



ENVIRONMENTAL HEALTH DEPARTMENT

AIR QUALITY PROGRESS REPORT



May 2008

Table of contents

Section		Page
	Table Of Contents	1
1.0	Policy background	2
2.0	Air quality review and assessment	3
2.1	Stage 1 review and assessment	3
2.2	Stage 2 review and assessment	3
2.3	Air quality management area	3
2.4	New developments	8
2.5	Conclusions	9
	Appendix 1	10
	Appendix 2	12

1.0 Policy Background

The UK Government published its strategic policy framework for air quality management in 1995 establishing both national strategies and policies on air quality issues. In Northern Ireland, the Environment (NI) Order 2002 came into operation in January 2003 which provided the framework for local air quality management (LAQM) across the province and implemented both the European Air Framework Directive 96/62 EC and the UK Air Quality Strategy. The Air Quality objectives set out in the Air Quality Regulations (NI) 2003 provides the statutory basis for the LAQM process and prescribes the air quality objectives for Northern Ireland. These are set out in Table 1

Table 1 Air Quality Objectives

Pollutant	Objective Concentration	Measured as	To be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$ (5ppb)	running annual mean	31 December 2003
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$ (1ppb)	running annual mean	31 December 2003
Carbon monoxide	11.6 $\mu\text{g}/\text{m}^3$ (10ppm)	running 8 hour mean	31 December 2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	annual mean	31 December 2004
	0.25 $\mu\text{g}/\text{m}^3$	annual mean	31 December 2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ (105ppb) not to be exceeded more than 18 times a year	1 hour mean	31 December 2005
	40 $\mu\text{g}/\text{m}^3$ (21ppb)	annual mean	31 December 2005
Particles (PM ₁₀)	50 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a year	24 hour mean	31 December 2004
	40 $\mu\text{g}/\text{m}^3$	annual mean	31 December 2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$ (132ppb) not to be exceeded more than 24 times a year	1 hour mean	31 December 2004
	125 $\mu\text{g}/\text{m}^3$ (47ppb) not to be exceeded more than 3 times a year	24 hour mean	31 December 2004
	226 $\mu\text{g}/\text{m}^3$ (100ppb) not to be exceeded more than 35 times a year	15 minute mean	31 December 2005

2.0 Air Quality Review and Assessment

2.1 Stage 1 Review and Assessment

This assessment was carried out as a desktop exercise in accordance with the relevant Technical Guidance. The assessment highlighted three areas that further investigation of the following areas was required:

- nitrogen dioxide (NO₂) – from traffic sources
- sulphur dioxide (SO₂) – from the burning of solid/smokeless fuel, and,
- particulate matter (PM₁₀) – from the burning of solid/smokeless fuel

2.2 Stage 2 Review and Assessment

In light of the findings of our Stage 1 review and assessment the following work was carried out.

Nitrogen dioxide

DMRB modelling was carried out for all major roads within the borough. This modelling indicated that it was unlikely that the Air Quality Objectives for NO₂ would be exceeded. However monitoring was then carried out to establish if the modelling predictions were accurate and indeed monitoring showed that within one area of the borough, Main Street Dungiven NO₂ levels were in excess of the annual mean objective level of 40 µg m⁻³.

Sulphur dioxide and Particulate matter modelling

Given that the stage 1 assessment had flagged up issues around the levels of these two pollutants modelling was carried out to establish if levels of both were high. Modelling indicated that whilst the SO₂ levels were well below the objective levels there was the possibility of 'hotspots' for PM₁₀ within one of the three residential areas modelled. To assess if this was the case continuous monitoring was carried out over a six month winter period which indicated that PM₁₀ levels were well below the national air quality objective levels.

Update Screening and Assessment

An update screening and assessment exercise was carried out in 2006. This report flagged up the continuing issues within the Dungiven AQMA but indicated that other pollutant levels within the borough were below the air quality objective levels. There has been little or no change within the borough which would impact on these levels. The NO₂ levels within the AQMA were the only issue which the USA report suggested warranted further investigation.

