Antrim Borough Council

REVIEW AND ASSESSMENT OF AIR QUALITY IN THE BOROUGH OF ANTRIM

THE ENVIRONMENT (NORTHERN IRELAND) ORDER 2002
LOCAL AIR QUALITY MANAGEMENT

UPDATING AND SCREENING ASSESSMENT
May 2012

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Executive Summary

Part III of the Environment (NI) Order 2002 requires each district council to periodically review air quality in its area and the Air Quality Regulations (NI) 2003 prescribe the air quality objectives to be achieved. The process of reviewing and assessing air quality represents a cornerstone in the system of local air quality management (LAQM).

The first round of review and assessment for Antrim Borough Council was completed in April 2004. This concluded that, based on available data, the risk of the air quality objectives in respect of carbon monoxide; benzene; 1,3-butadiene; lead; nitrogen dioxide and fine particulates (PM_{10}) not being met within the prescribed timescales was negligible.

The review and assessment predicted that the objectives for sulphur dioxide would be exceeded in parts of Antrim town as the result of domestic solid fuel burning, and consequently the Council declared an Air Quality Management Area (AQMA) in October 2004. Subsequently, in July 2007, the Council produced an Air Quality Action Plan (AQAP), which set out the measures to be introduced in pursuit of the air quality objectives within the AQMA. The AQAP was subsequently full implement and the AQMA was revoked in 2011.

A second round of review and assessment commenced with the submission of an Updating and Screening Assessment in 2006 and ended with a Progress Report in 2008. Progress Reports are intended to maintain continuity in the LAQM process, and fill in the gaps between the three-yearly cycle of Review and Assessment. Progress reports are required in all years when not completing an Updating and Screening Assessment. The second round confirmed that the conclusions of the first round were still valid.

In 2009, Antrim Borough Council submitted an Updating and Screening Assessment which concluded that there was no need to proceed to Detailed Assessment for any of the regulated pollutants, and in 2010 and 2011 Progress Reports were submitted.

This document is Antrim Borough Council's Updating and Screening Assessment and represents the first step of the next round of review and assessment for the area. It has looked primarily at new monitoring data and has sought to identify matters that have changed since the last review and assessment and which might lead to a risk of an air quality objective for one of the seven key pollutants referred to above, being exceeded.

The report has been compiled in accordance with Technical Guidance LAQM.TG(09), using the report template downloaded from LAQM website.

The report presents data derived from 8 nitrogen dioxide diffusion tube monitoring sites located at the busiest roads and road junctions. Transport, industrial, commercial and domestic sources have also been considered in turn.

The main conclusion of the report is that there are no sources within the borough likely to give rise to an exceedence of an air quality objective and that there is no requirement to proceed to a detailed assessment for any of these sources in Antrim Borough Council.

The next step for Antrim Borough Council is the completion of a Progress Report which is due by the end of April 2013.

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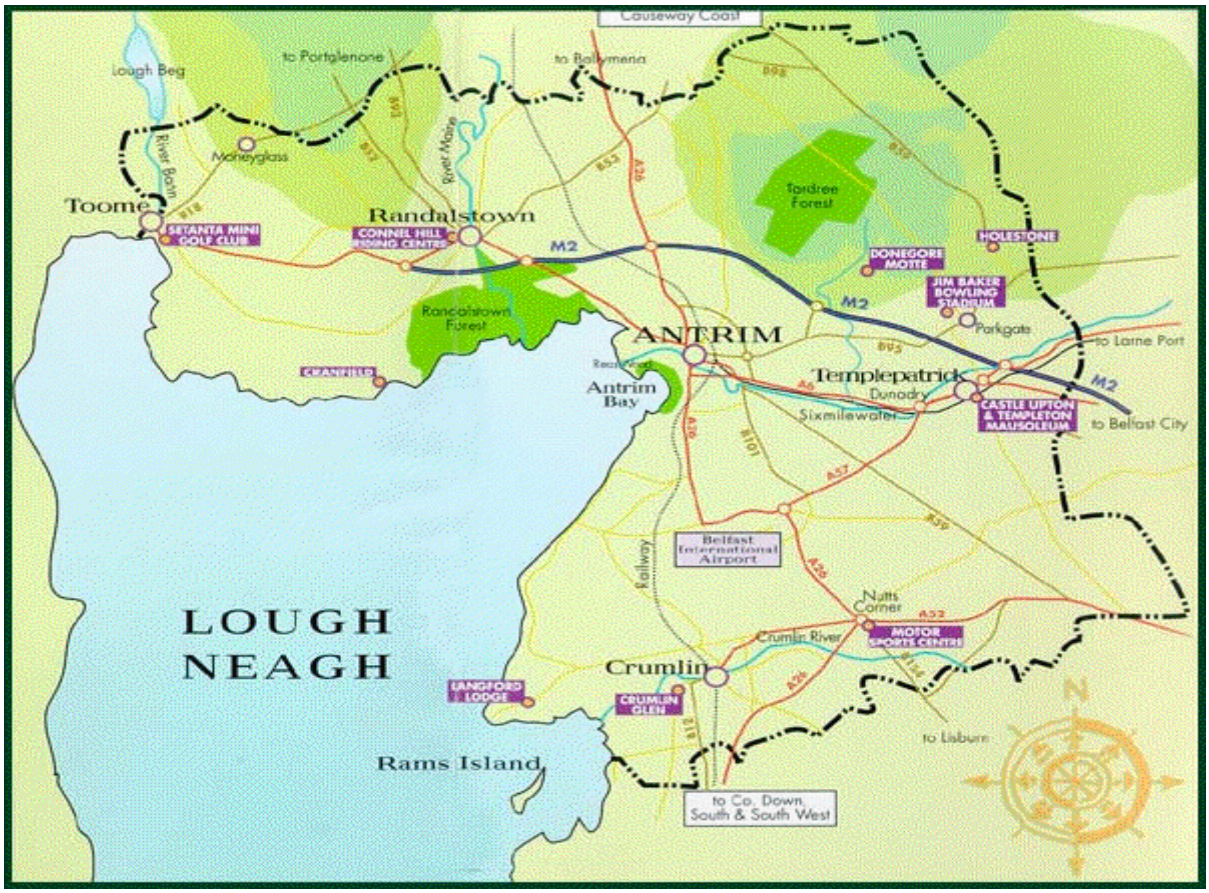
1 Introduction

1.1 Description of Local Authority Area

Antrim Borough Council, named after the town of Antrim, is a local government district in Northern Ireland. It is one of twenty-six districts created in 1973, and was granted borough status on 9 May 1977. The borough covers an area of some 220 square miles (570 km^2) with a population of 54,100 (2010). It is situated about 19 miles (31 km) north-west of Belfast. It borders the north and east shores of Lough Neagh the largest fresh water lake in the United Kingdom, and includes the towns of Antrim, Toomebridge, Crumlin, Randalstown, Parkgate and Templepatrick. The council headquarters are located on the outskirts of Antrim town. Although the borough is not within the Belfast Metropolitan Area, it houses the city's international airport and many commuter villages.

