sub> as NO<sub>2</sub> µg m<sup>-3</sup>**Air Quality Exceedences**

Pollutant	Air Quality (England) Regulations 2000 & (Amendment) Regulations 2002	Max Conc	Number	Days	Allowed	Exceeded
PM <sub>10</sub> Particulate Matter (Gravimetric)	Daily mean > 50 µg m <sup>-3</sup>	95 µg m <sup>-3</sup>	24	24	35 days	No
PM <sub>10</sub> Particulate Matter (Gravimetric)	Annual mean > 40 µg m <sup>-3</sup>	30 µg m <sup>-3</sup>	0	-	-	No
Nitrogen Dioxide	Annual mean > 40 µg m <sup>-3</sup>	26 µg m <sup>-3</sup>	0	-	-	No
Nitrogen Dioxide	Hourly mean > 200 µg m <sup>-3</sup>	195 µg m <sup>-3</sup>	0	0	18 hours	No



# Air Quality Report

## BLYTH TOWN CENTRE 2011 Hourly Mean Timeseries



Blyth Town Centre Air Quality Report produced by:

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<http://www.UKAirQuality.net>



## Cowpen Road AQ Monitoring Station

# Air Quality Report

Produced by AQD on behalf of Northumberland

## BLYTH COWPEN ROAD 2011

These data have been fully ratified by AQD to LAQ TG(09) standards

### Site Description

### Air Quality Statistics

Pollutant	PM <sub>10</sub> *	NO	NO <sub>2</sub>	NO <sub>x</sub>	PM <sub>10</sub> *
Number Very High #	0	-	0	-	-
Number High #	0	-	0	-	-
Number Moderate #	4	-	0	-	-
Number Low #	263	-	8472	-	-
Maximum 15-minute mean	-	483 µg m <sup>-3</sup>	237 µg m <sup>-3</sup>	840 µg m <sup>-3</sup>	-
Maximum hourly mean	127 µg m <sup>-3</sup>	350 µg m <sup>-3</sup>	139 µg m <sup>-3</sup>	670 µg m <sup>-3</sup>	152 µg m <sup>-3</sup>
Maximum running 8-hour mean	69 µg m <sup>-3</sup>	202 µg m <sup>-3</sup>	111 µg m <sup>-3</sup>	419 µg m <sup>-3</sup>	82 µg m <sup>-3</sup>
Maximum running 24-hour mean	60 µg m <sup>-3</sup>	115 µg m <sup>-3</sup>	80 µg m <sup>-3</sup>	255 µg m <sup>-3</sup>	72 µg m <sup>-3</sup>
Maximum daily mean	54 µg m <sup>-3</sup>	113 µg m <sup>-3</sup>	80 µg m <sup>-3</sup>	242 µg m <sup>-3</sup>	65 µg m <sup>-3</sup>
90th percentile of daily means	32 µg m <sup>-3</sup>	-	-	-	-
98.08th percentile of daily means	43 µg m <sup>-3</sup>	-	-	-	-
Average	19 µg m <sup>-3</sup>	27 µg m <sup>-3</sup>	29 µg m <sup>-3</sup>	71 µg m <sup>-3</sup>	22 µg m <sup>-3</sup>
Data capture	77.2 %	96.7 %	96.7 %	96.7 %	77.2 %

# Daily Air Quality Index (DAQI) as defined by COMEAP 1st January 2012

+ PM<sub>10</sub> as measured by a BAM using a gravimetric factor of 0.83333 for Inductive Gravimetric Equivalent