2.3 Air Quality Management Area (AQMA)

Given the monitored levels of nitrogen dioxide within Main Street Dungiven a section of the street was declared an AQMA in March 2006. The AQMA is shown in Appendix 1. Monitoring has continued since within the AQMA and an action plan has been drawn up stating those measures which Council and the relevant authorities feel could be implemented to reduce levels.

2006 and 2007 monitoring data

Since the AQMA was declared passive monitoring has been carried out within the AQMA. This work was undertaken for two reasons:

- to comply with the legislative requirement to continually monitor within an AQMA
- to determine if the AQMA boundary has been accurately delineated

Duplicate passive diffusion tubes (20% TEA in water) were set up at various locations along Main Street. Appendix 2 shows the locations of these tubes. A set of tubes were located in New Street to provide information on the background levels of NO₂. The data obtained for the periods since this declaration are set out in Tables 2 - 6.

Table 2

NO₂ Passive diffusion tube monitoring, Dungiven AQMA 2006

Tube	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
A1	58.35	59.54	51.13	50.67	46.62	39.43	57.70	*	46.93	62.92	52.91	41.74
A2	56.20	52.23	53.52	45.05	43.85	42.66	52.49	*	40.50	54.34	36.71	44.45
B1	68.43	58.43	52.40	45.76	48.76	53.63	20.97	51.11	65.89	56.51	58.62	43.47
B2	65.95	67.14	58.57	38.27	45.94	55.40	21.08	45.96	65.57	64.20	60.98	43.85
C1	64.71	65.69	63.40	43.28	53.27	51.13	56.87	65.75	56.71	64.40	51.18	46.18
C2	59.18	58.32	55.55	37.97	60.67	54.61	49.51	56.06	50.23	64.79	44.56	41.13
D1	59.34	46.92	40.28	41.86	45.60	48.11	46.96	42.25	48.18	54.04	53.34	*
D2	53.56	46.19	42.83	40.80	45.66	50.84	46.75	43.49	48.12	50.19	48.41	48.29
E1	57.11	52.45	47.11	48.45	42.27	43.92	-	45.65	45.58	52.46	50.82	50.09
E2	53.97	40.44	51.52	47.59	45.15	50.56	-	47.30	53.04	46.55	52.39	52.43
F1	-	56.19	48.40	35.03	38.77	37.27	47.48	35.19	39.05	43.83	40.30	37.22
F2	-	57.87	48.05	41.00	43.62	39.55	45.03	49.57	45.80	49.16	39.68	36.27
G1	50.99	47.87	47.81	40.75	35.16	43.29	51.03	36.58	52.98	-	48.58	44.67
G2	63.06	54.41	43.45	40.03	37.98	45.19	46.28	41.01	54.11	-	41.35	49.19
H1	62.65	52.00	51.75	47.59	41.48	53.37	59.06	42.10	56.07	53.65	58.06	55.22
H2	53.72	51.22	51.22	46.52	43.85	57.24	58.43	46.06	58.66	59.07	50.55	54.69
I1	59.76	55.63	56.69	-	-	-	-	-	-	-	45.19	-
I2	*	*	*	*	*	*	*	*	*	*	*	*
J1	32.73	24.19	23.00	21.36	18.68	18.54	23.01	23.50	-	18.24	26.79	24.75
J2	30.08	24.13	22.08	14.28	19.41	19.24	22.23	22.31	-	25.69	25.67	25.01
DC1	44.04	47.40	37.72	27.98	31.04	32.77	36.47	24.68	32.36	40.74	*	40.44
DC2	42.31	41.55	40.15	23.57	28.84	30.24	36.79	25.71	34.03	37.73	42.14	40.89
DC3	44.79	46.79	39.93	28.59	30.70	35.37	34.60	22.52	34.62	37.14	44.16	39.84
DAUN1	31.18	24.90	19.41	12.12	10.46	12.08	12.56	10.46	14.28	18.69	25.41	18.94
DAUN2	26.15	22.72	18.49	10.34	11.77	13.08	14.07	9.53	18.97	19.97	20.18	10.14
DAUN3	23.18	22.17	19.85	13.84	13.19	14.26	12.71	8.19	13.42	17.80	20.57	12.22

All figures in µg/m³

- missing tube

* control - not exposed J1 & J2: background monitoring site, New Street, Dungiven.

