2018 Updating and Screening Assessment for

Lisburn & Castlereagh City Council

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

June 2018

Local Authority Officer	Sally Courtney Cheryl Harkness
Department	Environmental Services
Address	Lisburn & Castlereagh City Council Bradford Court Upper Galwally Belfast BT8 6RB
Telephone	02890494500
e-mail	Sally.Courtney@lisburncastlereagh.gov.uk Cheryl.harkness@ardsandnorthdown.gov.uk
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Executive Summary

The Air Quality Strategy has established the framework for air quality management in the UK. Local Authorities have a duty under the Environment Act 1995 and subsequent regulations to review and assess air quality in their areas on a periodic basis so as to identify all areas where the air quality objectives are being or are likely to be exceeded. A phased approach has been adopted for the review and assessment process so that the level of assessment undertaken is commensurate with the risk of an exceedence of an air quality objective.

An updating and screening assessment (USA) is required to be prepared every three years by all local authorities in the UK with two interim progress reports. The last updating and screening assessment of air quality was undertaken in 2015, this followed with a progress report in 2016 and 2017. This is the 2018 USA report for Lisburn and Castlereagh City Council (LCCC) and has been completed using the recommended template. The report is fully compliant with the applicable policy and technical guidance.

This report identified no exceedances with relevant exposure, of the Air Quality Strategy objectives during 2017 for any of the pollutants assessed. NO_2 levels due to vehicle emissions is still the main source of concern within LCCC which is one of the main commuter belts of Greater Belfast. A number of diffusion tube sites were elevated in 2017 including the Normandy Court site within the AQMA but LCCC has determined this is most likely due to the uncertainty of diffusion tubes rather than an increase in NO_2 levels, although extensive road works preparing for the new rapid Transport System on the Upper Newtownards Road may also had a contribution within the AQMA.

The real-time analyser with good data capture and accurate results 30M from the AQMA showed no increase in 2017.

Monitoring shall continue within the AQMA and throughout the Council area using NO_2 tubes to ascertain further trends. In 2017 the AQMA shall remain in the Dundonald area, as a continuing trend in a reduction of NO_2 has not been determined.

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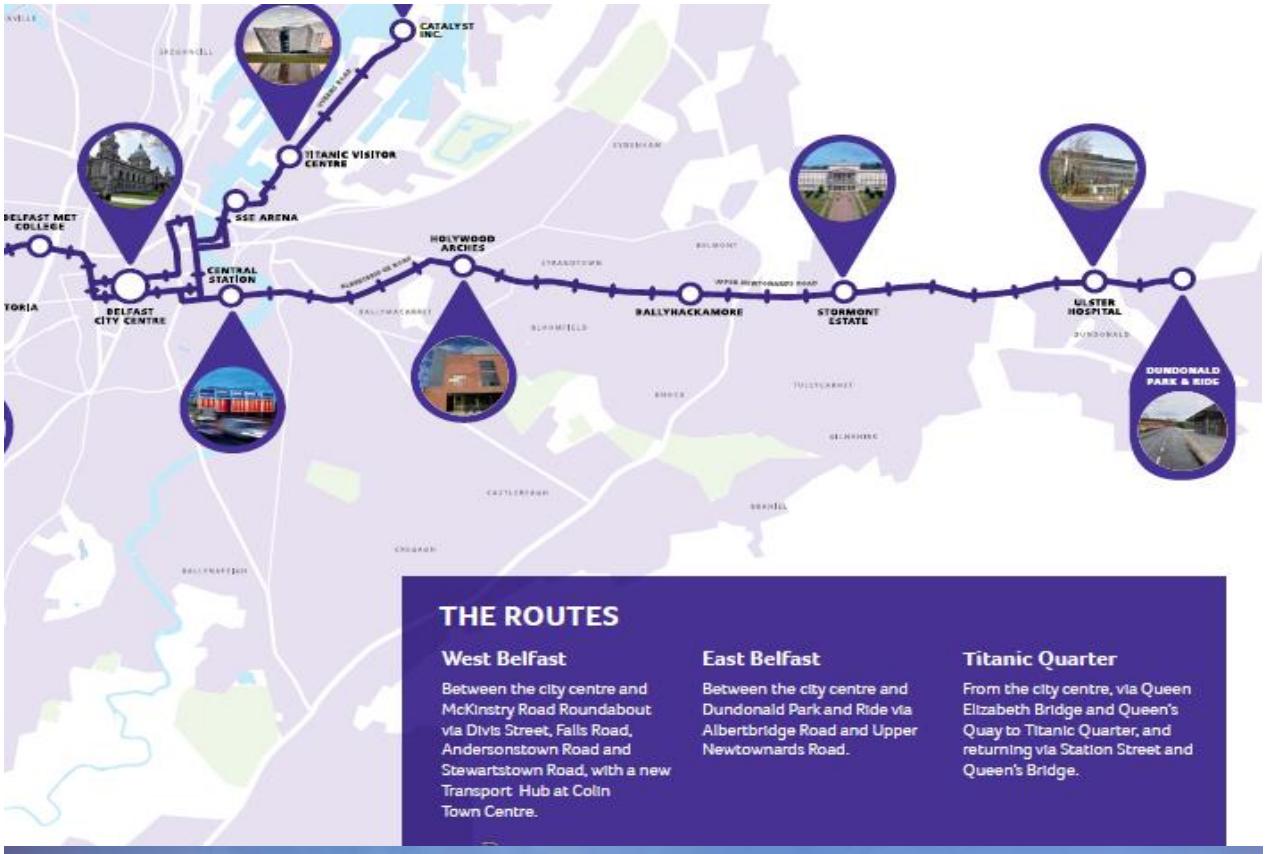
1 Introduction

1.1 Description of Local Authority Area

LCCC has a population of 141,200 and an area of approximately 200 square miles. The area is of urban rural character and the predominant wind direction is from the Southwest. It is bounded by a number of other council areas and has the largest boundary with Belfast City Council. This has made LCCC a very popular residential area due to the ease of the commute to Belfast City Centre. There are several main arterial routes into Belfast City centre through LCCC, and the Council was located within Belfast Metropolitan Transport plan (www.infrastructure-ni.gov.uk/publications/belfast-metropolitan-transport-plan). Dundonald to the East also falls within the New Belfast Rapid transport network to be completed in September 2018 https://www.infrastructure-ni.gov.uk/articles/belfast-rapid-transit-glider-introduction. Road transport remains one of the main concerns, however solid fuel use as a secondary fuel is still quite common in the Lisburn area.

Figure 1.1 Map showing position of LCCC within Northern Ireland

Figure 1.2 Map of new Rapid transport route (glider bus) from Dundonald



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 exceedances 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 $\mu g/m^3$ (milligrams per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedances 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

Local authorities in Northern Ireland amalgamated on 1st April 2015 creating 11 new councils. Lisburn & Castlereagh City Council (LCCC) is one of the new 11 councils. In September 2015 LCCC submitted an Update and Screening Assessment, reference was made in this report of the new boundaries and previous relevant reports, and further progress reports were submitted in 2016 and 2017.

MAPS of AIR QUALITY MANAGEMENT AREA (AQMA)

