



2011 Air Quality Progress Report for Larne Borough Council

In fulfillment of the Environment (Northern Ireland) Order
2002 - Local Air Quality Management

April 2011

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Executive Summary

This Progress Report allowed Larne Borough Council to review and assess air quality of monitored pollutants within the borough and to determine whether or not the air quality objectives are likely to be achieved.

Where exceedences are considered likely, the local authority must then consider a detailed assessment for that pollutant.

The Progress Report of air quality in Larne Borough has concluded that Nitrogen Dioxide, the air quality objectives are likely to be met and that a more detailed assessment is not required.

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Larne Borough Council - Northern Ireland

1 Introduction

1.1 Description of Local Authority Area

Larne Borough is situated on the east coast of Northern Ireland and is often described as 'The Gateway to Ulster' due to the operations of cross channel ferries to and from the port of Larne.

The Borough covers an area of approximately 131km², stretching over 36 miles along the Antrim coastline from Islandmagee and Ballycarry in the south to Glenarm and Carnlough in the north. Two of the Glens of Antrim and part of the Antrim Plateau make Larne Borough very scenic with two thirds designated as areas of outstanding natural beauty. (See Figure 1)

The population of the council area is just over 30,000 of which Larne town alone makes up approximately $\frac{2}{3}$ of the total population. Larne is a busy seaport and market town situated 20 miles north of Belfast. It is within easy reach of Northern Ireland's two main airports being 21 miles from Belfast International Airport and 24 miles from Belfast City Airport. The area is supported both by major roads and a continuous rail link to Belfast – Dublin route. The manufacturing, tourism and agriculture industries provide the main economic base of the Borough

Figure 1.1



1.2 Purpose of Progress Report

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

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

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in **Northern Ireland** are set out in the Air Quality Regulations (Northern Ireland) 2003, Statutory Rules of Northern Ireland 2003, no. 342, and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in Northern Ireland.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	3.25 $\mu\text{g}/\text{m}^3$	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 mg/m^3	Maximum daily 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 (PM₁₀) (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

LAQM Activity	Completion Date	Brief Outcomes
1st Stage Review And Assessment	July 2001	<p>A second stage assessment is required for nitrogen dioxide due to significant road traffic and industrial sources.</p> <p>Second stage assessment is necessary for sulphur dioxide due to significant industrial, domestic and shipping sources.</p> <p>Second stage assessment for PM₁₀ is necessary due to significant road traffic, domestic, industrial and shipping sources.</p>
2 nd and 3 rd Stage Review and Assessment	2004	Air Quality Objectives for NO ₂ , SO ₂ and PM ₁₀ unlikely to be exceeded. No AQMAs declared.
Progress Report	April 2005	SO ₂ , NO ₂ and PM ₁₀ objectives met. No AQMA to declare.
Update and Screening Assessment	April 2006	No detailed assessment required for any of the 7 pollutants. Monitoring of SO ₂ , NO ₂ and PM ₁₀ to continue.
Detailed Assessment	April 2007	Not applicable- no AQMAs
Progress Report	April 2007	SO ₂ , NO ₂ and PM ₁₀ objectives met. No AQMA to declare.
Progress Report	April 2008	SO ₂ , NO ₂ and PM ₁₀ objectives met. No AQMA to declare.
Update and Screening Assessment	August 2009	No detailed assessment required for any of the 7 pollutants. Monitoring of SO ₂ , NO ₂ and PM ₁₀ to continue. SO ₂ , NO ₂ and PM ₁₀ objectives met.
Progress Report	April 2010	SO ₂ , NO ₂ and PM ₁₀ objectives met. No AQMA to declare.
Addendum to Update and Screening Assessment Report 2009		<p>Air quality objectives for SO₂ and PM₁₀ met over the past 4 years and therefore continued monitoring no longer required. Air quality monitoring station decommissioned.</p>

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

No Automatic Monitoring carried out

2.1.2 Non-Automatic Monitoring Sites

Monthly average concentrations of NO₂ are monitored using passive diffusion tubes located at 8 sites identified as having potentially the highest concentration of NO₂ at the first round of review and assessment.

Environmental Scientifics Group (ESG) have had the contract for supplying and analysing the Nitrogen Dioxide Diffusion Tubes since April 2008 and prior to that Lambeth Scientific Services were used.

