2015 Updating and Screening Assessment for Antrim and Newtownabbey Borough Council

In fulfillment of Environment (Northern Ireland) Order 2002

Local Air Quality Management

September 2015

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Executive Summary

This report follows Guidance LAQM.TG(09) issued by DEFRA and intends to identify any significant changes that have occurred since the previous stage of Review and Assessment which may have the potential to affect the localised air quality.

The findings of this assessment would indicate the following:

AQMA 3, Antrim Road, Elmfield

Results of Automatic Monitoring for nitrogen dioxide showed an annual mean concentration of 40 µg/m^3. Results of diffusion tube monitoring on the façade of the relevant locations were below the annual mean objective.
Antrim and Newtownabbey Borough Council will continue to monitor and implement Action Plan measures in this AQMA.

Diffusion tube monitoring results have been well below the annual mean objective at all the previous Antrim Borough Council monitoring sites since 2010 and at Sites 1 and 56 in the previous Newtownabbey Borough Council area since 2011, therefore monitoring will cease at these sites.

This report has not identified any new sources with relevant exposure therefore it is not considered necessary to proceed to a Detailed Assessment based on potential sources.

Antrim and Newtownabbey Borough Council will be submitting its next Progress Report in April 2016 as well as an Action Plan Progress Report.

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1 Introduction

1.1 Description of Local Authority Area

The Borough of Antrim and Newtownabbey covers 274sq miles from the shores of Lough Neagh in the west to the shores of Belfast Lough in the east and from its northern boundary with Ballymena, the Glens of Antrim and the Port of Larne to its southern borders with Belfast and Lisburn.

Antrim and Newtownabbey Borough Council has a population of 138,000 with 3,730 business and 212,000 annual visitors. Five million people arrive or depart every year through Northern Ireland's busiest gateway, Belfast International Airport.

Two of Northern Ireland's most popular and modern retails outlets, Junction One and Abbey Centre, attract shoppers from far and wide.

Three higher education facilities, the University of Ulster at Jordanstown, CAFRE Agricultural College at Greenmount Campus in Antrim and Northern Regional College cater for 20,000 students. Two hospitals, Antrim Area and Whiteabbey are within its boundaries.

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 microgrammes 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 µg/m^3	Running annual mean	31.12.2003
	3.25 µg/m^3	Running annual mean	31.12.2010
1,3-Butadiene	2.25 µg/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 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/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

Newtownabbey Borough Council:

Report Type	Date	Exceedances	AQMA's Declared/Revoked
Stage 1 Review and Assessment of Air Quality	Mar 2001	None	No
Stage 2/3 Review and Assessment of Air Quality	Aug 2004	Yes PM10	PM10 for Ballyclare Declared
Stage 3 Domestic Fuel Combustion (PM10) Stage 4 Air Quality Review and Assessment PM10	Aug 2004	Yes	
Declaration of AQMA for PM10 Ballyclare	Oct 2004		
Progress Report	Apr 2005	None	
Updating and Screening Assessment	May 2006	None	PM10 Ballyclare Revoked
Revocation of AQMA for PM10	Nov 2006		
Air Quality Progress Report	Aug 2007	Yes Nitrogen Dioxide	3 Declared for: • Ballyclare • Antrim Road, Elmfield • Sandyknowes
Declaration of 3 Air Quality Management Areas for Nitrogen Dioxide	Jan 2008		
Air Quality Progress Report	Aug 2008	Yes Nitrogen Dioxide	
Air Quality Detailed Assessment Nitrogen Dioxide	Apr 2009		
Amendment of AQMA, Antrim Road, Elmfield	Jun 2009		
Updating & Screening Assessment	Aug 2009	1. Exceedances of annual mean and 1 hour objective at Antrim Road, Elmfield; 2. No exceedances at Ballyclare or	

		Sandyknowes	
Progress Report	Sep 2010	1. Exceedances of annual mean and 1 hour objective at Antrim Road, Elmfield; 2. No exceedances at Ballyclare or Sandyknowes	
Action Plan for Antrim Road, Elmfield	Mar 2011		
Progress Report	Jun 2011	1. Exceedances of annual mean and 1 hour objective at Antrim Road, Elmfield; 2. No exceedances at Ballyclare or Sandyknowes	
Updating and Screening Assessment	April 2012	1. Exceedances of annual mean and 1 hour objective at Antrim Road, Elmfield; 2. No exceedances at Ballyclare or Sandyknowes. Revocation of both AQMAs.	
Action Plan Progress Report	October 2012		
Progress Report	Dec 2013	Exceedances of annual mean at Antrim Road, Elmfield	
Progress Report	Sept 2014	No Exceedances of annual mean at Antrim Road, Elmfield	

Antrim Borough Council:

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)	Report determined AQMA could be revoked. SO_2 real time analyser could be decommissioned.
2011	Progress Report	AQMA revocation came into effect on 31 January 2011. No significant changes found.
2012	Updating & Screening Assessment	No requirement for detailed assessment.
2013	Progress Report	No significant changes found
2014	Progress Report	No significant changes found

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Antrim and Newtownabbey Borough Council has one automatic monitoring station located at Antrim Road, Elmfield. The details of the automatic continuous monitoring station is included in **Table 2.1** and the map is included in **Appendix C**.

- **Antrim Road, Elmfield**

This monitor has been located here since January 2008. In January 2010 on advice from Review and Assessment Helpdesk we moved the sample inlet to 1m from the façade of the relevant location.

Table 2.1 Details of Automatic Monitoring Site

Site Name	**Site Type**	**X OS Grid Ref**	**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?**
Antrim Road, Elmfield	Roadside	332305	381697	NO_2	Y		Y (1m)	3m	Y

2.1.2 Non-Automatic Monitoring Sites

Newtownabbey Borough Council operated a network of 14 nitrogen dioxide diffusion tubes in 2014 and Antrim Borough Council area operated 8 nitrogen dioxide diffusion tubes.

The diffusion tubes are exposed for a 4-5 week period and further site specific details on these tube locations are provided in **Table 2.2** with maps in **Appendix C**.

The diffusion tube data is presented in **Table 2.5** with exceedances of the 40 µg/m3 annual mean NO2 highlighted in bold.

In 2014 the diffusion tubes were analysed by Gradko Services using 20% triethylamine in water for Newtownabbey Borough Council and by Environmental Scientifics Group (ESG) using 50% TEA in Acetone for Antrim Borough Council.

QA/QC details which include the bias adjustment factors for 2014 is reported in **Appendix A**.

Table 2.2 Details of Non-Automatic Monitoring Sites

Newtownabbey Borough Council:

Site Name	Site Type	X & 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)*
Site 1 Main Street, Ballyclare	Roadside	328854 391134	NO_2	N	N	Y (located on property)	2m
Site 57 7 Sandyholme Way	Roadside	330514 382939	NO_2	N	N	Y (5m)	9m
Site 12 7 Sandyholme Way	Roadside	330514 382939	NO_2	N	N	Y (5m)	9m
Site 8 Braden Heights, Rathcoole	Urban Background	333898 381926	NO_2	N	N	Y (5m)	n/a

Site Name	Site Type	X & 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)*
Site 11 44 Sandyknowes Avenue	Roadside	330675 382586	NO_2	N	N	Y (7m)	7m
Site 46 12 Collinbridge Road	Roadside	332193 381666	NO_2	N	N	Y (located on property)	9m
Site 47 13 Sandyholme Park	Roadside	330554 382848	NO_2	N	N	Y (7m)	7m
Site 48 24 Sandyknowes Avenue	Roadside	330631 382729	NO_2	N	N	Y (located on property)	17m
Site 49 6 Sandyknowes Gardens	Urban Background	330641 382771	NO_2	N	N	Y (located on property)	55m

Site Name	Site Type	X & 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)*
Site 50 45 Burney's Lane	Roadside	331025 382224	NO_2	N	N	Y (located on property)	17m
Site 56 5 Sandyholme Park	Roadside	330589 382908	NO_2	N	N	Y (7m)	68m
Site 58 Lamp-post, 198 Antrim Road ,Elmfield	Roadside	332305 381697	NO_2	Y	N	Y (3m)	1.7m
Site 60 196 Antrim Road	Roadside	332305 381697	NO_2	Y	N	Y (located on Property	4m
Site 61 **196 Antrim** **Road**	Roadside	332305 381697	NO_2	Y	N	Y (located on property)	4m

Antrim Borough Council:

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
1	Fountain St	Roadside	315197	386539	2.5	NO_2	N	N	Y (1m)	1.5m	Y
2	Lisnevenagh Rd	Roadside	313254	319205	2.5	NO_2	N	N	Y(4m)	3m	Y
3	Templepatrick	Kerbside	322992	385675	2.3	NO_2	N	N	Y(1m)	1m	Y
4	Randalstown	Kerbside	308113	390461	2.5	NO_2	N	N	Y(1m)	<1m	Y
5	Ballyrobin Roundabout	Roadside	317496	381750	2.5	NO_2	N	N	Y(5m)	2m	Y
6	Castle Road	Roadside	308669	390123	2.5	NO_2	N	N	Y(15m)	2m	Y
7	Ballymena Rd	Roadside	314670	387541	2.5	NO_2	N	N	Y(10m)	2m	Y
8	Belfast Rd Roundabout	Roadside	351662	386516	2.5	NO_2	N	N	Y(30m)	3m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Table 2.3 provides all nitrogen dioxide continuous monitoring data collected since 2010 and **Table 2.4** compares the results with the 1 hour Mean Objective.