No's 2,6,10,1,5,7 Normandy Court Dundonald BT16 2LA

Figure 1.3 Map showing position of Dundonald Village within LCCC

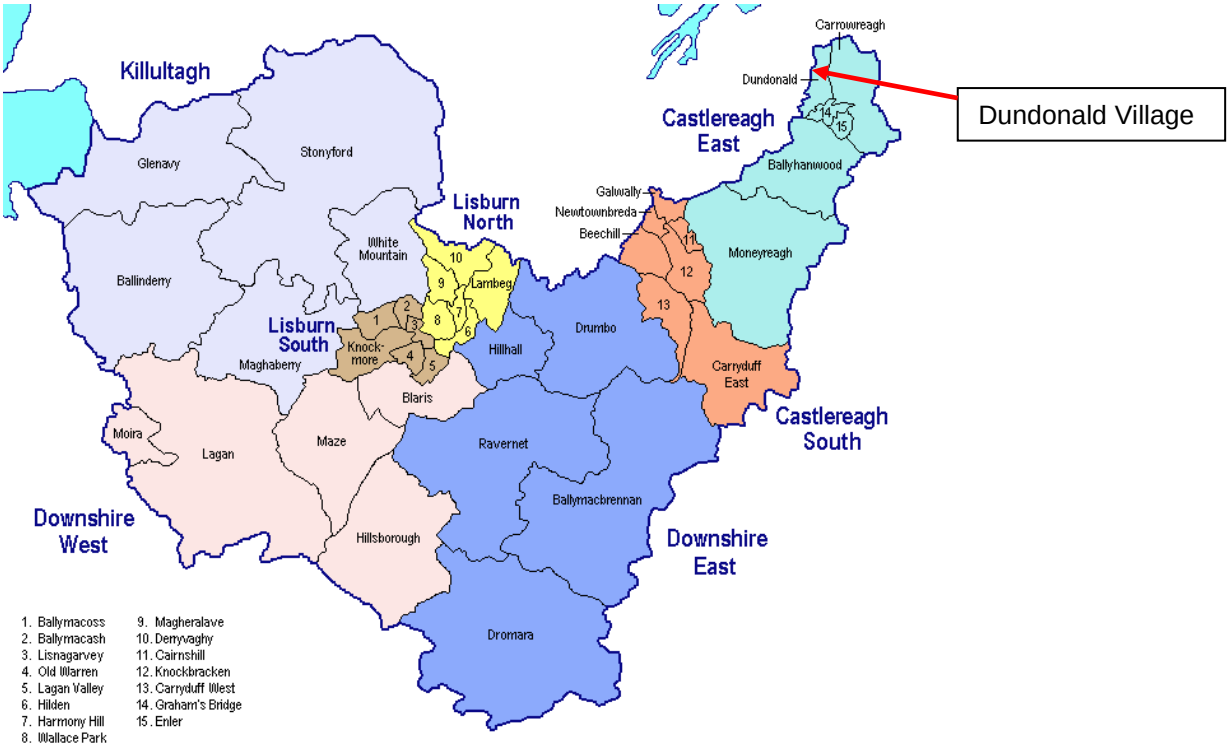


Figure 1.4 Map showing position of AQMA in Dundonald Village

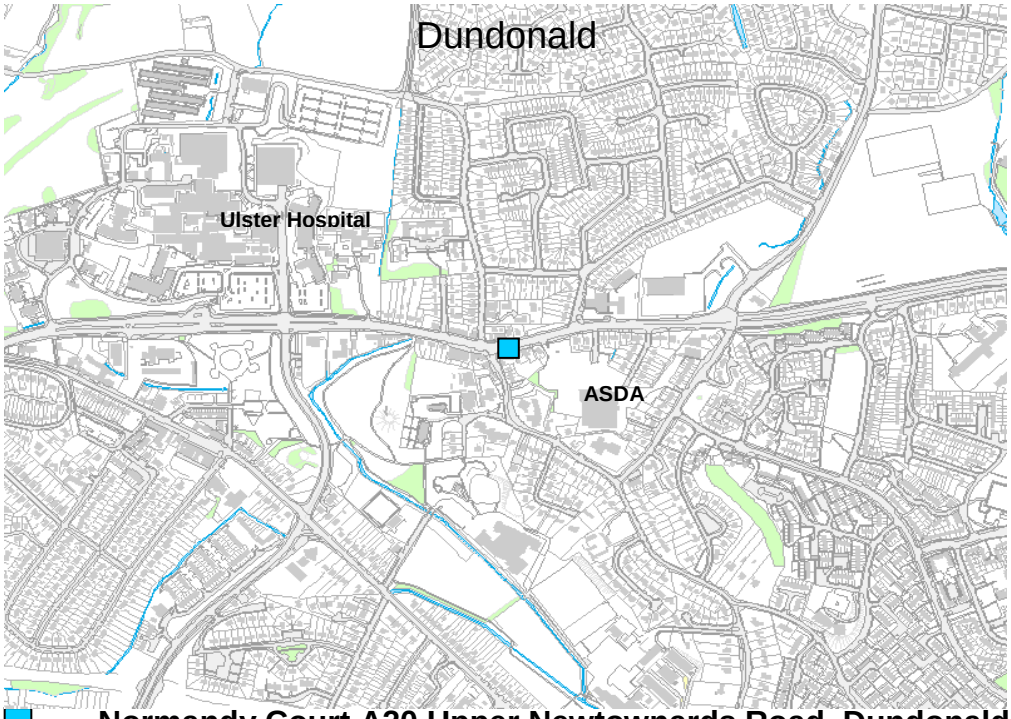
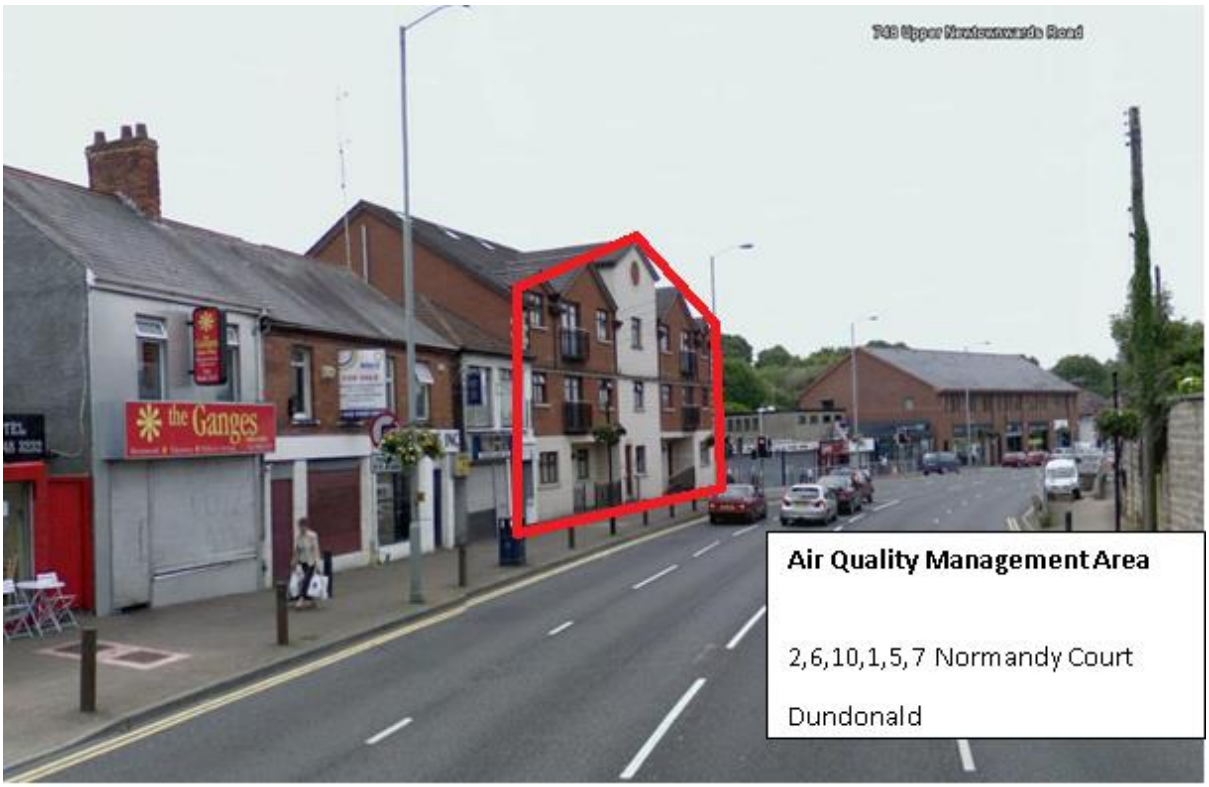


Figure 1.5 Ariel photograph showing position of AQMA in Dundonald Village

Figure 1.6 Photograph showing position of Normandy Court within AQMA



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Lisburn & Castlereagh City Council has two automatic monitoring sites.

Kilmakee Activity Centre Seymour Hill

Measuring SO_2 and PM_{10}, this site also houses a Defra network PAH and black carbon monitor and therefore meets the requirements for the AURN specifications.
Data has been available from this site since Nov 2012. The 2013-2017 data is included in this report.

Dundonald

Measuring NOx using a chemiluminescence analyser, this site is within 30m of the AQMA. A co-location study for the NO_2 diffusion tubes is also carried out at this site. Results from this study were submitted to the national data base for 2017.
Manual calibrations are carried out every two weeks by the Local Air Quality officer. Air Quality Data Management (AQDM) are employed to ratify and validate the data. A specialist engineer is employed to service and maintain the site as required. Results and correction factors are detailed in Appendix A

Figure 2.1 Position of the two air monitoring sites within LCCC

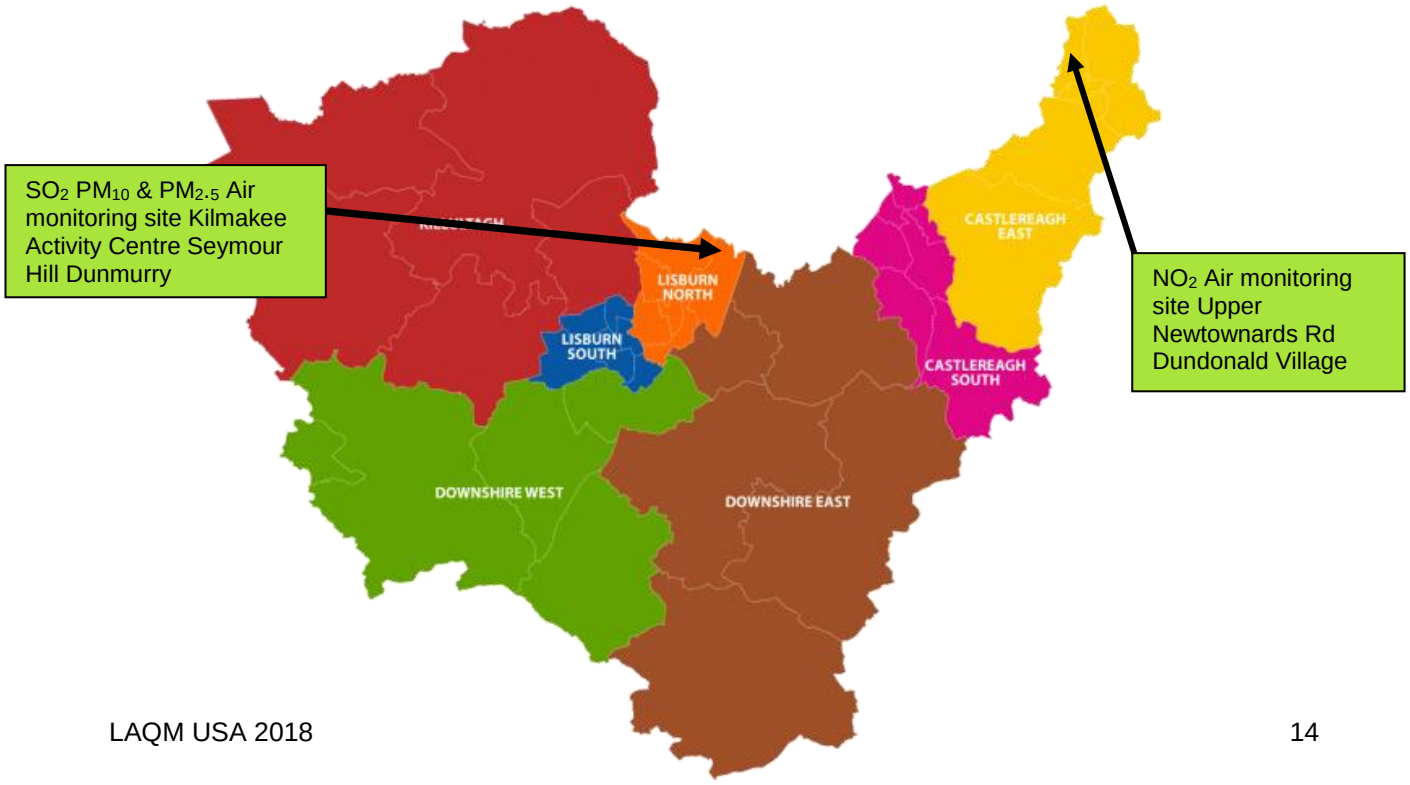
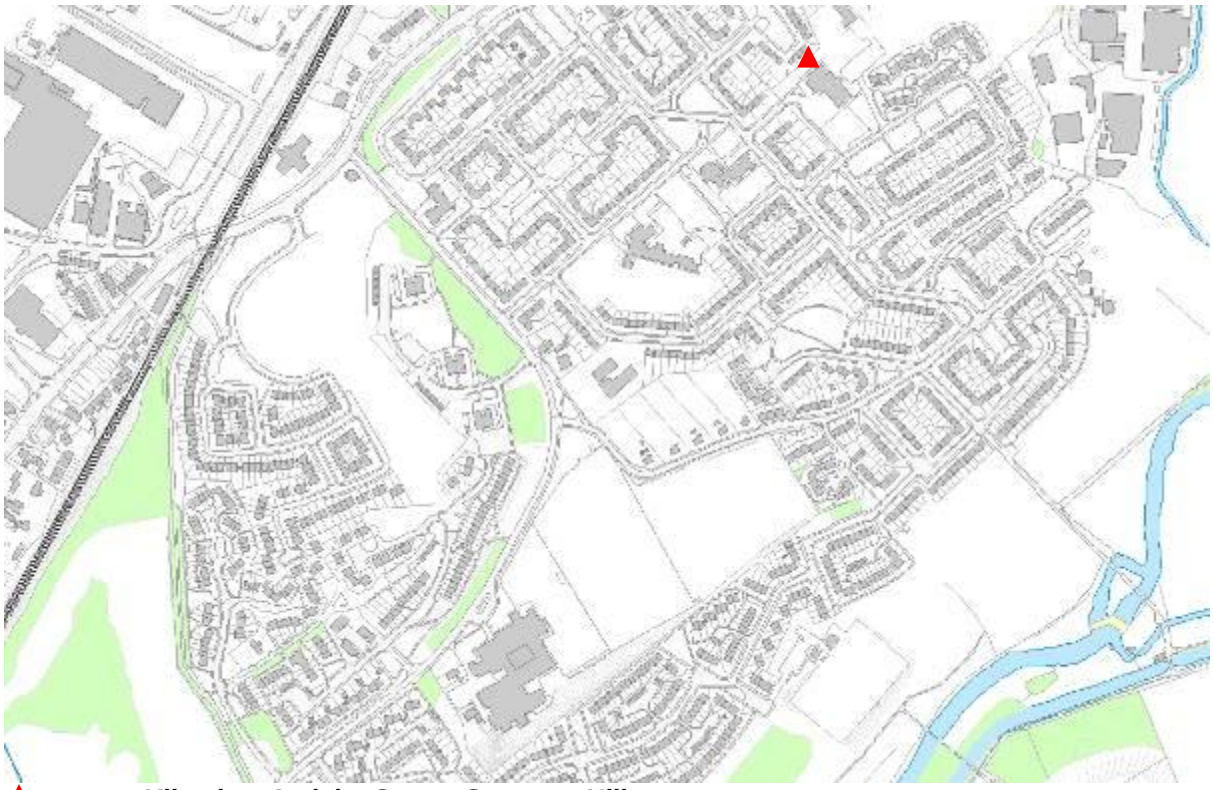


