

NEWTOWNABBEY BOROUGH COUNCIL
Environmental Services Department

LOCAL AIR QUALITY PROGRESS REPORT

APRIL 2005



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1 INTRODUCTION

- 1.1 Local authorities in Northern Ireland have air quality management duties which are specified in Part III of The Environment (Northern Ireland) Order 2002. The aim of these duties is to deliver the national objectives as set out in the Air Quality Strategy for England, Wales and Northern Ireland.
- 1.2 In August 2004 Newtownabbey Borough Council published its detailed Second and Third Stage Review and Assessment of Local Air Quality.
- 1.3 Local authorities in Northern Ireland are now required to prepare a Progress Report as specified in Environment (Northern Ireland) Order 2002 Local Air Quality Management Progress Report Guidance LAQM.PRGNI (04). Some of the aims of the Progress Report are to provide a means of communicating air quality information to elected members and the public and providing information to assist in other policy areas such as transport and land planning. The overall aim of the report is to:
- Report progress on implementing local air quality management; and
 - Report progress in achieving or maintaining concentrations below the air quality objectives.
- 1.4 In order to achieve this Newtownabbey Borough Council's progress report will focus on:
- **New monitoring results** (since those reported in Second/Third Stage Review and Assessment)
 - **New local developments** likely to affect air quality

2 NEW MONITORING RESULTS

2.1 Automatic Monitoring Sites

Nitrogen Dioxide

From April 2003 the automatic monitoring of NO₂ has been undertaken at two roadside locations in the Borough using chemiluminescent analysers. The analysers are sited at:

Location	Grid Ref.
Antrim Road, Mallusk	305 830
Shore Road	347 805

Sulphur Dioxide and Particulate Matter

From February, 2005 the automatic monitoring of SO₂ and PM₁₀ has been undertaken in the Ballyclare area using a chemiluminescent analyser and a TEOM. The station is sited at:

Location	Grid Ref.
Ollardale, Ballyclare	283 909

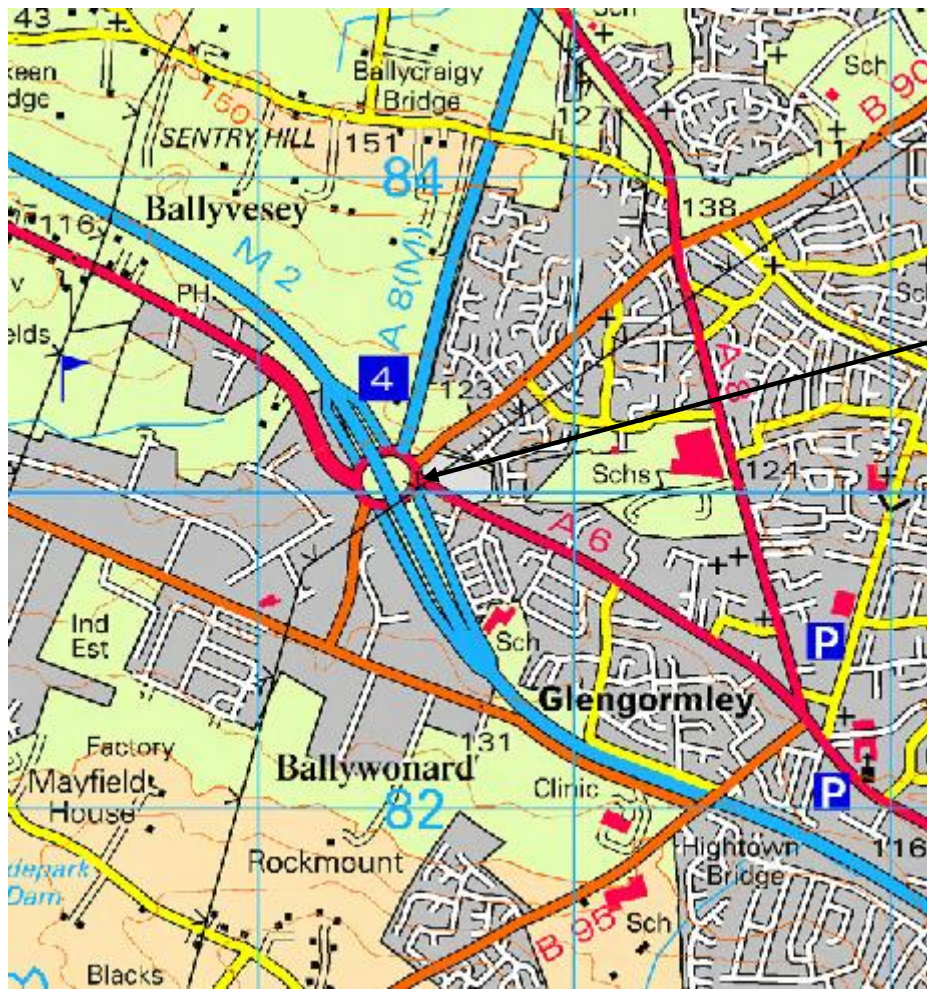
Monitoring sites are shown on the following maps.

