Lisburn & Castlereagh City Council

2022 Air Quality Progress Report

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

June 2022

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Report Reference number	LCCC PR 2022
Date	June 2022

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 2021, this is the 2022 progress 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 2021 for any of the pollutants assessed. NO_2 levels due to vehicle emissions is still the main source of concern within Lisburn & Castlereagh City Council (LCCC) as it has several main commuter belts into Belfast City centre. The real-time analyser with good data capture and accurate results showed a continuing decrease of NO_2 in 2019 and the NO_2 tubes within the AQMA also continued to show a decrease, which may have been due to the growing popularity of the Park & Rides and the completion in 2018 of the new Rapid Transport system to the city centre. However, it is too early to establish a trend in the reduction of NO_2, as the large reduction in emissions in 2020 are more likely to have been a result of the low traffic flows during the COVID pandemic, levels increased slightly during 2021 as the COVID restrictions eased and traffic flows increased, this was noticeable as the Park & Ride facilities in Dundonald that could have been found over capacity pre COVID and seldom used during COVID, in 2021 were back to approximately 60% capacity. LCCC launched a new initiative in 2019 in primary schools “Engine off Prevent the Cough”, educating pupils and parents to the harmful emissions from vehicles with the emphasis on idling engines outside schools, unfortunately it was not

run in 2020 due to COVID 19, it was re-launched in 2021 although uptake was slow due to the uncertainty of COVID restrictions and schools only returning to some normality in September 2021. The Blaris Greenway walking and cycling path was completed in 2020, linking Sprucefield Shopping Centre with the city centre, encouraging the cycling and walking trend that became popular during the COVID restrictions.

Monitoring shall continue within the AQMA and throughout the Council area using NO_2 tubes to ascertain further trends. In 2022 the AQMA shall remain in the Dundonald area, as a continuing trend and consistent reduction of NO_2 has not yet been determined due to the reduced traffic during COVID.

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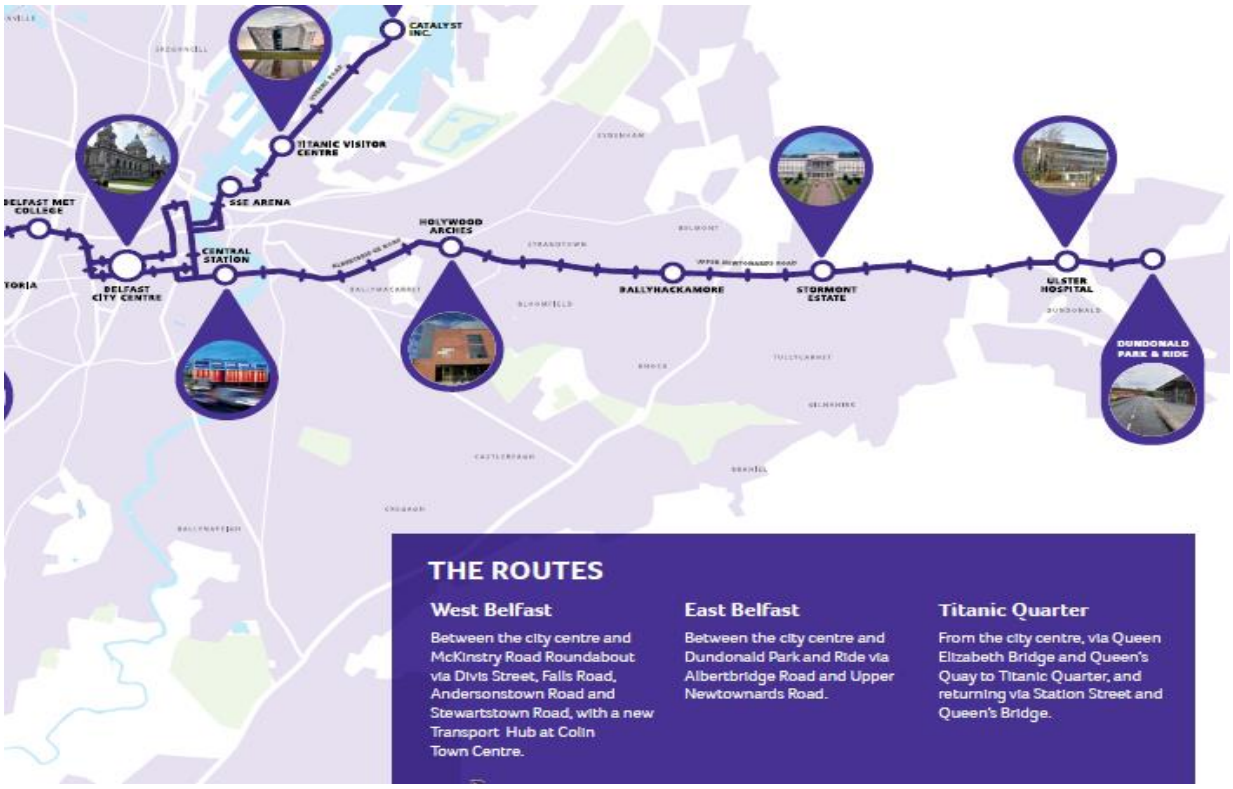
1.1 Description of Local Authority Area

LCCC has a population of 146,452 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 fell within the New Belfast Rapid transport network which was completed in September 2018. This included a Park & Ride facility in Dundonald and a new hybrid Glider bus and a designated bus lane through Dundonald Village and into Belfast City centre. 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 Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) 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.

For Local Authorities in Northern Ireland, Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

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

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in Northern Ireland** are set out in the Air Quality Regulations (Northern Ireland) 2003, Statutory Rules of Northern Ireland 2003, no. 342, and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre µg/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 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 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
Particulate matter (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 11 councils and the following reports have since been submitted and can be found on the DAERA website District Council Reports - Northern Ireland Air (airqualityni.co.uk)

2015 - Update and Screening Assessment

2016 - Progress report

2017 - Progress report

2018 - Update and Screening Assessment

2019 - Progress report (not presently on website)