The economy of the area revolves around construction, distribution, transport and hospitality. It has a well-developed transport infrastructure that provides easy access to all the main external gateways for Northern Ireland and all parts of the region. Antrim Town lies on two of the main transport corridors, the Belfast –Derry corridor and the Southern corridor. Belfast International Airport is located within the borough, only 4 miles (6.4 km) from Antrim town.

Figure 1. Map of Antrim Borough.



1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in the Environment (Northern Ireland) Order 2002, 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 exceedences 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 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 LAQM in Northern Ireland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
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	1-hour mean	31.12.2005

	than 18 times a year		
	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

The cornerstone of the LAQM process is the review and assessment of air quality. This is a statutorily required process whereby local air quality monitoring and modelling results are compared to the national air quality standards and objectives. Where objectives are breached or are predicted to be breached, an Air Quality Management Area (AQMA) is declared. An Action Plan must then be produced stating how the district council will drive air quality towards the objective.

The first round of review and assessment which was completed in 2004 concluded that:

1. The risk of the objectives for the following pollutants being exceeded was negligible:

Carbon Monoxide, Benzene, 1,3 butadiene, Lead, Nitrogen Dioxide, PM10

2. As the result of the prevalence of the use of solid fuel for domestic heating, the 15 minute mean objective for sulphur dioxide is likely to be breached in the Greystone and Ballycraigy housing estates.

The first round of the Review and Assessment process resulted in the following measures:

1. The declaration of an AQMA
2. The installation of a continuous real-time sulphur dioxide analyser within the AQMA.

As a result of these findings an AQMA which took in the Greystone and Ballycraigy housing estates in their entirety was declared in October 2004.

In 2005 a Progress Report was submitted that found no changes to circumstances previously reported.

The second round of air quality review and assessment commenced in 2006 with the production of a Updating & Screening Report (USA). This updated the review and assessments previously undertaken for all the pollutants identified in the Air Quality Regulations. The USA concluded that, other than within the Air Quality Management Area declared after the first round of review and assessment, there is no risk of exceeding any of the air quality objectives and that a detailed assessment is not required for the current round of review and assessment. The main recommendation that came out of this report was the production of an action plan for the AQMA

In 2007 and 2008 Progress Reports were submitted which concluded that there had not been any significant changes in local circumstances to indicate possible

exceedences of the air quality objectives and that the conclusions of the 2006 USA were still valid.

In 2009 Antrim Borough Council submitted a further USA which covered all regulated pollutants, and considered monitoring data, road traffic sources, other transport sources, industrial sources, commercial and domestic sources, fugitive or uncontrolled sources and concluded that there was no requirement to a detailed assessment for any of the pollutants.

In 2010 Antrim Borough Council produced a Progress Report which incorporated a report on the implementation of the council's action plan for the AQMA. The main conclusions of the report were:

- Air Quality Objectives were being met at all nitrogen dioxide diffusion tube sites.
- Nitrogen dioxide concentrations at six out of eight sites were high enough to require continued monitoring. The other two sites will be closed down and the diffusion tubes relocated to monitor other road junctions.
- Data from the Council's real time sulphur dioxide monitoring station showed continuing compliance with the air quality objectives. The data did not make a case for retention of this site and it would be closed down.
- No new local developments likely to have an impact on air quality were identified.
- All the measures in Antrim Borough Council's Action Plan had been fully implemented and Antrim Borough Council was in a position to revoke its AQMA.

In 2011 a further Progress Report was submitted. The main findings of the report were:

- Air Quality Objectives were being met at all nitrogen dioxide diffusion tube sites.
- There are no new local development likely to have an adverse effect on local air quality
- There are a number of planning permissions granted that have the potential to impact on local air quality. These will be assessed as they come on stream.

The main outcomes of Antrim Borough Council's reports are set out in the following table:

Year	**Report**	**Outcomes**
2001	1st Stage Review & Assessment	2nd/3rd Stage Assessments required for Nitrogen Dioxide, Sulphur Dioxide & Particulates (PM_{10}).
2004	2nd/3rd Stage Review & Assessment	AQMA required for domestic sulphur dioxide emissions.

		(Declared Oct 2004)
2005	Progress Report	Confirmed no change to local circumstances
2005	Detailed Assessment	Confirmed need for AQMA
2006	Updating & Screening Assessment	Identified need for Action Plan for AQMA. Identified need for No_2 monitoring near Belfast International Airport.
2007	Progress Report	No significant changes found
2008	Progress Report	No significant changes found
2009	Updating & Screening Assessment	No requirement for detailed assessment.
2010	Progress Report (Incorporating AQMA Action Plan Progress Report)	AQMA could be revoked SO_2 real time analyser could be decommissioned.
2011	Progress Report	No significant changes found.

Figure 1.1 Map of AQMA Boundaries (if applicable)

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Antrim Borough Council does not operate any automatic monitoring sites

Figure 2.1 Map(s) of Automatic Monitoring Sites (if applicable)

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS GridRef	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	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?
Example 1	Urban background	332395,	433175	NO_2	Y		Y (1m)	3m	Y

2.1.2 Non-Automatic Monitoring Sites

Antrim Borough Council currently monitors nitrogen dioxide at 8 sites around the district using passive diffusion tubes. The diffusion tube are supplied and analysed by Environmental Scientifics Group (EGS).

Diffusion tubes represent a simple and cost-effective method of monitoring air quality in an area, to give a good general indication of average pollution concentrations. They are particularly useful for assessment against annual mean objectives.

QA/QC

The diffusion tubes used are supplied, prepared and analysed by EGS. The preparation method used is 50% TEA in Acetone. This preparation meets the guidelines set out in DEFRA's Harmonisation Practical Guidance.

EGS has a defined quality system, which forms part of the UKAS accreditation that the laboratory holds. All accredited methods are fully documented. UKAS assessors visit on an annual basis and review all aspects of the analysis, from sample handling to analysis and reporting. As a condition of accreditation, the laboratory is required to participate in any suitable proficiency schemes in operation. EGS participates in the WASP scheme organised by the Health and Safety Laboratory. ECG is currently ranked as a Category Good laboratory.

Tube Preparation and Analysis

The NO_2 tubes are prepared and analysed in a separate, designated part of the laboratory. Ambient nitrogen dioxide concentrations within the laboratory are monitored routinely. Blanks from each batch of tubes prepared in the laboratory are retained for verification. Tubes are prepared by spiking acetone:triethanolamine (50:50) onto the grids prior to the tubes being assembled.

Samples are analysed in accordance with ESG's standard operating procedure HS/WI/1015 which meets the guidelines set out in DEFRA's " Diffusion Tubes For Ambient NO2 Monitoring: Practical Guidance"

The tubes are desorbed with distilled water and the extract analysed on a using a segmented flow auto-analyser with ultraviolet detection.

Antrim Borough Council's QA/QC.

Our QA/QC procedure is to ensure that diffusion tubes are handled and stored in accordance with the manufacturer's instructions. When a tube batch is received they are immediately placed in a refrigerator in the bag in which they are received. So far as is possible the Council conforms to the calendar of exposure periods supplied by the EGS. On the day of sampling they are removed from the fridge and installed. Laboratory blanks are retained in the fridge and are taken out only when the exposed tubes are being returned to the laboratory.

When tubes are collected from sampling sites they are immediately packaged and sent to the laboratory for analysis.