QA/QC

All the monitors are covered by a QA/QC contract with Netcen.

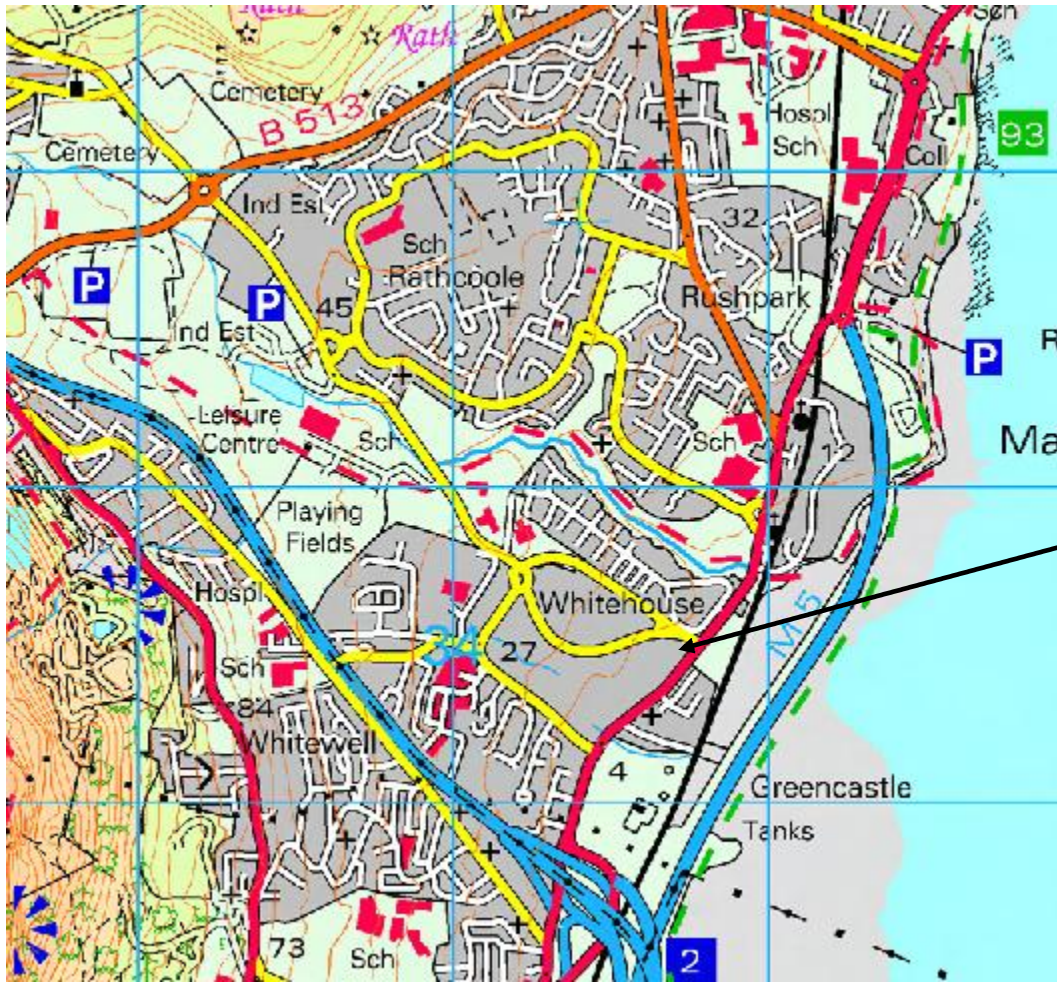
The Data Quality Report by Netcen for the two NO₂ sites for the period 1 April 2004 to 30 September 2004 is shown in Appendix 1.