2020 - Progress report

2021 - Update and Screening Assessment

Figure 1.3 – Map of AQMA Location within LCCC

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

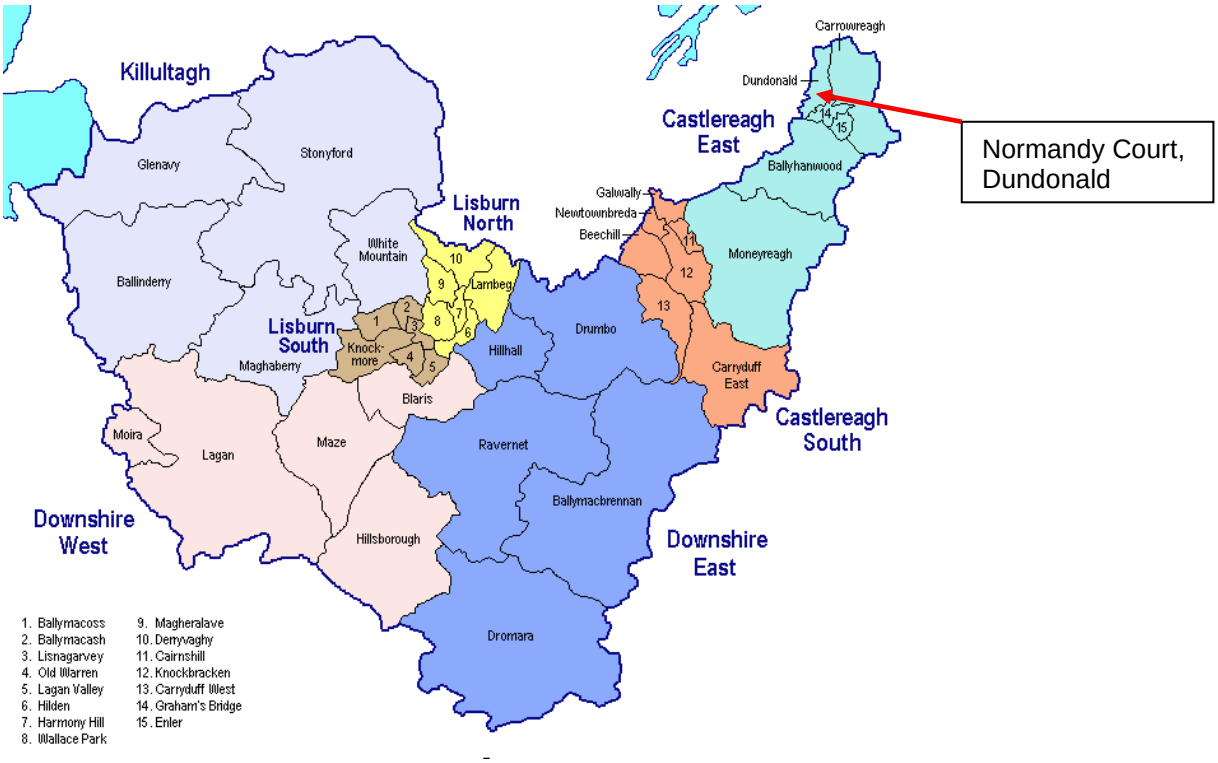
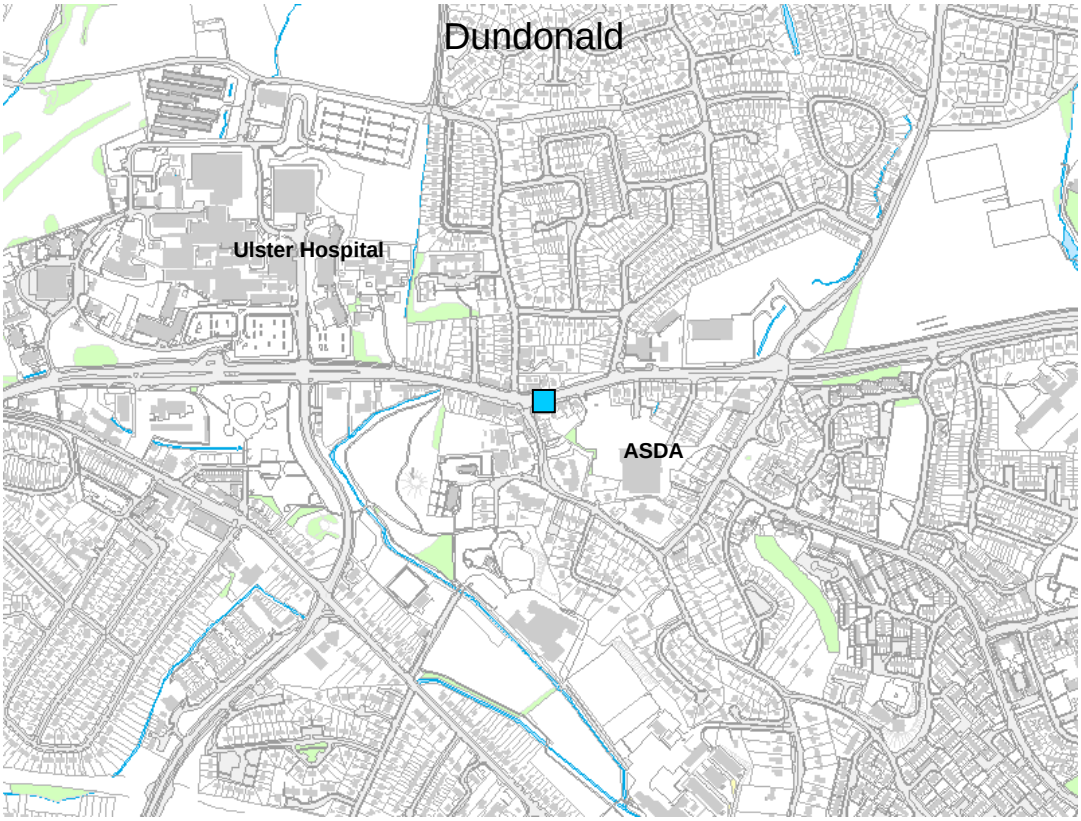
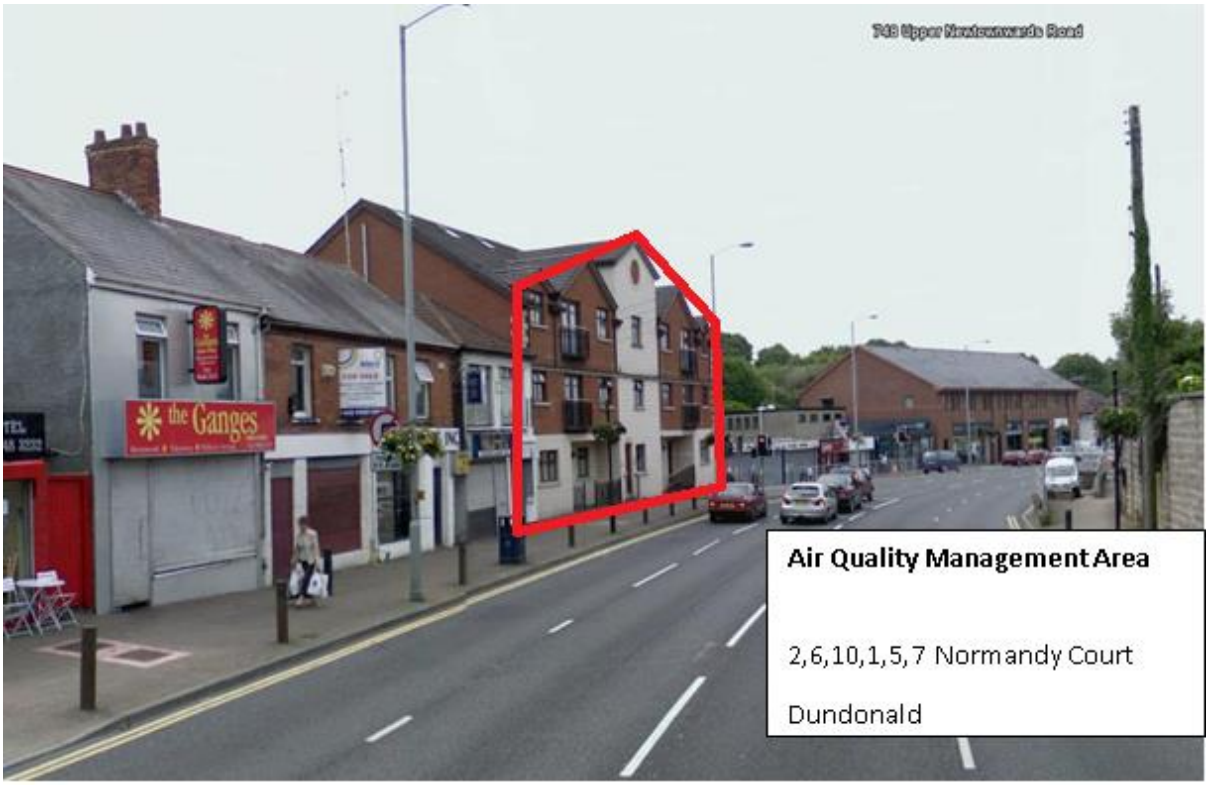


Figure 1.4 Map showing position of AQMA in Dundonald Village



Normandy Court A20 Upper Newtownards Road, Dundonald

Figure 1.5 Ariel photograph showing position of AQMA in Dundonald Village


the Ganges
Air Quality Management Area
2,6,10,1,5,7 Normandy Court
Dundonald

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},$PM_{2.5}$ 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. This site is now well established and the 2017 - 2021 data is included in this report.

Dundonald

Measuring NOx using a chemiluminescence analyser, this site is within 30m of an 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 2021 to be included in the March 2022 data.

Manual calibrations are carried out every two weeks by the Local Air Quality officer. AQDM (Air Quality Data Management) 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.