Table 2.3 Results of Automatic Monitoring for NO_2 Comparison with Annual Mean Objective (2010-2014)

Site ID	Site Type	Within AQMA?	Valid Data Capture 2014 %	Annual Mean Concentration μg/m³				
				2010	2011	2012	2013	2014
Antrim Rd, Elmfield	Roadside	Y	94.5	**46**	**43**	**42**	39	40

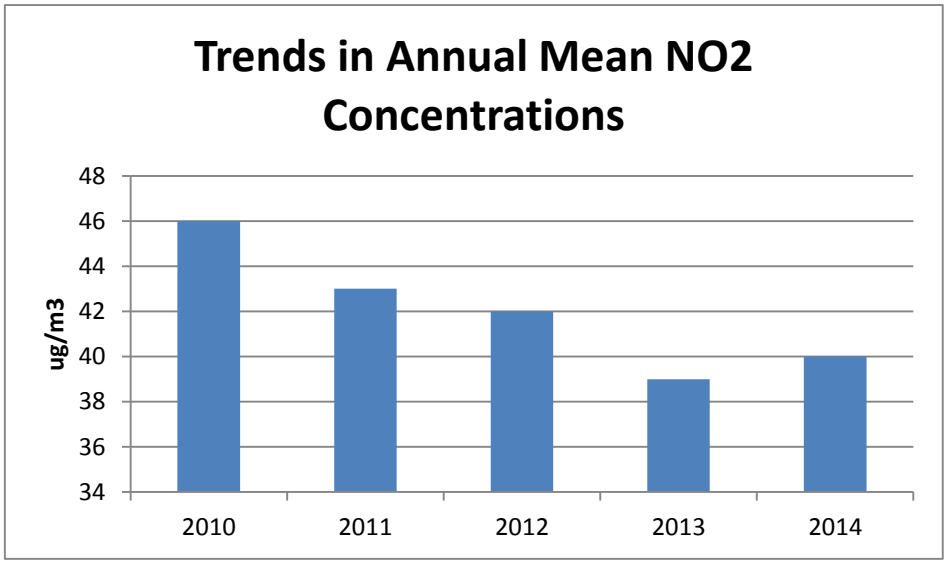
Table 2.4 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective (2010-2014)

Site ID	Site Type	Within AQMA?	Valid Data Capture 2014 %	Number of Exceedences of Hourly Mean (200 μg/m³)				
				2010	2011	2012	2013	2014
Antrim Rd, Elmfield	Roadside	Y	94.5	3	7	3	0	1

Exceedances of the 40 μg/m^3 annual mean nitrogen dioxide objective and cases where there are more than the permitted 18 exceedances of the 200 μg/m^3 1-hour mean nitrogen dioxide objective are highlighted in bold.

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

Figure 2.3 shows the Trends in Annual Mean Nitrogen Dioxide Concentrations measured at the Antrim Road, Elmfield monitoring site. In 2010 the sample inlet was moved from the roadside to within 1m of the façade of the relevant location and this resulted in a significant decrease in the concentrations. Since then there has been a decrease in concentrations at the site, with only a slight increase of 1 µg/m^3 in 2014



Diffusion Tube Monitoring Data

Newtownabbey Borough Council operated a network of 14 nitrogen dioxide diffusion tubes in 2014 and Antrim Borough Council area operated 8 nitrogen dioxide diffusion tubes.

Table 2.5 Results of NO_2 Diffusion Tubes 2014 (full monthly data sheets are in Appendix D)

Newtownabbey Borough Council:

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (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 (national Bias Adjustment factor = 0.91) 2014 (μg/m^3)
Site 1	Main Street, Ballyclare	Roadside	N		12 months		N	29.23
Site 57	7 Sandyholme Way	Roadside	N	Collocated with Site12	12 months		Y	35.31*
Site 12	7 Sandyholme Way	Roadside	N	Collocated with Site 57	12 months		Y	36.58*
Site 8	Braden Heights, Rathcoole	Urban Background	N		12 months		N	16.51
Site 11	44 Sandyknowes Avenue	Roadside	N		12 months		Y	30.58*
Site 46	12 Collinbridge Road	Roadside	N		12 months		N	37.94

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (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 (national Bias Adjustment factor = 0.91) 2014 (μg/m^3)
Site 47	13 Sandyholme Park	Roadside	N		12 months		Y	32.76*
Site 48	24 Sandyknowes Avenue	Roadside	N		12 months		N	39.12
Site 49	6 Sandyknowes Gardens	Urban Background	N		12 months		N	25.33
Site 50	45 Burney's Lane	Roadside	N		12 months		N	32.67
Site 56	5 Sandyholme Park	Roadside	N		12months		N	28.15
Site 58	Lamp-post, 198 Antrim Road ,Elmfield	Roadside	Y		12 months		Y	38.13*
Site 60	196 Antrim Road	Roadside	Y	Collocated with site 61	12 months		N	34.63
Site 61	196 Antrim Road	Roadside	Y	Collocated with site 60	12 months		N	34.67

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m$^{3.}$

*Distance Correction Calculations in Appendix E

Antrim Borough Council:

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2014 (Number of Months or %) [a]	Confirm if data has been distance corrected (Y/N)	2014 Annual Mean Concentration (µg/m^3) Bias Adjustment factor = 0.81
1	Fountain St	Roadside	N	N	11 months	N	26.5
2	Lisnevenagh Rd	Roadside	N	N	12 months	N	32.3
3	Templepatrick	Kerbside	N	N	12 months	N	31.3
4	Randalstown	Kerbside	N	N	12 months	N	33.0
5	Ballyrobin Roundabout	Roadside	N	N	12 months	N	24.7
6	Castle Road	Kerbside	N	N	12 months	N	25.5
7	Ballymena Rd	Roadside	N	N	12 months	N	23.2
8	Belfast Rd Roundabout	Roadside	N	N	12 months	N	23.4

Table 2.6 Results of NO_2 Diffusion Tubes (2010 to 2014)

Newtownabbey Borough Council:

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m³				
			2010 (Bias Adjustment Factor = 0.96)	2011 (Bias Adjustment Factor = 0.92)	2012 (Bias Adjustment Factor = 0.96)	2013 (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.91)
Site 1 Main Street, Ballyclare	Roadside	Y	32	27	30.4	28.74	29.23
Site 57 7 Sandyholme Way	Roadside	Y	40	40	**40.74**	38.30*	35.31*
Site 12 7 Sandyholme Way	Roadside	Y	40	40	**40.05**	35.40*	36.58*
Site 8 Braden Heights, Rathcoole	Urban Background	N	19	16	16.72	15.70	16.51
Site 11 44 Sandyknowes Avenue	Roadside	N	**41**	37	38.87	32.10*	30.58*
Site 46 12 Collinbridge Road	Roadside	N	37	36	37.79	32.92	37.94

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3				
			2010 (Bias Adjustment Factor = 0.96)	2011 (Bias Adjustment Factor = 0.92)	2012 (Bias Adjustment Factor = 0.96)	2013 (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.91)
Site 47 13 Sandyholme Park	Roadside	Y	**47**	**41**	**40.56**	33.30*	32.76*
Site 48 24 Sandyknowes Avenue	Roadside	N	35	35	35.39	33.86	39.12
Site 49 6 Sandyknowes Gardens	Urban Background	N	31	27	27.97	26.10	25.33
Site 50 45 Burney's Lane	Roadside	N	36	37	34.59	33.87	32.67
Site 56 5 Sandyholme Park	Roadside	N	32	30	28.43	24.63	28.15
Site 58 Lamp-post, 198 Antrim Road ,Elmfield	Roadside	Y	**47**	**48**	**49.10**	34.8*	38.13*

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3				
			2010 (Bias Adjustment Factor = 0.96)	2011 (Bias Adjustment Factor = 0.92)	2012 (Bias Adjustment Factor = 0.96)	2013 (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.91)
Site 60 196 Antrim Road	Roadside	Y	**42**	39	37.7	33.02	34.63
Site 61 **196 Antrim Road**	Roadside	Y	**41**	38	37.75	33.80	34.67

In bold, exceedence of the NO_2 annual mean AQS objective of 40μg/m^3

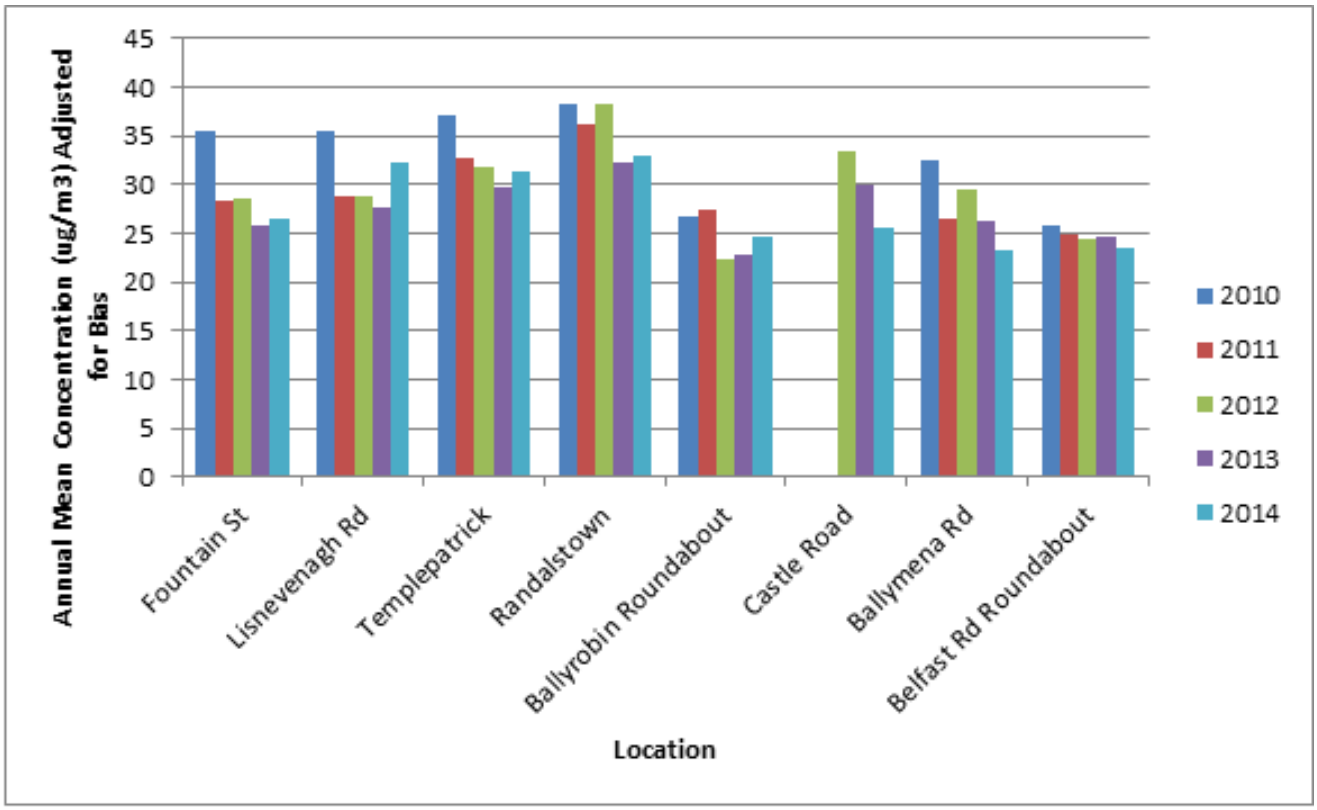
*Distance Corrected

Antrim Borough Council:

Site ID	Location	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]					
				2010 (Bias Adjustment Factor = 0.84)	2011 (Bias Adjustment Factor = 0.84)	2012 (Bias Adjustment Factor = 0.79)	2013 (Bias Adjustment Factor = 0.81)	2014 (Bias Adjustment Factor = 0.81)	
1	Fountain St	Roadside	N	35.5	28.4	28.6	25.7	26.5	
2	Lisnevenagh Rd	Roadside	N	35.4	28.9	28.7	27.7	32.3	
3	Templepatrick	Kerbside	N	37.1	32.8	31.9	29.7	31.3	
4	Randalstown	Kerbside	N	38.2	36.1	38.3	32.2	33.0	
5	Ballyrobin Roundabout	Roadside	N	26.6	27.5	22.3	22.8	24.7	
6	Castle Road	Kerbside	N			33.3	29.9	25.5	
7	Ballymena Rd	Roadside	N	32.4	26.5	29.4	26.3	23.2	
8	Belfast Rd Roundabout	Roadside	N	25.8	24.9	24.5	24.6	23.4	

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites

Antrim Borough Council:



As can be seen from Figure 2.3, nitrogen dioxide levels continued to decrease at 3 out of the 8 diffusion tube monitoring sites compared to the 2013 levels. All other monitoring sites had annual mean values below 33μg/m^3 i.e. well below the annual mean air quality objective of 40μg/m^3. It is possible that this is attributable to the difficult economic conditions experienced in recent years, such as high fuel costs, rise in unemployment and increased cost of living resulting in less cars being on the road. Sites such as Fountain Street are possibly experiencing lower volumes of road traffic due to an increase in out of town shopping.