ESG are UKAS accredited and demonstrate satisfactory performance in the Workplace Analysis Scheme for Proficiency (WASP) over the past five quarterly rounds as verified on the Defra Local Air Quality Management Web pages.

The tubes are analysed by an aqueous extraction followed by automated flow injection analysis/UV spectroscopy.

A Bias Adjustment factor of 0.83 has been applied which was taken from the latest spreadsheet of factors i.e. version 04/11, year 2010- Environmental Scientifics Group (50% TEA in Acetone) from the Review and Assessment Website.

Please refer to Appendix A for diffusion tube locations and Appendix B full data set (monthly mean values) from January 2005-December 2010

Table 2.2 Details of Non- Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Antiville Road/A8 Junction	Roadside	3864 0212	NO ₂	N	N	n/a	Y
Riverdale/ Lathama House	Urban Background	3968 249	NO ₂	N	N	n/a	
Main Street Larne	Urban Centre	4016 0260	NO ₂	N	N	Approx 1m	Y
Victoria Rd/Agnew St Junction	Kerbside	4033 0285	NO ₂	N	N	Approx 3m	Y
Upper Cairncastle Rd	Kerbside	3920 0323	NO ₂	N	N	Approx 3m	
Larne Harbour Roundabout	Roadside	4123 0196	NO ₂	N	N	n/a	Y
Coastguard Rd/Castle Terrace	Other	4131 0171	NO ₂	N	N	n/a	
Ballylumford Rd, Islandmage	Other	4206 0203	NO ₂	N	N	n/a	Y

2.2.1 Nitrogen Dioxide

Diffusion Tube Monitoring Data

The Annual mean concentrations for Nitrogen Dioxide for the last three years are shown in Table 2.4 below.

Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes

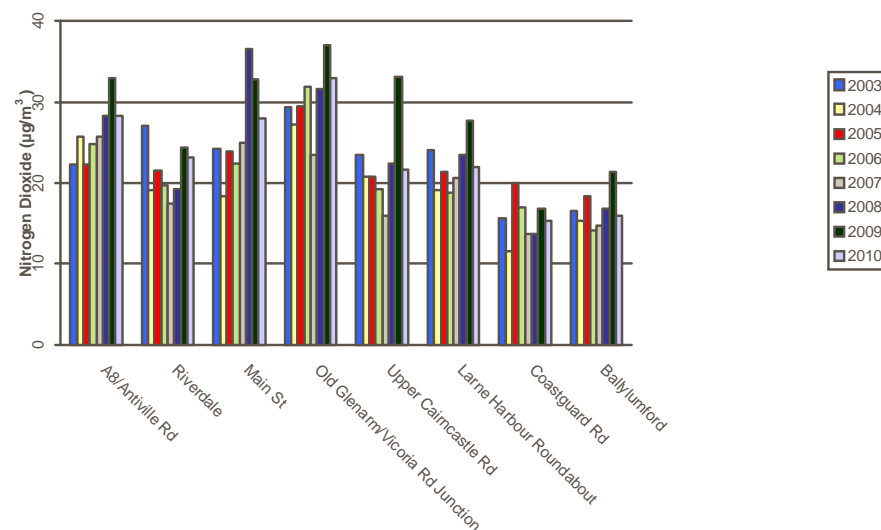
Site ID	Location	Within AQMA?	Relevant public exposure? Y/N	Data Capture for monitoring period %	Data Capture for full calendar year 2010 %	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)		
						2008 ¹	2009 ²	2010 ³
L1	Antiville Road/A8 Junction	N	N	100	100	28.27	32.9	28.32
L2	Riverdale/Latharna House	N	N	100	100	19.20	24.39	23.23
L3	Main Street, Larne	N	N	100	100	36.48	32.8	28
L4	Victoria Rd/Old Glenarm Rd	N	N	100	100	31.62	36.96	32.94
L5	Upper Cairncastle Rd	N	N	100	10	22.39	33.09	21.66
L6	Larne Harbour Roundabout	N	N	91	91	23.44	29.7	21.92
L7	Coastguard Rd/Cast Terrace	N	N	100	100	13.75	16.9	15.26
L8	Ballylumford Rd, Islandmage	N	N	100	100	16.86	21.29	15.99

¹ A bias adjustment factor of 0.93 has been applied which was taken from the latest spreadsheet of factors i.e. version 03/09, year 2008- Bureau Veritas (Gradko 50% TEA in Acetone and Annualised using Box 3.2 from the Technical Guidance

³ A Bias Adjustment factor of 0.83 has been applied which was taken from the latest spreadsheet of factors i.e. version 04/11, year 2010- Environmental Scientifics Group (50% TEA in Acetone) from the Review and Assessment Website.