Map(s) of Automatic Monitoring Sites

Figure 2.1 - Position of Automatic monitoring sites within LCCC

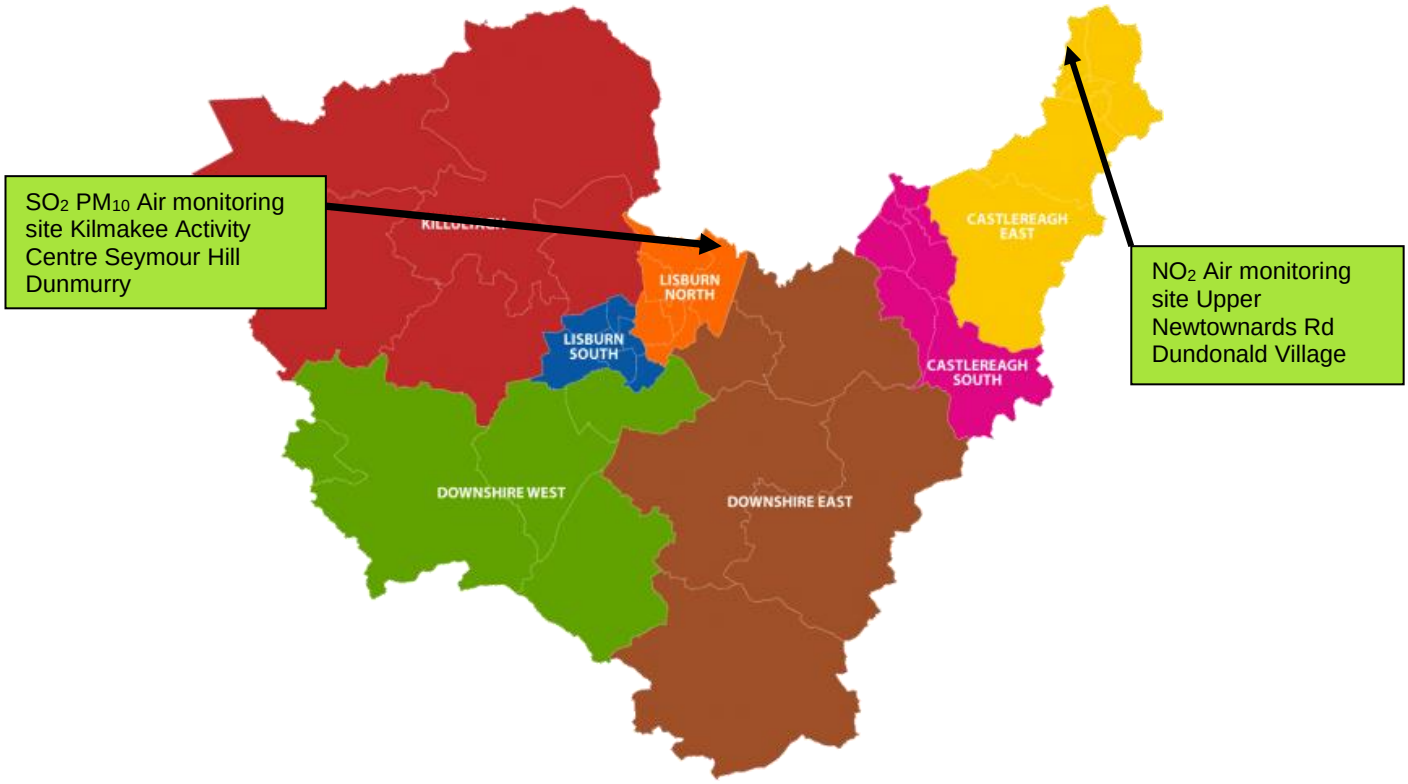


Figure 2.2 Position of Air monitoring site in Seymour Hill

▲ **Kilmakee Activity Centre Seymour Hill**

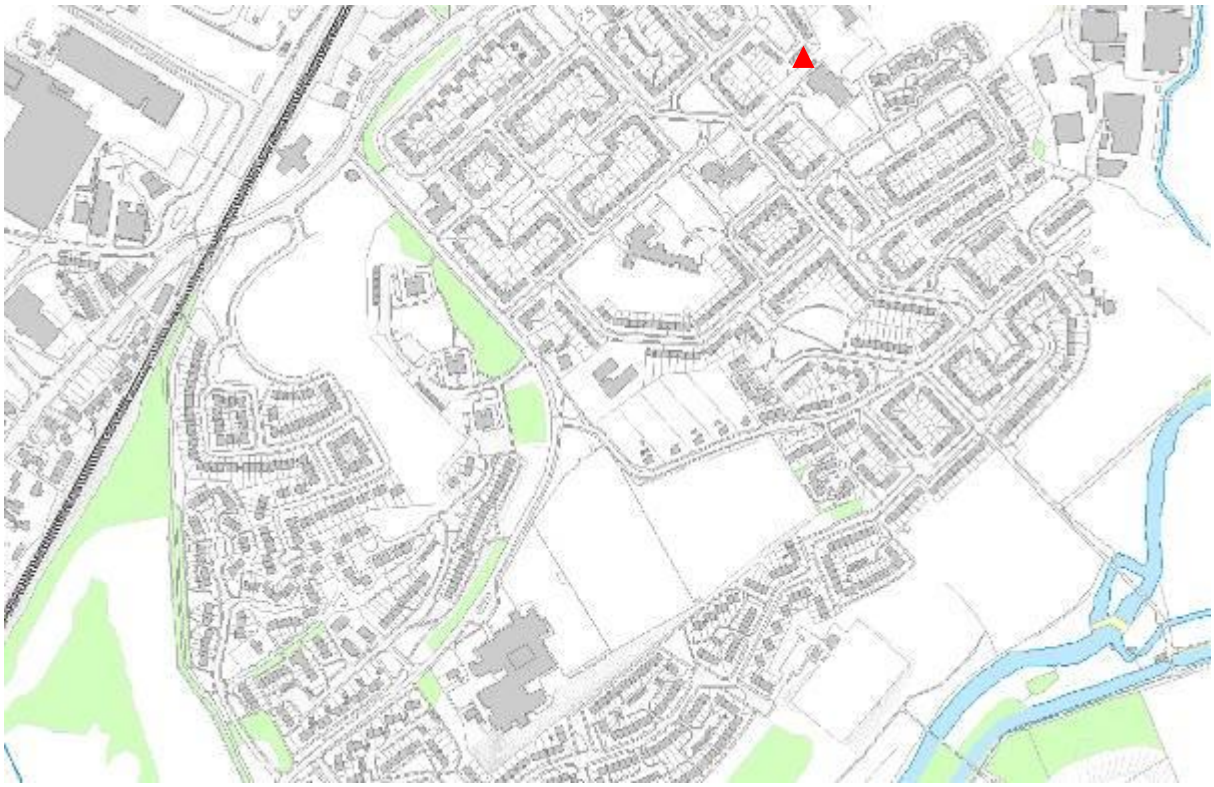


Figure 2.3 Position of Automatic Monitoring Site at Kilmakee Activity Centre

■ Air monitoring station

Figure 2.4 Picture of Automatic Monitoring Stations at Kilmakee Activity Centre

Figure 2.5 Position of automatic monitoring site in Dundonald Village

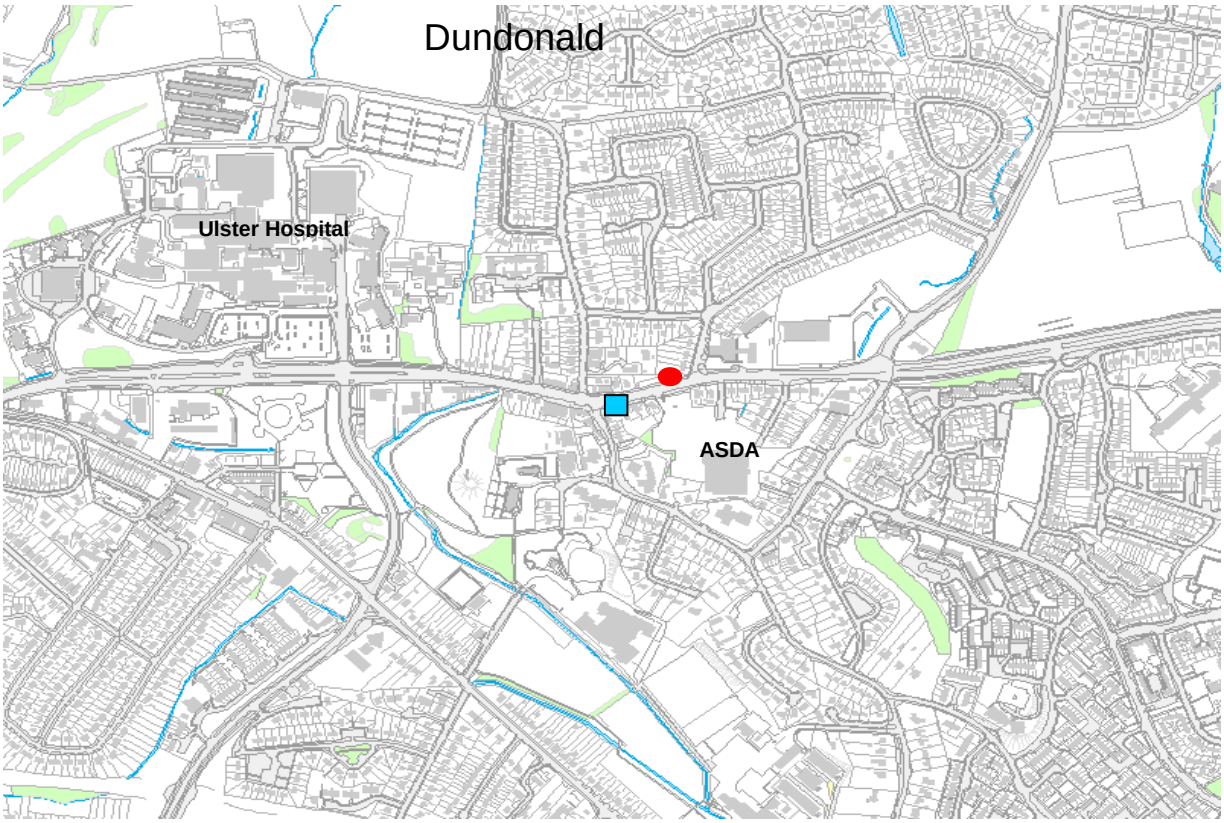


Figure 2.6 Picture of Automatic Monitoring Station in Dundonald Village

Table 2.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	Irish Grid Reference	Irish Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	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?
	Kilmakee Activity Centre	Urban Background	E328956	N367973	**2.5**	PM_{10}, $PM_{2.5}$ SO_2	NO	FIDAS 200 UV Analyser	YES 10m	N/A	YES
	Dundonald Village	Roadside	E342016	N374041	**2.5**	NO_2,	NO	Chemiluminescence	YES 22m	3M	YES (30m from AQMA)

2.1.2 Non-Automatic Monitoring Sites

Lisburn and Castlereagh City Council in 2021 had 25 passive monitoring NO_2 diffusion tubes, at 18 roadside and background sites and a co-location study at the automatic station in Dundonald. Most are positioned along the main arterial routes into Belfast, there are triplicate tubes at the co-location site in Dundonald and to enable more accurate results triplicate tubes are also positioned on the façade of Normandy Court within the AQMA and the Newtownbreda Road site where the highest results have been recorded within the council area

The following sites in 2019, were identified through monitoring and planning applications and established to assist in future air quality assessments;

1. Blaris Road/Green/Drive – A number of new houses have been built in this area adjacent to the M1 motorway with future plans for further residential developments and link road to a new train halt.
2. Knockmore Road – A new road layout is planned for the future also leading to the proposed new train halt.

A new site in 2020 was also established at Cairnshill Park & Ride as there were plans to extend the facilities.

Results from the co-location study at the automatic station in Dundonald, were submitted into the national data base

The diffusion tube studies for the past five years do not show any particular trends outside of the AQMA (See Fig. 2.18)

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, and the new sites established in 2019 and 2020.