DC1-DC3: Dales Corner, Derry City Council continuous NO_x monitor – Collocation study

DAUN1-DAUN3: Derry City Council AURN site continuous background NO_x monitor – collocation study

** bias as stated in University of West England website www.uwe.ac.uk/aqm/review/links.html (overall factor 0.98 (2006 data) Gradko 20%TEA in water).

These monthly results have been averaged and Table 3 shows the annual mean concentrations of NO₂ for each tube

Table 3: NO₂ Annual Mean, Dungiven 2006

Sampling point	Location in Dungiven	Annual mean NO ₂ concentration (µg/m ³)
A1	Main Street	51.63
A2	Main Street	47.45
B1	Main Street	51.99
B2	Main Street	52.74
C1	Main Street	56.88
C2	Main Street	52.71
D1	Main Street	47.89
D2	Main Street	47.09
E1	Main Street	48.72
E2	Main Street	49.17
F1	Main Street	41.70
F2	Main Street	45.05
G1	Main Street	45.43
G2	Main Street	46.90
H1	Main Street	52.75
H2	Main Street	54.41
I1	Main Street/ Ballyquin Rd junction	54.31
I2	Not exposed	- (control)
J1	New Street	23.16 (background)
J2	New Street	23.71 (background)

As duplicate diffusion tubes were used at each sampling point the results for each site have been averaged and the results are shown in Table 4

Table 4 Average annual mean concentration for each site, Dungiven AQMA (2006)

Site	Location	Annual mean NO ₂ concentration (µg/m ³)
A	Main Street	49.54
B	Main Street	52.36
C	Main Street	54.79
D	Main Street	47.49
E	Main Street	48.95
F	Main Street	43.37
G	Main Street	46.16
H	Main Street	53.58
I	Main Street/ Ballyquin Rd	54.31
J	New Street	23.43 (background)

Table 5 below lists the monitoring results obtained at the sampling sites in Dungiven for the period January to December 2007. The annual mean concentrations have been calculated from these monthly values and are shown in Table 6. Monitoring at sites K-O commenced in May 2007.