Selection of Monitoring Sites

Monitoring sites are chosen to provide data on locations that appear to be representative of likely residential exposure and, where possible, are close to the nearest receptor to the busy road or road junction of interest. Where sites do not represent actual relevant public exposure they are located closer to the source than the nearest receptor. The sites are subject to periodic review and where sufficient data has been gathered, some of the diffusion tubes are relocated to new locations.

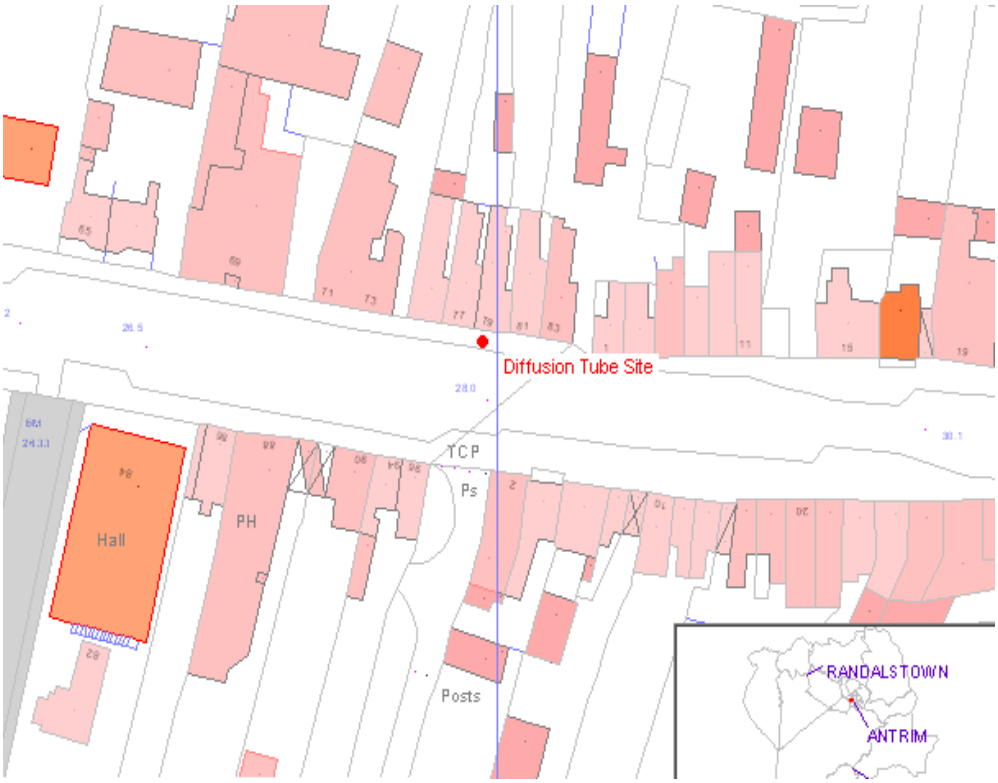
Data Adjustment

Results obtained from diffusion tubes need to be corrected for possible over or under reading. Deriving a correction factor by comparing the diffusion tube results with those obtained from a continuous real time analyser can do this. The Council does not operate a continuous analyser and therefore a co-location study has not been undertaken to determine a specific local bias adjustment factor. However, bias adjustment factors for various labs are available on the review and assessment website (Spreadsheet Version 3/12), and this gives a correction factor of 0.84 for the year 2011, based on 22 studies. This value has been used in this report.

Figure 2. Maps of Non-Automatic Monitoring Sites

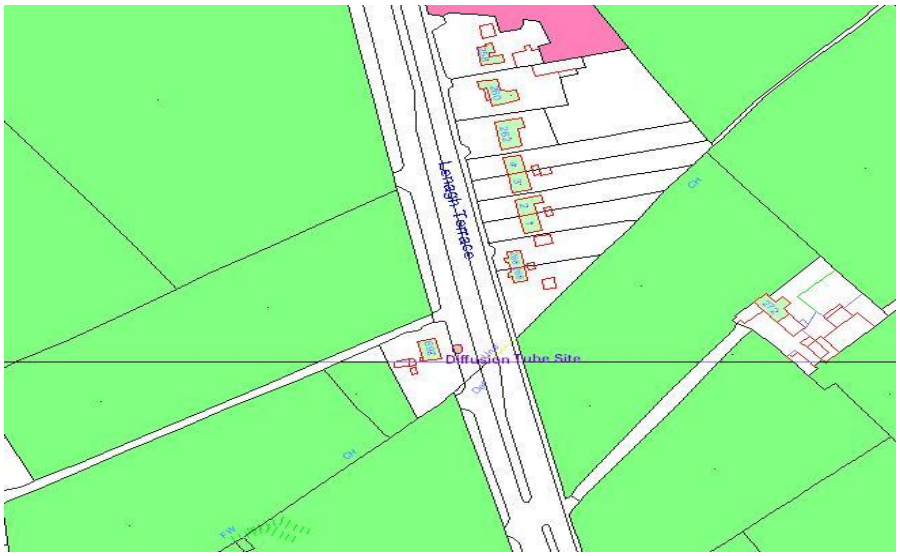
The monitoring sites referred to in this report are shown in the following maps. All maps are subject to Ordinance Survey copyright.

Fountain Street Site



Fountain Street is the main traffic route through Antrim town and has fairly high traffic flows. The site monitors the nearest dwelling to traffic lights.

A26 Lisnevenagh Road Site

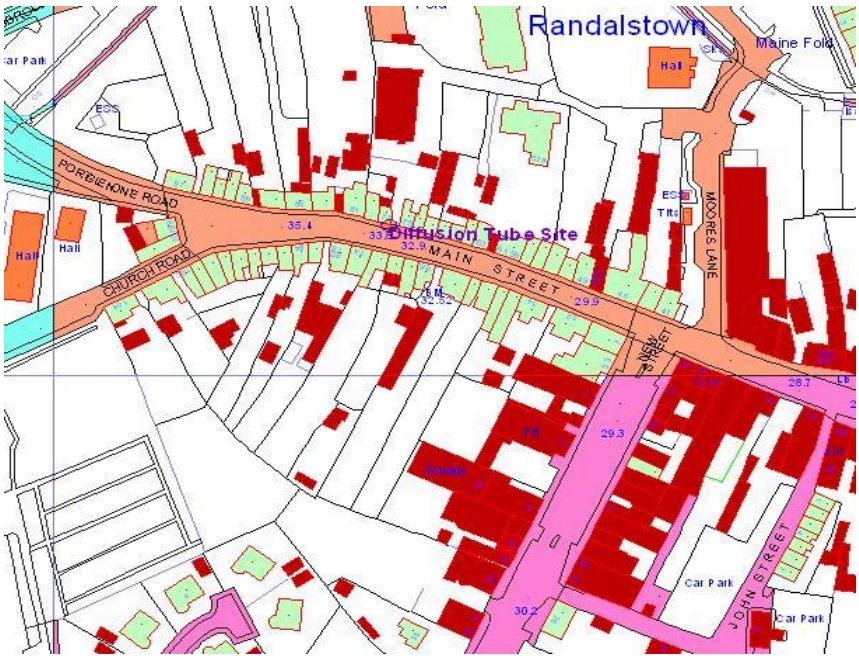


The Lisnevenagh Road is to the North of the Dunsilly roundabout and is a dual carriageway connecting Antrim with Ballymena. This site was set up to monitor concentrations close to the nearest dwelling to this busy road after Design Manual for Roads and Bridges (DMBR) modelling carried out for the Second Stage Review and Assessment predicted an exceedance of the objective at this property. (AADT) (7day) on this section of road is 30,640 (2009).