Figure 2.2 Position of Air monitoring site Kilmakee Activity Centre Seymour Hill



▲ **Kilmakee Activity Centre Seymour Hill**

Figure 2.3 Position of Automatic Monitoring Site at Kilmakee Activity Centre

■ Automatic sites

Figure 2.4 Picture of Automatic Monitoring Stations at Kilmakee Activity Centre

Figure 2.5 Position of automatic monitoring site in Dundonald Village

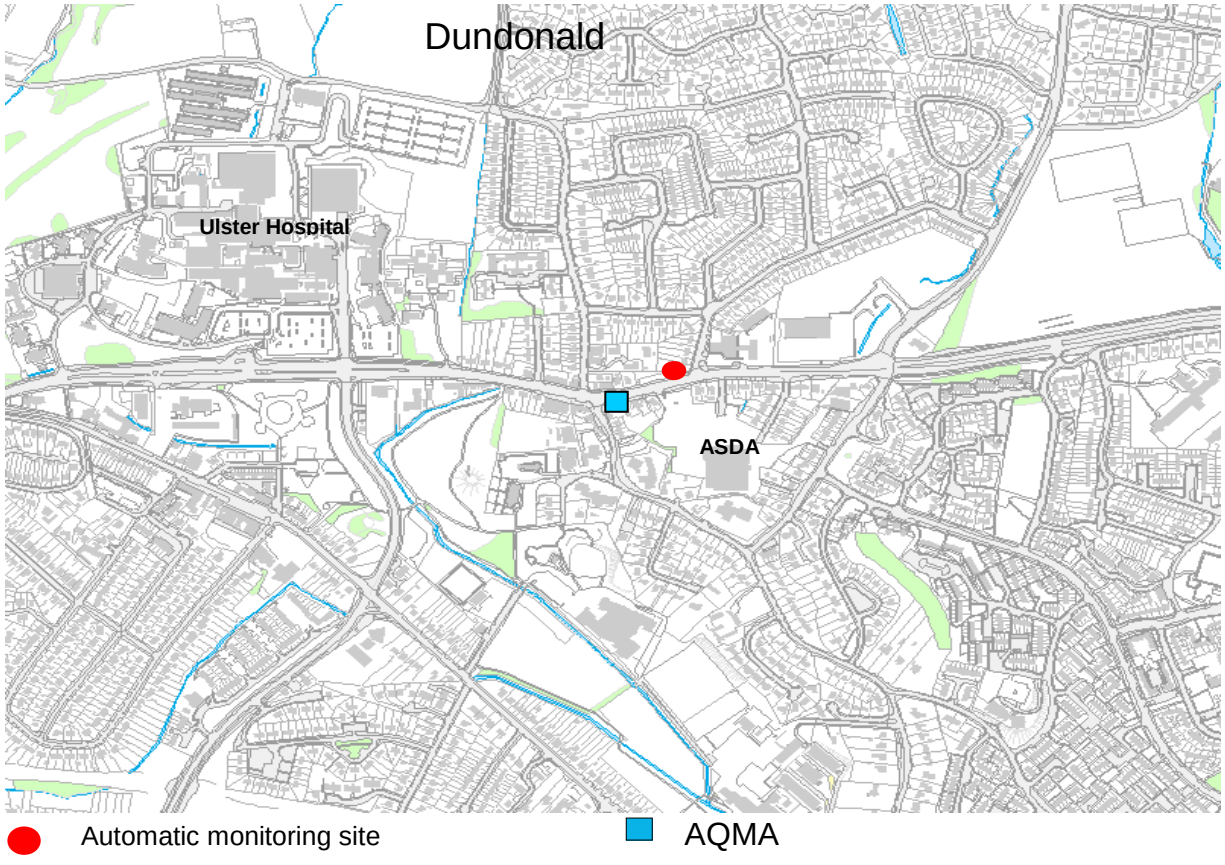


Figure 2.6 Picture of Automatic Monitoring Station in Dundonald Village

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	Irish Grid Ref	Irish 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?
Kilmakee Activity Centre	Urban Background	E328956	N367973	PM_{10}, SO_2	NO	TEOM UV Analyser	YES 10m	NA	YES
Dundonald Village	Roadside	E342016	N374041	NO_2,	NO	Chemiluminescence	YES 22m	3M	YES (30m from AQMA)

2.1.2 Non-Automatic Monitoring Sites

Lisburn and Castlereagh City Council in 2016 had 19 passive monitoring NO_2 diffusion tubes, at 12 roadside and background sites and a co-location study with the automatic station in Dundonald. Most are positioned along the main arterial routes into Belfast, triplicate tubes are positioned on the façade of Normandy Court within the AQMA and in April 2015 the single tube at Newtownbreda was changed to triplicate for improved accuracy, due to results being elevated since 2012. A co-location study is carried out at the automatic station in Dundonald. The results of this study were submitted into the national data base.

In 2017 the historic background site in Lambeg (Ventnor) and the two sites in Culcavy were removed as sufficient data had been collated, the results were below the objective and concerns of increased HGV traffic did not materialise.

Six new sites were identified in 2017 that may in the future have increased traffic levels as new developments and new road layouts are planned, these are as follows

1. One tube Blaris Road Lisburn (A new development of houses to be completed in 2018 and future plans for a link road and further housing increasing traffic.)
2. One tube Moira Road, Lisburn (Future plans for a new link Road, Park& Ride and train station which may change traffic follow on Moira Road.)
3. Two tubes Comber Road Dundonald (large new development on the Comber Road and increased traffic due to redirected traffic from the Upper Newtownards Road Dundonald due to construction of the new Rapid Transport scheme lanes.)
4. One tube Seymour Hill Lisburn (collation of NO_2 levels at high rise flats behind Montupet factory where construction of a new emissions stack is planned.)
5. Saintfield Road Lisburn (new housing development planned)

The diffusion tube studies for the past five years do not show any particular trends. (See Fig. 2.16). All sites have remained within the objective, the sites indicating an increase in the levels of NO_2 is possibly due to a combination of uncertainty of passive monitoring tubes and climatic conditions.

The NO_2 diffusion tubes were supplied and analysed by Gradko Environmental.

Details of the QA/QC for the diffusion tubes and the reason for the use of the bias adjustment factor can be found in Appendix A

Below are maps of the diffusion tube sites.

Figure 2.7 Map(s) of Non-Automatic Monitoring Sites

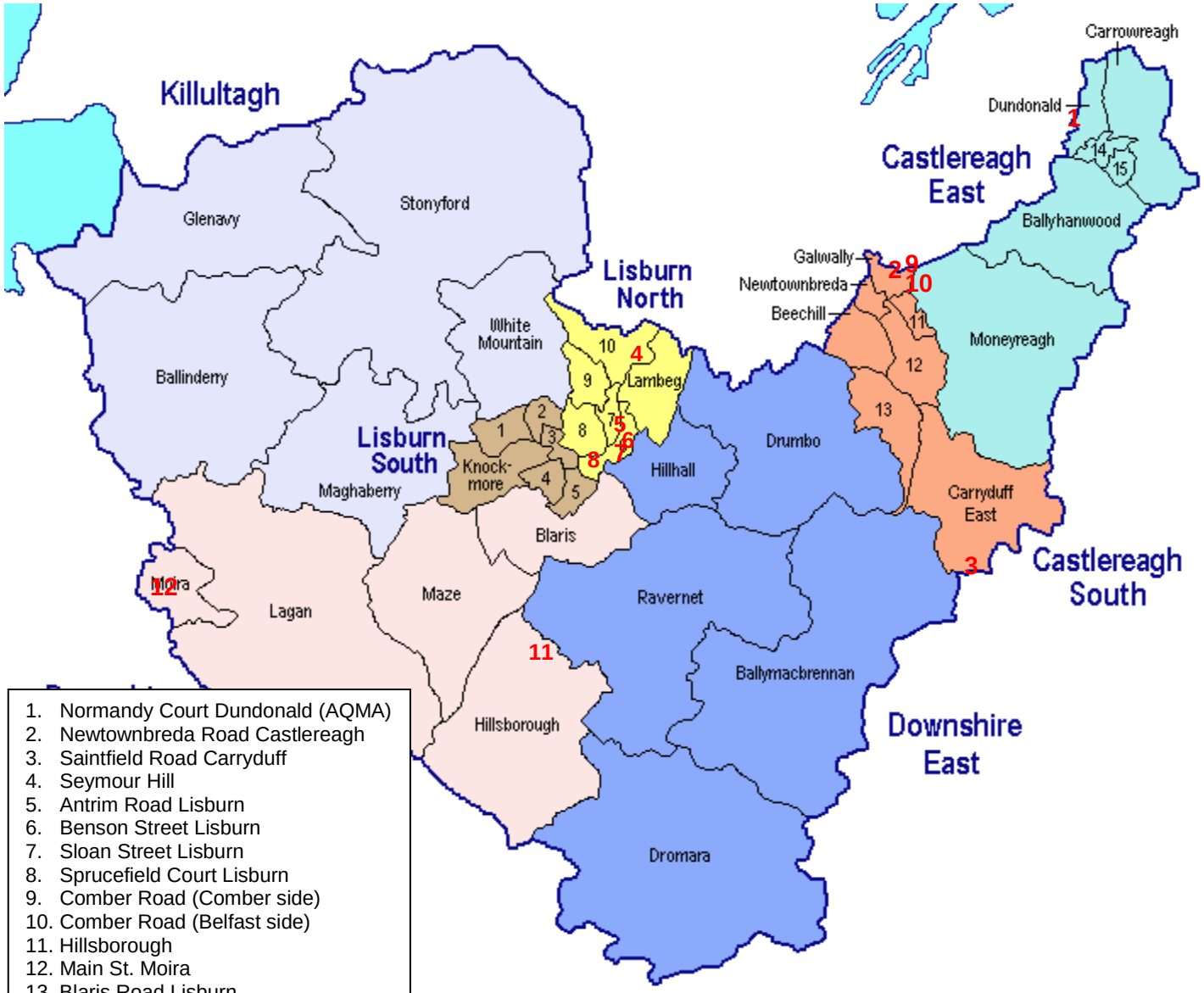


Figure 2.8 Position of tube 1. Dundonald village in AQMA(Normandy Court), and Comber Road Dundonald