Table 5: Nitrogen dioxide monitoring results 2007, AQMA Dungiven

Tube	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
A1	52.40	55.10	49.81	62.75	47.51	60.28	52.89	69.99	51.79	56.94	54.98	50.34
A2	53.92	54.08	50.27	46.98	56.61	60.68	52.54	41.26	61.10	58.13	53.87	43.90
B1	56.66	-	57.77	70.82	48.60	49.90	42.87	51.42	47.99	-	49.38	64.11
B2	54.35	-	59.31	54.83	54.11	61.89	55.26	50.42	56.41	-	50.18	76.21
C1	53.72	60.95	63.92	80.08	61.07	79.33	79.08	83.44	67.36	70.87	63.94	62.55
C2	55.91	48.11	72.69	68.56	64.50	83.27	72.18	70.32	60.21	66.23	64.34	55.72
D1	52.11	53.79	55.15	59.60	50.95	50.50	46.82	46.20	49.32	54.66	51.03	50.93
D2	53.22	52.31	56.50	60.78	50.49	42.19	52.81	45.09	50.65	50.02	52.32	49.76
E1	54.84	58.90	54.33	62.28	61.92	49.95	49.93	49.00	50.90	63.14	57.63	60.10
E2	56.21	60.04	57.41	65.42	56.10	49.24	47.67	50.34	57.04	62.50	56.97	47.42
F1	51.18	55.21	52.53	56.26	42.04	68.85	48.71	52.25	60.95	48.46	53.28	-
F2	52.08	50.21	48.91	51.69	41.99	65.83	57.82	52.34	54.19	46.55	52.63	-
G1	44.73	51.40	52.71	-	41.08	47.03	38.44	37.85	42.87	65.41	42.83	62.07
G2	45.72	53.22	47.64	-	42.07	49.55	39.18	39.30	48.69	60.58	44.03	55.04
H1	57.92	62.08	49.72	66.86	50.37	54.64	49.54	48.34	-	61.76	-	57.19
H2	56.50	63.10	51.71	65.56	57.75	61.89	50.22	49.92	-	61.40	-	57.87
I1	-	61.74	-	63.98	45.63	51.01	39.94	34.35	40.84	47.37	-	52.40
I2	*	*	*	*	*	*	*	*	*	*	*	*
J1	23.33	30.44	27.21	23.76	19.82	23.39	19.90	19.19	21.72	-	20.19	-
J2	22.71	31.98	24.73	22.05	18.68	22.98	21.26	19.24	21.02	27.78	21.00	-
K1					43.94	41.54	40.01	42.26	-	45.92	42.03	39.08
K2					36.66	41.89	40.52	41.05	-	44.10	43.09	40.06
L1					50.82	45.01	48.37	46.34	46.92	60.31	47.39	51.81
L2					48.12	46.87	48.77	47.92	49.39	56.40	45.38	52.98
M1					-	67.74	50.58	52.50	44.13	43.91	42.16	44.79
M2					-	62.90	51.31	47.01	47.74	48.20	41.86	42.64
N1					-	-	53.16	46.26	39.00	-	-	44.89
N2					-	-	55.37	43.51	44.57	-	-	39.91
O1					-	45.16	35.87	36.51	-	49.02	44.82	-
O2					-	42.78	35.65	35.69	-	36.58	42.65	-
DC1	32.97	23.49	-	33.21	31.72	37.75	31.48	28.95	36.01	40.27	-	44.54
DC2	33.41	36.65	41.83	35.63	37.64	39.52	30.64	27.53	31.26	30.97	-	44.20
DC3	32.53	44.71	40.28	33.94	35.56	-	32.05	26.37	32.21	39.13	-	33.34
DAUN1	10.14	34.24	18.06	16.00	12.13	12.90	11.75	09.78	16.59	22.33	19.83	19.97
DAUN2	11.93	29.30	16.61	19.13	12.18	13.10	11.24	11.11	15.07	20.00	18.74	28.33
DAUN3	10.78	22.77	22.22	17.50	13.58	13.10	10.34	10.45	14.75	20.60	17.97	26.86

All figures in $\mu\text{g}/\text{m}^3$

- missing tube

* control - not exposed

J1 & J2: background monitoring site, New Street, Dungiven.

DC1-DC3: Dales Corner, Derry City Council continuous NOx monitor – Collocation study

DAUN1-DAUN3: Derry City Council AURN site continuous background NOx monitor – collocation study

** bias as stated in University of West England website www.uwe.ac.uk/aqm/review/links.html (overall factor 0.89 (2007 data) Gradko 20% TEA in water).

Table 6 Annual mean NO₂ concentrations, Dungiven AQMA (2007)