Please refer to Appendix B for the full data set (monthly mean values) from January 2005-December 2010

Figure 2.1 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Diffusion Tube Monitoring Sites 2003- 2010



Although over the last 7 years there have been no exceedences of the annual mean NO₂ objective of 40 µg/m³, in the years 2007-2009 there was a year on year increase on NO₂ levels. However, in 2010 levels have begun to fall at all sites.

There have been no exceedences of 60 µg/m³. (This would indicate a risk that the 1-hour objective may also be exceeded.)

Further monitoring will take place to ensure this trend continues and the air quality objective is met.

It should be noted that the monitoring sites are not representative of public exposure. However as there were no exceedences it was not necessary to use the procedure specified in Box 2.3 of TG(09) to estimate the concentration at the nearest receptor.

A review of the monitoring sites will take place to establish if more relevant sites are available

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

Larne Borough Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Larne Borough Council confirms that all the following have been considered –

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

5 Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

The assessment has indicated that there are no exceedences for Nitrogen Dioxide identified within the borough and the Air Quality objectives are being met.

5.2 Conclusions relating to New Local Developments

No new local developments were identified

5.3 Proposed Actions

The progress report has identified that no Detailed Assessment is required for Nitrogen Dioxide.

Work will continue on producing a Local air quality Strategy.

A Progress Report will then be submitted in 2011.

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Numbering

6 References

The Environment (Northern Ireland) Order 2002

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000
Department of the Environment's Local Air Quality Management Technical Guidance LAQM. TG(03).

Air Quality Regulations (Northern Ireland) 2003
Local Air Quality Management Policy Guidance LAQM.PGNI(03) (EHS)

Larne Borough Council First Stage Review and Assessment of Air Quality 2001

Air Quality Review and Assessment Stage 2 AEA/ENV/R/1010

Air Quality Review and Assessment Stage 3 – Domestic Fuel Combustion. Report produced for Larne Borough Council Netcen/ED49246/Issue 1/AEAT/ENV/R/1642 January 2004

Local Air Quality Management Technical Guidance LAQM.TG (09)

Air Quality Website (<http://laqm.defra.gov.uk>)

Appendices

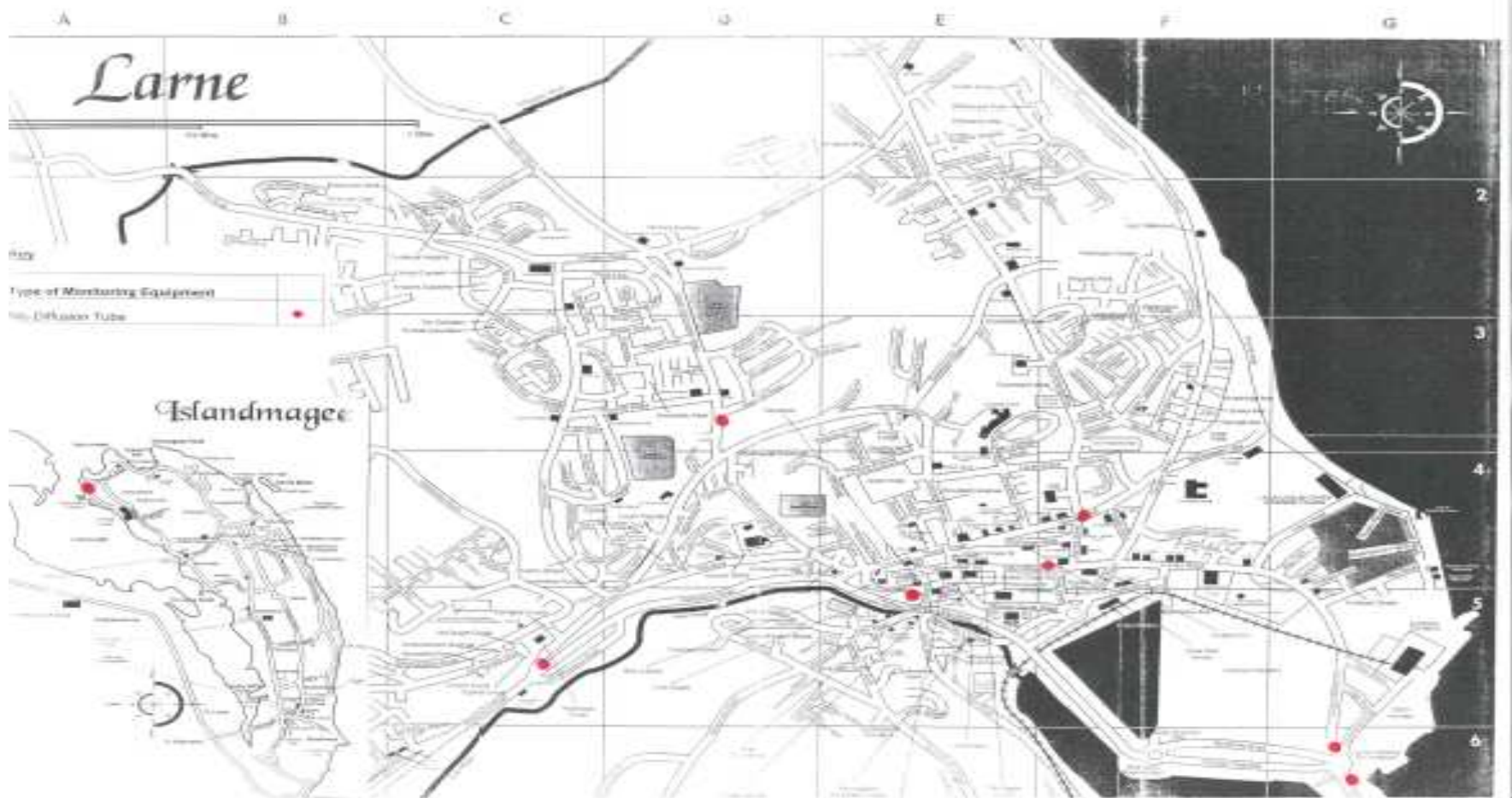
Appendix A: Map of Diffusion Tube Locations