The Annual Mean Objective has not being exceeded at any site throughout the borough since 2010 therefore monitoring will cease at all sites.

2.2.2 PM_{10}

Antrim and Newtownabbey Borough Council does not carry out PM_{10} monitoring.

2.2.3 Sulphur Dioxide

Antrim and Newtownabbey Borough Council does not carry out SO2 monitoring.

2.2.4 Benzene

Antrim and Newtownabbey does not carry out any Benzene monitoring

2.2.5 Summary of Compliance with AQS Objectives

Antrim and Newtownabbey Borough Council has examined the results from monitoring in the Antrim and Newtownabbey Borough Council area. Concentrations are meet or are 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

Antrim and Newtownabbey 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

Antrim and Newtownabbey 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.

Antrim and Newtownabbey Borough Council has assessed newly identified road(s) with high flows of buses or HDVs in a busy street where people may spend 1 hour or more close to traffic that it has not previously been assessed, and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.4 Junctions

Antrim and Newtownabbey 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

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

3.6 Roads with Significantly Changed Traffic Flows

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

3.7 Bus and Coach Stations

Antrim and Newtownabbey 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 2014 passenger numbers carried were 4,033,954. In addition the airport handled a total of 30,073 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 1/3 mppa making a total of approximately 300,000 passengers per annum. This is well under the 10million passengers per annum threshold for relevant exposure.

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

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Antrim and Newtownabbey 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 and Newtownabbey 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 and Newtownabbey 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 and Newtownabbey Borough Council area in 2014.

There have, however, been a number of applications received that have required an air quality assessment to be submitted in support of their application. No decisions have yet been made as to whether permission will be granted or refused.

As reported in Antrim Borough Council's 2013 Air Quality Progress Report, consultations had been reissued by Planning NI for a biomass fuelled power plant just over Antrim and Newtownabbey Borough Council's borough (S/2008/0630 F). The status of this application remains on hold awaiting submission of environmental statement.

Following on from the previously reported pre-application preliminary enquiry, T/2010/0240/Q, for arc21 waste treatment facilities for the sorting, biological treatment and incineration of waste at Hightown Quarry, a full application has now been submitted to Planning NI. An Environmental Statement, including an Air Quality Assessment, was submitted in support of the application. The assessment concluded that the impacts at local receptors will be well within Environmental Action Levels as well as statutory air quality limit values, target values and objectives. No decision has yet been taken as to whether this proposal will be granted permission or refused.

No decision has been made in relation to two planning application for a recycling facility and landfill site for inert construction and demolition waste at a disused quarry (T/2005/0977/F and T/2005/1054/F). Should permission be granted, activities at

these developments may be a potential source of fugitive particulate emissions and would be considered as such in future reports.

The status of the above-mentioned planning applications will be reassessed and given further consideration in the next Progress Report in 2016.

Antrim and Newtownabbey 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 and Newtownabbey 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 2014 and there have been no significant changes to existing installations.

Antrim and Newtownabbey Borough Counil 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 major fuel (petrol) storage depots within the Antrim and Newtownabbey Borough Council area.

5.3 Petrol Stations

Applegreen, M2 Northbound, Browns Road, Newtownabbey is the only new petrol station opened since the last round of review and assessment. It has an annual throughput of >3500 m3 however the petrol station is fitted with Stage 2 recovery systems and there is no relevant exposure within 10m of the pumps.

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

5.4 Poultry Farms

Antrim and Newtownabbey 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 and Newtownabbey 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 has been previously screened, 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 and Newtownabbey 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 and Newtownabbey Borough Council has identified one commercial biomass combustion installation which was assessed a previous 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 and Newtownabbey 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

Antrim and Newtownabbey 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 PM10 at these sites, taken from the national maps (2010) are all under 26µg/m3 and there are no relevant receptors within 200m of any of these sources.

Antrim and Newtownabbey 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

Newtownabbey Borough Council:

AQMA 3, Antrim Road, Elmfield

Results of the Automatic Monitor, whose inlet is 1m from the façade of the relevant location, for nitrogen dioxide in 2014 showed an annual mean concentration of 40 µg/m^3. This was a slight increase from 2013 (39 µg/m3) however there was only 1 exceedance of the 1 hour objective.

However all diffusion tubes within this AQMA were below the annual mean objective:

Diffusion tube 58 is located on a lamp post adjacent to the road, within 3m from the relevant location, and showed a decrease in the annual mean concentration with a result of 38 µg/m^3.

Diffusion tubes 60 and 61 are located on the façade of the relevant location and they both showed an annual mean concentration of 34 µg/m^3

Even though the measurements on the façade of the relevant location are below the annual mean objective Antrim and Newtownabbey Borough Council will continue to monitor in 2015.

Other monitoring results

Site 1 and Site 56

Diffusion tube monitoring results have been 30 µg/m^3 and below since 2011 therefore monitoring will cease at these sites.

Site 11 and Site 47

Results have been continuing to decrease at these two sites for the past 2 years with results in 2014 being 30 µg/m^3 and 32 µg/m^3 respectively. We will continue to monitor to see if this trend continues.

Site 50

Results have been continuing to decrease for the past 3 years with results in 2014 being 32 µg/m^3. Again we will continue to monitor to see if this trend continues.

Antrim Borough Council:

Monitoring results at all of the Antrim Borough Council sites have been well below the annual mean objective since 2010 and monitoring will cease at these.

8.2 Conclusions from Assessment of Sources

No new sources with relevant exposure have been identified through this Update and Screening Assessment. It is therefore not considered necessary to proceed to a 'Detailed Assessment' based on potential sources.

8.3 Proposed Actions

- AQMA 3, Antrim Road, Elmfield

  Continue monitoring and implement Action Plan Measures

- Review Diffusion Tube locations outside AQMA's and cease monitoring at all sites in the previous Antrim Borough Council area and at the sites 1 and 56 in the previous Newtownabbey Borough Council area
- Submit Progress Report 2016
- Submit Action Plan Progress Report

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 NO2 Monitoring: A Practical Guide for Laboratories and Users.

https://en.wikipedia.org/wiki/Belfast_International_Airport - for passenger numbers, freight tonnage at Belfast International Airport

Appendices

Appendix A	QA/QC Data
Appendix B	Location of Air Quality Management Area
Appendix C	Locations of Monitoring Sites
Appendix D	Monthly Diffusion Tube Results
Appendix E	Nitrogen Dioxide Fall off with Distance Calculator

Appendix A: QA/QC Data

Appendix A: QA:QC Data

Newtownabbey Borough Council:

Diffusion Tube Bias Adjustment Factors

In 2014 the diffusion tubes were analysed by Gradko Services using 20% TEA in water.

There are no co-located diffusion tubes at the inlet of the continuous monitor therefore the national bias adjustment factor was used. The laboratory bias correction factor was calculated using the diffusion tube spreadsheet tool. This diffusion tube spreadsheet tool is published by Air Quality Consultants Ltd on behalf of DEFRA, the Welsh Assembly Government, the Scottish Executive and the Department of the Environment Northern Ireland and it is available on the UWE website.

The bias adjustment factor of 0.91 was calculated from 21 studies from Gradko Services for 2014 using the diffusion tube spreadsheet tool, for the diffusion tubes study.

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 06/15

Follow the steps below in the correct order to show the results of relevant co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of September 2015

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List. If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List. If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List. If a year is not shown, we have no data.

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953

Analysed By[1]	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2014	R	Dudley MBC	12	41	35	15.2%	G	0.87
Gradko	20% TEA in water	2014	R	Dudley MBC	12	52	60	-12.8%	G	1.14
Gradko	20% TEA in water	2014	R	Gateshead Council	10	35	32	10.8%	G	0.90
Gradko	20% TEA in water	2014	R	Gateshead Council	12	36	36	-0.1%	G	1.00
Gradko	20% TEA in water	2014	R	Gateshead Council	12	34	32	6.4%	G	0.94
Gradko	20% TEA in water	2014	UB	Luton Borough Council	9	36	37	-4.0%	G	1.04
Gradko	20% TEA in water	2014	KS	Marylebone Road Intercomparison	12	115	80	42.8%	G	0.70
Gradko	20% TEA in water	2014	R	Monmouthshire County Council	10	42	38	10.1%	G	0.91
Gradko	20% TEA in water	2014	R	NOTTINGHAM CITY COUNCIL	12	44	39	14.9%	G	0.87
Gradko	20% TEA in water	2014	R	Bedford Borough Council	12	38	39	-2.7%	G	1.03
Gradko	20% TEA in water	2014	R	City of Lincoln Council	12	45	38	16.8%	G	0.86
Gradko	20% TEA in water	2014	R	East Herts Council	11	37	33	14.5%	G	0.87
Gradko	20% TEA in water	2014	R	Lancaster City Council	11	36	38	-4.0%	G	1.04
Gradko	20% TEA in water	2014	R	Wokingham Borough Council	12	40	37	9.3%	G	0.91
Gradko	20% TEA in water	2014		Overall Factor[3] (21 studies)				Use		0.91

