2010 Air Quality Progress Report for Larne Borough Council.

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

April, 2010

Local Authority Officer	Julie Parkinson

Department	Environmental Health Service
Address	Larne Borough Council Victoria Road Larne BT40 1RU
Telephone	028 28272313
e-mail	parkinsonj@larne.gov.uk

Report Reference number	Progress/10
Date	30th April 2010

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 for each of the three monitored pollutants, Nitrogen Dioxide, Sulphur Dioxide and Particulate Matter, the air quality objectives are likely to be met and that a more detailed assessment is not required.

Monitoring of Nitrogen Dioxide will continue, with a review of the location of diffusion tubes to take place. Monitoring of Sulphur Dioxide and Particulate Matter will cease due to air quality objectives having been met over the last four years.

Table of contents

Appendices

List of Tables

List of Figures

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 131km^2, 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 0f which Larne town alone makes up approximately $^2/_3$ 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 micrograms per cubic metre $\mu g/m^3$ (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 $\mu g/m^3$	Running annual mean	31.12.2003
	3.25 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, 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	A second stage assessment is required for nitrogen dioxide due to significant road traffic and industrial sources. Second stage assessment is necessary for sulphur dioxide due to significant industrial, domestic and shipping sources. Second stage assessment for PM_{10} is necessary due to significant road traffic, domestic, industrial and shipping sources.
2nd and 3rd 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.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Automatic Monitoring is carried out of SO_2 and PM_{10}

Please refer to Appendix A for a map indicating the location of SO_2, PM_{10} and NO_2 monitoring sites.

The SO_2 analyser is calibrated manually every fortnight by trained Larne Borough Council staff. The calibration is performed with zero air from a zero air cylinder and span checks using a certified gas cylinder.

NETCEN, a UKAS accredited laboratory, are appointed to provide QA/QC and data management services. Data is downloaded by NETCEN daily thus any faults or unusual results are detected early and brought to attention of Larne Borough Council. NETCEN carry out 6 monthly site audits and issue a UKAS certificate of calibration. Full ratification of data is provided which is comparable to that produced within the national network.

The equipment is US EPA approved and also approved in the DEFRA Automatic Urban Network. In addition, Envirotechnology Services plc, the supplier of the equipment, service and calibrate the equipment 6 monthly and provide emergency call out visits in the event of technical faults.

The +PM10 is measured using a factor of 0.833333 to give Gravimetric Equivalent concentrations and the data was fully ratified by AEA.

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?
							3m	Y
Craigyhill/ Churchill Road	Suburban	41320175	PM_{10} SO_2		N	N	N/A	Y

2.1.2 Non-Automatic Monitoring

Monthly average concentrations of NO_2 are monitored using passive diffusion tubes located at 8 sites identified as having potentially the highest concentration of NO_2 at the first round of review and assessment.

Bureau Veritas 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.

Bureau Veristas are UKAS accredited and the WASP results met AEA Energy & Environment's performance criteria in 2006 with an RSD of 5.3% and 9 out of 10 periods have a CV smaller than 20%.

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

A Bias Adjustment factor of 0.99 has been applied which was taken from the latest spreadsheet of factors i.e. version 03/10, year 2009- Bureau Veritas (Gradko 50% TEA in Acetone) from the Review and Assessment Website.

The data was annualised according to Box 3.2 of the Technical Guidance LAQM.TG(09) for all sites, except for Coastguard Road and Ballylumford Road.

Please refer to Appendix C and D for further information. (See Appendix A for locations)

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/ Latharna House	Urban Background	3968 249	NO_2	N	N	N/A	
Main Street Larne	Urban Centre	4016 0260	NO_2	N	N	N/A	Y
Victoria Rd/Agnew St Junction	Kerbside	4033 0285	NO_2	N	N	Approx 3m	
Upper Cairncastle Rd	Kerbside	3920 0323	NO_2	N	N	Approx 3m	
Larne Harbour RaB	Roadside	4123 0196	NO_2	N	N	N/A	
Coastguard Rd/Castle Terrace	Other	4131 0171	NO_2	N	N	N/A	Y
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 2.4 Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Data Capture for monitoring period %	Data Capture for full calendar year 2009 %	Annual mean concentrations (µg/m^3)		
					2007[3]	2008[2]	2009[1]
L1	Antiville Road/A8 Junction	N	83	83	25.65	28.27	32.9
L2	Riverdale/Latharna House	N	92	92	17.45	19.20	24.39
L3	Main Street, Larne	N	92	92	25.00	36.48	32.8
L4	Victoria Rd/Old Glenarm Rd	N	75	75	23.49	31.62	36.96
L5	Upper Cairncastle Rd	N	92	92	15.95	22.39	33.09
L6	Larne Harbour RaB	N	83	83	20.56	23.44	29.7
L7	Coastguard Rd/Cas Terrace	N	100	100	13.75	13.75	16.9
L8	Ballylumford Rd, Islandmage	N	100	100	14.69	16.86	21.29