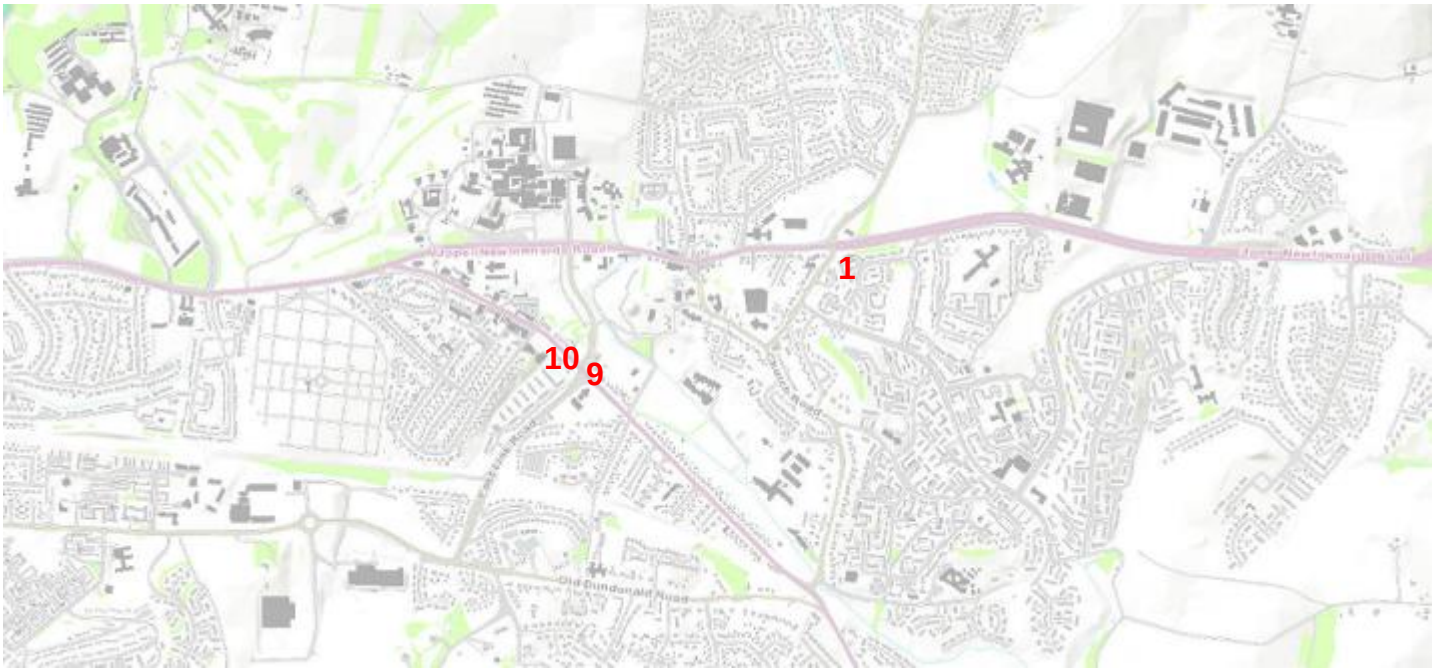


Figure 2.9 Picture of NO_2 Tubes on AQMA Normandy Court Dundonald

Figure2.10 Position of tubes Castlereagh area (Newtownbreda)