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

Distribution of NO_2 diffusion tubes within Council area

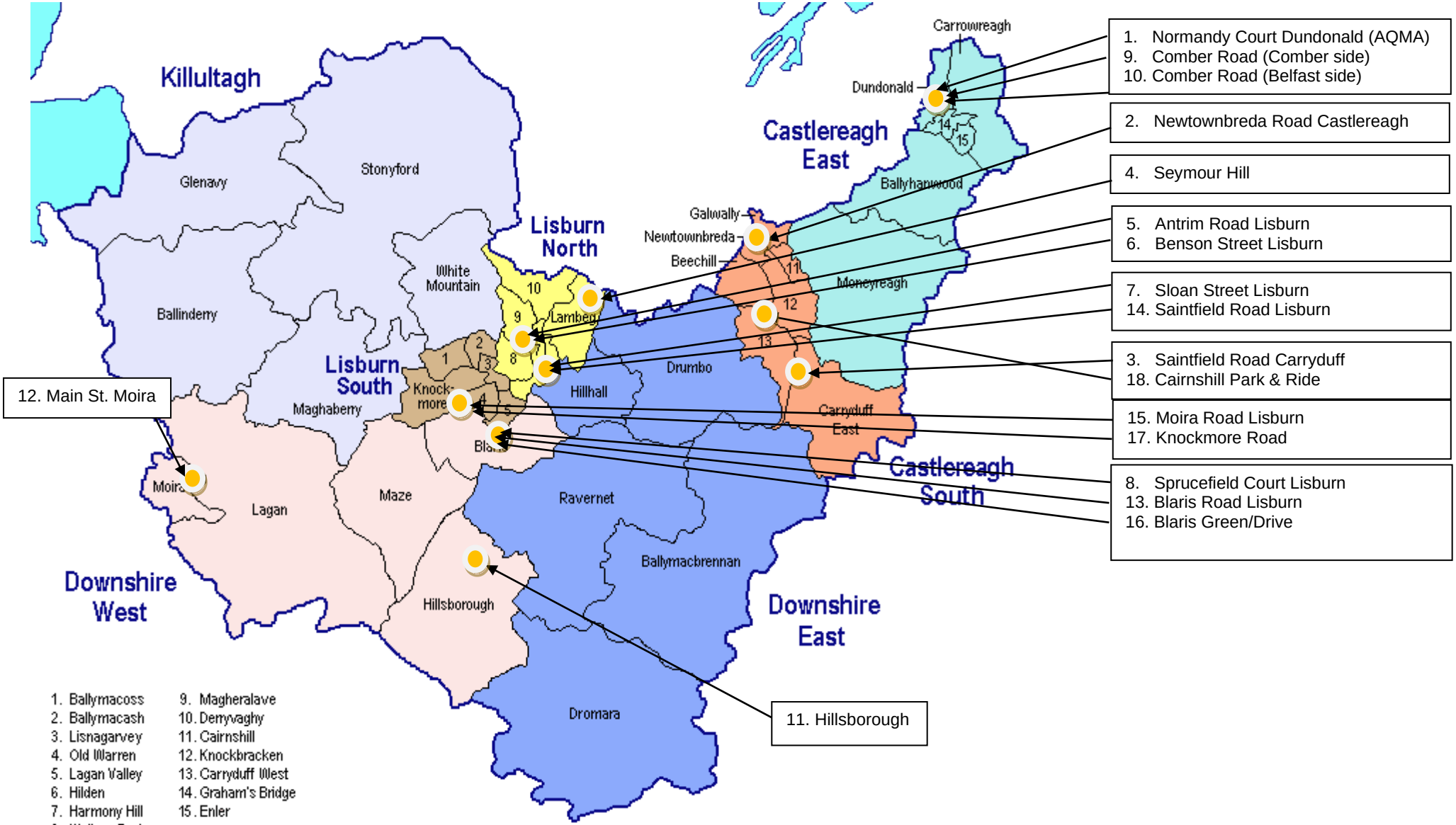


Figure 2.8 Position of tube 1. Dundonald village in AQMA(Normandy Court), and Comber Road Dundonald (tubes 9,10)

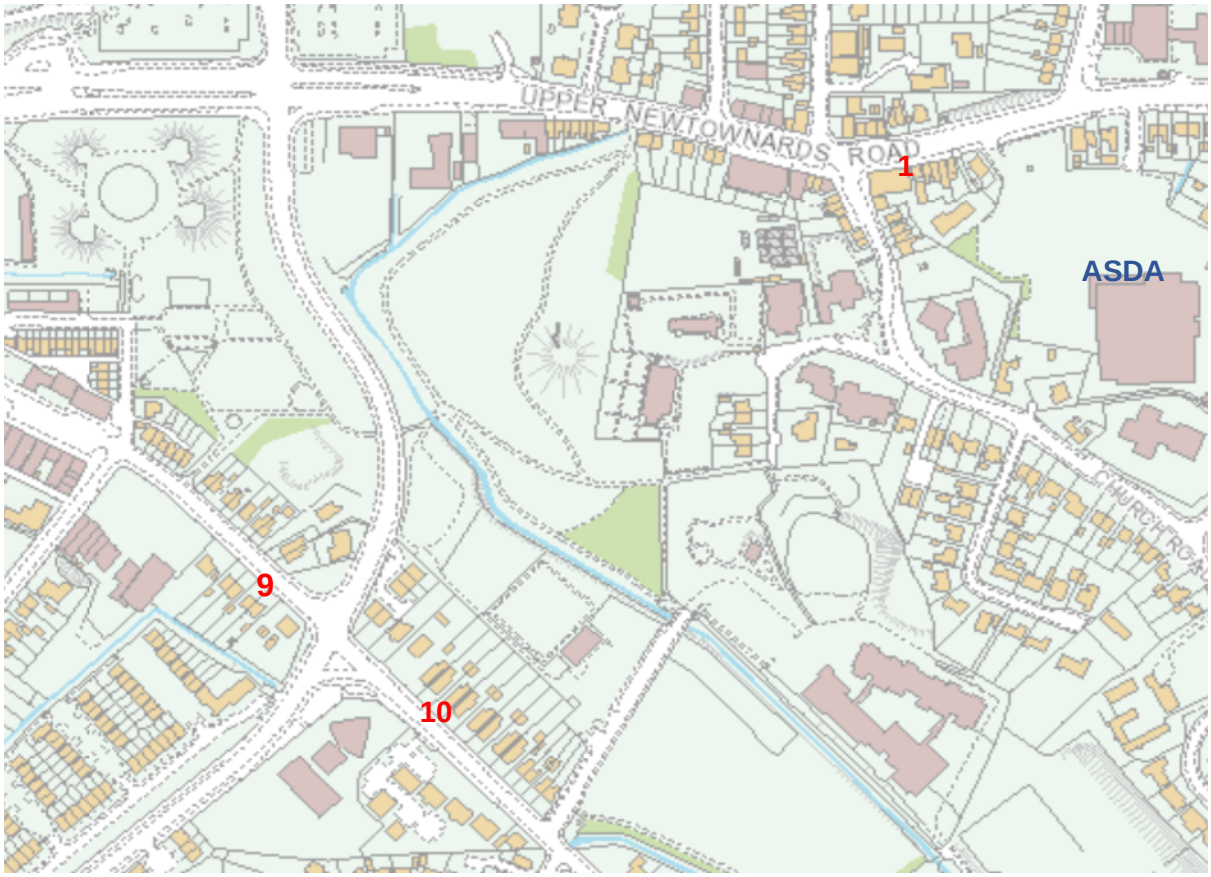


Figure 2.9 Picture of NO_2 Tubes in AQMA Normandy Court Dundonald

Figure2.10 Position of tube 2 Castlereagh area (Newtownbreda Road)