Mallusk NO₂ Analyser Site



Analyser Site

Shore Road NO₂ Analyser Site



Analyser Site

2.2 Automatic Monitoring Results

Nitrogen Dioxide

The mean nitrogen dioxide concentrations obtained from ratified data for the period 1 April, 2004 to 30 September, 2004 are shown below:

Location	Mean NO2 Conc. μgm^{-3}	Maximum Hourly Average μgm^{-3}
Antrim Road, Mallusk	23.3	85
Shore Road	21.7	86.7

The monthly nitrogen dioxide concentrations for 1 January, 2004 to 31 December, 2004 are shown below:

Mallusk

	NO2 (μgm^{-3})	% Data Capture	Ratified/ Provisional
January	33	96	R
February	45	89	R
March	29	54	R
April	29	95	R
May	33	98	R
June	26	100	R
July	25	100	R
August	28	100	R
September	24	99	R
October	33	97	P
November	36	100	P
December	32	100	P

Shore Road

	NO ₂ (µg ^m ⁻³)	% Data Capture	Ratified/ Provisional
January	33	96	R
February	38	89	R
March	28	54	R
April	28	94	R
May	29	94	R
June	24	95	R
July	23	96	R
August	26	95	R
September	24	95	R
October	31	97	P
November	33	100	P
December	31	100	P

The mean nitrogen dioxide concentrations for the period 1 January, 2004 to 31 December, 2004 at both automatic monitoring sites are below the Annual Mean Air Quality Objective of 40 µg^m⁻³.

Sulphur Dioxide and Particular Matter

There is no ratified data available for either of these analysers.

2.3 Passive Monitoring

Nitrogen Dioxide

Passive diffusion tubes are used to measure nitrogen dioxide at a number of roadside locations throughout the Borough. The tubes remain at the location for a four week exposure period and are then sent to Lambeth Scientific Services Limited, London for analysis and to calculate the average NO₂ concentration at each location.

Since June 2003 tubes were placed in triplicate at the two automatic monitoring sites.

In June 2004 a review of diffusion tube monitoring site results was completed. As a result, monitoring at several sites ceased and some tubes were relocated to a more appropriate location close to a sensitive receptor. In December 2004 a tube was also located at a property in Collinbridge, Newtownabbey which had been identified in the Environmental Statement for the M2 widening scheme as the closest property to the M2.

2.4 Passive Monitoring Results

Diffusion tube results for 2004 are listed below (where tube missing/zero result recorded, average taken for number of tubes present).

Live sites are highlighted in black.

Site Ref.	Location	No. of Tubes Averaged	Average
1	Main Street, Ballyclare	11	27
2	Burnthill Road	6 (ceased Jun 04)	18
3	St Bernard School	6 (ceased Jun 04)	26
4	Hightown/Mallusk Road	6 (ceased Jun 04)	28
5	McMillan House	12	26
6	Greenacres	6 (ceased Jun 04)	17
7	Valley Leisure Centre	6 (ceased Jun 04)	22
8	Braden Heights	12	12
9	Merville Garden Village	6 (ceased Jun 04)	20
10	M5, Shore Road	5 (ceased Jun 04)	28
11	44 Sandyknowes Avenue	10	24
12	12 Sandyholme Way	9 (commenced Apr 04)	30
12	Tudor Park, Mallusk	3 (ceased Mar 04)	10
13	Scullions Road, Mallusk	6 (ceased Jun 04)	20
14	Btm Main Street, Ballyclare	6 (ceased Jun 04)	19
15	North End, Ballyclare	6 (ceased Jun 04)	40
16	Doagh Village	10	22
17	The Longshot, Doagh	6 (ceased Jun 04)	19
18	Main Street, Ballynure	6 (commenced Jul 04)	23
18	Main Street, Ballynure	6 (ceased Jun 04)	19
19	A8, Doagh Road	3 (ceased Jun 04)	14
20	A8M at Sandyknowes	12	26
21	Ballyclare Road/Manse Road	12	23
22	Nortel	6 (ceased Jun 04)	16
23	Opp. 189 Doagh Road	6 (ceased Jun 04)	25