QA/QC of diffusion tube monitoring

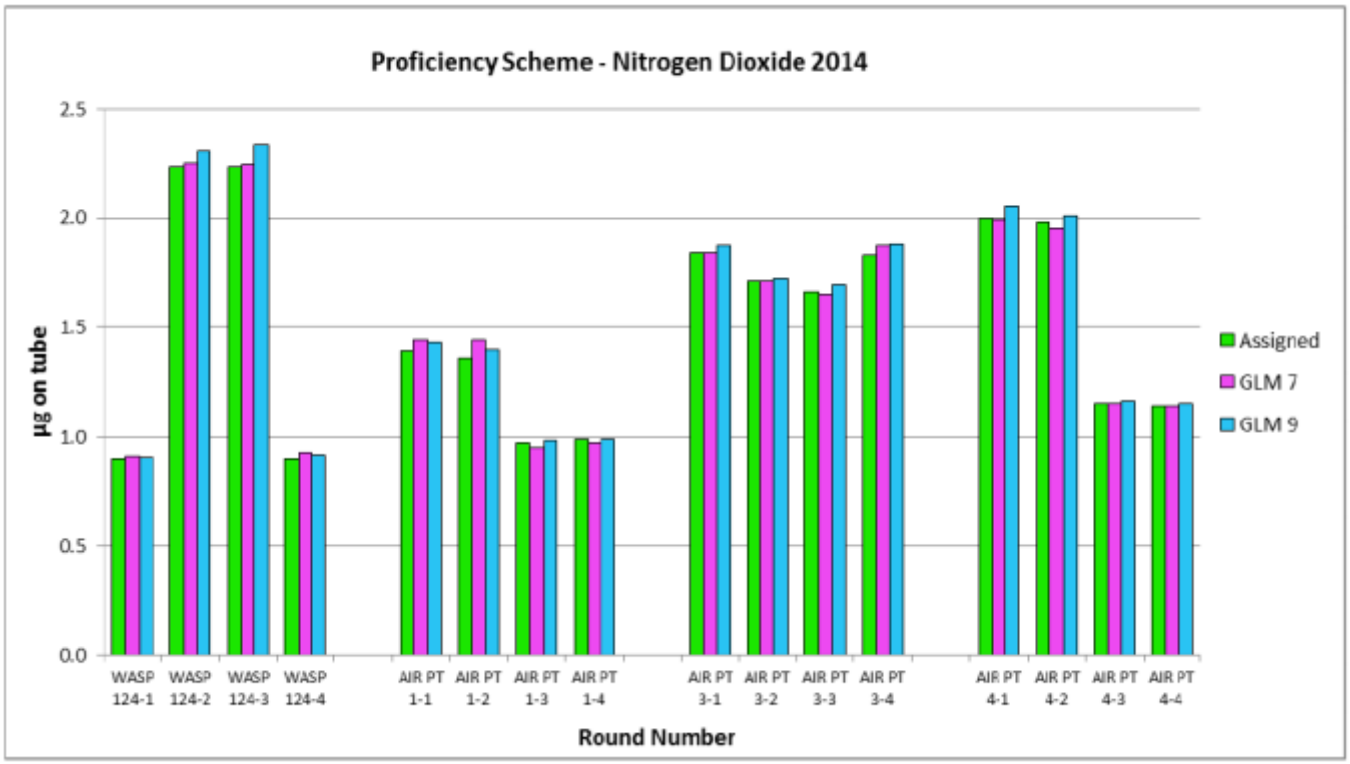
Diffusion tubes were analysed by Gradko Services using 20% triethylamine in water.

Gradko have confirmed that their laboratory complies with the procedures detailed in the DEFRA Harmonisation Practical Guidance and their WASP results for 2014 were satisfactory.

Nitrogen Dioxide Proficiency Scheme 2014

Methods: GLM 7 – Camspec M550 Spectrophotometer, GLM 9 – QuAAtro Continuous Flow analyser

Proficiency Scheme - Nitrogen Dioxide 2014								
Date	Round	Assigned value	Camspec M550 - GLM 7			QuAAtro - GLM 9		
			Measured concentration	z-Score	% Bias	Measured concentration	z-Score	% Bias
Feb-14	WASP 124-1	0.90	0.91	0.14	1.2%	0.91	0.06	0.6%
Feb-14	WASP 124-2	2.24	2.25	0.09	0.5%	2.31	0.41	2.9%
Feb-14	WASP 124-3	2.24	2.25	0.07	0.4%	2.33	0.58	4.2%
Feb-14	WASP 124-4	0.90	0.93	0.46	2.9%	0.92	0.32	1.9%
May-14	AIR PT 1-1	1.39	1.44	0.48	3.6%	1.43	0.38	2.9%
May-14	AIR PT 1-2	1.36	1.44	0.78	5.9%	1.40	0.39	2.9%
May-14	AIR PT 1-3	0.97	0.95	-0.27	-2.1%	0.98	0.14	1.0%
May-14	AIR PT 1-4	0.99	0.97	-0.27	-2.0%	0.99	0.0	0.0%
Aug-14	AIR PT 3-1	1.84	1.84	0.0	0.0%	1.87	0.22	1.6%
Aug-14	AIR PT 3-2	1.71	1.71	0.0	0.0%	1.72	0.08	0.6%
Aug-14	AIR PT 3-3	1.66	1.65	-0.08	-0.6%	1.69	0.24	1.8%
Aug-14	AIR PT 3-4	1.83	1.87	0.29	2.2%	1.88	0.36	2.7%
Nov-14	AIR PT 4-1	2	1.99	-0.07	-0.5%	2.05	0.33	2.5%
Nov-14	AIR PT 4-2	1.98	1.95	-0.2	-1.5%	2.01	0.2	1.5%
Nov-14	AIR PT 4-3	1.15	1.15	0	0.0%	1.16	0.12	0.9%
Nov-14	AIR PT 4-4	1.14	1.14	0	0.0%	1.15	0.12	0.9%


Proficiency Scheme - Nitrogen Dioxide 2014
µg on tube
2.5
2.0
1.5
1.0
0.5
0.0
WASP 124-1
WASP 124-2
WASP 124-3
WASP 124-4
AIR PT 1-1
AIR PT 1-2
AIR PT 1-3
AIR PT 1-4
AIR PT 3-1
AIR PT 3-2
AIR PT 3-3
AIR PT 3-4
AIR PT 4-1
AIR PT 4-2
AIR PT 4-3
AIR PT 4-4
Round Number
Assigned
GLM 7
GLM 9

QA/QC of Automatic Monitoring

In 2014 Air Quality Data Management for the Automatic Analyser was carried out by Ricardo-AEA. The measured data was ratified using the techniques developed for the AURN and AEA Calibration Club as specified in LAQM TG(09). Bi-annual Quality Control audits were carried out by Ricardo-AEA.

Routine calibration of the NO_X analyser is undertaken by Newtownabbey Borough Council fortnightly, using on-site certified calibration gas cylinders traceable to National Calibration Standards.

The 2014 summary for the Antrim Road, Elmfield monitor are provided below:

Full Statistical Reports for Monitor

NEWTOWNABBEY ANTRIM ROAD

01 January to 31 December 2014

These data have been fully ratified by Ricardo-AEA

POLLUTANT	NO	NO_2	NO_X
Number Very High	-	0	-
Number High	-	0	-
Number Moderate (1 day)	-	1	-
Number Low (348 days)	-	8276	-
Maximum 15-minute mean	525 µg m^{-3}	231 µg m^{-3}	999 µg m^{-3}
Maximum hourly mean	423 µg m^{-3}	202 µg m^{-3}	810 µg m^{-3}
Maximum running 8-hour mean	278 µg m^{-3}	170 µg m^{-3}	571 µg m^{-3}
Maximum running 24-hour mean	186 µg m^{-3}	108 µg m^{-3}	391 µg m^{-3}
Maximum daily mean	180 µg m^{-3}	100 µg m^{-3}	374 µg m^{-3}
Average	30 µg m^{-3}	40 µg m^{-3}	86 µg m^{-3}
Data capture	94.5 %	94.5 %	94.5 %

All gaseous pollutant mass units are at 20'C and 1013mb. NO_X mass units are NO_X as NO_2 µg m-3

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	1	1

Antrim Borough Council:

Diffusion Tube Bias Adjustment Factors

The diffusion tubes were supplied, prepared and analysed by ESG, Didcot using the 50% TEA in Acetone preparation Method.

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.

The laboratory bias correction factor was calculated using the diffusion tube spreadsheet tool. This diffusion tube spreadsheet tool is published by Air Quality Consultants Ltd on behalf of DEFRA, the Welsh Assembly Government, the Scottish Executive and the Department of the Environment Northern Ireland and it is available on the UWE website.

The bias adjustment factor of 0.81 was calculated from 30 studies from ESG, Didcot for 2014 using the diffusion tube spreadsheet tool, for the diffusion tubes study.

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 06/15

Follow the steps below in the correct order to show the results of relevant co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of September 2015

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Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data

Step 4:

Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor shown in blue at the foot of the final column.

If you have your own co-location study then see footnote. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953

Analysed By	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision	Bias Adjustment Factor (A) (Cm/Dm)
ESG Didcot	50% TEA in acetone	2014	R	Swale Borough Council	9	42	33	28.4%	P	0.78
ESG Didcot	50% TEA in acetone	2014	R	Swale Borough Council	12	50	38	31.7%	P	0.76
ESG Didcot	50% TEA in acetone	2014	SU	Thanet District Council	12	19	17	9.0%	P	0.92
ESG Didcot	50% TEA in acetone	2014	R	Thanet District Council	12	28	27	6.0%	P	0.94
ESG Didcot	50% TEA in acetone	2014	R	Wrexham County Borough Council	10	23	22	5.6%	G	0.96
ESG Didcot	50% TEA in acetone	2014	UB	City of York Council	11	24	19	28.4%	P	0.78
ESG Didcot	50% TEA in acetone	2014	R	City of York Council	10	37	27	36.7%	G	0.73
ESG Didcot	50% TEA in acetone	2014	R	City of York Council	11	32	28	12.4%	G	0.89
ESG Didcot	50% TEA in acetone	2014	R	City of York Council	11	40	36	12.7%	G	0.89
ESG Didcot	50% TEA in acetone	2014	R	Horsham District Council	12	30	27	11.7%	G	0.90
ESG Didcot	50% TEA in acetone	2014	R	Medway Council	12	32	26	26.0%	G	0.79
ESG Didcot	50% TEA in acetone	2014	B	Medway Council	12	21	15	43.3%	P	0.70
ESG Didcot	50% TEA in acetone	2014	R	Sandwell MBC	10	55	47	17.5%	G	0.85
ESG Didcot	50% TEA in acetone	2014	KS	Suffolk Coastal District Council	10	40	39	17.7%	G	0.85
ESG Didcot	50% TEA in acetone	2014	R	Vale of White Horse District Council	12	34	30	14.0%	G	0.88
ESG Didcot	50% TEA in acetone	2014	R	West Oxfordshire District Council (WODC)	12	48	36	32.4%	G	0.76
ESG Didcot	50% TEA in acetone	2014		Overall Factor (30 studies)					blue	0.81

QA/QC of Diffusion Tube Monitoring

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

ESG 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. ESG participates in the WASP scheme organised by the Health and Safety Laboratory. ESG currently holds the highest rank of a Satisfactory laboratory.