Figure2.11 Position of tube 3 Saintfield Road Carryduff

Figure2.12 Position of tube 4 Seymour Hill

Figure 2.13 Position of tubes in Lisburn City

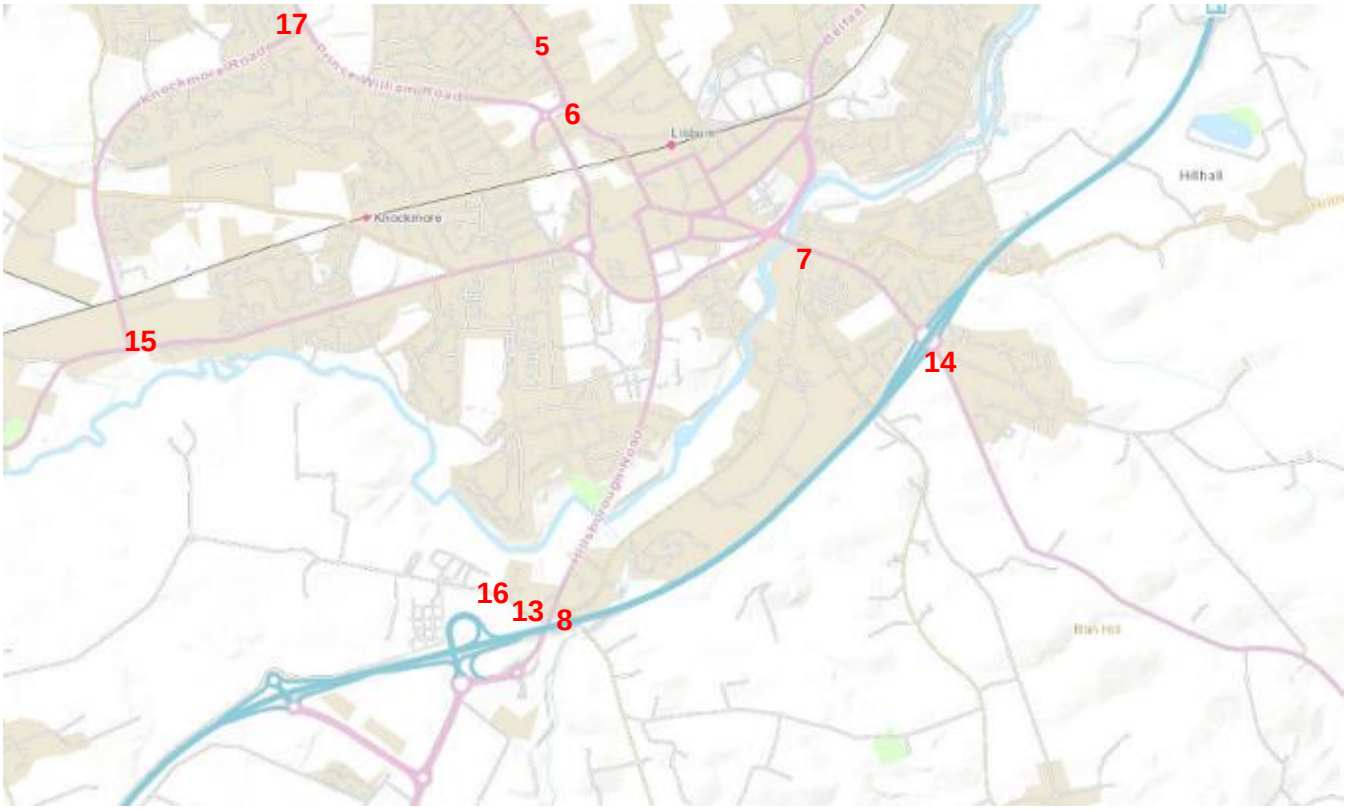


Figure 2.13.1 Position of tubes 5,6 (Antrim Rd, Benson St.)in Lisburn City

Figure 2.13.2 Position of tubes 7 Sloan Street in Lisburn City

Figure 2.13.3 Position of tubes 8,13,16,(Sprucefield Ct. Blaris Road, Blaris Green/Drive) in Lisburn City

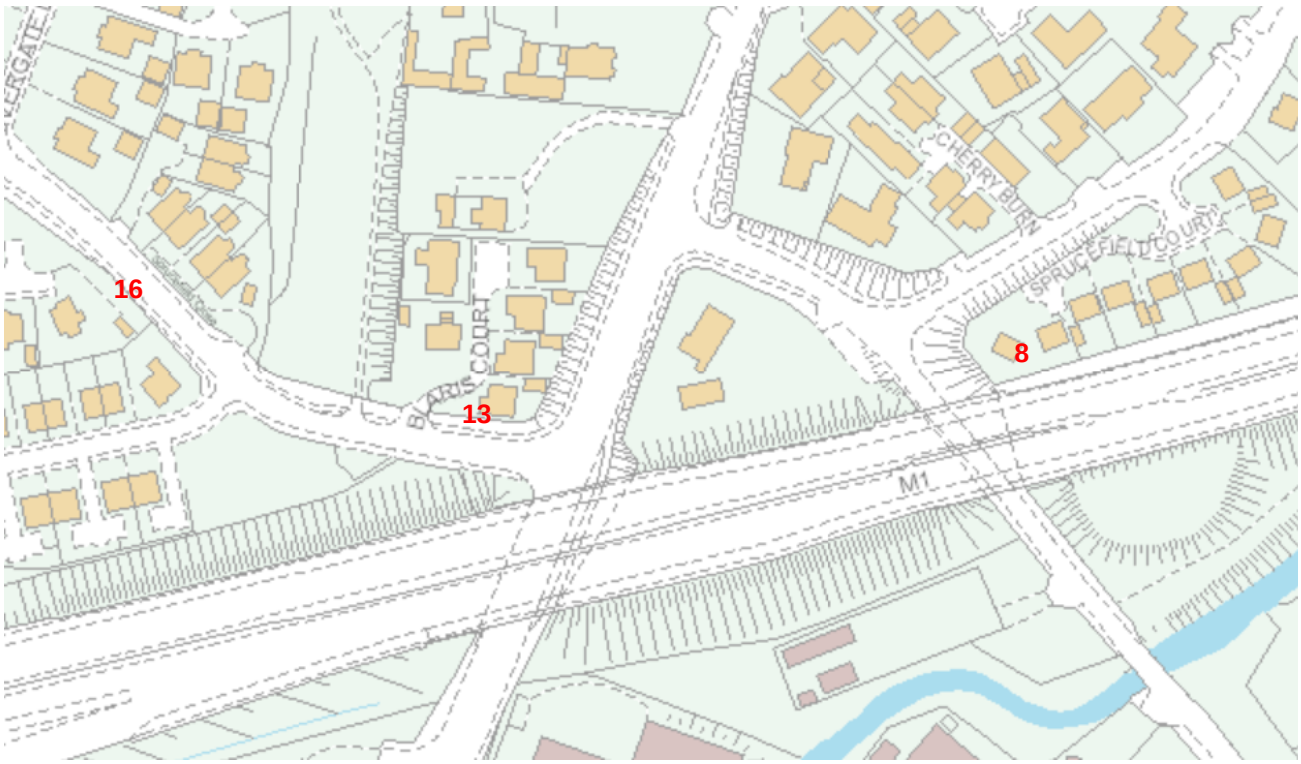


Figure 2.13.4 Position of tubes 14, Saintfield Road in Lisburn City

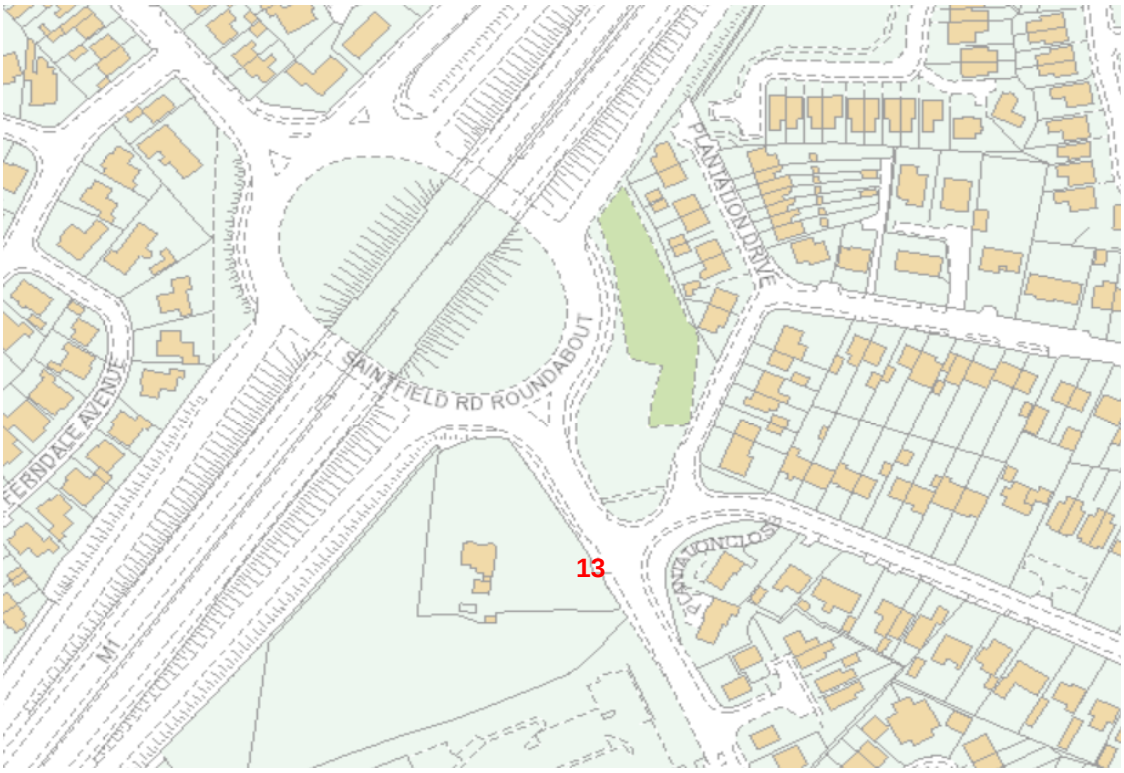


Figure 2.13.5 Position of tubes 15, Moira Road in Lisburn City

Figure 2.13.6 Position of tubes 17, Knockmore Road junction Road in Lisburn City

Figure 2.14 Map of tube 11 in Ballynahinch Street Hillsborough

Figure 2.15 Position of tube 12 in Main Street Moira

Figure 2.16 Position of tube no.18 Cairnshill Park & Ride

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 (7m)	2.5m	Yes
3	Saintfield Road Carryduff	Roadside	336832	365625	2m	NO_2	No	No	Yes (70m)	10m	Yes
4	Seymour Hill	Background	328585	368117	2.5m	NO_2	No	No	No (50m)	100m	No
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) Façade of garage adjacent to house from road	15m	Yes
9	Comber Road (Comber side)	Roadside	341731	373666	2.5m	NO_2	No	No	Yes (4m)	1.5m	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?
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 facade	Roadside	325993	362462	2m	NO_2	No	No	Yes (0m)	5.5m	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
16.	Blaris Green/Drive	Roadside	325883	362501	2.5m	NO_2	No	No	Yes (7m)	1m	Yes
17.	Knockmore Road	Roadside	324883	365180	2.5m	NO_2	No	No	Yes (19m)	1.5m	Yes
18.	Cairnshill Park & Ride	Roadside	335702	368362	2.5m	NO_2	No	No	Yes (7m)	1.5m	Yes
19 (triplicate)	Co-located tubes at Dundonald Automatic site	Roadside	342016	374041	2.5m	NO_2	No	Yes	Yes (22m)	3m	Yes

Sites in purple were new in 2019

Sites in orange were new in 2020

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 Update and Screening Assessment. 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 (NO_2)

In the following section results are presented for NO_2 at the automatic and diffusion tube sites and compared with the objective. There was no signification change in the results in 2021 outside of the AQMA and all sites were below the objective.