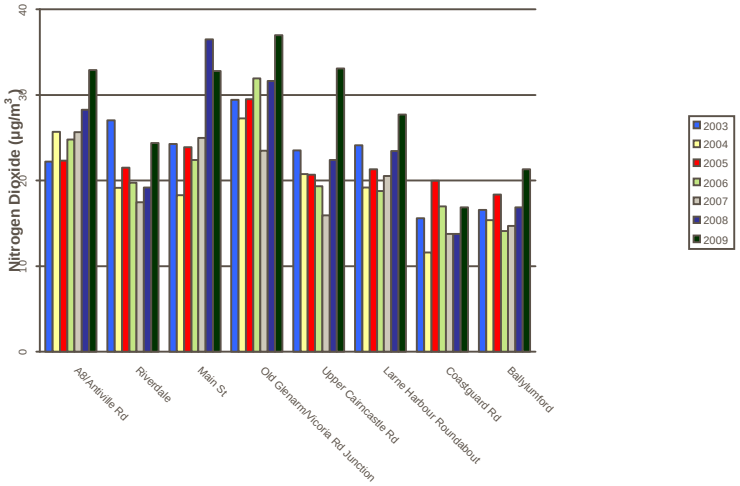
[1] A bias adjustment factor of 0.99 has been applied which was taken from the latest spreadsheet of factors i.e. version 004/10, year 2009- Bureau Veritas (Gradko 50% TEA in Acetone and Annualised using Box 3.2 from the Technical Guidance

2 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[3]A bias adjustment factor of 1.217 was applied – Lambeth Scientific Service

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Diffusion Tube Monitoring Sites.

Figure 1 Comparison of Measured NO_2 Concentrations 2003-2009



Although over the last 7 years there have been no exceedences of the annual mean NO_2 objective of 40 $\mu g/m^3$ the last 3 years have shown a year on year increases on NO_2 levels.
Further monitoring will take place to ensure this trend does not continue to a point where the air quality objective is met or even exceeded.

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.

2.2.2 PM_{10}

Table 2.5a Results of PM_{10} Automatic Monitoring: Comparison with Annual Mean Objective

Location	Within AQMA?	Data Capture for monitoring period [a] %	Data Capture for full calendar year 2009 [b] %	Annual mean concentrations (µg/m^3)		
				2007	2008	2009
1 Example Site	N	98	98	**45**	**41**	**44**
Churchill Road	N	86.6	86.6		17	18

Table 2.5b Results of PM_{10} Automatic Monitoring: Comparison with 24-hour Mean Objective

Location		Data Capture for monitoring period [a] %	Data Capture 2009 [b] %	Number of Exceedences of daily mean objective (50 µg/m^3) If data capture < 90%, include the 90th percentile of daily means in brackets.		
				2007	2008	2009
Churchill Rd	N	86.6	86.6	5	3	2

The number of exceedances have fallen year on year (for the last 4 years).

2.2.3 Sulphur Dioxide

Table 2.6A Results of SO_2 Automatic Monitoring: Comparison with Objectives

Location	Within AQMA?	Data Capture for monitoring period %	Data Capture 2009 %	Number of Exceedences of: (µg/m^3)		
				15-minute Objective (266 µg/m^3)	1-hour Objective (350 µg/m^3)	24-hour Objective (125 µg/m^3)
Churchill Rd	N	96.5	96.5	2	0	0

Table 2.6b Results of SO_2 Automatic Monitoring: Comparison with Objectives 2005-2009

Pollutant	Air Quality Regulations (Northern Ireland) 2003	2006 (Jan-Dec) Exceedances 98.6% Data capture	2007 (Jan-Dec) Exceedances 98.7% data capture	2008 (Jan-Dec) Exceedances 96.8% Data capture	2009 (Jan-Dec) Exceedances 96.5%Data Capture
Sulphur Dioxide	15-minute mean > 266 µg m^{-3}	0	0	0	2
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	0	0	0	0
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	0	0	0	0

Over the four year period only two 15-minute exceedances have been recorded. Both Exceedances occurred on the same day.
No other exceedences of the other objectives have been recorded.

2.2.4 Summary of Compliance with AQS Objectives

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.

3 New Local Developments

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.

Formatted: Bullets and Numbering

4 Conclusions and Proposed Actions

Formatted: Bullets and Numbering

4.1 Conclusions from New Monitoring Data

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

4.2 Conclusions Relating to New Development

No new local developments were identified

Formatted: Bullets and Numbering

4.3 Proposed Actions

The progress has identified that no Detailed Assessment is required for any of the pollutants.