Templepatrick Site

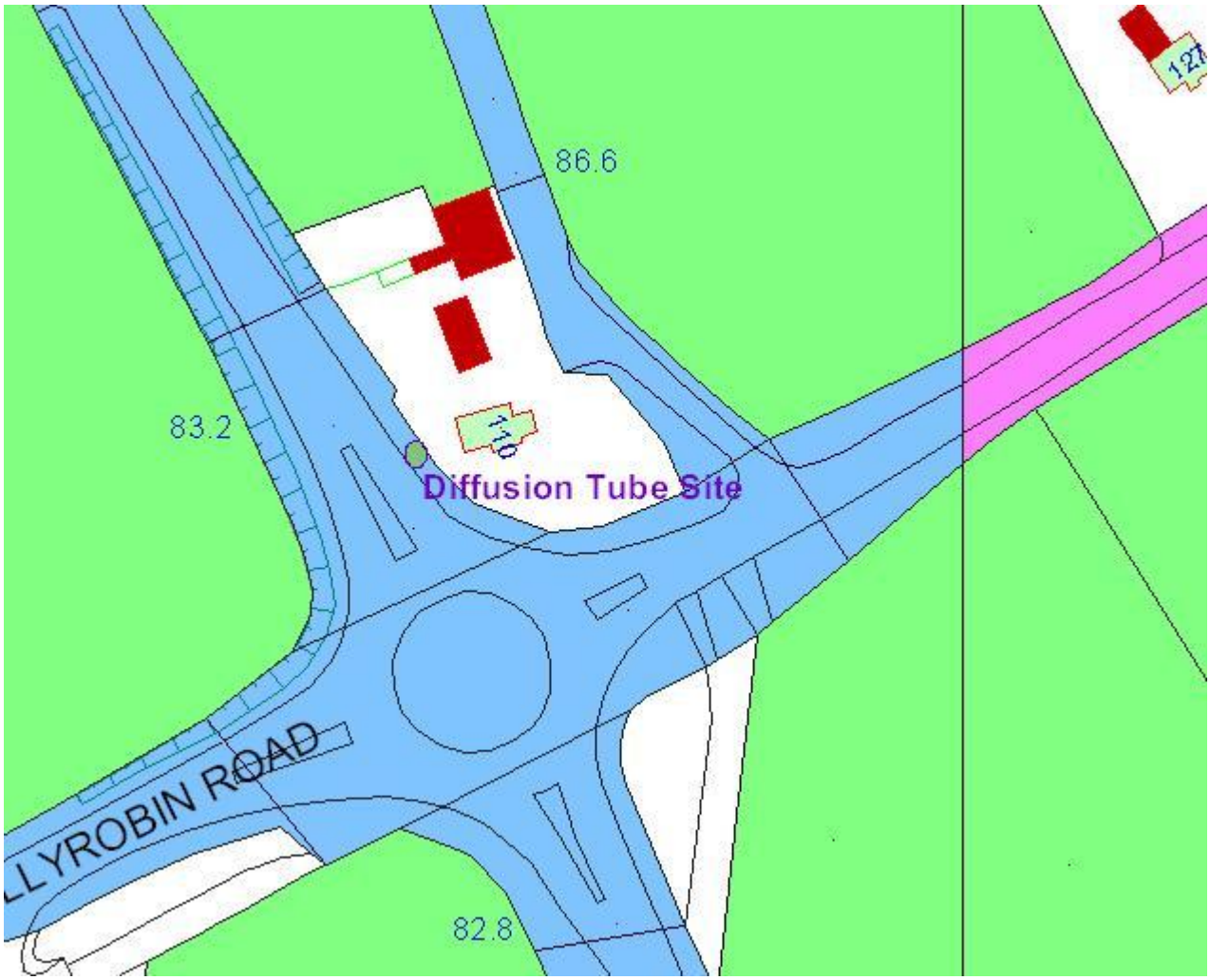
The site in Templepatrick is located on a lamppost in front of the Templeton Hotel. The site is very close to the facade of a residential property. Templepatrick is on the main route between the M2 motorway and Belfast International Airport and experiences high traffic flows. This site has been in operation for 8 years. The 7 day AADT here is 16,240(2009).

Randalstown Site



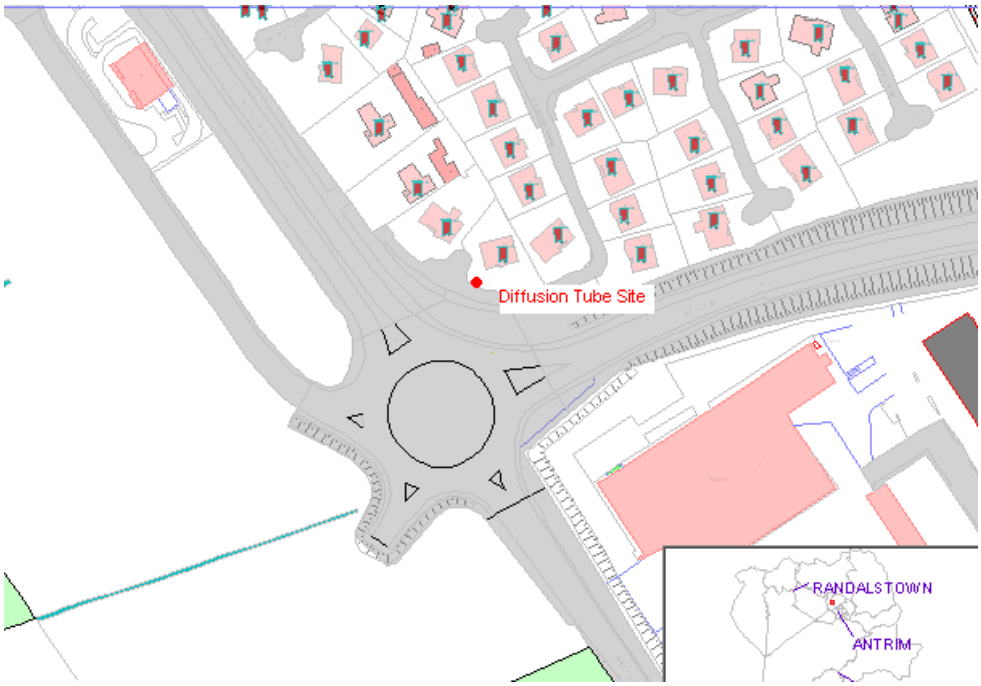
This site is located in front of a residential property on Main Street. The street is narrow at this location and traffic can be slow moving during periods of the day. This site has been operational for 7 years. The narrowness of the street and high buildings here could give rise to raised concentrations because of the canyon effect.