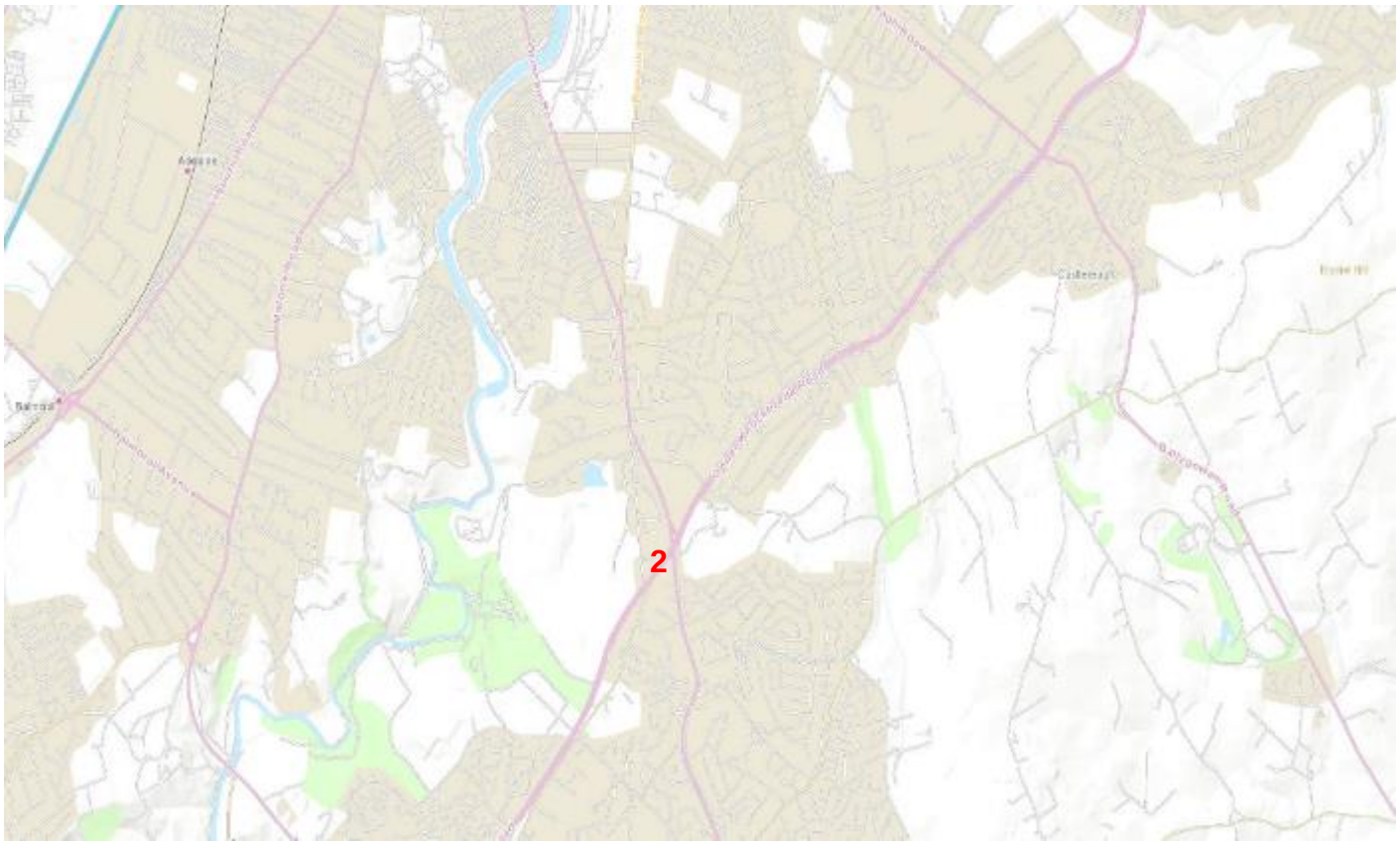


Figure2.11 Position of tube Saintfield Road, Carryduff

Figure2.12 Position of tube Seymour Hill

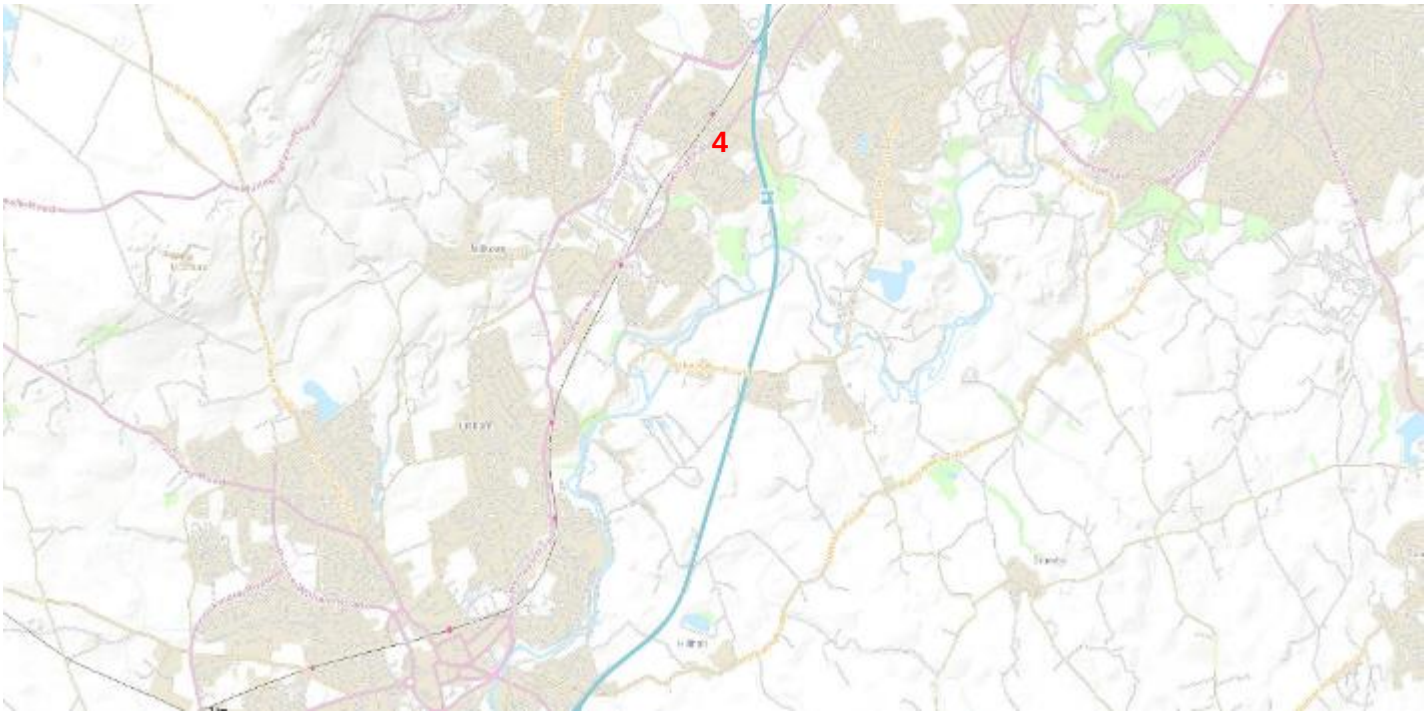


Figure 2.13 Position of tubes in Lisburn City

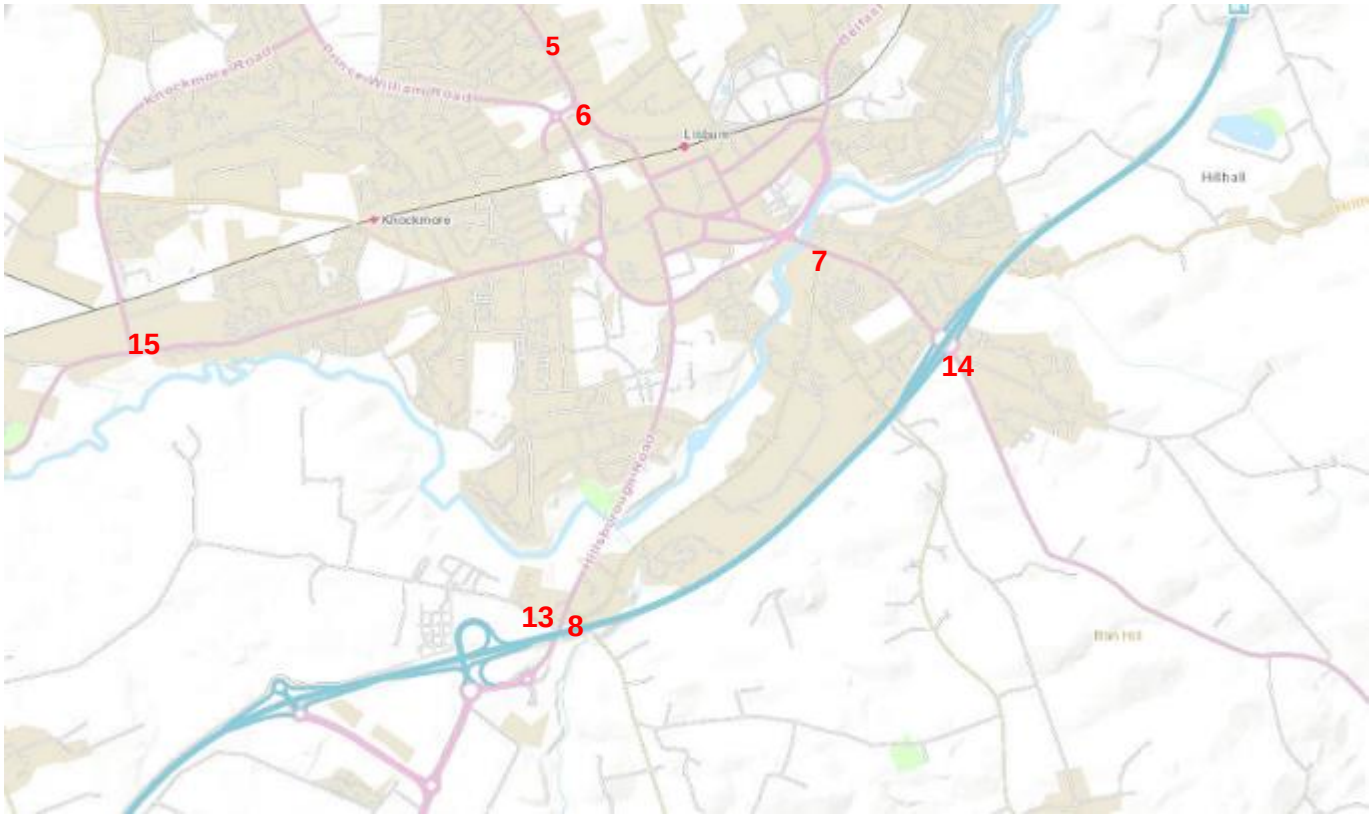
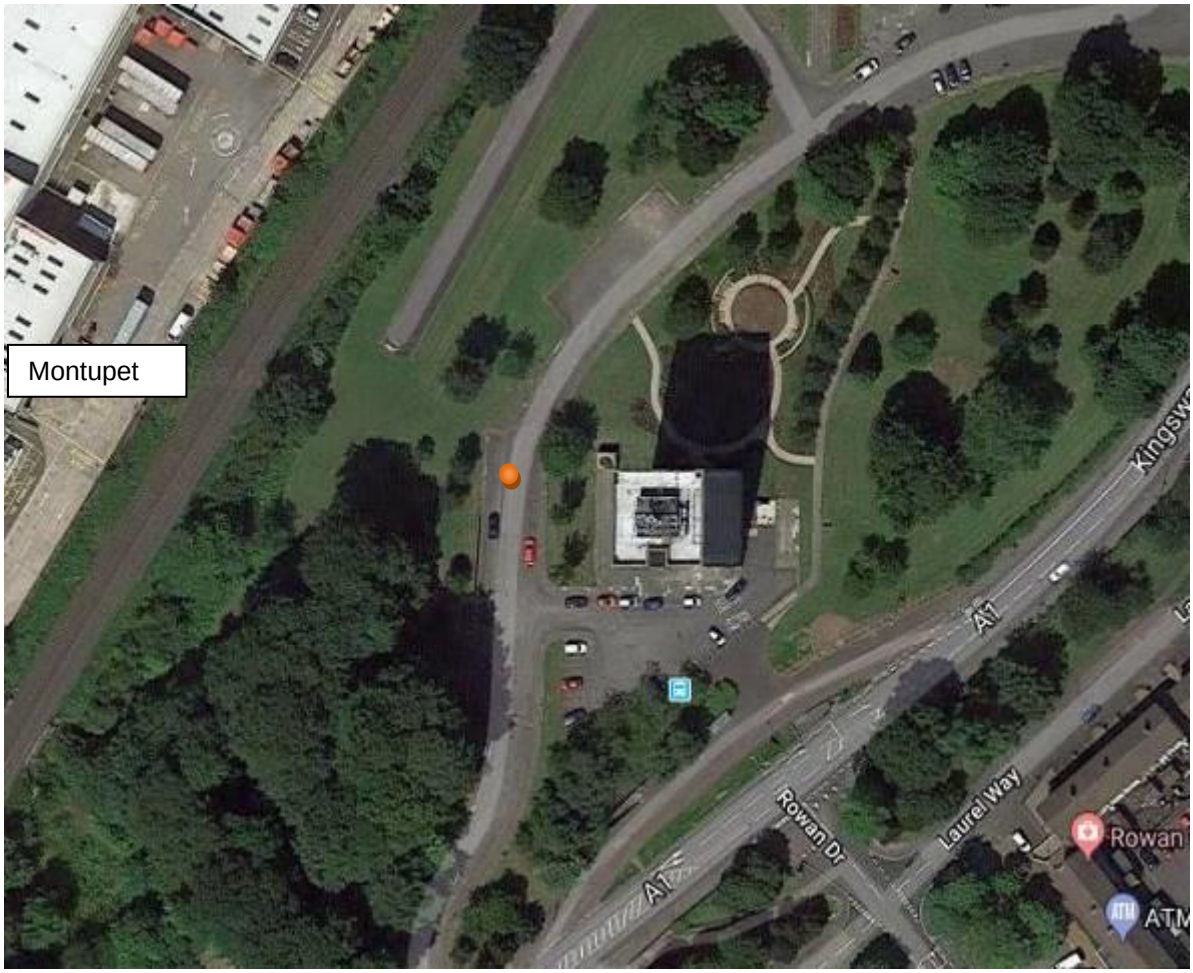


Figure 2.14 Map of the tube in Hillsborough

Figure 2.15 Position of the tube in Main Street Moira

Figure 2.16 Picture of the location of the new site Seymour Hill



Position of diffusion tube

Figure 2.17 Picture of the location of the new diffusion tube Blaris Road

Position of Diffusion tube

Figure 2.18 Picture of the new diffusion tube site Saintfield Road Lisburn

Position of diffusion tube

Figure 2.19 Picture of the new diffusion tube sites Comber Road Dundonald

Position of diffusion tubes

Table 2.2 Details of Non-Automatic Monitoring Sites

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	Normandy Court Dundonald (AQMA)	Roadside	341991	374013	3m	NO_2	Yes	No	Yes (0m)	0.5m	Yes
2	Newtownbreda Road Castlereagh	Roadside	335246	370061	2.5m	NO_2	No	No	Yes (12m)	2.5m	Yes
3	Saintfield Road Carryduff	Roadside	336832	365625	2m	NO_2	No	No	Yes (70m)	10m	Yes
	Ventnor Pk Lambeg	Background	326900	362013	2.5m	NO_2	No	No	No (6m)	0.5m	No
4	Seymour Hill	Background	328585	368117	2.5m	NO_2	No	No	No (50m)	100m	
5	Antrim Rd Lisburn	Roadside	326313	364621	2.5m	NO_2	No	No	Yes (7m)	1m	Yes
6	Benson Street Lisburn	Roadside	326090	364619	2m	NO_2	No	No	Yes (0.1m)	Yes	Yes
7	Sloan Street Lisburn	Roadside	327236	364102	2.5m	NO_2	No	No	Yes (1.5m)	2m	Yes
8	Sprucefield Court Lisburn	Roadside	327586	363586	2m	NO_2	No	No	Yes (1m)	15m	Yes
	Harry's Road Culcavy	Roadside	323811	360577	3m	NO_2	No	No	Yes (10m)	5m	Yes

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?
	Culcvavy Road Culcavy	Roadside	323849	360318	2.5m	NO_2	No	No	Yes (10m)	2m	Yes
9	Comber Road (Comber side)	Roadside	341731	373666	2.5m	NO_2	No	No	Yes (4m)	1.5m	Yes
10	Comber Road (Belfast side)	Roadside	341622	373759	2.5m	NO_2	No	No	Yes (4m)	1.5m	Yes
11	Hillsborough	Roadside	324404	358876	2m	NO_2	No	No	Yes (0.1m)	1m	Yes
12	58-62 Main Street Moira	Roadside	314994	360589	3m	NO_2	No	No	Yes (4m)	1.5m	Yes
13	Blaris Road Lisburn	Roadside	325993	362462	2.5m	NO_2	No	No	Yes (4m)	1.5m	Yes
14	Saintfield Road Lisburn	Roadside	327810	363609	2.5m	NO_2	No	No	Yes (4m)	1.5m	Yes
15	Moira Road Lisburn	Roadside	324169	363671	2.5m	NO_2	No	No	Yes (4m)	1.5m	Yes

(sites listed in green, the tubes where re-located to new sites)

(sites listed in blue were new in 2017)

2.2 Comparison of Monitoring Results with Air Quality Objectives

No exceedances of the AQS objectives have been identified from the monitoring data collected since the last progress report. All monitored pollutant concentrations outside of the AQMA have been below their respective air quality objective limits at relevant exposure. In the following section results are presented for NO_2 at the automatic and diffusion tube sites and compared with the objective.

2.2.1 Nitrogen Dioxide

In the following section results are presented for NO_2 at the automatic and diffusion tube sites and compared with the objective. A number of diffusion tube sites were elevated in 2017 including the Normandy Court site within the AQMA but LCCC has determined this is most likely due to the uncertainty of diffusion tubes rather than an increase in NO_2 levels, although extensive road works preparing for the new Rapid Transport System on the Upper Newtownards Road may also had a contribution within the AQMA.
The real-time analyser with good data capture and accurate results 30M from the AQMA showed no increase in 2017.

Automatic Monitoring Data

Table 2.3 presents the annual mean concentrations of NO_2 determined at the automatic site in 2017 from the hourly measurements.