Appendix B: NO₂ Diffusion Tube Monitoring Results

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Appendix A: Map of Diffusion Tube Locations



Appendix B: NO₂ Diffusion Tube Monitoring Results

Month and Year	Average Monthly NO ₂ Concentration (µg/m ³)							
	Location							
	Antiville Rd/A8 (Grid Ref 3864 0212)	Riverdale (Grid Ref 3968 0249)	Main Street (Grid Ref 4016 0260)	Victoria Rd/Agnew Street (Grid Ref 4033 0285)	Upper Cairncastle Road (Grid Ref 3920 0323)	Larne Harbour Roundabout (Grid Ref 4123 0196)	Coastguard Road (Grid Ref 4131 0171)	Ballylumford Road (Grid Ref 4206 0203)
January 2005	18	15	17	22	17	20	15	-
February 2005	22	20	20	29	18	14	13	14
March 2005	20	15	24	16	12	6	8	10
April 2005	14	19	19	19	19	19	12	16
May 2005	18	26	28	24	18	24	21	20
June 2005	35	39	29	33	25	27	21	20
July 2005	18	14	17	23	14	11	13	20
August 2005	13	11	-	22	8	-	13	16
September 2005	21	14	14	31	12	19	8	13
October 2005	16	14	16	24	23	14	46	13
November 2005	4	12	17	20	18	16	11	9
December 2005	24	17	36	29	24	24	16	17
January 2006	29	27	28	62	22	16	12	18
February 2006	22	15	15	20	21	25	12	14
March 2006	11	12	8	15	9	12	6	5
April 2006	16	16	10	19	11	12	9	6
May 2006	22	14	21	25	15	16	16	13
June 2006	21	-	28	19	13	14	8	-
July 2006	19	-	20	25	19	16	13	9
August 2006	16	14	19	20	14	19	12	14