Oldstone Road / Ballyrobin Road Site



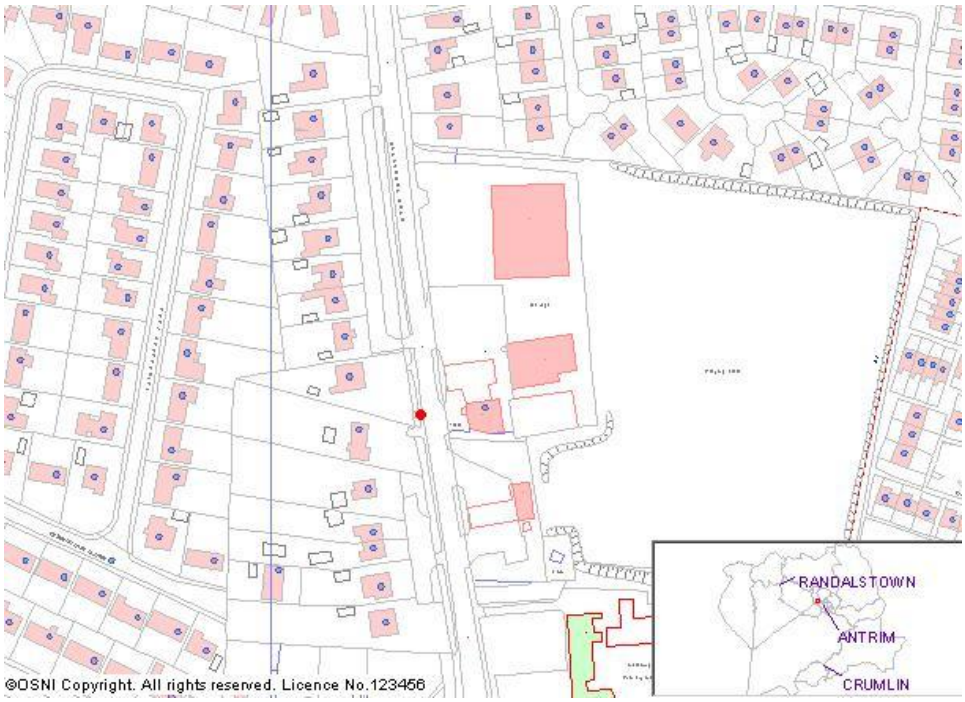
This site is on the Oldstone Road at the Ballyrobin Roundabout and is in front of a residential property. An estimation of concentrations at this location carried out in the first round of Review and Assessment using the Design Manual for Roads and Bridges (DMRB) forecast concentrations near to the national objective.

Meadowlands Site



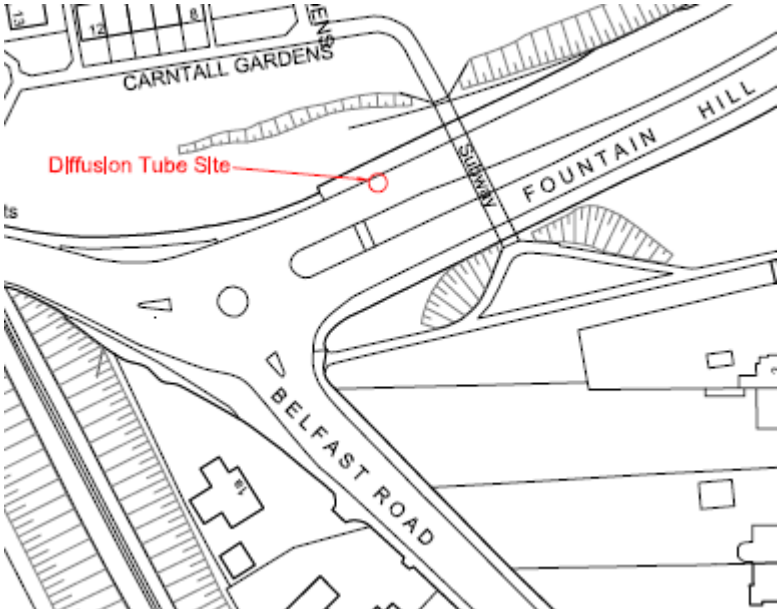
This site is at the Stiles Way / Ballymena Road junction, leading to the Junction One retail & leisure development.

Ballymena Road Site.



The Ballymena road is the main arterial route between Antrim town centre and the new Junction One development. This road has a 7 day average 16,880, 24 hour AADT (2009).

Belfast Road Roundabout Site



This site monitors a busy roundabout at the top of Antrim town.

Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
Fountain St	Roadside	315197	386539	NO_2	N	N	Y (1m)	1.5m	Y
Lisnevenagh Rd	Roadside	313254	319205	NO_2	N	N	Y(4m)	3m	Y
Templepatrick	Kerbside	322992	385675	NO_2	N	N	Y(1m)	1m	Y
Randalstown	Kerbside	308113	390461	NO_2	N	N	Y(1m)	<1m	Y
Ballyrobin Roundabout	Roadside	317496	381750	NO_2	N	N	Y(5m)	2m	Y
Ballymena Rd/Stiles Way	Roadside	314360	388309	NO_2	N	N	Y(15m)	6m	Y
Ballymena Rd	Roadside	314670	387541	NO_2	N	N	Y(10m)	2m	Y
Belfast Rd Roundabout	Roadside	351662	386516	NO_2	N	N	Y(45m)	3m	Y

2.2 Comparison of Monitoring Results with AQ Objectives

The only pollutant monitored by Antrim Borough Council in 2011 was nitrogen dioxide.

2.2.1 Nitrogen Dioxide

Antrim Borough Council currently monitors nitrogen dioxide at 8 sites around the district using passive diffusion tubes. There are no automatic monitoring sites within the borough.

Automatic Monitoring Data

Antrim Borough Council does not operate a continuous nitrogen dioxide monitor.

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2011 % [b]	Annual Mean Concentration μg/m^3				
					2007*[c]	2008* [c]	2009* [c]	2010* [c]	2011 [c]
A1	Roadside	Y	95	95	27.1	25.1	26.2	28.7	26.3

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] 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%.)
[c] 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.

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations measures at Automatic Monitoring Sites

Not applicable.

Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2011 % [b]	Number of Exceedences of Hourly Mean (200 μg/m^3)				
					2007*[c]	2008* [c]	2009* [c]	2010* [c]	2011 [c]
A1	Roadside	Y	95	95	27.1	25.1	26.2	28.7	26.3

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] 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%.)
[c] If the period of valid data is less than 90%, include the 99.8th percentile of hourly means in brackets
*Number of exceedences for previous years are optional.

Diffusion Tube Monitoring Data

Antrim Borough Council currently monitors nitrogen dioxide at 8 sites around the district using passive diffusion tubes. The diffusion tube are supplied and analysed by Environmental Scientifics Group.

Monitoring sites are chosen to provide data on locations that appear to be representative of likely residential exposure and, where possible, are close to the nearest receptor to the busy road or road junction of interest. Where sites do not represent actual relevant public exposure they are located closer to the source than the nearest receptor.