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 Monitoring Period % [a]	Valid Data Capture 2017 % [b]	Annual Mean Concentration (µg/m^3)				
					2013	2014	2015	2016	2017
Castlereagh Dundonald	Roadside	N (within 30M)	N/A	99.9%	32	37	29	27	27

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 Monitoring Period % [a]	Valid Data Capture 2017 % [b]	Number of Hourly Means > 200µg/m^3				
					2013	2014	2015	2016	2017
Normandy Court Dundonald (AQMA)	Roadside	Y	N/A	99.9%	0	5	0	0	0

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

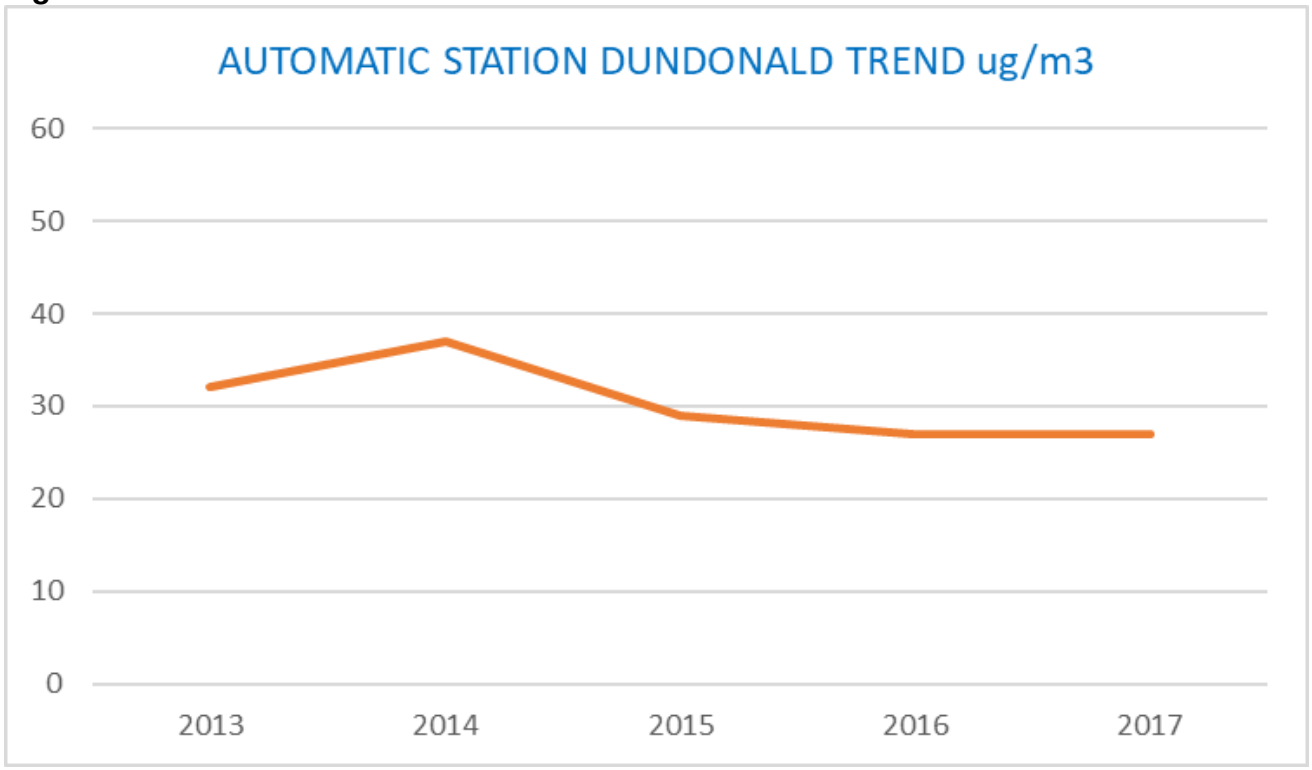
[c] Means should be “annualised” as in Boxes 7.9 and 7.10 of LAQM.TG16, if valid data capture is less than 75%

* Annual mean concentrations for previous years are optional

Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Automatic Monitoring Sites

The automatic station was installed in Dundonald in 2008 because of high results from NO_2 tubes at the Upper Newtownards Road site at Normandy Court. Results have been consistent at this site except for a slight increase in 2014 but this was probably due to climatic conditions rather than changes in emissions. There was a noticeable reduction in 2015 and the trend has continued in 2016 and 2017, this coincides with the opening of the Park & Ride in 2014.

Figure 2.20 trend in annual mean NO2 at Dundonald Automatic site



Diffusion Tube Monitoring Data

Results at the NO_2 diffusion tube sites, situated within the council area are shown below in Table 2.5. They are sited in accordance with the technical guidance LAQM.TG (09). A diffusion tube co-location study was carried out at the Dundonald automatic site. The results of this study have been submitted into the national data base. The 2017 local bias was **0.66,** in 2016 it was 0.68 which is low compared to 2014 (0.86) and 2015 (0.80) giving an uncertainty as to the accuracy of the local bias adjustment factor. A decision therefore has been made to apply the national figure for the analytical laboratory Gradko 20% TEA/water(March 2018) **0.89** as 34 studies are included, however a number of studies are still to be included in June 2018 which may have an effect on the final bias figure for 2017, a realistic figure for LCCC diffusion tubes bias is probably somewhere between the local figure and the national figure as Northern Ireland has consistent sea breezes as mainly coastal.

The Newtownbreda Road site which has been elevated since 2012 was changed from a single tube to triplicate in April 2015 to give a more accurate average. The 2017 results were below the objective and therefore have not been distance calculated to the nearest relevant exposure as in previous years.

Results from the Sprucefield Court site were elevated in 2017. Monitoring has been carried out at this site for a number of years as the M1 motorway runs behind the dwelling, LCCC investigated further monitoring sites in this area and a new site was established in 2017 at Blaris Road where new residential developments are under construction, further developments are planned to include a new link Road.

The Normandy Court tube site within the AQMA in 2015 showed a reduction in NO_2, subsequent to the new Park & Ride in Dundonald opening in December 2014, however results in 2016 and 2017, although still not above the objective showed an increase.

There is an uncertainty with diffusion tubes and in 2017 LCCC determined the elevated result within the AQMA may be due to this uncertainty as the automatic monitor 30 metres from the site showed no increase at this time. All other diffusion tube sites are below the objective. Details of the QA/QC for the diffusion tubes and the reason for the use of the bias adjustment factor **0.89** can be found in Appendix A

Trends for the 12 diffusion tube sites within the Council area are shown in Figure 2.16

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2017

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2017 (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 = 0.89) 2017 (µg/m^3)
1	Normandy Court Dundonald (AQMA)	Roadside	Y	Triplicate	12 months	N/A	N	40
2	Newtownbreda Road Castlereagh	Roadside	N	single	12 months	N/A	Y	37
3	Saintfield Road Carryduff	Roadside	N	single	12 months	N/A	N	19
4	Seymour Hill	Background	N	single	7 months	Y	N	13.6(a)
	Antrim Rd Lisburn	Roadside	N	single	11 months	N/A	N	27
6	Benson Street Lisburn	Roadside	N	single	12 months	N/A	N	26
7	Sloan Street Lisburn	Roadside	N	single	12 months	N/A	N	26
8	Sprucefield Court Lisburn	Roadside	N	single	12 months	N/A	N	39
9	Comber Road (Comber side)	Roadside	N	single	10 months	N/A	N	28
10	Comber Road (Belfast side)	Roadside	N	single	11 months	N/A	N	29
11	Hillsborough	Roadside	N	single	12 months	N/A	N	27
12	58-62 Main Street Moira	Roadside	N	single	12 months	N/A	N	29
13	Blaris Road Lisburn	Roadside	N	single	10 months	N/A	N	39

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2017 (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 = 0.89) 2017 (µg/m^3)
14	Saintfield Road Lisburn	Roadside	N	single	10 months	N/A	N	31
15	Moira Road Lisburn	Roadside	N	single	6 momths	Y	N	25(a)

(a) These sites were new in 2017 and had short term data periods and therefore the results have been annualised in accordance with **LAQM.TG(16)**

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

Underlined, annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective

[a] Means should be "annualised" as in Boxes 7.9 and 7.10 of LAQM.TG16, if full calendar year data capture is less than 75%

[b] If an exceedence is measured at a monitoring site not representative of public exposure, NO_2 concentration at the nearest relevant exposure should be estimated based on the "NO_2 fall-off with distance" calculator (http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html), and results should be discussed in a specific section. The procedure is also explained in paragraphs 7.77 to 7.79 of LAQM.TG16.

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2013 to 2017)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3				
			2013 (Bias Adjustment Factor = 0.80)	2014 (Bias Adjustment Factor =0.86)	2015 (Bias Adjustment Factor = 0.88)	2016 (Bias Adjustment Factor = 0.92)	2017 (Bias Adjustment Factor = 0.89)
1	Normandy Court Dundonald (AQMA)	Roadside	39	39	34.75	39	40
2	Newtownbreda Road Castlereagh	Roadside	**44** b(36)	40 b(33)	34.10	40 b(33)	37
3	Saintfield Road Carryduff	Roadside	14	17	14.03	17	19
	Ventnor		26	14	13.12	14	
4	Seymour Hill	Roadside					13.6(a)
5	Antrim Rd Lisburn	Roadside	33	29	26.51	29	27
6	Benson Street Lisburn	Roadside		29	24.62	27	26
7	Sloan Street Lisburn	Roadside	28	33	29.81	34	26
8	Sprucefield Court Lisburn	Roadside	37	40	32.27	37	39
	Harry's road Culcavy	Roadside		18	19.19	20	
	Culcavy Road	Roadside		16	14.43	17	
9	Comber Road (Comber side)	Roadside					28
10	Comber Road (Belfast side)	Roadside					29
11	Hillsborough	Roadside		32	25.82	28	27

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) µg/m^3				
			2013 (Bias Adjustment Factor = 0.80)	2014 (Bias Adjustment Factor =0.86)	2015 (Bias Adjustment Factor = 0.88)	2016 (Bias Adjustment Factor = 0.92)	2017 (Bias Adjustment Factor = 0.89)
12	58-62 Main Street Moira	Roadside		28	25.86	30	29
13	Blaris Road Lisburn	Roadside					39
14	Saintfield Road Lisburn	Roadside					31
15	Moira Road Lisburn	Roadside					25(a)

(a) These sites were new in 2017 and had short term data periods and therefore the results have been annualised in accordance with **LAQM.TG(16)**