Advice from the air quality helpdesk suggested that four years data would be sufficient to base further decisions with regard to monitoring. Therefore based on the trend of data from 2006 it is proposed to decommission the air quality monitoring station at Churchill Road, Larne from the 1st April 2010 for both Sulphur Dioxide and Particulate Matter.

Using information contained within the 2009 Update and Screening Assessment it is felt that it will not be necessary to relocate the monitoring station elsewhere in the Borough.

An assessment of Nitrogen Dioxide monitoring sites will take to establish if more suitable sites are available with regards to relevant exposure.

Work will commence on producing a Local air quality Strategy.

A Progress Report will then be submitted in 2011.

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

5 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

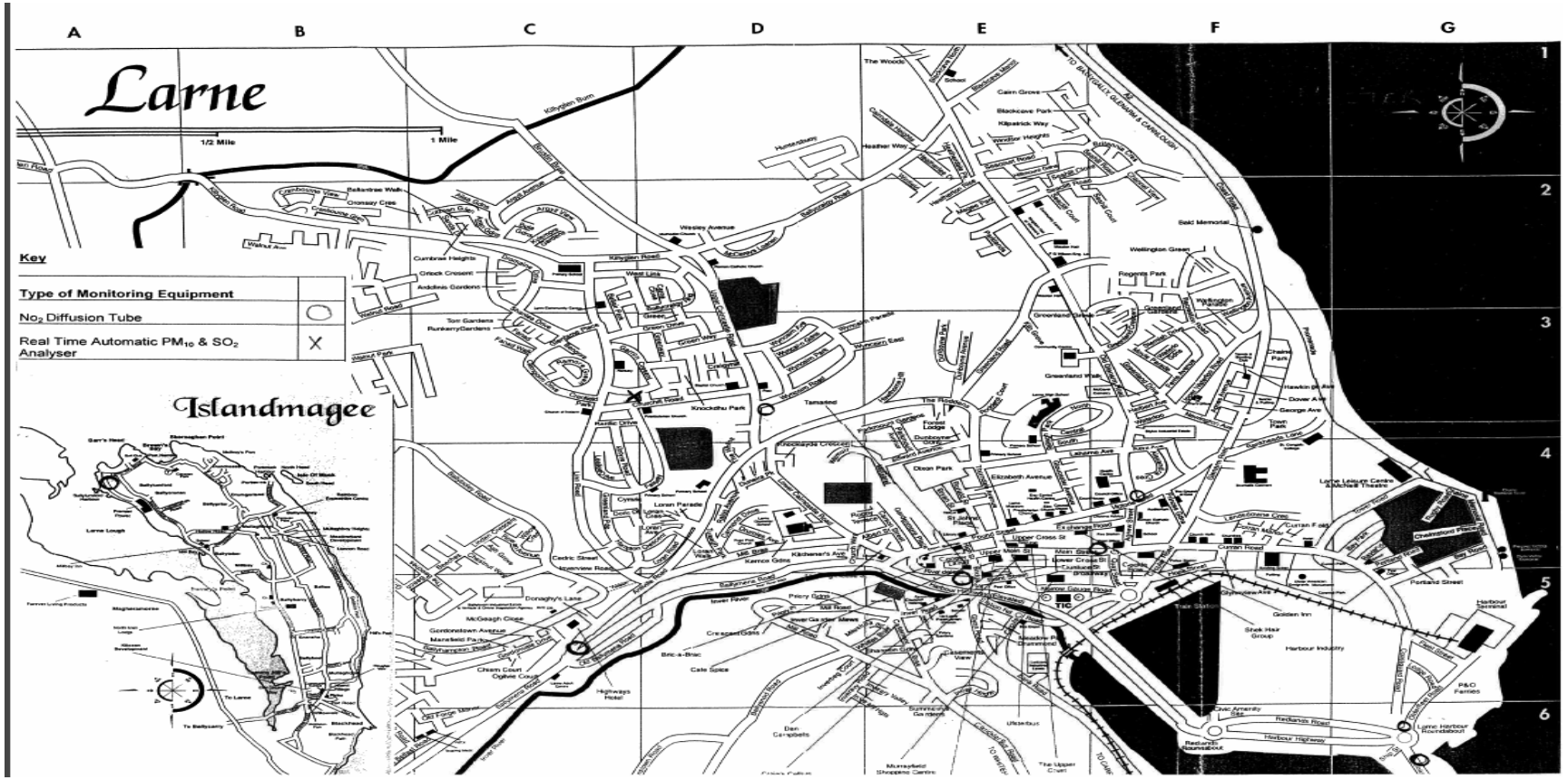
Air Quality Review and Assessment Stage 2 AEA/ENV/R/1010