Annual mean concentrations for 2011 are shown in Table 2.5, below. A minimum of 11 month's data is available for each site so the means have not been "annualised". In every case where data is missing the loss of data has been caused by vandalism to the monitoring site. The annual means have been bias adjusted using the appropriate bias adjustment factor from the Review & Assessment website. The correction factor for 2011, based on 22 studies is 0.84.

The annual mean air quality objective of 40 $\mu g/m^3$ was not exceeded at any of the monitoring sites and there were no monthly mean values in excess of 60 $\mu g/m^3$.

The full data set (monthly mean values) for 2011 are set in Appendix 2.

Table 2.5 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 ($\mu g/m^3$)
1	Fountain St	Roadside	N	N	12 months		N	28.44
2	Lisnevenagh Rd	Roadside	N	N	12 months		N	28.86
3	Templepatrick	Kerbside	N	N	11 months		N	32.75
4	Randalstown	Kerbside	N	N	11 months		N	36.10
5	Ballyrobin Roundabout	Roadside	N	N	11 months		N	27.45
6	Ballymena Rd/Stiles Way	Roadside	N	N	11 months		N	20.11
7	Ballymena Rd	Roadside	N	N	11 Months		N	26.51
8	Belfast Rd Roundabout	Roadside	N	N	12 months		N	24.86

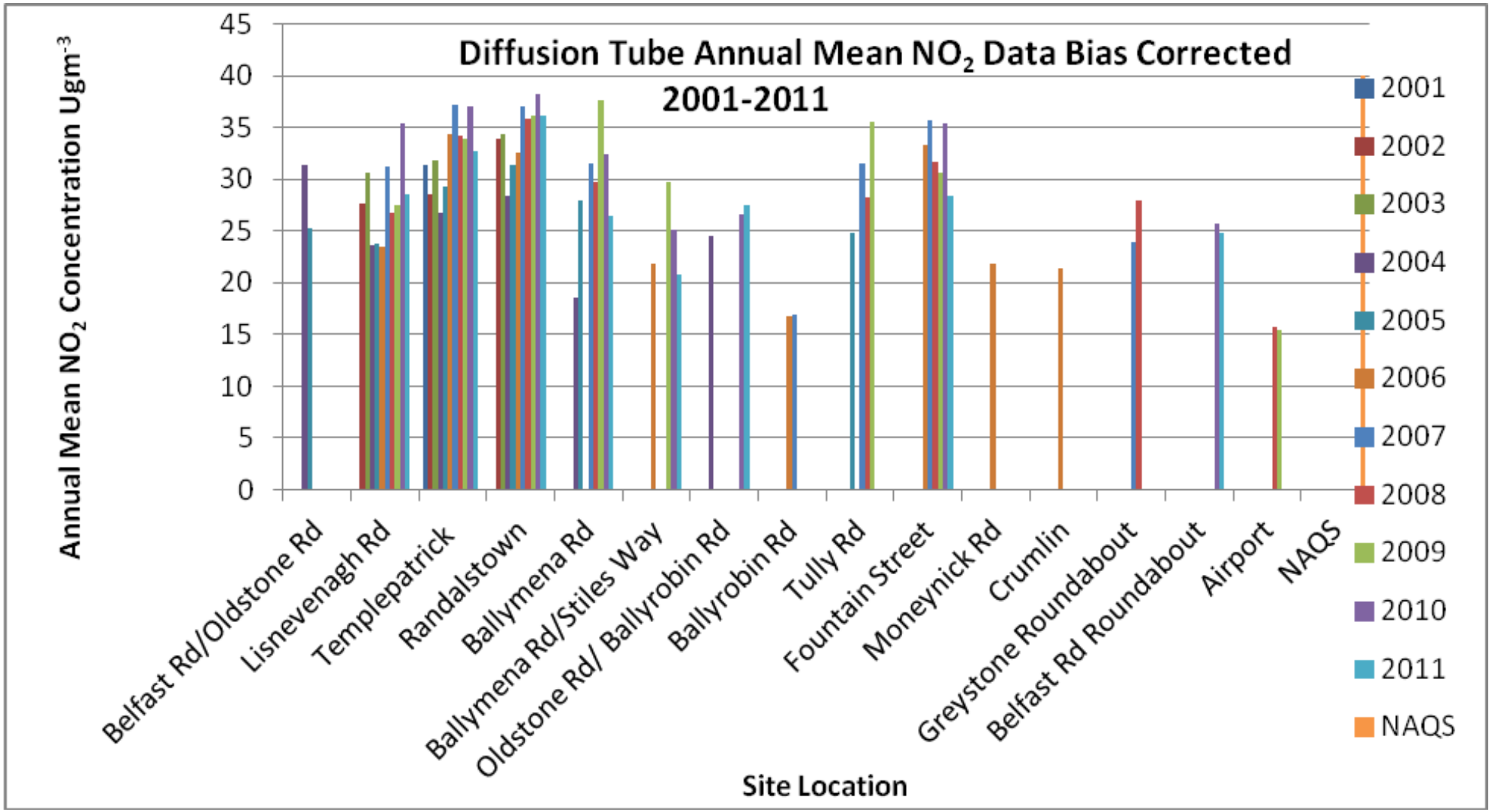
[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] Means should 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 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2011)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3				
			2007* (Bias Adjustment Factor = 0.90)	2008* (Bias Adjustment Factor = 0.83)	2009* (Bias Adjustment Factor = 0.81)	2010* (Bias Adjustment Factor = 0.84)	2011 (Bias Adjustment Factor = 0.84)
1	Roadside	N	35.78	31.62	30.58	35.48	28.44
2	Roadside	N	31.28	26.79	27.54	35.35	28.86
3	Kerbside	N	37.26	34.24	33.95	37.11	32.75
4	Kerbside	N	37.05	35.90	36.23	38.21	36.10
5	Roadside	N				26.64	27.45
6	Roadside	N		21.96	29.67	25.05	20.11
7	Roadside	N	31.58	29.80	39.63	32.42	26.51
8	Roadside	N				25.75	24.86

*Optional

Figure 2.1 Trends in Annual Mean Nitrogen Dioxide Concentrations



Annual mean concentrations for 2011 and, where they are available, for preceding years are shown in the graph in Figure 2.1, above. For most of the sites where monitoring has been continuous for a number of years an rising trend is noticeable although apparently levelling off in recent years. This trend reflects the increase in population that Antrim town has experienced. Noticeably, at the Fountain Street site the trend appears to be downwards, possibly reflecting the growth of out of town shopping taking traffic away from the town centre.

The Annual Mean Objective is not exceeded at any site although results from the Templepatrick and Randalstown remain close to it. Monitoring will continue at the majority of sites, however, the Ballymena Road/Stiles Way site which recorded the lowest annual mean concentration of any of the 8 existing sites in 2011 and has returned consistently low results over 5 years will be decommissioned and the diffusion tube relocated to Castle Street, Randalstown which experiences rush hour traffic congestion on a daily basis.

2.2.2 PM_{10}

Antrim Borough Council does not monitor PM_{10}.