Automatic Monitoring Data

Table 2.3 presents the annual mean concentrations of NO_2 determined at the automatic site in 2021 from the hourly measurements.

Table 2.3 – Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period	Valid Data Capture 2021	Annual Mean Concentration (µg/m^3)				
					2017	2018	2019	2020	2021
Castlereagh Dundonald	Roadside	N (within 30M)	N/A	100%	27	24	22	17	19

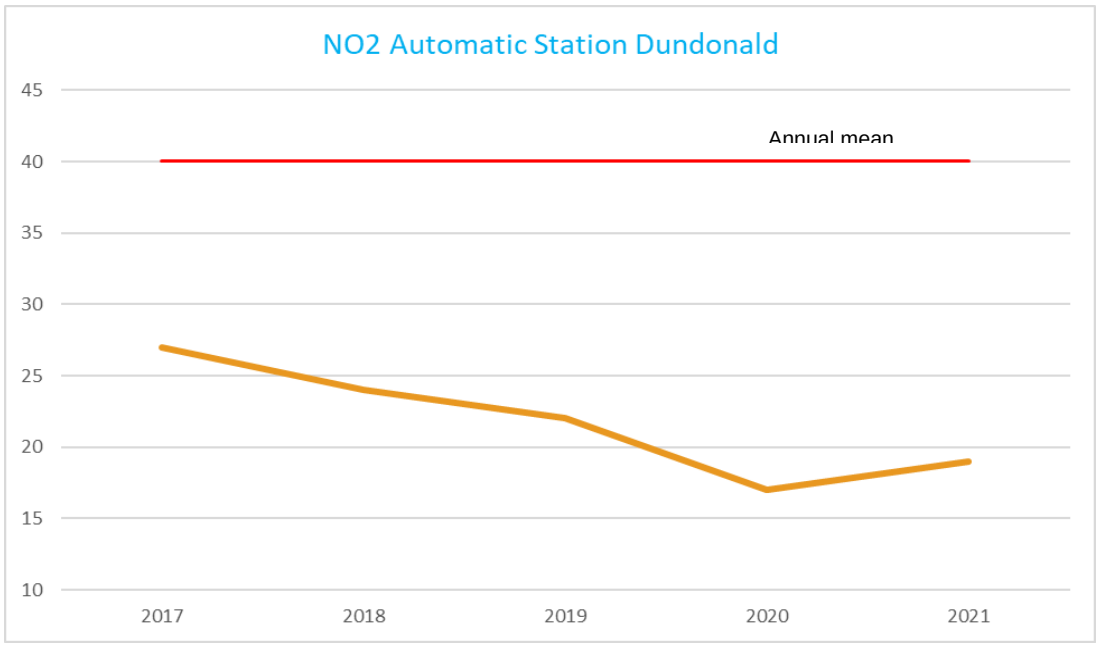
Table 2.4 – Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2021 % [b]	Number of Hourly Means > 200µg/m^3				
					2017	2018	2019	2020	2021
Castlereagh Dundonald	Roadside	N (within 30M)	N/A	100%	0	0	0	0	0

Trends in Annual Mean NO_2 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 shown a steady reduction since 2015, with a significant reduction by 2019, this coincides with the opening of the Park & Ride in 2014 and the new Rapid transport System coming into operation in September 2018, at the beginning of 2019 the Park & Ride was at full capacity during working hours. In 2020 there was another significant reduction in the NO_2 results at the automatic site, however the 19% reduction was during the COVID restrictions, the traffic flow through Dundonald was greatly reduced during lockdown and this continued when lockdown was lifted as home working and schooling continued during the remainder of 2020, 2021 showed an increase in results probably due to many of the restriction being lifted and schools returning, although with guidance continuing to encourage home working in 2021 traffic flows were still reduced from pre-COVID and at the end of 2021 the Park & Ride had only returned to approx. 60% capacity, therefore LCCC are unable to ascertain a continued trend of a reduction in NO_2 emissions through Dundonald village since the introduction of the Rapid Transport System.

Figure 2.17 Trend in annual mean NO_2 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 (16)

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 2021 local bias was **0.76.** As in previous years a decision has been made to apply the national bias adjustment factor of **0.84,** as based on 32 studies this was deemed to be a more realistic figure. All diffusion tube sites are below the objective at relevant exposure. In 2019 three new sites were identified, Blaris Road and a further site was added at Blaris Green opposite, where a new residential development is nearing completion next to the M1 motorway and Knockmore Road were a new road junction is planned. A new site was established in 2020 at the entrance of Cairnshill Park & Ride next to residential properties as plans to extend this site were under discussion. The Normandy Court Dundonald NO_2 tube site within the AQMA showed a further reduction in 2019, this was most likely due to the Park & Ride in Dundonald which opened in 2014 which had continued to grow in popularity since the completion in September 2018 of the new Glider Rapid Transport Network from Dundonald with a direct link to Belfast City, and was regularly found to be at capacity.

Although the results of the NO_2 diffusion tube sites were greatly reduced in 2020, to a large extent the COVID pandemic will have been the contributing factor. Traffic flows which have been deemed to be the main source of NO_2 emissions within the LCCC area were greatly reduced during lockdown, and home working and schooling also had a large impact on traffic flows for the remainder of 2020, there was a slight increase in 2021 probably due to a number of the restrictions on travel being eased although the Park & Ride facilities were still only at 60% capacity in the later part of the year. In 2021 COVID still had an effect on the NO_2 results within the AQMA, due to this LCCC will continue to monitor NO_2 in Dundonald to establish if existing measures within the Action Plan continue to show a trend in reducing NO_2 within the AQMA.

Trends for the 18 diffusion tube sites within the Council area are shown in Figure 2.18

Details of the QA/QC for the diffusion tubes and the reason for the use of the bias adjustment factor **0.84** can be found in Appendix A

Table 2.5 – Results of NO_2 Diffusion Tubes 2021

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2021 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.84) 2021 (μg/m^3)
1	Normandy Court Dundonald (AQMA)	Roadside	Y	riplicate	12 months	N/A	N	26
2	Newtownbreda Road Castlereagh	Roadside	N	triplicate	12 months	N/A	Y	30
3	Saintfield Road Carryduff	Roadside	N	single	12 months	N/A	N	14
4	Seymour Hill	Background	N	single	12 months	N/A	N	15
5	Antrim Rd Lisburn	Roadside	N	single	12 months	N/A	N	21
6	Benson Street Lisburn	Roadside	N	single	11 months	N/A	N	19
7	Sloan Street Lisburn	Roadside	N	single	11 months	N/A	N	25
8	Sprucefield Court Lisburn	Roadside	N	single	12 months	N/A	N	29
9	Comber Road (Comber side)	Roadside	N	single	11 months	N/A	N	18
10	Comber Road (Belfast side)	Roadside	N	single	11 months	N/A	N	18

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2021 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.84) 2021 (μg/m^3)
11	Hillsborough	Roadside	N	single	11 months	N/A	N	19
12	58-62 Main Street Moira	Roadside	N	single	12 months	N/A	N	21
13a	Blaris Road Lisburn facade	Roadside	N	single	12 months	N/A	Y	30
14	Saintfield Road Lisburn	Roadside	N	single	11 months	N/A	N	26
15	Moira Road Lisburn	Roadside	N	single	12 momths	N/A	N	20
16.	Blaris Green/Drive	Roadside	N	single	12 momths	N/A	N	29
17.	Knockmore Road	Roadside	N	single	10 months	N/A	N	30
18	Cairnshill Rark & Ride	Roadside	N	single	12 months	N/A	N	25
19	Co-located tubes at Dundonald Automatic site	Roadside	N	triplicate	11 months	N/A	N	21

Sites in purple were new in 2019

Sites in orange were new in 2020

Table 2.6 – Results of NO_2 Diffusion Tubes (2017 to 2021)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m³				
			2017 (Bias Adjustment Factor =0.89)	2018 (Bias Adjustment Factor = 0.93)	2019 (Bias Adjustment Factor = 0.92)	2020 (Bias Adjustment Factor = 0.81)	2021 (Bias Adjustment Factor = 0.84)
1	Normandy Court Dundonald (AQMA)	Roadside	40	34	31	23	26
2	Newtownbreda Road Castlereagh	Roadside	37	38	37	33	30
3	Saintfield Road Carryduff	Roadside	19	23	17	11	14
4	Seymour Hill	Roadside	14	18	17	17	15
5	Antrim Rd Lisburn	Roadside	27	30	27	20	21
6	Benson Street Lisburn	Roadside	26	28	26	18	19
7	Sloan Street Lisburn	Roadside	26	32	28	23	25
8	Sprucefield Court Lisburn	Roadside	39	38	34	26	29
9	Comber Road (Comber side)	Roadside	28	25	24	18	18
10	Comber Road (Belfast side)	Roadside	29	28	23	17	18
11	Hillsborough	Roadside	27	29	25	20	19
12	58-62 Main Street Moira	Roadside	29	29	26	20	21
13	Blaris Road Lisburn facade	Roadside			31[a]	24	30
14	Saintfield Road Lisburn	Roadside		33	29	23	26