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 (www.airquality.co.uk)

Appendix A: Maps of Locations



Appendix B: WASP and Precision Data for Bureau Veritas

ESG GLASGOW WASP NOx SCHEME RESULTS SUMMARY 2008

WASP Round	n	Nominal Value µg/tube	BV Average µg/tube	BV Standard Deviation	BV RSD	BV Z-Score	Current Z-score PT performance score	
100A Jan 08	2	1.36	1.185	0	0%	-1	good	CAT 1
100BJan 08	2	1.47	1.283	0.011	0.9%	-0.9	good	CAT 1
101A Apr 08	2	0.92 0	0.885	0	0%	-0.3	good	CAT 1
101B Apr 08	2	1.86	1.733	0.032	1.8%	-0.5	good	CAT 1
102A Jul 08	2	1.37	1.470	0.043	2.9%	0.6	good	CAT 1
102B Jul 08	2	2.28	2.355	0.043	1.8%	0.4	good	CAT 1
103A Oct 08	2	1.22	1.230	0	0%	0.1	good	CAT 1
103B Oct 08	2	0.94	0.960	0	0%	0.2	good	CAT 1

ESG GLASGOW WASP NOx SCHEME RESULTS SUMMARY 2009

WASP Round	n	Nominal Value µg/tube	BV Average µg/tube	BV Standard Deviation	BV RSD	BV Z-Score	Current Z-score PT performance score	
104A Jan 09	2	2.02	1.323*	0.003	0.2%	-2.7	warning	N/A
104BJan 09	2	1.22	0.803*	0.01	1.2%	-2.6	warning	N/A
105A Apr 09	2	1.68	1.730	0.003	0.2%	0.4	good	CAT 1
105B Apr 09	2	0.96	1.018	0.007	0.7%	0.7	good	CAT 1
106A Jul 09	2	1.84	2.002	0.012	0.6%	1.2	acceptable	CAT 2
106B Jul 09	2	1.42	1574	0.015	1.0%	1.4	acceptable	CAT 2
107A Oct 09	2	2.03	1.998	0.013	0.7%	-0.2	good	CAT 1
107B Oct 09	2	2.20	2.140	0.010	0.5%	-0.4	good	CAT 1

* Round 104: The poor performance in this round triggered a non-conformance report and review by QA management. Review revealed that the raw analytical data was good but was submitted before applying a multiplication factor of 1.5. When correctly applied, the data is close to the nominal values and would have fit into the PT performance criteria applied at the time as good (CAT 1) for both rounds 104A and 104B. Procedures were put in place to prevent recurrence.

Appendix C: NO_2 Diffusion Tube Monitoring Results

	Average Monthly NO_2 Concentration ($\mu g/m^3$)							
	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 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
	Average Monthly NO_2 Concentration ($\mu g/m^3$)							
	Location							
Month and Year	**Antiville Rd/A8**	**Riverdale**	**Main**	**Victoria**	**Upper**	**Larne**	**Coastguard**	**Ballylumford**

	(Grid Ref 3864 0212)	(Grid Ref 3968 0249)	Street (Grid Ref 4016 0260)	Rd/Agnew Street (Grid Ref 4033 0285)	Cairncastle Road (Grid Ref 3920 0323)	Harbour Roundabout (Grid Ref 4123 0196)	Road (Grid Ref 4131 0171)	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 ($\mu g/m^3$)

	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

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

Appendix D: Short-term to Long-term Data adjustment

Adjustment Factor for Antiville Road Data

Site	Annual Mean	Period Mean	Ratio
Belfast	33	35.1	0.94
Londonderry	16	17.375	0.92
		Average	0.93

Adjustment Factor for Riverdale Data

Site	Annual Mean	Period Mean	Ratio
Belfast	33	34.5	0.96
Londonderry	16	16.78	0.95
		Average	0.955

Adjustment Factor for Main Street Data

Site	Annual Mean	Period Mean	Ratio
Belfast	33	33.9	0.97
Londonderry	16	16.3	0.98
		Average	0.975

Adjustment Factor for Victoria Rd/Agnew Street Data

Site	Annual Mean	Period Mean	Ratio
Belfast	33	36.88	0.89
Londonderry	16	18.7	0.860
		Average	0.875

Adjustment Factor for Upper Cairncastle Rd Data

Site	Annual Mean	Period Mean	Ratio
Belfast	33	33.8	0.98
Londonderry	16	15.3	1.045
		Average	1.01

Adjustment Factor for Larne Harbour Roundabout Data

Site	Annual Mean	Period Mean	Ratio
Belfast	33	33.5	0.99
Londonderry	16	16.3	0.98
		Average	0.985