Tube	Location	Annual mean NO ₂ concentration (µg/m ³)	Annual mean NO ₂ concentration (µg/m ³) – bias adjusted (x 0.89)
A1	Main Street	55.39	49.30
A2	Main Street	52.77	46.96
B1	Main Street	53.95	48.02
B2	Main Street	57.29	50.99
C1	Main Street	68.86	61.23
C2	Main Street	65.17	58.00
D1	Main Street	51.75	46.06
D1	Main Street	51.34	45.69
E1	Main Street	56.07	49.90
E2	Main Street	55.53	49.22
F1	Main Street	53.61	47.71
F2	Main Street	52.20	46.46
G1	Main Street	43.96	39.12
G2	Main Street	47.73	42.47
H1	Main Street	55.84	49.69
H2	Main Street	57.53	51.20
I1	Main Street	48.58	43.23
I2	Not exposed (control)	*	*
J1	New Street (background)	22.89	20.37
J2	New Street (background)	23.04	20.50
K1	Main Street		
K2	Main Street		
L1	Main Street		
L2	Main Street		
M1	Main Street		
M2	Main Street		
N1	Main Street		
N2	Main Street		
O1	Main Street		
O2	Main Street		
DC1	Dales Corner Derry City	34.04	30.29
DC2	Dales Corner Derry City	35.38	31.49
DC3	Dales Corner Derry City	35.01	31.16
DAUN 1	Brooke Park Derry City	16.97	15.10
DAUN2	Brooke Park Derry City	17.23	15.33
DAUN3	Brooke Park Derry City	16.74	14.90

The monitored levels have been bias adjusted in line with current technical guidance. Annual data is not available at present for sites K-O.

Table 7 Annual mean NO₂ concentrations at monitoring sites, Dungiven AQMA

Site	Location	Annual mean NO ₂ concentration (µg/m ³)	Annual mean NO ₂ concentration (µg/m ³) – bias adjusted (x 0.89)
A	Main Street	54.08	48.13
B	Main Street	55.62	49.50
C	Main Street	67.02	59.65
D	Main Street	51.54	45.87
E	Main Street	55.80	49.66
F	Main Street	52.90	47.08
G	Main Street	45.84	40.79
H	Main Street	56.68	50.44
I	Main Street	45.82	40.77
J	New Street	22.96	20.43
DC	Dales Corner Derry City	34.81	30.98
DAUN	Brooke Park Derry City	16.98	15.11

All site annual mean concentrations within Dungiven with the exception of New Street (background site) are above the annual mean objective level for NO₂ of 40 µg/m³.

The action plan for the AQMA sets out what measures Council and DRD Roads Service feel can be implemented to improve air quality within Dungiven. It is felt that whilst there are many measures which impact on traffic emissions and many of these have been seen to be quite effective in other areas the only solution to the nitrogen dioxide issue in Dungiven is the construction of a bypass. This matter is being considered by the Department of Regional Development at ministerial level. A bypass of the village is proposed as part of a wider dualling scheme of the A6 from Londonderry to Dungiven. This scheme is in the pipeline and the preferred route will be determined by 2009. This scheme forms part of the Strategic Transport Network Transport Plan (RSTN TP) 2015. In the interim Limavady Borough Council will continue to monitor levels within the AQMA. It is envisaged that a continuous monitor will be installed within the AQMA within the next year. A source apportionment exercise is being carried out to determine the reduction in traffic volume which is required to reduce pollutant levels to below that of the air quality objective levels.

2.4 New local developments

Within the AQMA and indeed the borough there have been no significant developments which would impact on air quality. There have been no Part A, B or C prescribed processes undertaken, no new retail development and no new roads constructed in the last three years. No additional quarrying activity has been undertaken and those existing quarries within the borough are not in close proximity to relevant locations. The Council operated landfill site within the borough has now closed and no new private landfill sites have been licensed. The Council are not aware of any pending planning applications which will impact on air quality, not only within the AQMA but within the borough. Residential development within the borough

continues at various locations but it is not felt that these dwellings are at relevant locations nor do they impact on air quality. They are of a similar type and density to existing housing within these areas.

Conclusions

In summary the current indications would suggest that the air quality objective levels are being achieved with the exception of the annual mean objective level for NO₂ within the AQMA in Dungeness. This issue forms the basis of our action plan and further work will be undertaken to assess the situation. Monitoring will continue and discussions will take place in the very near future with all relevant authorities to determine how this issue can be resolved.

Should any significant changes occur within the borough which would significantly impact on the levels of other pollutants a detailed assessment will be undertaken.

APPENDIX 1



Map showing designated AQMA in Dungiven

APPENDIX 2

**Map 2: NO_x Sampling points within Dungiven
AQMA**