Table 1: Laboratory summary performance for WASP NO2 PT Rounds 121-124 and AIR NO_2 PT rounds AR001, 3, 4 and 6

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent WASP/AIR NO_2 PT rounds and the percentage (%) of results submitted which were subsequently determined to be **satisfactory** based upon a z-score of ≤ ± 2 as defined above.

WASP Round	WASP R121	WASP R122	WASP R123	WASP R124	AIR PT AR001	AIR PT AR003	AIR PT AR004	AIR PT AR006
Round conducted in the period	April – June 2013	July – September 2013	October – December 2013	January – March 2014	April – May 2014	July – August 2014	October – November 2014	January – February 2015
Aberdeen Scientific Services	100 %	100 %	NR [2]	75 %	100 %	100 %	100 %	
Cardiff Scientific Services	100 %	100 %	100 %	100 %	NR [2]	NR [2]	NR [2]	
Edinburgh Scientific Services	100 %	75 %	100 %	100 %	100 %	100 %	100 %	
Environmental Services Group, Didcot [1]	100 %	100 %	100 %	??	100 %	100 %	100 %	
Exova (formerly Clyde Analytical)	NR [2]	NR [2]	NR [2]	50 %	NR [2]	NR [2]	NR [2]	
Glasgow Scientific Services	25 %	100 %	100 %	100 %	100 %	100 %	100 %	
Gradko International [1]	100 %	100 %	100 %	100 %	100 %	100 %	100 %	
Kent Scientific Services	75 %	100 %	100 %	100 %	NR [2]	NR [2]	NR [2]	
Kirklees MBC	100 %	100 %	100 %	100 %	100 %	100 %	100 %	
Lambeth Scientific Services	0 %	50 %	75 %	25 %	50 %	100 %	100 %	
Milton Keynes Council	100 %	75 %	75 %	75 %	100 %	100 %	75 %	
Northampton Borough Council	100 %	100 %	100 %	100 %	100 %	0 %	0 %	
Somerset Scientific Services	100 %	75 %	100 %	100 %	100 %	100 %	100 %	
South Yorkshire Air Quality Samplers	100 %	100 %	100 %	100 %	100 %	100 %	100 %	
Staffordshire County Council	100 %	100 %	100 %	100 %	100 %	25 %	100%	
Tayside Scientific Services (formerly Dundee CC)	100 %	100 %	100 %	100 %	NR [2]	100 %	100 %	
West Yorkshire Analytical Services	100 %	50 %	100 %	75 %	75 %	100 %	75 %	

[1] Participant subscribed to two sets of test samples (2 x 4 test samples) in each WASP PT round.
[2] NR Not reported.

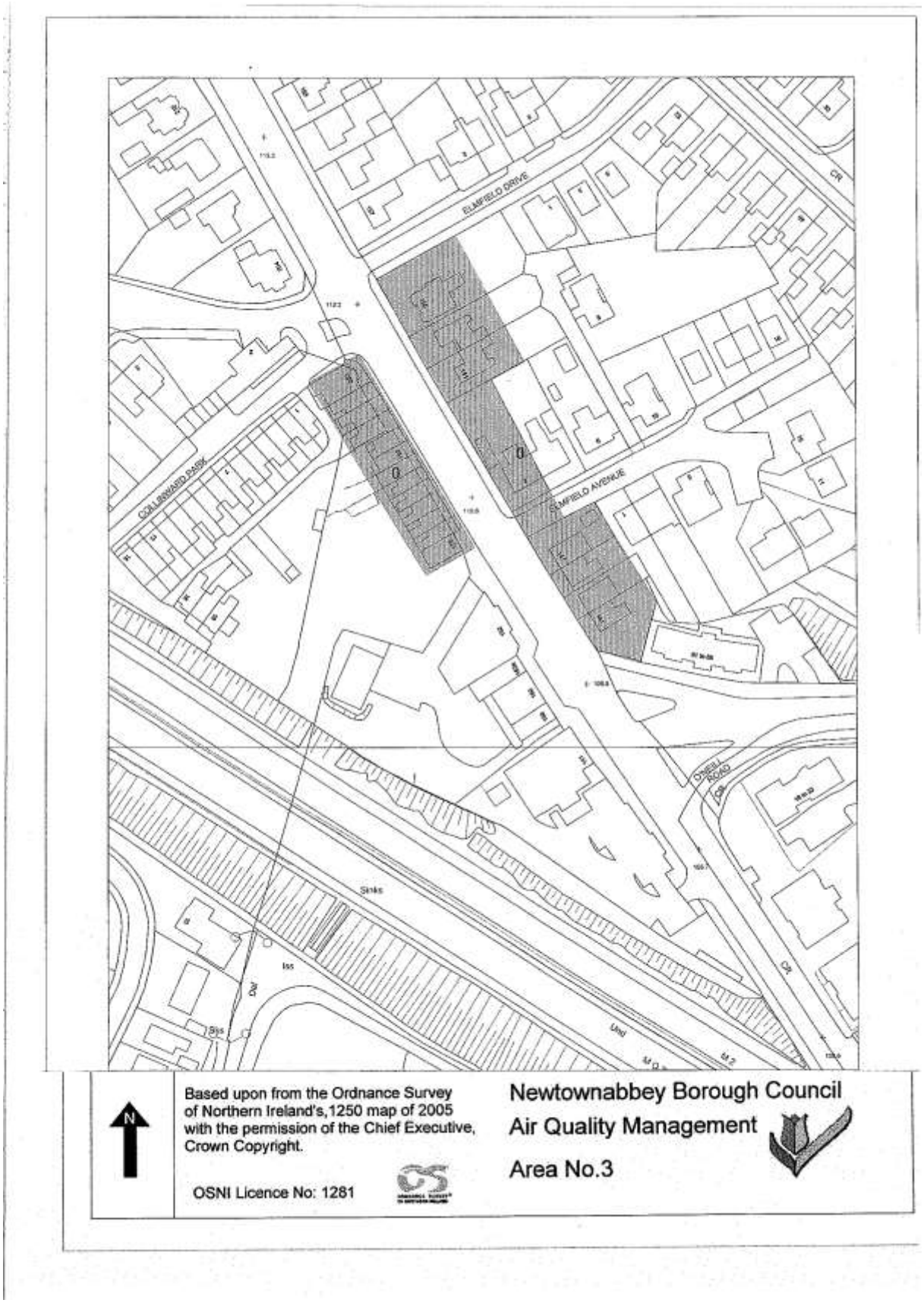
Antrim Borough Council's QA/QC

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.