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3				
			2017 (Bias Adjustment Factor =0.89)	2018 (Bias Adjustment Factor = 0.93)	2019 (Bias Adjustment Factor = 0.92)	2020 (Bias Adjustment Factor = 0.81)	2021 (Bias Adjustment Factor = 0.84)
15	Moira Road Lisburn	Roadside	25	25	23	17	20
16	Blaris Green/Drive	Roadside			27	23	29
17	Knockmore Road	Roadside			32	24	30
18	Cairnshill Rark & Ride	Roadside				20	25
19 (triplicate)	Co-located tubes at Dundonald Automatic site	Roadside	36	30	26	19	21

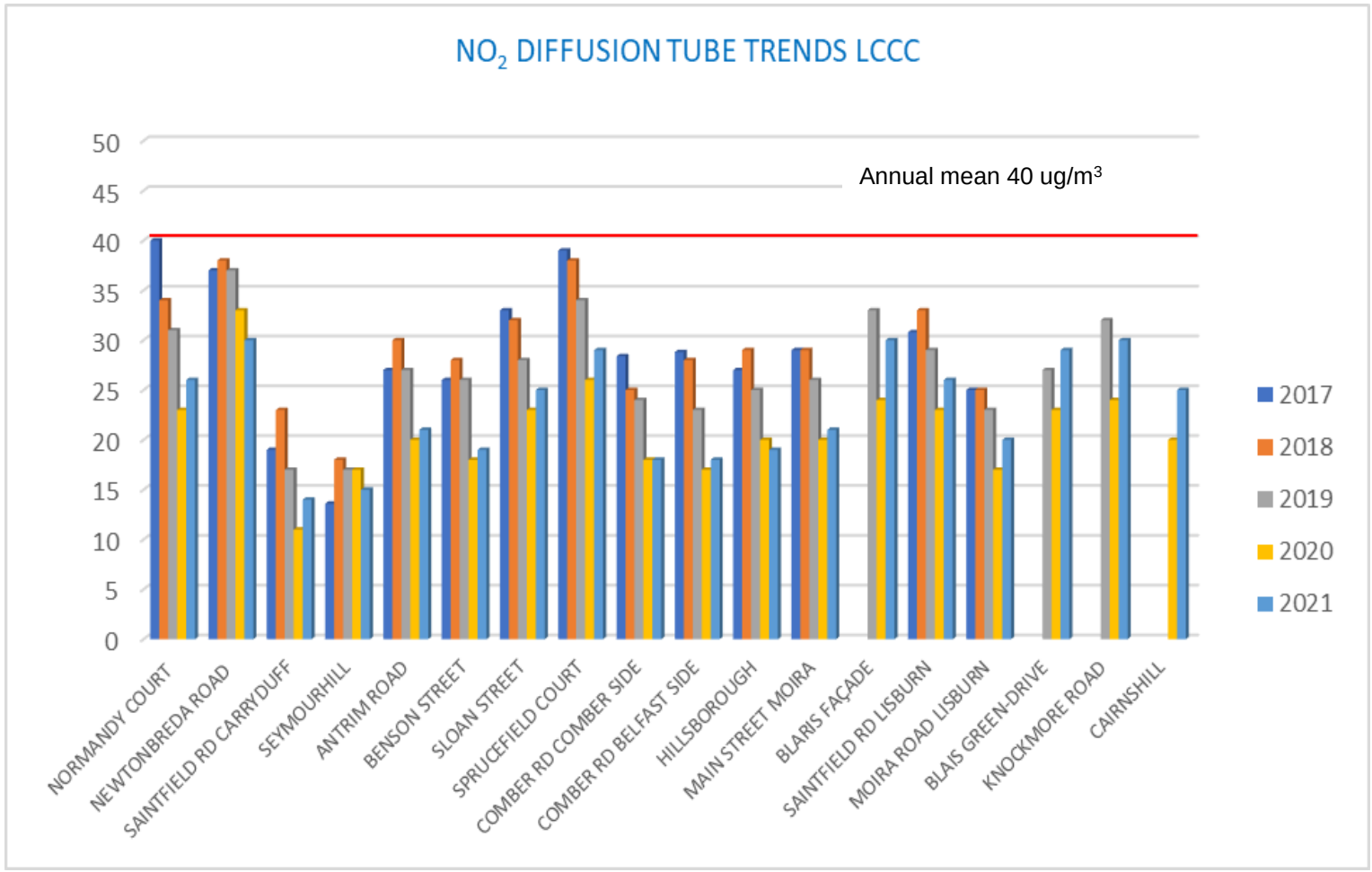
[a] This site has been "annualised" as in Boxes 7.9 and 7.10 of LAQM.TG16, as full calendar year data capture was less than 75%

Sites in purple were new in 2019

Site in orange was new in 2020

Figure 2.18 – Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

Due to COVID restriction reducing traffic flows within LCCC area the trend in NO_2 is inconclusive.



2.2.2 Particulate Matter (PM_{10})

Automatic monitoring of PM_{10} in 2021 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.

Before 2021 measurements were recorded using a TEOM instrument, in 2021 this instrument was upgraded to a FIDAS 200 also measuring $PM_{2.5}$, 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 for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2021 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)				
						2017	2018	2019	2020	2021
Kilmakee Activity Centre (PM_{10})	Urban Background	N	N/A	99.9%	Y	11	14	14	12	14

Figure 2.5 – Trends in Annual Mean PM_{10} Concentrations

PM_{10} has remained consistently low in Dunmurry

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 2021 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3				
						2017	2018	2019	2020	2021
Kilmakee Activity Centre (PM_{10})	Urban Background	N	N/A	99.9%	Y	0	0	0	0	0

2.2.3 Sulphur Dioxide (SO_2)

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 exceedances of the air quality objective in 2021.

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 for SO_2: Comparison with Objectives

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2021 % [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	N/A	89.6%	0	0	0

Figure 2.6 – Trends in SO_2 Concentrations

Results have remained very low at this site.

2.2.4 Benzene

No monitoring of Benzene was carried out in 2021, LCCC review all planning application and all air quality assessments received, no major changes have been identified requiring a further assessment of Benzene. LCCC borders Belfast city Council with the largest population and traffic flows within Northern Ireland, Benzene has been monitored in Belfast since 2002 and remains well below the objective of 3.25 ug/m^3

Table 2.10 Results of monitoring for benzene: Annual mean concentrations for the Belfast Centre site

Site ID	Site type	Within AQMA? Which AQMA?	Valid Data Capture 2020%	Running annual mean concentrations (µg/m^3)				
				2016	2017	2018	2019	2020
Belfast Centre	Urban Background	N	100	0.49	0.46	0.45	0.44	0.37

2.2.5 Other Pollutants Monitored

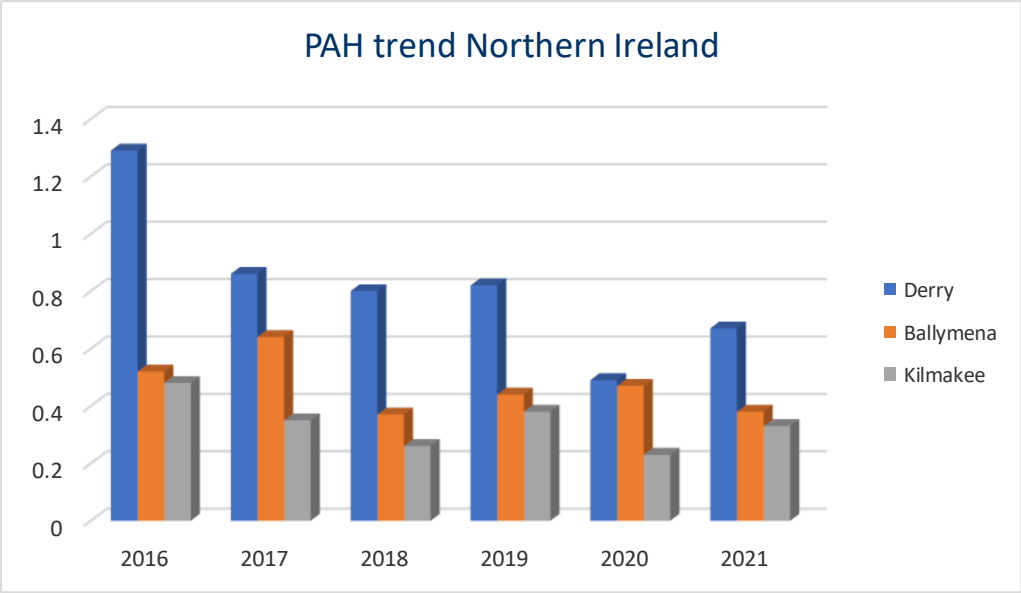
Polycyclic aromatic hydrocarbons (PAH)

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 in LCCC is below the EU objective but slightly over the UK non-mandatory objective, and there have been no new local developments.

The following table shows the results 2016 - 2021.