Table 2.7 Results of Automatic Monitoring of PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2011 %[b]	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration μg/m^3				
						2007*[c]	2008* [c]	2009* [c]	2010* [c]	2011 [c]
A1	Roadside	Y	95		Y	27.1	25.1	26.2	28.7	26.3

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] 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%.)
[c] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.
* Optional

Table 2.8 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2011 %[b]	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 μg/m^3)				
						2007*	2008*	2009*	2010*	2011
A1	Roadside	Y	95	92	Y	0	3	4	8	6

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] 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%.)
[c] if data capture is less than 90%, include the 90th percentile of 24-hour means in brackets
* Optional

Figure 2.5 Trends in Annual Mean PM_{10} Concentrations

A trend chart may be inserted here. Please discuss any trends shown.

2.2.3 Sulphur Dioxide

Antrim Borough Council does not monitor Sulphur Dioxide.

Table 2.9 Results of Automatic Monitoring of SO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2011 %[b]	Number of Exceedences (percentile in bracket μg/m³)[c]		
					15-minute Objective (266 μg/m³)	1-hour Objective (350 μg/m³)	24-hour Objective (125 μg/m³)
A1	Roadside	N	98	94	4	1	0

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] 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%.)
[c] if data capture is less than 90%, include the relevant percentile in brackets
* Optional

Figure 2.6 Trends in SO_2 Concentrations

A trend chart may be inserted here. Please discuss any trends shown.

2.2.4 Benzene

Antrim Borough Council does not monitor for Benzene.

2.2.5 Other pollutants monitored

No other pollutants are monitored by Antrim Borough Council.

2.2.6 Summary of Compliance with AQS Objectives

Antrim 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 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

The only street that meets all the screening criteria given in the guidance and where the 'street canyon' effect could be a factor is Main Street, Randalstown. Traffic in this street is often slow moving and although most of the properties on this street are commercial, there are a number of domestic properties and these are within 2 metres of the kerb. Diffusion tube monitoring has been ongoing at a 'relevant location' in this street since 2001 and results for the last five years from this site are shown above in table 2.6 (Site 4).

The monitoring results indicate that the air quality standard is consistently being met at this location and consequently no further assessment is necessary. Although not borderline, the annual mean concentration at this site is, at 36.1 µg m^{-3}, high enough to merit continued monitoring.

Antrim Borough 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

Shopping facilities in Antrim town are largely restricted to the Castle Mall shopping centre and Junction One Outlet Centre which are located away from any busy roads. The only street with a significant number of shops is High Street which was pedestrianised several years ago.

Antrim Borough 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.

According to the most recent Department of Regional Development Roads Service traffic census (2009), the road with the highest proportion of HGV's within the Antrim Borough Council area is the A26 Moira Road (15.3%). There are no receptors within 10 metres of this road.

Antrim Borough Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

There are no "busy junctions" within the borough that are new or have not been considered in earlier assessments.

Antrim Borough 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

No proposed new roads have been constructed or have passed through the planning system in the year under consideration.

Antrim Borough Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

There have been no significant changes in traffic flows in the last year. The most recent traffic information available to the Council is the Department for Regional Development (DRD) Roads Service report, Traffic and Travel Information 2009.

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

3.7 Bus and Coach Stations

The largest bus station in the borough is the Translink station at Railway Street, Antrim. The number of movements of buses at this station is currently in the region of 1400 per week.

Antrim Borough Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

The largest airport in Northern Ireland, Belfast International Airport, is located within the Borough. In 2011 passenger numbers carried were 4.1million. In addition the airport handled a total of 46,000 tonnes of freight. If it is assumed that all freight arrives in “freight-only” then using the method given in the technical guidance this is approximately equivalent to a further ½ mppa making a total of 4.6 million. This is well under the 10million passengers per annum threshold for relevant exposure.

Antrim Borough Council confirms that there are no relevant airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

Antrim station was opened in 1848, and was closed for goods traffic in 1965. The passenger station is still open to trains on the Belfast to Derry line.

4.2.1 Stationary Trains

Antrim station is a passenger stop off point on the Belfast to Derry railway line. Under normal circumstances locomotives would never be stationary at the station for as long as 15 minutes.

Antrim Borough 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

Antrim station is a stop off point on the Belfast to Derry railway line. Typically 28 trains pass through the station daily.

Antrim Borough 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)

Antrim Borough Council has no areas of coastline and no port.

Antrim Borough 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

No planning permissions have been granted for installations for which air quality assessments were carried out as part of the planning process within the Antrim Borough Council area in 2011. Enquiries made with Belfast City Council, Newtownabbey Borough Council, Ballymena Borough Council, Lisburn City Council and with the Department of the Environment Planning Service have confirmed that no such installations have received planning permission in neighbouring boroughs. A new waste to energy plant within the Lisburn area but barely 200m from the borough boundary is currently under consideration by Planning Service. Any decision on this proposed development is likely to be some time away. Planning permission has been applied for in relation to a waste to energy plant within the borough but this application is at an early stage. Dependant on its progress through the planning process, this installation will be considered in a future AQ report.

Antrim Borough Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.1.2 Existing Installations where Emissions have increased substantially or New Relevant Exposure has been introduced

There have been no significant changes to existing industrial installations within the borough and no residential development close to existing installations.

Antrim Borough 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

No new installations have been in operation during 2011 and there have been no significant changes to existing installations.

Antrim Borough Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no large scale petrol storage depots within or near to the Antrim Borough Council area.

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

5.3 Petrol Stations

There are 10 petrol filling stations within the Antrim Borough Council area that have been issued with permits under the Pollution Prevention and Control Regulations (Northern Ireland) 2003 with an annual throughput in excess of 1000m^3 of petrol. Only one of these, Tannaghmore Filling Station, is located close to a road with more than 30,000 vehicles per day, the A26 Lisnevenagh Road (24hr AADT (2009) 30, 640) but this filling station does not have any relevant locations within 10 metres of the pumps.

Antrim Borough Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

There are 10 poultry farms within the Antrim Borough Council area for which permits have been issued by Northern Ireland Environment Agency (NIEA) under the Pollution Prevention and Control Regulations (N.I.) 2003. Three of these farms, although in separate ownership, are in a single block of 9 buildings at Nutts Corner Road, Crumlin. Taken together, these farms are permitted to house a maximum of 285,000 broiler birds. The buildings that house these birds are mechanically ventilated so the criteria for proceeding to a detailed assessment are not met. The next largest farm houses 182,000 chickens and is also mechanically ventilated.

Antrim Borough Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

There is one industrial process within the Antrim Borough Council area involving biomass combustion. Springfarm Architectural Mouldings Ltd, which is located within the Newpark Industrial Estate on Greystone Road, Antrim, produces architectural mouldings manufactured from medium density fibreboard (MDF) for the construction and DIY industries. MDF dust and chips generated by the manufacturing process are collected and burnt to generate heat and electricity.

The installation consists of 3 boilers. Boilers 1 & 2 are rated at 2.2Mw Thermal and Boiler 3 is rated at 5Mw Thermal.

This installation was screened in the last USA, in accordance with the procedure set out in Section D.1a of chapter 5, TG(09), by comparing the background adjusted emission rates of particulate matter (PM10) and NO_2 with the screening target rate for the relevant pollutant. It was concluded that a detailed assessment was not required.

There have been no changes to this biomass installation that would require these findings to be reconsidered.