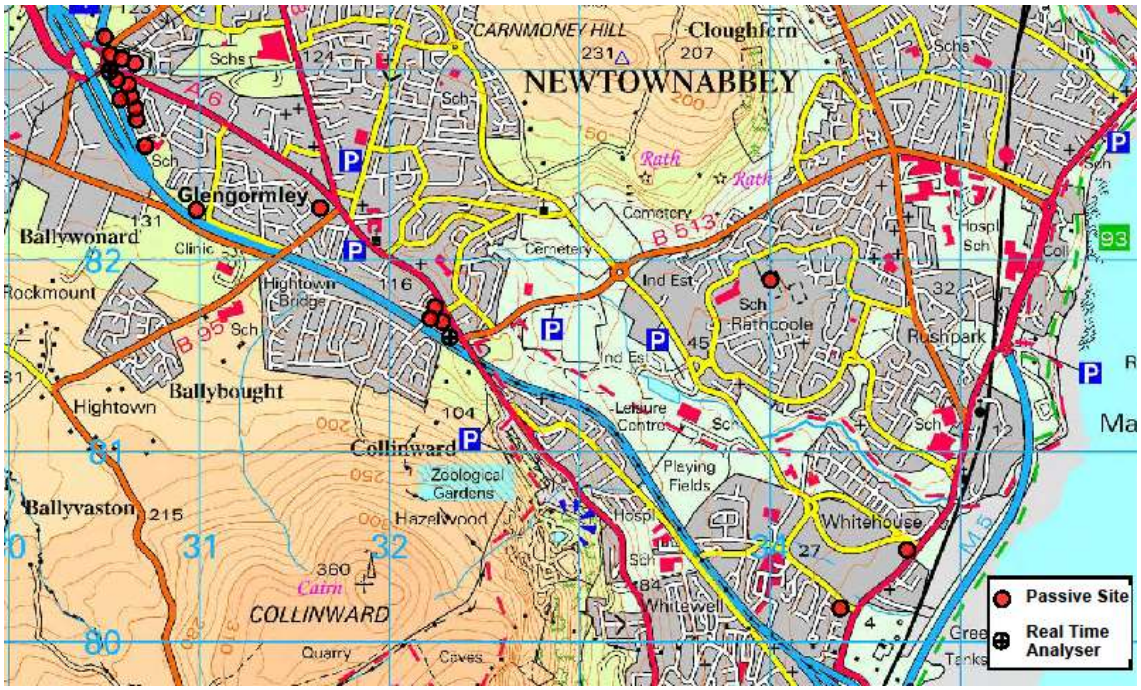
Appendix B: Location of AQMA

Figure 1-1 AQMA 3 (amended) Antrim Road, Elmfield



Appendix C: Location of Monitoring Sites

Newtownabbey Borough Council



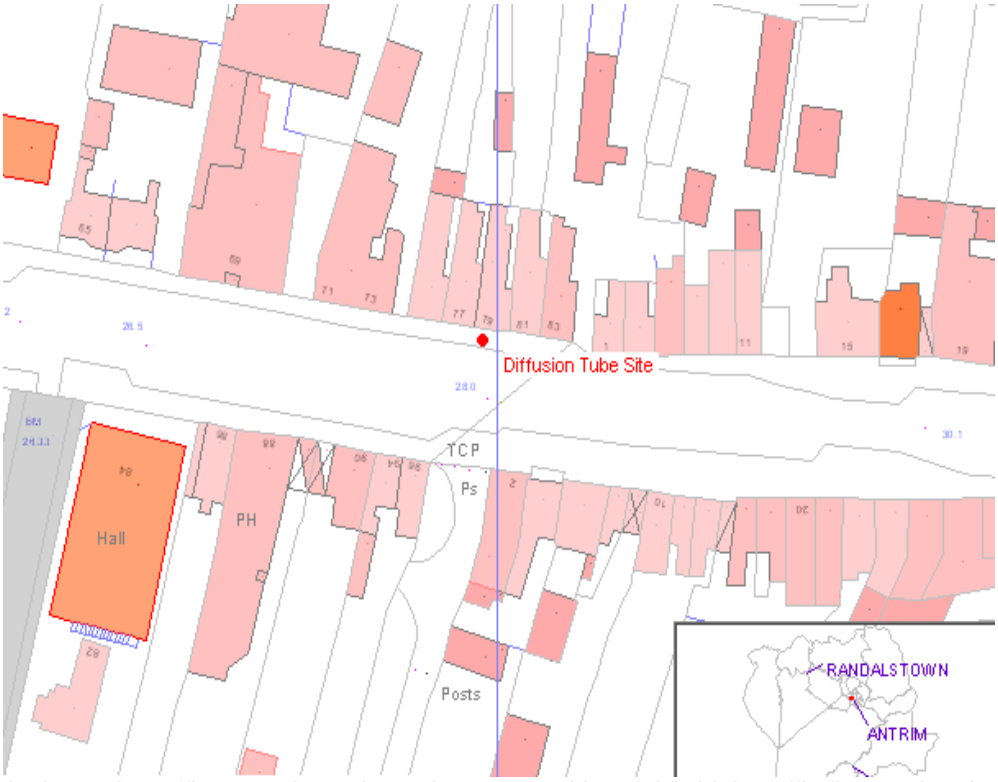
Continuous Monitor at Antrim Road, Elmfield

Antrim Borough Council

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.

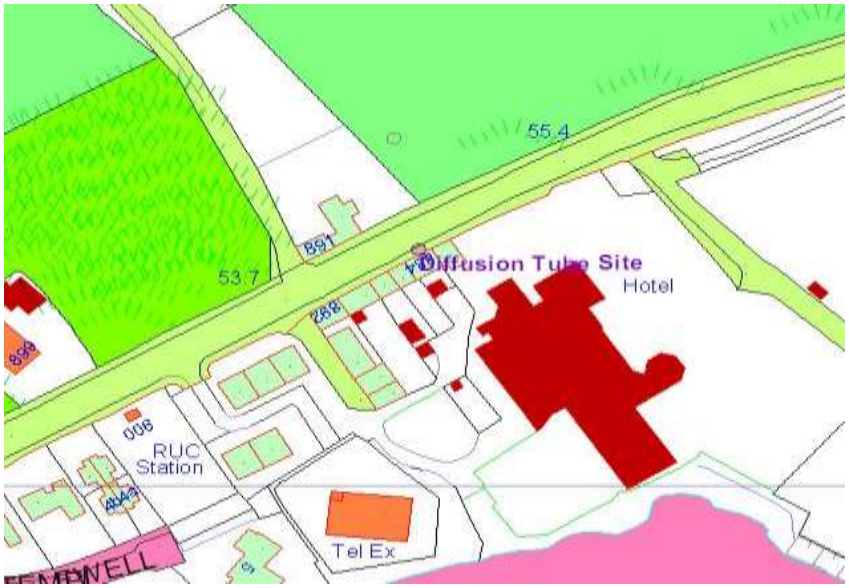
Fountain Street Site



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

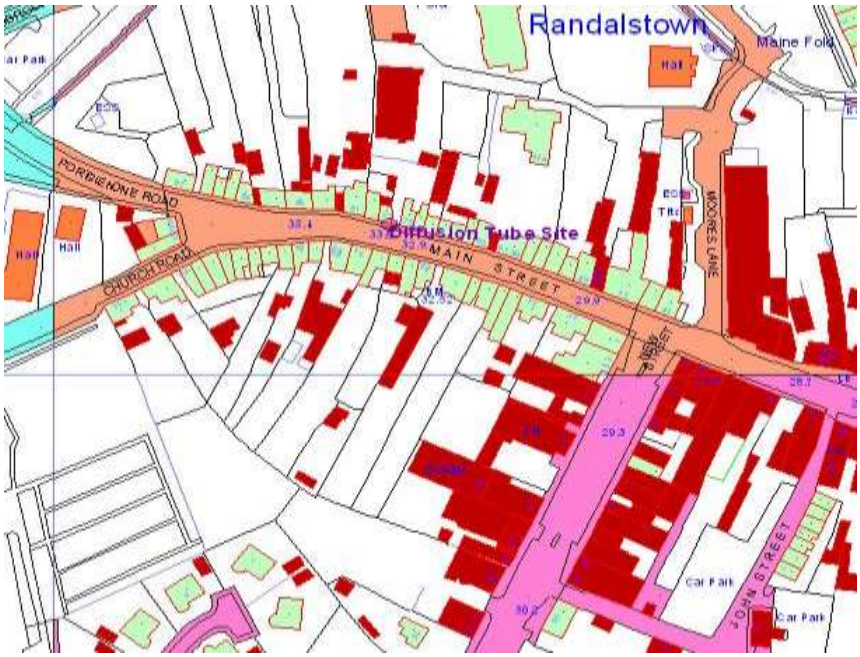
The Lisnevenagh Road is to the North of the Dunsilly roundabout and is a dual carriageway connecting Antrim with Ballymena. This site was set up to monitor concentrations close to the nearest dwelling to this busy road after Design Manual for Roads and Bridges (DMBR) modelling carried out for the Second 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



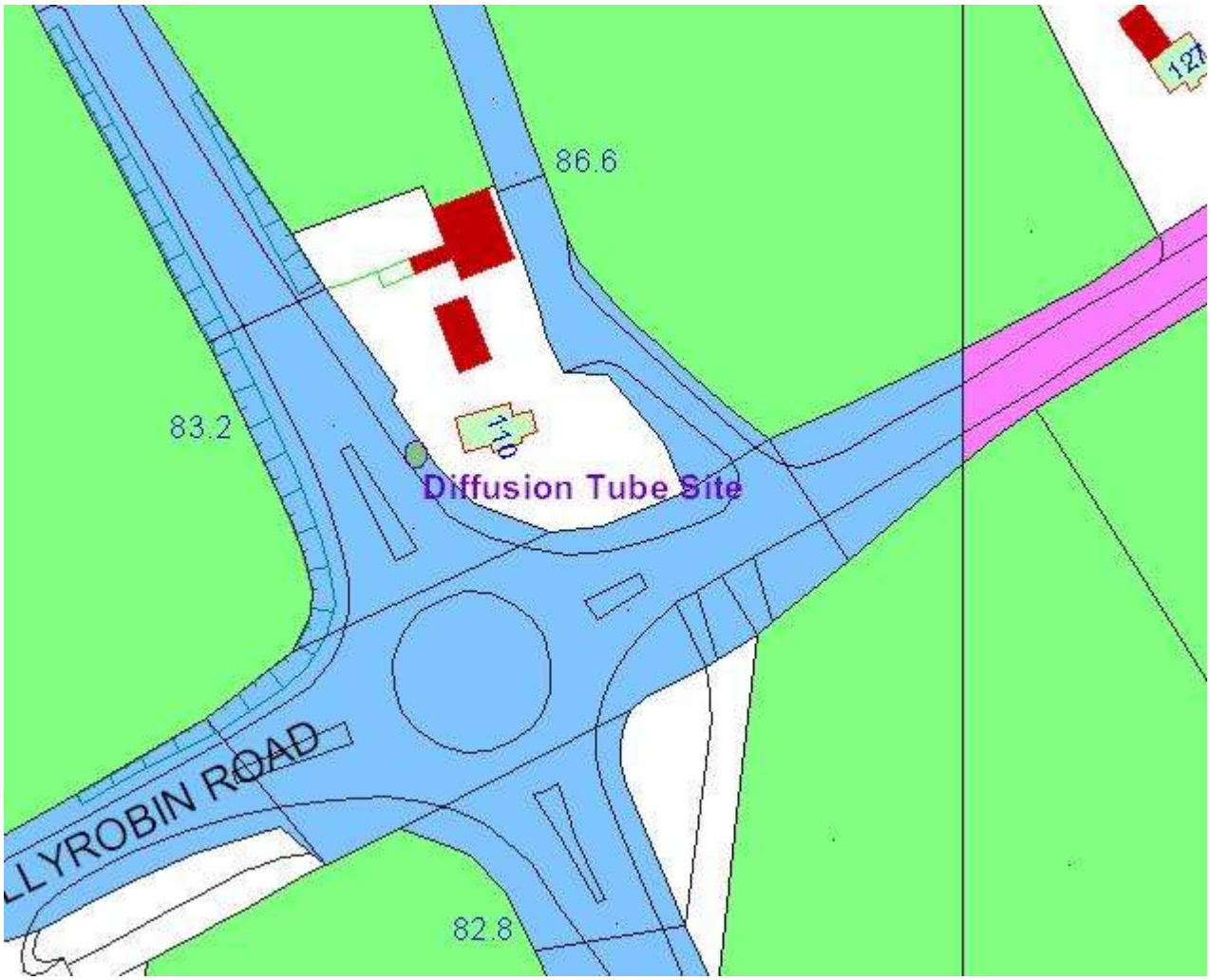
The site in Templepatrick is located on a lamppost in front of the Templeton Hotel. The site is very close to the facade of a residential property. Templepatrick is on the main route between the M2 motorway and Belfast International Airport and experiences high traffic flows. This site has been in operation for 12 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 11 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