(b) **figure in red are the distance calculated figures**

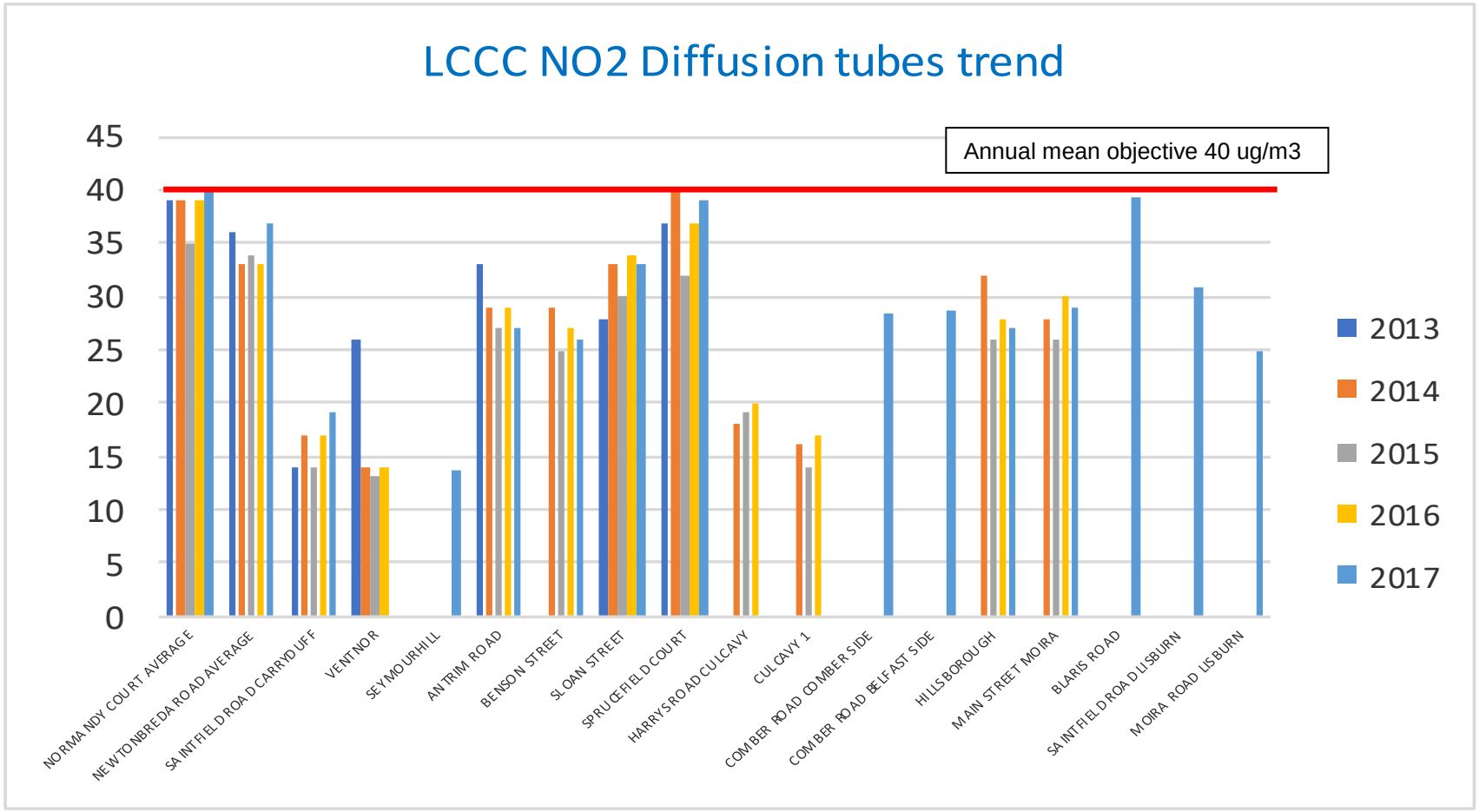
In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

Underlined, annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective

[a] Means should be "annualised" as in Boxes 7.9 and 7.10 of LAQM.TG16, if full calendar year data capture is less than 75%

[b] If an exceedence is measured at a monitoring site not representative of public exposure, NO_2 concentration at the nearest relevant exposure should be estimated based on the "NO_2 fall-off with distance" calculator (http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html), and results should be discussed in a specific section. The procedure is also explained in paragraphs 7.77 to 7.79 of LAQM.TG16.

Figure 2.21 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites



2.2.2 PM_{10}

Automatic monitoring of PM_{10} in 2017 was undertaken at Kilmakee Activity Centre, Rowan Drive, Seymour Hill situated between Lisburn City and Belfast City.

This location is also the site for the AURN PAH and Black Carbon monitors, and was chosen due to the high use of secondary solid fuel use.

In 2017 measurements were recorded using a TEOM instrument, the results are ratified and adjusted accordingly by AQDM, the data management company. Summaries of this data, with regard to annual and hourly mean objectives, are presented below.

All results remain below the objective.

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 2017 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)				
						2013	2014	2015	2016	2017
Kilmakee Activity Centre (PM_{10})	Urban Background	N	N/A	98.6%	Y	18	16	14	12	11

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 2017 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3				
						2013	2014	2015	2016	2017
Kilmakee Activity Centre (PM_{10})	Urban Background	N	N/A	98.7%	Y	5	0	0	2	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 90th percentile of 24-hour means in brackets
* Optional

Figure 2.22 Trends in Annual Mean PM_{10} Concentrations

PM_{10} has remained consistently low in Dunmurry

2.2.3 Sulphur Dioxide

Lisburn and Castlereagh City Council have an SO_2 automatic site situated at Kilmakee alongside the PM_{10} and PAH analysers, installed at the end of 2012. This site was chosen due to high PAH results in the area and across Northern Ireland compared to the rest of the UK, there is secondary high solid fuel use in the area and it is adjacent to relevant exposure. There were no exceedences of the air quality objective in 2017.

The data has been fully ratified by AQDM.

Details of the QA/QC are available in Appendix A

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2017 % [b]	Number of exceedances:		
					15-minute Means > 266µg/m^3	1-hour Means > 350µg/m^3	24-hour Means > 125µg/m^3
Kilmakee Activity Centre Dunmurry	Urban Background	N	99.8	99.8%	0	0	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

Figure 2.23 Trends in SO_2 Concentrations

Results have remained very low at this site.

2.2.4 Benzene

No monitoring of Benzene is carried out in 2017.

2.2.5 Other pollutants monitored

PAHs

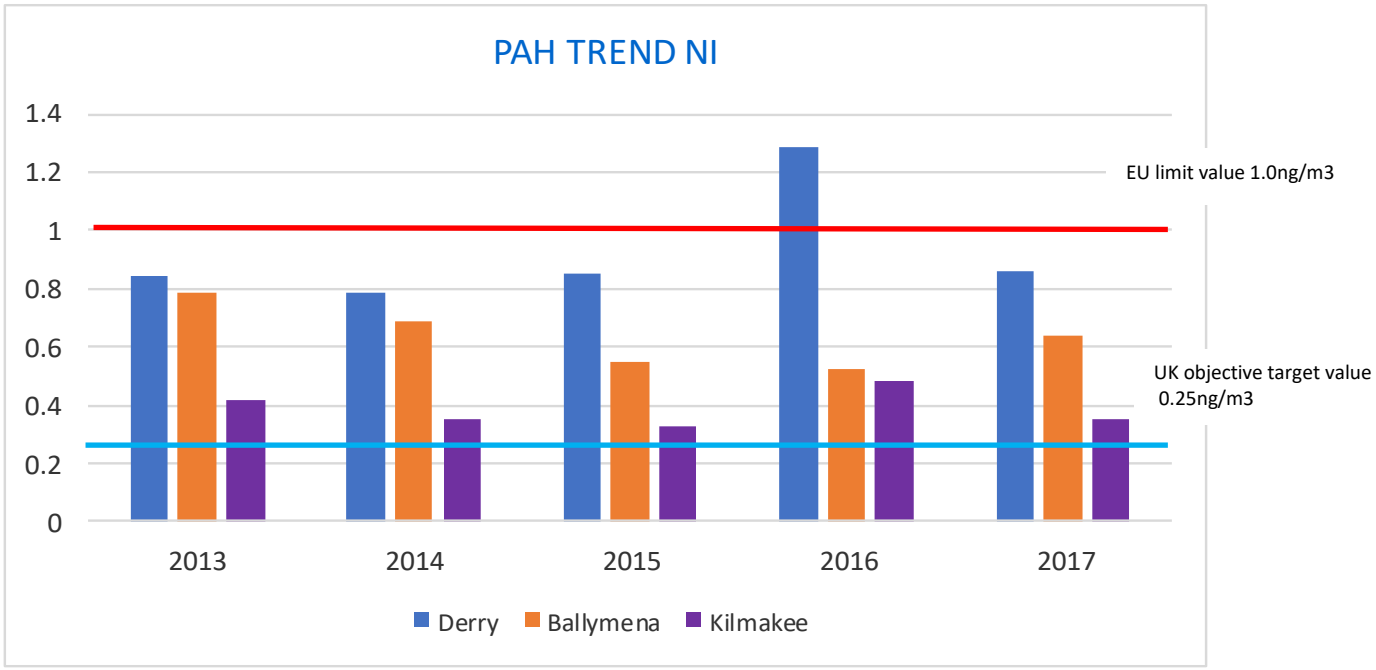
Polycyclic aromatic hydrocarbons (PAH)

The national network monitoring for PAH includes three monitoring sites in Northern Ireland, Kilmakee Activity Centre, Seymour Hill in LCCC is one of these. The UK National Air Quality Objective for PAH is an annual average of 0.25ng /m3, the EU limit value for PAH is an annual average of 1ng BaP/m3. The Kilmakee site is below the EU objective but over the UK non-mandatory objective. Results have shown an increase in 2016 which is most probably climatic as the Derry site showed a similar percentage increase and there have been no new local developments, the 2017 results have remained consistent.

Table 2.10 PAH results 2013 - 2017.

Site	2013 ng/m^3 annual mean	2014 ng/m^3 annual mean	2015 ng/m^3 annual mean	2016 ng/m^3 annual mean	2017 ng/m^3 annual mean
Derry	0.84	0.79	0.85	1.29	0.86
Ballymena	0.79	0.69	0.55	0.52	0.64
Kilmakee	0.42	0.35	0.33	0.48	0.35

Figure 2.24 Trends in PAH Northern Ireland



Radiation Monitoring

Radiation monitoring has been carried out in Lisburn & Castlereagh City Council on a quarterly basis the 2017 results are shown in the table below:

Table 2.11 Radiation results LCCC

Site	03/08/2017	26/10/2017
Derriaghy (96)	-	0.07
Ballinderry (97)	-	0.06
Glenavy (79)	-	0.06
Dundrod (80)	-	0.05
Red Hill Road	-	0.08
Dundonald	0.09	
Carryduff	0.08	
Drumlough	0.09	
Cargycreevy	0.09	

2.2.6 Summary of Compliance with AQS Objectives

Lisburn and Castlereagh City Council has examined the results from monitoring in the area. Concentrations outside of the AQMA are all below the objectives at relevant locations, 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

Lisburn and Castlereagh City 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

Lisburn and Castlereagh City 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.

Lisburn and Castlereagh City Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

Lisburn and Castlereagh City 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

Lisburn and Castlereagh City Council confirms that there are no new/proposed roads meeting the criteria in Table 7.1 of Chapter 7 of LAQM.TG16

3.6 Roads with Significantly Changed Traffic Flows

Lisburn and Castlereagh City Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

Lisburn and Castlereagh City Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Lisburn and Castlereagh City confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Lisburn and Castlereagh City 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

Lisburn and Castlereagh City 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)

Lisburn and Castlereagh City 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

Lisburn and Castlereagh City 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

Lisburn and Castlereagh City 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

Lisburn and Castlereagh City 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 major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Lisburn and Castlereagh City Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

Lisburn and Castlereagh City Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Lisburn and Castlereagh City Council confirms that there are no biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

Lisburn and Castlereagh City Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

Lisburn and Castlereagh City Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Lisburn and Castlereagh City 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

All monitoring sites at relevant exposure within the Council Area are below the objective a number of NO_2 diffusion tube sites have shown an increase in levels although the more accurate automatic site did not. In 2018 LCCC will continue monitoring at all NO_2 diffusion tube sites to ascertain if a detailed assessment may be required at any of the locations and will submit a progress in 2019.

The NO_2 levels within the AQMA (Normandy Court) on the A20 Dundonald in 2015 showed a reduction after the new Park & Ride in Dundonald opened in December 2014, however results in 2016 and 2017, although still not above the objective showed an increase. The automatic site 30M from the AQMA showed no increase, due to the uncertainty of the bias adjustment figure and the extensive road works in 2017 preparing the new road layout, monitoring shall continue in Dundonald and the AQMA shall not be revoked until levels show a trend in reduction after the introduction of the new Rapid Transport system in September 2018 from the Park & Ride.

8.2 Conclusions from Assessment of Sources

No new sources were identified.

8.3 Proposed Actions

This 2018 Update and Screening Report for LCCC has identified there is no need to proceed to a detailed assessment for any of the pollutants, all monitoring sites are sited in accordance with the guidance and at relevant exposure and shall remain in 2018.