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Month and Year	Average Monthly NO ₂ Concentration (µg/m ³)							
	Location							
	Antiville Rd/A8 (Grid Ref 3864 0212)	Riverdale (Grid Ref 3968 0249)	Main Street (Grid Ref 4016 0260)	Victoria Rd/Agnew Street (Grid Ref 4033 0285)	Upper Cairncastle Road (Grid Ref 3920 0323)	Larne Harbour Roundabout (Grid Ref 4123 0196)	Coastguard Road (Grid Ref 4131 0171)	Ballylumford Road (Grid Ref 4206 0203)
September 2006	22	14	23	28	24	19	9	13
October 2006	19	15	16	19	6	7	11	13
November 2006	17	15	26	28	6	15	35	17
December 2006	29	22	19	25	25	16	9	10
January 2007	21	13	23	24	15	20	8	20
February 2007	37	23	29	24	18	21	11	15
March 2007								
April 2007	21	16	16	9	15	13	20	11
May 2007	-	11	19	13	14	13	10	9
June 2007	61	15	7	-	6	17	13	8
July 2007	14	14	-	25	9	18	11	11
August 2007	17	14	29	26	8	19	12	8
September 2007	24	14	-	26	14	20	13	13
October 2007	28	19	33	-	11	25	15	10
November 2007	26	19	-	30	21	22	14	23
December 2007	38	26	34	-	34	27	16	25

	Average Monthly NO ₂ Concentration ((µg/m ³))							
	Location							
Month and Year	Antiville Rd/A8 (Grid Ref 3864 0212)	Riverdale (Grid Ref 3968 0249)	Main Street (Grid Ref 4016 0260)	Victoria Rd/Agnew Street (Grid Ref 4033 0285)	Upper Cairncastle Road (Grid Ref 3920 0323)	Larne Harbour Roundabout (Grid Ref 4123 0196)	Coastguard Road (Grid Ref 4131 0171)	Ballylumford Road (Grid Ref 4206 0203)
January 2008	34	44	31	40	25	42	21	20
February 2008	31	21	31	37	32	23	18	19
March 2008	30	16	29	33	20	21	10	22
April 2008	26	20	32	32	23	28	14	14
May 2008	32	24	37	37	35	31	27	13
June 2008	25	17	27	32	17	17	14	19
July 2008	24	15	25	11	19	23	13	14
August 2008	27	19	30	33	21	20	9	12
September 2008	33	26	28	43	23	26	15	19
October 2008	33	14	24	38	19	22	10	17
November 2008	25	17	-	31	21	24	14	26
December 2008	42	29	38	41	33	30	14	25
January 2009	53	29	36	43	43	36	22	29
February 2009	45	27	43	55	32	31	18	26
March 2009	36	14	31	37	27	24	12	25
April 2009	36	26	40	40	37	-	18	18
May 2009	34	20	-	38	23	31	13	14
June 2009	-	29	30	-	-	30	28	17
July 2009	2	-	26	-	22	28	12	15
August 2009	-	19	26	-	24	28	11	15
September 2009	46	29	40	6	64	-	20	29
October 2009	24	32	28	79	27	35	14	21
November 2009	37	24	30	40	30	24	13	22
December 2009	44	35	44	46	35	38	24	27

	Average Monthly NO ₂ Concentration ((µg/m ³))							
	Location							
Month and Year	Antiville Rd/A8 (Grid Ref 3864 0212)	Riverdale (Grid Ref 3968 0249)	Main Street (Grid Ref 4016 0260)	Victoria Rd/Agnew Street (Grid Ref 4033 0285)	Upper Cairncastle Road (Grid Ref 3920 0323)	Larne Harbour Roundabout (Grid Ref 4123 0196)	Coastguard Road (Grid Ref 4131 0171)	Ballylumford Road (Grid Ref 4206 0203)
January 2010	42	55	42	46	33	31	21	27
February 2010	37.71	41.32	46.75	47.06	39.82	44.64	30.77	22.32
March 2010	46.99	29.76	46.68	50.13	33.52	30.08	19.11	29.76
April 2010	34.08	30.87	32.33	43.98	23.59	27.67	23.88	19.19
May 2010	30.40	21.15	28.75	26.70	24.85	22.59	16.64	15.81
June 2010	21.88	13.44	23.80	29.94	16.89	13.82	13.44	9.60
July 2010	32.34	18.58	28.72	37.64	22.68	-	11.58	16.17
August 2010	25.34	11.89	22.84	30.66	14.70	10.64	11.57	16.89
September 2010	30.5	21.7	26.4	40.5	25.4	27.1	13.1	20.1
October 2010	35.4	26.3	29.1	41.8	26.1	25.6	15.1	17.3
November 2010	33	28.6	30.5	36.8	22.4	28.4	19.6	14.5
December 2010	39.8	37.2	46.9	45.1	30.2	29	24.8	22.5

NB Lambeth Scientific Services collected and analysed the data from January 2008 to March 2008. A new contract started with Bureau Veritas (Now ESG) in April 2008.