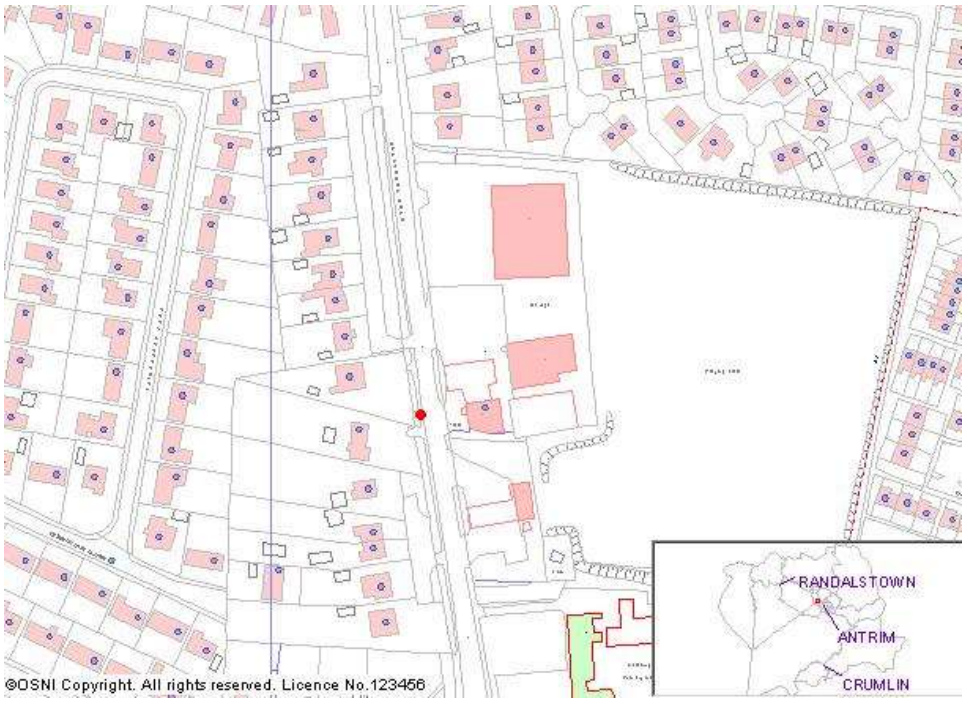


This site is on the Oldstone Road at the Ballyrobin Roundabout and is in front of a residential property. An estimation of concentrations at this location carried out in the first round of Review and Assessment using the Design Manual for Roads and Bridges (DMRB) forecast concentrations near to the national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

Castle Road Site

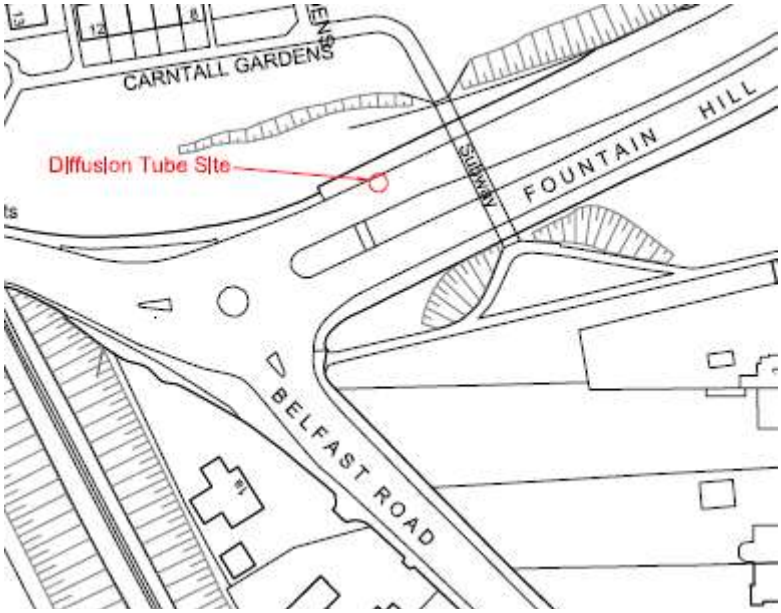
Castle Road takes all through traffic between Antrim & Randalstown and is subject to rush hour tailbacks twice a day during the working week. This is the second year a diffusion tube has been used to monitor NO2 concentrations here.

Ballymena Road Site



The Ballymena road is the main arterial route between Antrim town centre and the 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.

Appendix D: Monthly Diffusion Tube Results 2014

Newtownabbey Borough Council:

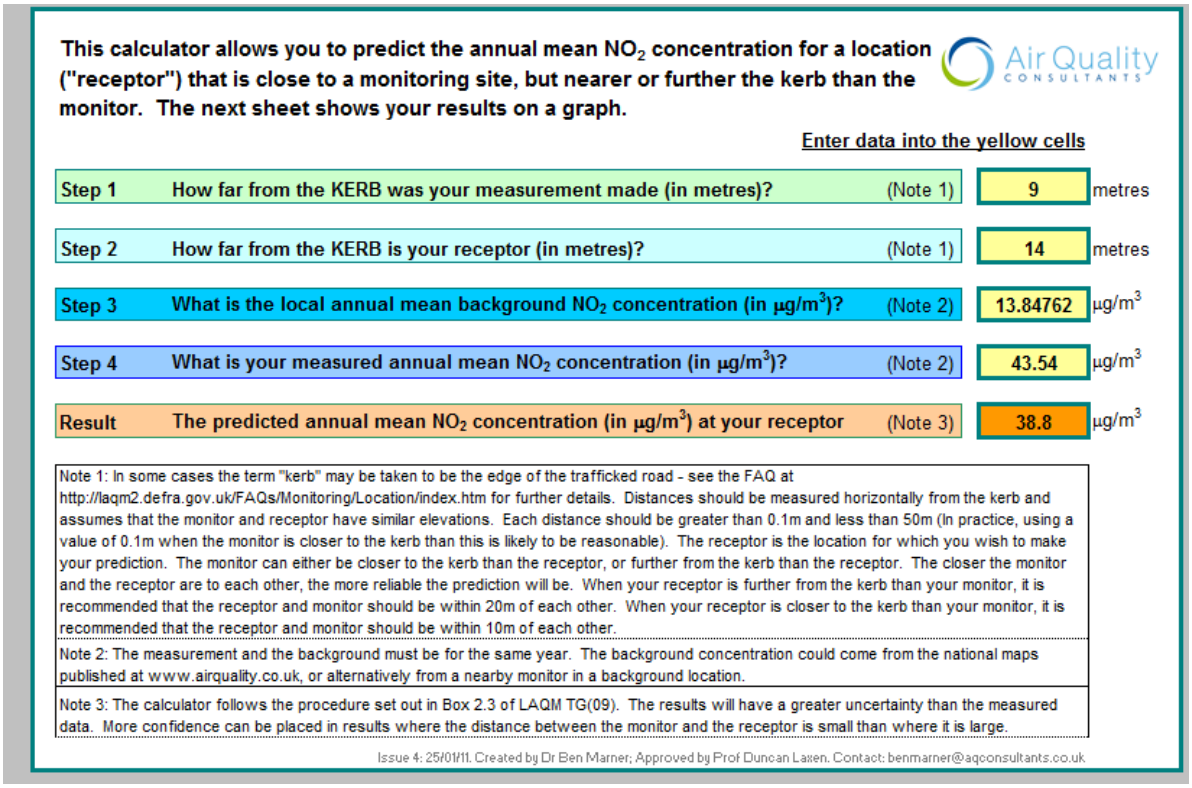
	Location	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Site 1	Main Street, Ballyclare	40.95	31.37	31.74	31.32	31.37	29.36	24.33	27.92	33.60	32.79	42.57	28.14
Site 57	7 Sandyholme Way	47.86	46.37	39.47	38.65	45.30	39.60	45.66	44.61	45.71	49.40	40.17	39.71
Site 12	7 Sandyholme Way	46.63	51.03	38.23	39.47	43.36	41.02	39.86	48.16	47.34	55.60	48.62	43.06
Site 8	Braden Heights, Rathcoole	30.27	17.45	19.80	17.15	12.85	10.73	11.68	10.50	15.77	23.10	29.29	19.04
Site 11	44 Sandyknowes Avenue	40.89	39.89	39.36	33.46	33.58	37.28	35.01	42.46	37.76	45.98	46.22	41.61
Site 58	Lampost at Antrim, Elmfield Analyser	66.66	47.49	45.14	43.52	51.09	46.67	40.92	42.17	51.89	53.73	67.14	48.79
Site 46	12 Collinbridge Road	43.11	39.57	41.11	42.58	42.48	31.38	34.51	40.00	47.40	41.60	52.94	43.58
Site 47	13 Sandyholme Park	46.76	48.77	40.42	38.45	42.20	33.41	37.50	41.06	35.54	45.77	48.73	52.59
Site 48	24 Sandyknowes Avenue	43.11	46.83	44.03	35.68	43.97	33.35	30.64	46.72	37.79	46.15	51.78	56.41
Site 49	6 Sandyknowes Gardens	29.94	29.36	29.22	26.72	26.11	23.31	22.93	24.16	27.10	27.88	35.87	31.47
Site 50	45 Burney's Lane	43.41	40.44	34.92	31.91	37.10	29.97	30.19	34.99	36.22	38.36	37.93	35.3
Site 56	5 Sandyholme Park	37.96	31.29	30.40	28.07	27.36	23.34	24.77	27.65	31.64	31.64	43.22	33.79
Site 60	On downpipe 196 Antrim Rd	38.52	39.55	37.06	36.87	37.78	31.08	31.78	36.69	40.39	39.17	47.80	40.01
Site 61	On downpipe 196 Antrim Rd	40.53	39.19	37.28	38.45	34.91	32.99	34.64	36.17	42.91	38.17	42.72	39.20

Antrim Borough Council:

	Location	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Site 1	Fountain St	34.7	24.5	35	-	35	26.9	33.4	32.1	32	28.8	42.2	35.3
Site 2	Lisnevenagh Rd	46.1	32.9	36.2	36.4	42.3	26.3	29.8	39.6	49.5	39.3	65.8	34.8
Site 3	Templepatrick	44	28	35.7	36.3	46	37.4	34.1	30.2	48	33.2	50.4	40.5
Site 4	Randalstown	45.9	37.2	41.8	27.7	45.1	27.7	37.5	37.6	47	36	57.4	47.4
Site 5	Ballyrobin Roundabout	40.5	33.6	29.6	30.9	21.8	25.8	23.3	25.3	33.5	31.3	39.6	30.3
Site 6	Castle Road	33.5	29.7	34.9	23.3	32.8	27.8	25.1	26.3	38.9	29.4	50.7	25
Site 7	Ballymena Rd	30.7	27	29	20	22.2	18.2	21.8	20.5	34.4	30.5	49.4	40
Site 8	Belfast Rd Roundabout	35	31.8	29.4	22.2	35	20.9	20.3	15.1	31	28.2	45.5	32.1

Appendix E: NO2 Fall off with Distance Calculator Results

Diffusion Tube 57 (7 Sandyholme Way)



This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

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Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	9	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	14	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	(Note 2)	13.84762	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	(Note 2)	43.54	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	(Note 3)	38.8	$\mu g/m^3$