24	O'Neill Road/Doagh Road	6 (ceased Jun 04)	18
25	Station Road	6 (ceased Jun 04)	21
26	690 Shore Road	6 (ceased Jun 04)	19
27	1A Jordanstown Road	6 (commenced Jul 04)	22
27	Opp. 1A Jordanstown Road	6 (ceased Jun 04)	20
28	Jordanstown Road	6 (ceased Jun 04)	18
29	174 Monkstown Road	6 (ceased Jun 04)	16
30	Hillhead Road/Mill Road	6 (ceased Jun 04)	18
31	Bernice Road/Mallusk Road (at stop sign)	6 (commenced Jul 04)	11
31	Bernice Road/Mallusk Road	6 (ceased Jun 04)	13
32	Antrim Road (Sandyknowes)	6 (ceased Jun 04)	25
33	Manse Road/Prince Charles Way	6 (ceased Jun 04)	21
34	Old Carrick Road	6 (ceased Jun 04)	20
35	Henryville Court	6 (ceased Jun 04)	13
36	NOx Analyser, Antrim Road	12	26
37	NOx Analyser, Antrim Road	12	26
38	NOx Analyser, Antrim Road	12	23
39	NOx Analyser, Antrim Road	10	19
40	NOx Analyser, Shore Road	11	21
41	NOx Analyser, Shore Road	10	25
42	Langley Hall	5 (commenced Jul 04)	16
43	Antrim Road, Elmfield	6 (commenced Jun 04)	30
44	Abbots Cross	5	16
45	B & Q	5	22
46	Collinbridge Road	1	22

The live sites with the highest average nitrogen dioxide concentrations (based on the actual number of months monitoring) are:

Site Ref.	Location	No. of Months Monitoring	NO ₂ Annual Average $\mu\text{g m}^{-3}$
1*	Main Street, Ballyclare	11	27
5	McMillan House, Glengormley	12	26
11*	44 Sandyknowes Avenue	10	24
12*	Sandyholme Way	9	30
20	A8M Sandyknowes	12	26
21	Ballyclare Road, Manse Road	12	23
43*	Antrim Road, Elmfield	6	30

* Sites 1, 11, 12 and 43 are based on less than 12 months' monitoring.

In order to obtain an estimation of the annual mean nitrogen dioxide concentration at both these sites an adjustment was made to the monitoring results as per Box 6.5 page 6-8 of the Technical Guidance LAQM TG (03).

The annual mean and period means were obtained for the neighbouring Belfast AURN site. The ratio of the annual mean to the average period mean was calculated. This was then used as the adjustment factor to estimate the annual mean short-term nitrogen dioxide concentration at sites 1, 11, 12 and 43. The calculations for sites 1, 11, 12 and 43 are shown in Tables 1 to 4 in Appendix 2 and are summarised below.

Adjusted Annual Average NO₂ Diffusion Tube Concentrations 2004 (μgm^{-3})

Site Ref.	Location	Adjusted Annual Average
1	Main Street, Ballyclare	26
11	44 Sandyknowes Avenue	23
12	Sandyholme Way	33
43	Antrim Road, Elmfield	31.5

2.5 Bias Adjustment Factor

Triplicate diffusion tubes have been collocated at both the Newtownabbey chemiluminescent NO_x monitors since June 2003. Bias adjustment factors for both sites for 2004 were calculated (shown in Tables 5 and 6, Appendix 2). A bias adjustment factor based on 4 collocation studies (East Hertfordshire DC, London Borough of Haringey and two in Newtownabbey) was also obtained from Air Quality Consultants Limited in April 2004. The Council has been advised this value, however, may be subject to change due to a number of unresolved issues, that is, tube precision and site type influences.

The various bias adjustment factors have been applied to the annual mean nitrogen dioxide concentrations at sites 1, 5, 11, 12, 20, 21 and 43 as shown below.

Bias Adjusted NO₂ Diffusion Tube Concentrations 2004 (µgm⁻³)

Site	Annual Average (adjusted if < 12 months)	Bias Adjustment Factor (Mallusk) 1.29	Bias Adjustment Factor (Shore Road) 1.45	Bias Adjustment Factor (Air Quality Consultants Limited) 1.21
1	26	33	38	31
5	26	33	38	31
11	23	30	33	28
12	33	43	48	40
20	26	33	38	31
21	23	30	33	28
43	31.5	41	46	38

These bias adjusted concentrations were then corrected to estimate the annual average NO₂ concentrations in 2005 as per box 6.6, page 6.9 of the Technical Guidance TG (03).

2004 correction factor = 0.915

2005 correction factor = 0.892

2005 mean average NO₂ conc.

= 2004 annual average x (0.892/0.915)

= 2004 annual average x 0.975

A summary of the bias adjusted figures and the estimated annual average NO₂ concentration for 2005 for sites 1, 5, 11, 12, 20, 21 and 43 are shown below. Concentrations predicted to be above the annual mean air quality objective of 40 µgm⁻³ for nitrogen dioxide are shown in bold.