Antrim Borough 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

Antrim Borough Council has identified one commercial biomass combustion installation which was assessed in the last USA. This installation is in an industrial park and there are no other commercial installations burning biomass or domestic properties burning solid fuel in the same 500 x 500 m square.

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

6.3 Domestic Solid-Fuel Burning

One of the major findings of the first round of review and assessment was that Antrim town contained areas where significant solid fuel burning took place. It was found that in a number of estates, built by the Northern Ireland Housing Executive (NIHE) in the early 1970s, a significant number of properties still relied on smokeless solid fuel room heaters. During the 1970s and 1980s solid fuel systems were installed in public sector dwellings being built, oil not being considered due to the various crises in the worldwide oil supply market around that time. In the 1970's Antrim was developing rapidly as a population centre mainly as the result of social housing projects built to accommodate people displaced by the slum clearance programmes in Belfast. This resulted in a large number of houses being built with solid fuel heating.

The largest solid fuel burning areas in the Antrim and the outlying villages were fully assesses in the first round with much of Antrim town being modelled for the Stage 3 Review and Assessment. The modelling predicted exceedences of the 15-minute mean objective for sulphur dioxide and resulted in the declaration of an AQMA which taook in two housing estates in Antrim town.

Subsequently, Antrim Borough Council developing an action plan and in 2010 was able to revoke the AQMA.

For the 2006 USA other, smaller, pockets of coal and solid fuel fired homes in Antrim and the larger villages of Crumlin and Randalstown were screened.

For the 2009 USA the largest remaining social housing estates at Dublin Road, Antrim were considered and were found not to require further assessment.

Since 2006 Antrim town has had access to a natural gas supply and all major housing developments since then have been connected to this supply. NIHE has also implemented a major programme of replacing solid fuel systems within their properties with gas. This commenced in Antrim 2008 and was completed 2 years later.

The completion of this programme has meant that there are no longer any areas in the borough of significant solid fuel use.

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

7 Fugitive or Uncontrolled Sources

There are three sites within the borough that could have the potential to generate fugitive emissions, a waste transfer and landfill site at Crosshill Road, Crumlin, a quarry at Boghill Road, Belfast and a waste transfer station at Belfast Road, Nutts Corner.

Background levels of PM_{10} at these sites, taken from the national maps (2010) are all under 26µg/m^3 and there are no relevant receptors within 200m of any of these sources.

Antrim Borough 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

Antrim Borough Council monitored for nitrogen dioxide using diffusion tubes at eight sites throughout 2011. No exceedences of the air quality objective were identified at any of the sites. The highest annual mean concentrations of Nitrogen dioxide were returned at the sites monitoring bottlenecks at Templepatrick and Randalstown. These particular monitoring sites have been in place for 9 and 10 years respectively and have consistently recorded annual means in excess of 30$\mu g/m^3$.

The sites at Lisnevenagh Road, Ballymena Road, Ballyrobin Roundabout, Fountain Street and Belfast Road Roundabout monitor the busiest roads and road junctions with relevant exposure within the borough and these along with the Templepatrick and Randalstown sites will be maintained throughout 2012.

The site at Ballymena Road/Stiles Way which is close to a busy roundabout has been in place for 5years overall and has produced enough data for a conclusion to be reached that the air quality objective will not be exceeded here. It has been decided to close this site down and to relocate the diffusion tube to a site on the Castle Road, Randalstown which experiences significant traffic congestion during the early evening rush-hour.

8.2 Conclusions from Assessment of Sources

All potential road transport, other transport, industrial, commercial and domestic sources have been considered and it is concluded that there is no need to proceed to a detailed assessment.

No new roads or roads with significantly increased traffic flows have been identified. The Castle Road at Randalstown experiences significant traffic congestion during the early evening rush hour and, and with the development of a row of townhouses has relevant exposure within 5m of the roadside. A nitrogen dioxide diffusion tube monitoring site will be set up here for 2012.

No new industrial processes have been identified and there have been no significant changes to existing installations.

All the major areas of domestic solid fuel burning had been considered in earlier rounds of review and assessment.

8.3 Proposed Actions

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

Consideration of existing nitrogen dioxide monitoring data has permitted the decommissioning of one of the existing sites. This site will be relocated to monitor a road which experienced traffic congestion and has acquired some new potential receptors in the last year.

The next air quality report will be a Progress Report which is due in April 2013.

9 References

Defra (2009) Part IV of the Environment Act 1995. Local Air Quality Management. Technical Guidance LAQM.TG(09).

AEA Energy & Environment (2008). Diffusion Tubes for Ambient NO_2 Monitoring: A Practical Guide for Laboratories and Users.

DRD Roads Service. Traffic and Travel Information 2009 incorporating Annual Traffic Cencus and Vehicle Kilometres of Travel.

Appendices

Appendix 1: QA/QC Data

Appendix 2: DMRB Calculations

Appendix 1: QA:QC Data

Factor from Local Co-location Studies (if available)

Antrim Borough Council does not operate a real time analyser and consequently does not conduct co-location studies.

Diffusion Tube Bias Adjustment Factors

The nitrogen dioxide diffusion tubes used by Antrim Borough Council are supplied by Environmental Scientifics Group (ESG). The preparation method used is 50% TEA in Acetone.
As Antrim Borough Council does not conduct co-location studies the bias adjustment factor used was taken from the data base on the LAQM Support Website. The adjustment factor for 2011, taken from Spreadsheet Version Number: 3/12 is 0.84.

Discussion of Choice of Factor to Use

Start writing here…In the absence of locally derived data Antrim Borough Council was obliged to use the adjustment factor from the website.

PM Monitoring Adjustment

Start writing here…Antrim Borough Council does not monitor for particulate matter.

Short-term to Long-term Data adjustment

Not applicable to Antrim Borough Council.

Site	Site Type	Annual Mean	Period Mean	Ratio
			Average	

QA/QC of automatic monitoring

Not applicable to Antrim Borough Council

QA/QC of diffusion tube monitoring

ESG participates in the WASP scheme organised by the Health and Safety Laboratory. In the 4 WASP rounds in 2011, R112 to R115, 100% of results returned for samples submitted by ESG were rated as satisfactory.

Appendix 2: Monthly Diffusion Tube Results

Site	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fountain St	50.3	40.5	45.4	35.7	24.7	35.4	33.8	29.7	25.2	31	29.3	25.3
Lisnevenagh Rd	57.8	51.8	42.5	38.6	20.5	32.4	31.6	33.7	23.2	31.6	28.8	19.8
Templepatrick	53.8	49.3	46.4	40.5	27	38.2	34.1	37.7		34.8	36.9	30.2
Randalstown	57	54.4	49.1			28.8	25.5	41.2	38.6	48	49.8	38.2
Ballyrobin Roundabout	35.1	41.1	36.4	28.6		45.9	34.8	25.2	27.2	31.6	30.5	23.1
Ballymena Rd/Stiles Way	39.2	37.1	29.9	21.3		18.5	11.1	18.2	19.8	24.2	23.3	20.8
Ballymena Rd	43.2	53.4	37	31.9	20.1		21.7	27.8	27.8	29.8	28.5	26
Belfast Rd Roundabout	44.7	46.4	34.1	28.1	21.9	25.1	15.8	20.5	22.3	29.8	38.2	28.3