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

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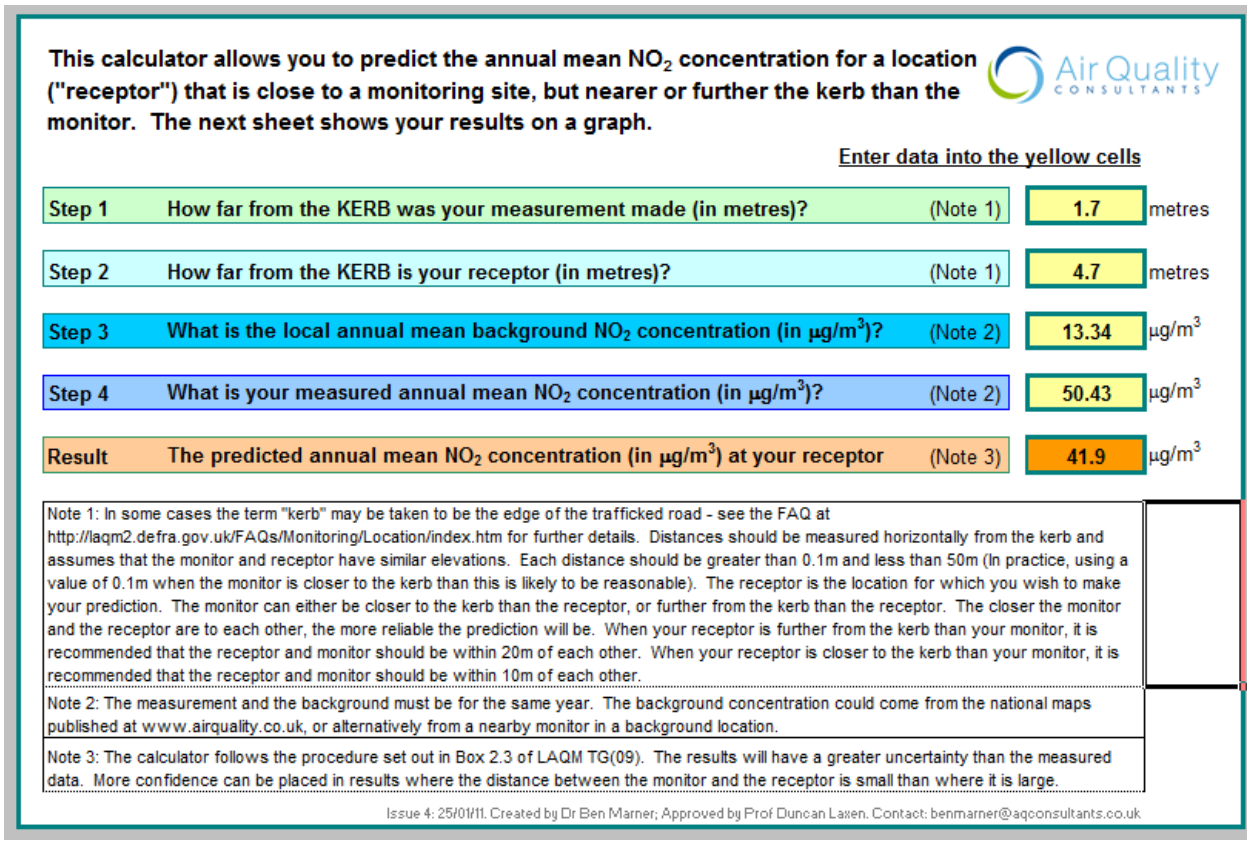
Diffusion Tube 58 – Lamp post Antrim Road



This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

Air Quality CONSULTANTS

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1.7	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	4.7	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	(Note 2)	13.34	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	(Note 2)	50.43	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	(Note 3)	41.9	$\mu g/m^3$

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Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

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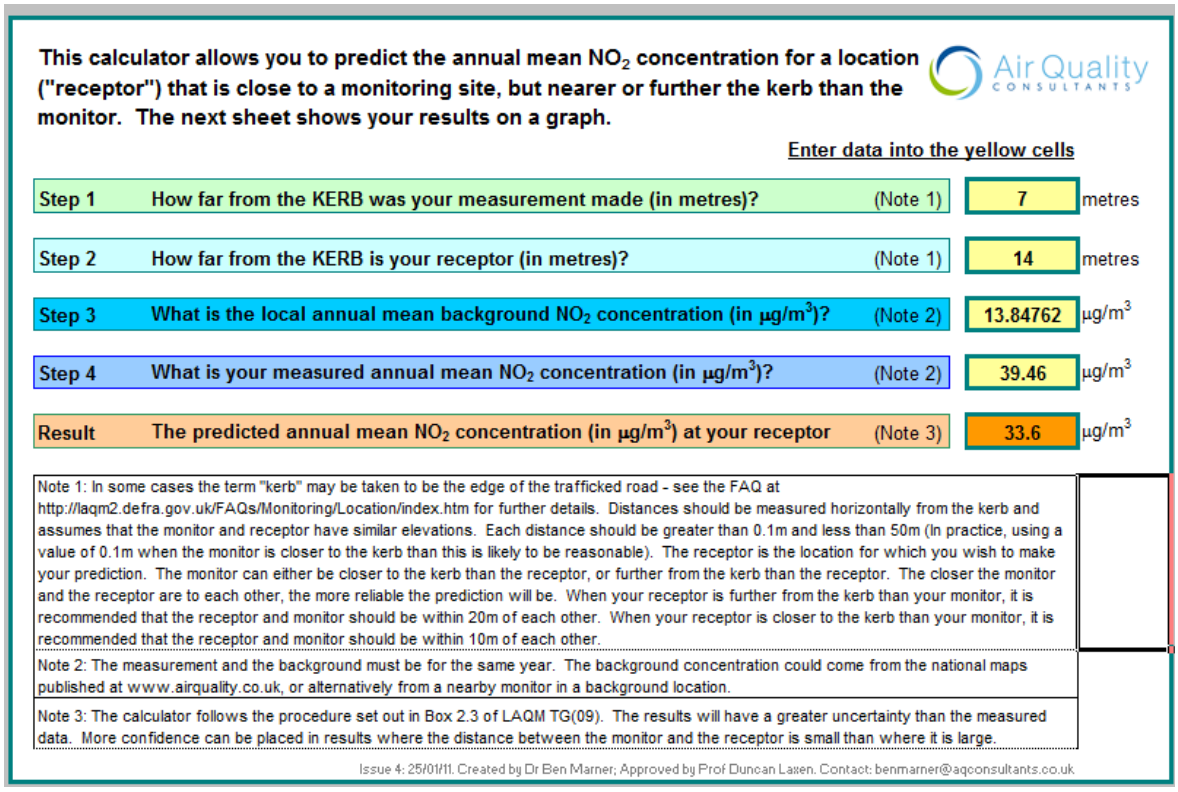
Diffusion Tube 11 (44 Sandyknowes Avenue)



This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

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Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	7	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	14	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	(Note 2)	13.84762	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	(Note 2)	39.46	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	(Note 3)	33.6	µg/m^3

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

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Diffusion Tube 47 (13 Sandyholme Park)

This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

Air Quality CONSULTANTS

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	7	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	14	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	(Note 2)	13.84762	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	(Note 2)	42.6	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	(Note 3)	36.0	µg/m^3

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

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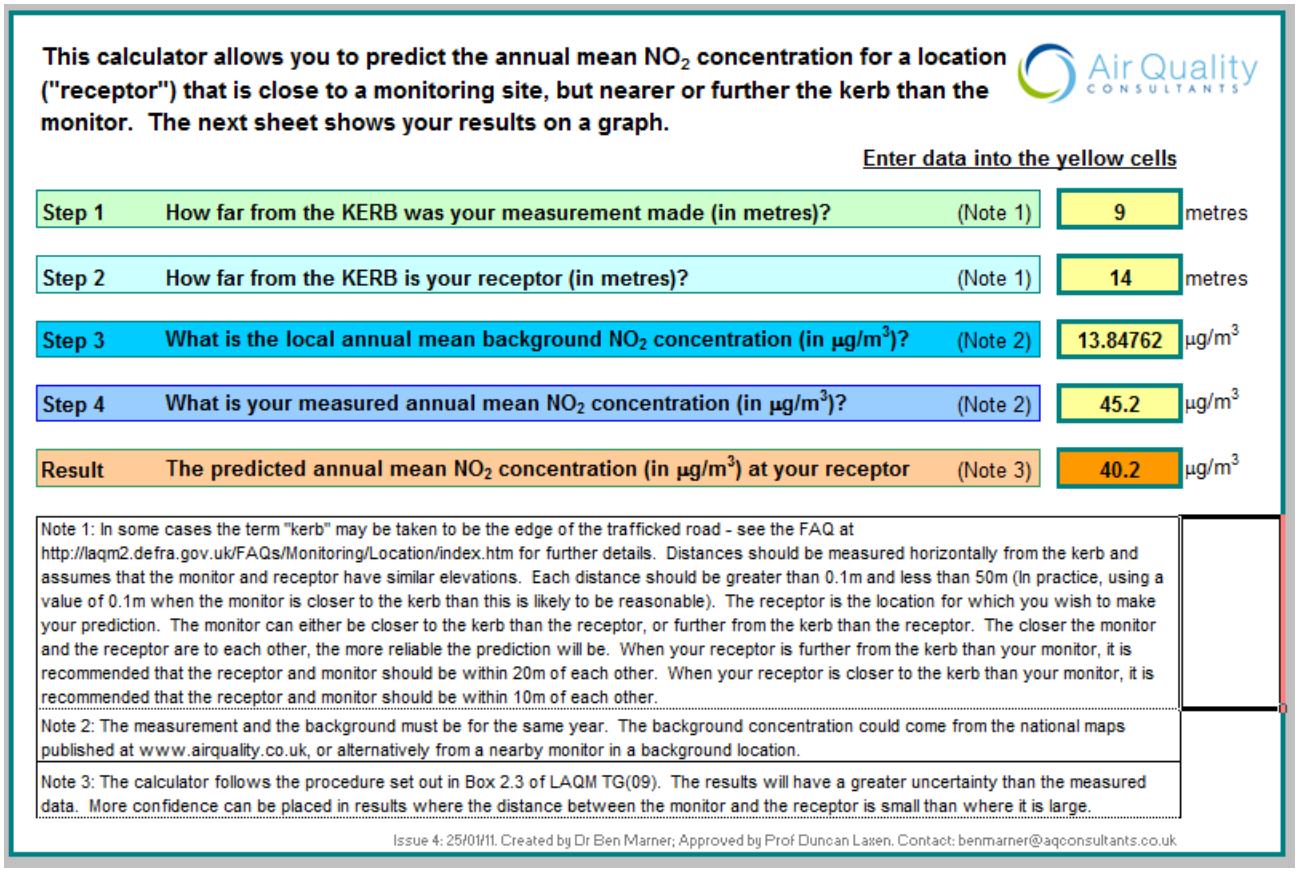
Diffusion Tube 12 (7 Sandyholme Way)



This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

Air Quality CONSULTANTS

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	9	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	14	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	(Note 2)	13.84762	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	(Note 2)	45.2	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	(Note 3)	40.2	µg/m^3

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

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