Nitrogen Dioxide Diffusion Tube Concentrations 2004 ($\mu\text{g}\text{m}^{-3}$) Bias Adjusted and Corrected to 2005 Concentration

Site	Mallusk Bias Adjustment (1.29)	Corrected to 2005 (Box 6.6TG(03))	Shore Road Bias Adjustment (1.45)	Corrected to 2005 (Box 6.6 TG(03))	Air Quality Consultants Bias Adjust (1.21)	Corrected to 2005 (Box 6.6 TG(03))
1	33	33	38	37	31	31
5	33	33	38	37	31	31
11	30	29	33	32	28	27
12	43	41	48	47	40	39
20	33	33	38	37	31	31
21	30	29	33	32	28	27
43	41	40	46	45	38	37

3 NEW LOCAL DEVELOPMENTS

The following are new local developments since completion of the Stage 1 Report.

3.1 Part A, B and C Processes

A list of Part A, Part B and Part C processes within Newtownabbey Borough Council are listed in Appendix 3.

3.2 New Retail Developments

Abbey Retail Park, Church Road, Newtownabbey

- Valley Retail Park, Church Road, Newtownabbey
- Old Courthouse site, Church Road, Newtownabbey

3.3 New Road Schemes

A8 dual carriageway and roundabouts scheme from Linden Lea to Hillhead Road

- Ballynure by-pass
- Northcott Link Road between Antrim Road and Ballyclare Road, Glengormley
- Mallusk Road/Scullion's Road junction serving Mayfield Development, Mallusk

3.4 New Landfill Developments

Baird's Brae Landfill Site Phase 2 has not progressed any further.

3.5 New Mixed Use Development

- Mayfield Village

3.6 Residential Developments

In addition, there have been a number of large residential developments within the Borough with the potential to increase traffic flow, including:

- Lands between Ballycraigy Road and Corr's Corner
- Glenmount Village, Church Road, Newtownabbey
- Victoria Road, Ballyclare
- Laurel Hill and Fernridge at Ballycraigy Road
- O'Neill Road
- Hydepark Road, Mallusk
- Mayfield Village, Hightown
- Ballyhamage, Burn Road, Doagh
- Arthur Avenue
- Castle Road, Ballynure
- Monkstown Road
- The Glade, Mossley
- Shore Road, Jordanstown
- Glebe Road
- Swiss Chalet, Ballyclare Road, Glengormley
- Mill Pond, Doagh
- Sixmile Manor, Ballyclare
- Antrim Road, Elmfield

4 CONCLUSIONS

- 4.1 The estimated 2005 annual average concentrations for the passive monitoring sites at Sandyholme Way (site 12) and Antrim Road at Elmfield (site 43) are equal to or above the Annual Mean Air Quality Objective of $40 \mu\text{g m}^{-3}$ if the local bias adjustment factors for Mallusk (1.29) and Shore Road (1.45) are applied. The monitoring results at both sites however are based on less than 12 months' monitoring data.

Site 12 is located on the exterior façade of the sensitive location which is situated adjacent to the onslip of the M2 motorway (southbound) at Sandyknowes roundabout. However, it is not proposed to declare an Air Quality Management Area for this sensitive location at this time. It is proposed to obtain detailed traffic data for the M2 motorway and all approach roads to the Sandyknowes roundabout, to model this area and to continue monitoring at the sensitive location.

Site 43 is located on the roadside on Antrim Road, Glengormley. It is proposed to move the diffusion tube to the façade of a sensitive location and continue monitoring in order to get a full year's results.

Further results will be provided in the Detailed Updating and Screening Assessment which is due in April 2006.

- 4.2 The Council declared an Air Quality Management Area in October 2004 in relation to a likely breach of the Annual and Daily Mean Objectives of Particulate Matter (PM_{10}) in Ballyclare (see Appendix 4).

Further modelling work has now been completed by Netcen in this AQMA (*Air Quality Review and Assessment Stage 4 – Domestic Fuel Combustion*). This modelling has not predicted any exceedance of the regulated objectives for SO_2 and PM_{10} . This, however, is subject to verification of the modelling using local monitoring data. Continuous monitoring of SO_2 and PM_{10} has been undertaken in the AQMA since February 2005. This will be reported in the Updating and Screening Assessment due in April 2006.