DAERA are presently producing a new Air Quality Action Plan (AQAP). It is this Council's view that the new air quality action plan for nitrogen dioxide for Northern Ireland will not solely focus upon delivering limit values within existing Air Quality Management Areas, but it will also focus

upon improving ambient air quality as a whole, therefore LCCC proposes to continue with automatic and passive monitoring of NO_2 and assess planning applications so as to reliably inform the AQAP for Northern Ireland.

9 References

TG (2009) Part IV of the Environment Act 1995. Local Air Quality Management: Technical

Guidance LAQM.TG(16). Guidance prepared by the Department for Environment, Food and Rural Affairs, February 2016

Appendix A:

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

QA/QC Data of automatic sites

Lisburn City & Castlereagh City Council commissioned AQDM Technology to provide the QA/QC of the automatic measurements of NO_2, SO_2, PM_{10}, for the Kilmakee, Seymour Hill and Dundonald A20 sites. Local authority staff act as the local site operator and visit the sites on a weekly basis carrying out any manual calibration or filter changes required. The sites were repaired as necessary and Wecare4air were contracted to service the sites.

Automatic station reports produced by data management company

Produced by AQDM on behalf of Lisburn

Air Quality Report

CASTLEREAGH DUNDONALD 2017

Air Quality Statistics

Pollutant	NO_2	NO	NO_x
Number Very High #	0	-	-
Number High #	0	-	-
Number Moderate #	0	-	-
Number Low #	8753	-	-
Maximum 15-min mean	170 µg m^{-3}	594 µg m^{-3}	1081 µg m^{-3}
Maximum hourly mean	140 µg m^{-3}	436 µg m^{-3}	807 µg m^{-3}
Maximum running 8-hr mean	90 µg m^{-3}	202 µg m^{-3}	395 µg m^{-3}
Maximum running 24-hr mean	67 µg m^{-3}	122 µg m^{-3}	254 µg m^{-3}
Maximum daily mean	65 µg m^{-3}	120 µg m^{-3}	249 µg m^{-3}
Average	27 µg m^{-3}	23 µg m^{-3}	62 µg m^{-3}
Data capture	99.9 %	99.9 %	99.9 %

Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013
Mass units for the gases are at 20'C and 1013mb
NO_x mass units are NO_x as NO_2 µg m^{-3}

Air Quality Exceedences

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Max Conc	Number	Days	Allowed	Exceeded
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	27 µg m^{-3}	0	-	-	No
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	140 µg m^{-3}	0	0	18 hours	No

Air Quality Report

LISBURN DUNMURRY SEYMOUR HILL 2017

Air Quality Statistics

Pollutant	PM_{10}*	PM_{10}*	SO_2	Wind Dir	Wind Speed
Number Very High #	0	-	0	-	-
Number High #	0	-	0	-	-
Number Moderate #	0	-	0	-	-
Number Low #	363	-	34792	-	-
Maximum 15-min mean	-	147 µg m^{-3}	69 µg m^{-3}	-	3.1 m/sec
Maximum hourly mean	109 µg m^{-3}	107 µg m^{-3}	19 µg m^{-3}	-	2.4 m/sec
Maximum running 8-hr mean	84 µg m^{-3}	73 µg m^{-3}	10 µg m^{-3}	-	2.3 m/sec
Maximum running 24-hr mean	60 µg m^{-3}	46 µg m^{-3}	8 µg m^{-3}	-	1.6 m/sec
Maximum daily mean	50 µg m^{-3}	37 µg m^{-3}	6 µg m^{-3}	-	1.5 m/sec
Average	11 µg m^{-3}	12 µg m^{-3}	1 µg m^{-3}	-	0.1 m/sec
Data capture	98.6 %	98.6 %	99.8 %	100.0 %	100.0 %

Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013
* PM_{10} as measured by a TEOM using the VCM for Indicative Gravimetric Equivalent
* PM_{10} as measured by a TEOM
Mass units for the gases are at 20'C and 1013mb

Air Quality Exceedences

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Max Conc	Number	Days	Allowed	Exceeded
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	50 µg m^{-3}	0	0	35 days	No
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	11 µg m^{-3}	0	-	-	No
Sulphur Dioxide	15-minute mean > 266 µg m^{-3}	69 µg m^{-3}	0	0	35 15 mins	No
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	19 µg m^{-3}	0	0	24 hours	No
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	6 µg m^{-3}	0	0	3 days	No
Sulphur Dioxide	Annual mean > 20 µg m^{-3}	1 µg m^{-3}	0	-	-	No

QA/QC of Diffusion Tube Monitoring

In 2017 the NO_2 tubes were supplied, prepared and analysed by Gradko International Limited, using the preparation method 20%TEA/Water. Gradko International Ltd. participates in the AIR-PT/WASP scheme, Quarterly summaries of participating laboratories' performance can be found here:

http://laqm.defra.gov.uk/documents/LAQM-AIR-PT-Rounds-1-12-(April-2014-February-2016)-NO2-report.pdf

Diffusion Tube Bias Adjustment Factors

Factor from Local Co-location Studies

A co-location study was carried out at the Dundonald site and the data submitted to the national data base.
http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

The local bias adjustment figure was **0.66,** this was calculated using the DEFRA precision & accuracy calculation tool.

Lisburn & Castlereagh NO_2 bias

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	04/01/2017	07/02/2017	49	49	46	48	1.7	4	4.3
2	07/02/2017	01/03/2017	46	50	50	49	2.3	5	5.7
3	01/03/2017	31/03/2017	54	54	49	52	2.9	6	7.2
4	31/03/2017	02/05/2017	35	34	36	35	1.0	3	2.5
5	02/05/2017	31/05/2017	45	44	44	44	0.6	1	1.4
6	31/05/2017	30/06/2017	31	33	32	32	1.0	3	2.5
7	30/06/2017	04/08/2017	33	31	31	32	1.2	4	2.9
8	04/08/2017	30/08/2017	30	31	35	32	2.6	8	6.6
9	30/08/2017	28/09/2017	33	33	33	33	0.0	0	0.0
10	28/09/2017	02/11/2017	35	37	38	37	1.5	4	3.8
11	02/11/2017	06/12/2017	45	50	52	49	3.6	7	9.0
12	06/12/2017	03/01/2018	43	43	44	43	0.6	1	1.4
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
36.3	99.8	Good	Good
29.7	99.2	Good	Good
34.6	99.9	Good	Good
26.4	99.9	Good	Good
25.1	99.9	Good	Good
20.1	99.9	Good	Good
18.2	99.9	Good	Good
18.7	99.8	Good	Good
20.6	99.4	Good	Good
24.7	99.9	Good	Good
33.1	99.9	Good	Good
32.4	99.9	Good	Good

Overall survey --> precision: Good, Overall: Good

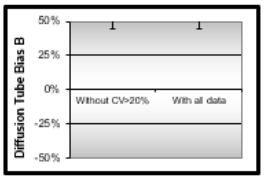
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision: 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 12 periods of data	
Bias factor A	0.66 (0.62 - 0.71)
Bias B	52% (42% - 62%)
Diffusion Tubes Mean:	41 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	27 µgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	27 (25 - 29) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	0.66 (0.62 - 0.71)
Bias B	52% (42% - 62%)
Diffusion Tubes Mean:	41 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	27 µgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	27 (25 - 29) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

If you have any enquiries about this spreadsheet please contact the LAQM Helpdesk at: LAQMHelpdesk@uk.bureauveritas.com

Discussion of Choice of Factor to Use

A decision was made not to use the local factor as it was deemed to be very low and would show a large decrease in the results. The national bias adjustment figure of 0.89 was therefore applied as 34 studies where included in this, although Northern Ireland is mainly coastal so with natural sea breezes somewhere between these two figures would probably seem more realistic.

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/18

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 June 2018

LAQM Helpdesk Website

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 [2]

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 (To undo your selection, choose (All) from the pop-up list)	Year [2] (To undo your selection, choose (All))	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 [4]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2017	R	Lancaster City Council	12	35	32	9.7%	G	**0.91**
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	12	54	52	3.3%	S	**0.97**
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	11	35	33	7.0%	G	**0.93**
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	9	33	29	14.3%	G	**0.87**
Gradko	20% TEA in water	2017	UB	Thurrock Borough Council	11	30	28	8.0%	S	**0.93**
Gradko	20% TEA in water	2017	R	Dudley MBC	12	50	50	0.8%	G	**0.99**
Gradko	20% TEA in water	2017	UB	Dudley MBC	12	24	19	26.6%	G	**0.79**
Gradko	20% TEA in water	2017	R	City of Lincoln Council	12	42	31	33.2%	G	**0.75**
Gradko	20% TEA in water	2017	R	Gedling Borough Council	12	35	31	10.1%	G	**0.91**
Gradko	20% TEA in water	2017	R	Gateshead Council	12	36	37	-2.7%	G	**1.03**
Gradko	20% TEA in water	2017	R	Gateshead Council	12	29	25	17.5%	G	**0.85**
Gradko	20% TEA in water	2017	R	Gateshead Council	12	34	35	-5.3%	G	**1.06**
Gradko	20% TEA in water	2017	R	LB Hounslow	12	65	54	22.2%	G	**0.82**
Gradko	20% TEA in water	2017	R	LB Hounslow	12	59	53	10.6%	G	**0.90**
Gradko	20% TEA in water	2017	B	LB Hounslow	11	28	30	-6.0%	G	**1.06**
Gradko	20% TEA in water	2017	R	LB Hounslow	11	43	34	28.8%	G	**0.78**
Gradko	20% TEA in water	2017	B	LB Hounslow	9	38	33	14.9%	G	**0.87**
Gradko	20% TEA in water	2017	R	LB Hounslow	11	52	42	24.4%	G	**0.80**
Gradko	20% TEA in water	2017	UB	Liverpool	11	20	17	15.2%	G	**0.87**
Gradko	20% TEA in water	2017	R	North Ayrshire Council	12	26	21	23.2%	G	**0.81**
Gradko	20% TEA in water	2017	R	South Gloucestershire Council	12	25	23	10.3%	G	**0.91**
Gradko	20% TEA in water	2017	KS	Marylebone Road Intercomparison	12	101	79	28.6%	G	**0.78**
Gradko	20% TEA in water	2017		**Overall Factor [3] (34 studies)**				**Use**		**0.89**

Short-term to Long-term Data adjustment

As only seven months NO_2 data was available for the new site at Seymour Hill and six months from the Moira Road Lisburn site both have been annualised using Boxes 7.9 and 7.10 of LAQM.TG16
https://laqm.defra.gov.uk/technical-guidance/

Table A.1 Short-Term to Long-Term Monitoring Data Adjustment Seymour Hill

Site	Site Type	Annual Mean (µg/m³)	Period Mean (µg/m³)	Ratio
Derry Rosemount	Urban background	8	7	1.1431
Belfast Centre	Urban Centre	25	31	0.806
Average				0.9741

Seymour Hill 2017 = 14 X 0.974 = 13.6

Table A.2 Short-Term to Long-Term Monitoring Data Adjustment Moira Road Lisburn

Site	Site Type	Annual Mean (µg/m^3)	Period Mean (µg/m^3)	Ratio
Derry Rosemount	Urban background	8	7	1.1431
Belfast Centre	Urban Centre	25	24	1.041
Average				1.092

Moira Road Lisburn 2017 = 23 X 1.092 = 25.1