\* PM<sub>10</sub> as measured by a BAM

Mass units for the gases are at 20°C and 1013mb

NO<sub>x</sub> mass units are NO<sub>x</sub> as NO<sub>2</sub> µg m<sup>-3</sup>

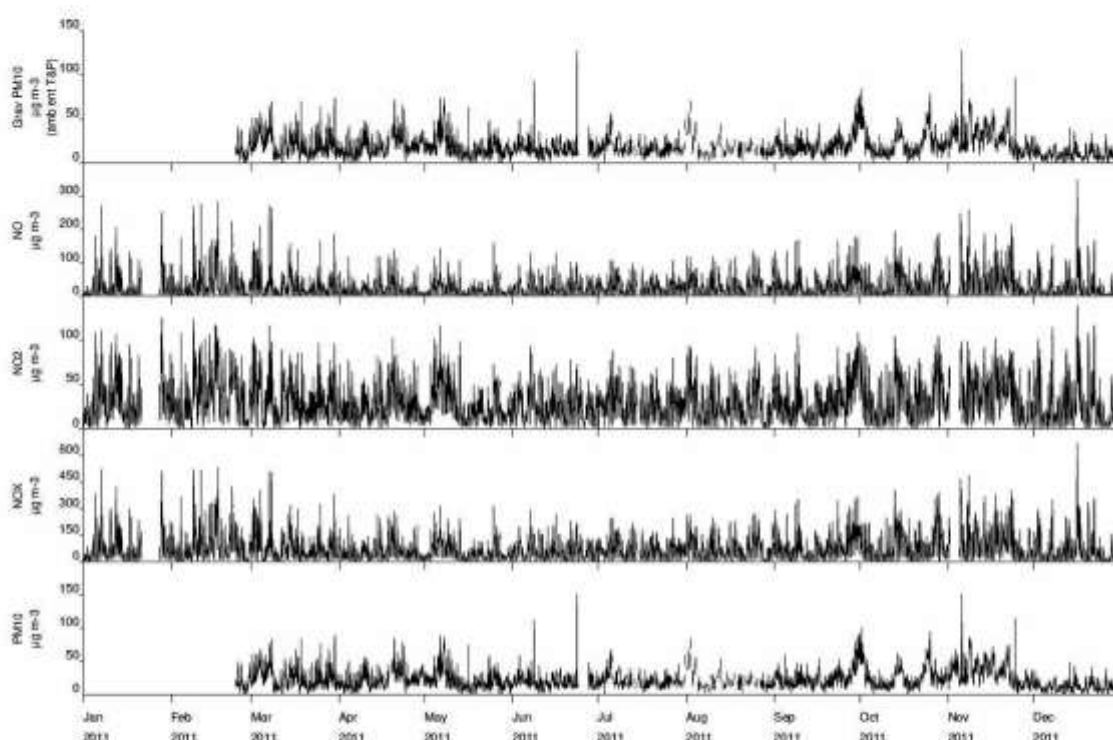
### Air Quality Exceedences

Pollutant	Air Quality (England) Regulations 2000 & (Amendment) Regulations 2002	Max Conc	Number	Days	Allowed	Exceeded
PM <sub>10</sub> Particulate Matter (Gravimetric)	Daily mean > 50 µg m <sup>-3</sup>	54 µg m <sup>-3</sup>	4	4	35 days	No
PM <sub>10</sub> Particulate Matter (Gravimetric)	Annual mean > 40 µg m <sup>-3</sup>	19 µg m <sup>-3</sup>	0	-	-	No
Nitrogen Dioxide	Annual mean > 40 µg m <sup>-3</sup>	29 µg m <sup>-3</sup>	0	-	-	No
Nitrogen Dioxide	Hourly mean > 200 µg m <sup>-3</sup>	139 µg m <sup>-3</sup>	0	0	18 hours	No



# Air Quality Report

## BLYTH COWPEN ROAD 2011 Hourly Mean Timeseries



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<http://www.uk.linkedin.com/pub/geoff-broughton/22/187/87>

<http://www.UKAirQuality.net>



# Air Quality Report

Produced by AQD on behalf of Northumberland

## NEWBIGGIN SPORTS CENTRE 2011

These data have been fully ratified by AQD to LAQ TG(09) standards

### Site Description

Newbiggin Sports Centre

### Air Quality Statistics

Pollutant	SO <sub>2</sub>
Number Very High #	0
Number High #	0
Number Moderate #	0
Number Low #	22840
Maximum 15-minute mean	138 µg m <sup>-3</sup>
Maximum hourly mean	64 µg m <sup>-3</sup>
Maximum running 8-hour mean	51 µg m <sup>-3</sup>
Maximum running 24-hour mean	35 µg m <sup>-3</sup>
Maximum daily mean	30 µg m <sup>-3</sup>
99.9th percentile of 15-minute means	48 µg m <sup>-3</sup>
99.7th percentile of hourly means	40 µg m <sup>-3</sup>
99.2nd percentile of daily means	24 µg m <sup>-3</sup>
Average	5 µg m <sup>-3</sup>
Data capture	66.1 %

# Daily Air Quality Index (DAQI) as defined by COMEAP 1st January 2012

Mass units for the gases are at 20°C and 1013mb

### Air Quality Exceedences

Pollutant	Air Quality (England) Regulations 2000 & (Amendment) Regulations 2002	Max Conc	Number	Days	Allowed	Exceeded
Sulphur Dioxide	15-minute mean > 266 µg m <sup>-3</sup>	138 µg m <sup>-3</sup>	0	0	35 15 mins	No
Sulphur Dioxide	Hourly mean > 350 µg m <sup>-3</sup>	64 µg m <sup>-3</sup>	0	0	24 hours	No
Sulphur Dioxide	Daily mean > 125 µg m <sup>-3</sup>	30 µg m <sup>-3</sup>	0	0	3 days	No
Sulphur Dioxide	Annual mean > 20 µg m <sup>-3</sup>	5 µg m <sup>-3</sup>	0	-	-	No

**Appendix E: Order to revoke an Air Quality Management Area Designation Order**

# Northumberland

Northumberland County Council

Ref: NCU000554

**Order to revoke an Air Quality Management Area Designation Order**

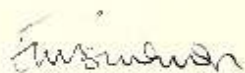
**Environment Act 1995**  
**Part IV, Section 83(2)(b)**

**Northumberland County Council** ("the County Council") in exercise of its powers under section 83 of the Environment Act 1995 ("the Act") hereby makes the following Order ("the Revocation Order"):

- 1 The **Blyth Valley Borough Council Air Quality Management Area No. 1 Order 211204** ("the Designation Order") was made by Blyth Valley Borough Council ("the Borough Council") and came into force on 22 December 2004..
- 2 The Designation Order prescribed Blyth town centre (as more specifically set out in the Designation Order) as a Designated Area for the purposes of section 83 of the Act.
- 3 The County Council is the successor authority to the Borough Council.
- 4 It appears to the County Council that upon an air quality review being carried out the air quality standards and objectives are being achieved, and are likely throughout the relevant period to be achieved, within the Designated Area for the purposes of the Air Quality (England) Regulations 2000.
- 5 In consequence of the circumstances detailed in paragraph 4 above, the County Council hereby revokes the Designation Order.

Dated this 29<sup>th</sup> day of June 2012

The Common Seal of the  
**Northumberland County Council**  
was hereunto affixed in the presence of:



Elizabeth Sinnamon  
Principal Solicitor  
Duty Authorised Officer



Seal No. 11347