Site	2016 ng/m^3 annual mean	2017 ng/m^3 annual mean	2018 ng/m^3 annual mean	2019 ng/m^3 annual mean	2020 ng/m^3 annual mean	2021 ng/m^3 annual mean
Derry	1.29	0.86	0.80	0.82	0.49	0.67
Ballymena	0.52	0.64	0.37	0.44	0.47	0.38
Kilmakee	0.48	0.35	0.26	0.38	0.23	0.33

Figure 2.19 Trends in PAH Northern Ireland



Particulate Matter ($PM_{2.5}$)

At the beginning of 2021 a new FIDAS 200 monitoring PM_{10} and $PM_{2.5}$ was installed at the Kilmakee site in Lisburn, the annual mean results for $PM_{2.5}$ in 2021 were 7 ug/m3, below the UK limit value of 20 ug/m^3

2.2.6 Summary of Compliance with AQS Objectives

Lisburn and Castlereagh City Council has examined the results from monitoring in the area.

Concentrations within the AQMA (Normandy Court, Dundonald) are not exceeding the objective for NO_2 in 2021. Because of COVID19 and the government advice to work at home, there has been a continued reduction in traffic within the AQMA and other main routes through the city council area. LCCC shall continue to monitor levels within the AQMA in 2022 and a Reduction monitoring will not be reconsidered until we see a return to normality on our roads.
Concentrations outside of the AQMA are also below the objectives at relevant exposure, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

Lisburn & Castlereagh City Council confirms that there are no new or newly identified local developments in 2021 that may have an impact on air quality within the Local Authority area.

Lisburn & Castlereagh City Council confirms that all the following have been considered:

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

3.1 Road Traffic Sources

LCCC can confirm they have considered

- Narrow congested streets with residential properties close to the kerb.
- Busy streets where people may spend one hour or more close to traffic.
- Roads with a high flow of buses and/or HGVs.
- Junctions.
- New roads constructed or proposed since the last Updating and Screening Assessment.
- Roads with significantly changed traffic flows.
- Bus or coach stations

The Environmental Health Department has commented on planning applications where an air quality impact assessment may be necessary and monitoring increased in the area to assist, in particular -

LA05/2018/1155/F
Application Received Mon 12 Nov 2018
Lands at Blaris Lisburn (lands between existing M1 junction 8/A101 roundabout and Moira Road/Knockmore Road junction)
Construction of a new link road (1.6km) connecting the existing M1 junction 8/A101 roundabout to existing Moira/Knockmore Road Junction
Air Quality Impact Assessment submitted

3.1 Other Transport Sources

LCCC can confirm they have considered

- Airports.
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.
- Locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

Ports for shipping.

3.2 Industrial Sources

LCCC can confirm they have considered the following

- **Industrial installations:** new or proposed installations for which an air quality assessment has been carried out.
- **Industrial installations:** existing installations where emissions have increased substantially or new relevant exposure has been introduced.
- **Industrial installations:** new or significantly changed installations with no previous air quality assessment.
- Major fuel storage depots storing petrol.
- Petrol stations.

Poultry farms.

The Environmental Health Department has commented on planning applications where an air quality impact assessment may be necessary the following are the most recent applications -

LA05/2021/0219/F
Land approx. 200m East of 1 Thornbrook Road Moira
Proposed free range poultry shed with 4 no. feed bins, 2 no. storage sheds, a standby generator building and associated site works (poultry shed to contain 32000 free range egg laying hens)
Air Quality Impact Assessment submitted and proposal contained a biomass unit
LA05/2020/0998/F

Lands approximately 175 meters west of 30 Lisleen Road East Ballyhanwood Comber BT5 7TG
Planning application for the retention of an existing on-farm (500KW) Anaerobic Digestion Facility (to include provision for 1 no Digestate Storage Tank, 1 no covered Digestate Tank, 2 no Agricultural Feedstock Storage Clamps, Biogas Feeder System, Associated CHP, pump room and office building, Emergency Backup Generator Container, Containerised Pressure Relief Container, Underground Pre-Reception Tank, 5 no Erected Lighting Columns, Associated retaining walls and existing hard standing area and access laneway), together with the proposed erection of a portal roof covering over the existing feedstock storage clamps, proposed new solid separator clamp and feedstock building, weighbridge, ancillary works and associated landscaping (amended description)
Air Quality Impact Assessment submitted and proposal contained a CHP unit

LA05/2021/0033/F
Lands formerly occupied by the Rolls Royce factory north of Upper Newtownards south of Inspire Business Centre east of Ballyoran Lane and west of Carrowreagh Road Dundonald
Proposed mixed use development comprising 153 no residential dwellings in a mix of apartments, semi detached and detached units with associated private amenity provision and public open spaces; 28 no Class B2 and B4 industrial/employment units (4,272sqm in total); a neighbourhood centre (965sqm in total) comprising a Petrol Filling Station with associated convenience store and 4 no retail units (2 no Class A1 and 2 no Sui Generis hot food bars); associated car parking; landscaping; creation of new accesses from Carrowreagh Road and Ballyoran Lane with associated works to the public road; and other ancillary development
Air Quality Impact Assessment submitted

3.3 Commercial and Domestic Sources

LCCC can confirm they have considered the following

- Biomass combustion plant – individual installations.
- Areas where the combined impact of several biomass combustion sources may be relevant.
- Areas where domestic solid fuel burning may be relevant.

Combined Heat and Power (CHP) plant.

The Environmental Health Department has commented on planning applications where an air quality impact assessment may be necessary the following are the most recent applications

LA05/2021/0219/F
Land approx. 200m East of 1 Thornbrook Road Moira
Proposed free range poultry shed with 4 no. feed bins, 2 no. storage sheds, a standby generator building and associated site works (poultry shed to contain 32000 free range egg laying hens)
Air Quality Impact Assessment submitted and proposal contained a biomass unit

LA05/2019/0606/F
Carryduff Nursing Home 19 Church Road Carryduff
Retention of existing 99KW biomass boiler enclosure and associated biomass fuel stores
Air Quality Impact Assessment submitted and proposal contained a biomass unit

LA05/2020/0998/F
Lands approximately 175 meters west of 30 Lisleen Road East Ballyhanwood Comber BT5 7TG
Planning application for the retention of an existing on-farm (500KW) Anaerobic Digestion Facility (to include provision for 1 no Digestate Storage Tank, 1 no covered Digestate Tank, 2 no Agricultural Feedstock Storage Clamps, Biogas Feeder System, Associated CHP, pump room and office building, Emergency Backup Generator Container, Containerised Pressure Relief Container, Underground Pre-Reception Tank, 5 no Erected Lighting Columns, Associated retaining walls and existing hard standing area and access laneway), together with the proposed erection of a portal roof covering over the existing feedstock storage clamps, proposed new solid separator clamp and feedstock building, weighbridge, ancillary works and associated landscaping (amended description)
Air Quality Impact Assessment submitted and proposal contained a CHP unit

3.4 New Developments with Fugitive or Uncontrolled Sources

LCCC can confirm they have considered the following

- Landfill sites.
- Quarries.
- Unmade haulage roads on industrial sites.
- Waste transfer stations, etc.

The Environmental Health Department has commented on planning applications where an air quality impact assessment may be necessary the following are the most recent applications

LA05/2020/1009/F
11 Leverogue Road Ballynagarrick Lisburn
Southern lateral extension to extraction operations, consolidation and deepening of the quarry void, relocation of processing plant, improvements to the existing quarry access, relocation of overburden and associated works including landscaping and planting; and quarry restoration
Air Quality Impact Assessment submitted

4 Planning Applications

LCCC Environmental Health department considered planning applications and the following submitted an Air Quality Impact assessment

Air quality assessments completed or requested

LA05/2020/1009/F
11 Leverogue Road Ballynagarrick Lisburn
Southern lateral extension to extraction operations, consolidation and deepening of the quarry void, relocation of processing plant, improvements to the existing quarry access, relocation of overburden and associated works including landscaping and planting; and quarry restoration
Air Quality Impact Assessment submitted

LA05/2021/0067/F
Lands at 49-51 Hillsborough Old Road Lisburn BT27 5EW
Residential development comprising off 100 no dwellings (apartments, detached, semi detached, bungalows and townhouses) with associated car parking and landscaping
Air Quality Impact Assessment submitted

LA05/2020/0401/F
Lands at 757-759 Upper Newtownards Road Dundonald BT16 2QY
Erection of 15 no. apartments comprising 8 no. two bed apartments and 7 no. one bed apartments with associated parking and access works from Reaville Park.
Air Quality Impact Assessment submitted

LA05/2017/1124/F
Agricultural land south of Glenavy Road and west of Brokerstown Road Lisburn; section of Glenavy Road from Penworth Green to Ballymacash Road; mini roundabout at Ballymacash Road Nettlehill Road and Brokerstown Road; and section of Brokerstown Road from Glenavy Road junction to west of Glenbrae
507 residential units comprising a mix of detached houses, semi detached houses, townhouses and apartments; internal site distributor and access roads; open space and landscaping; access roundabout on Glenavy Road and associated realignment works; new bus lay-by on Glenavy Road; improvements to Glenavy Road/ Brokerstown Road junction and Glenavy Road/ Nettlehill Road/ Ballymacash Road mini roundabout junction; widening of part of Brokerstown Road to provide a new bus lay-by facility for Ballymacash Primary School; cycle/footway connections; and associated site works
Air Quality Impact Assessment submitted

LA05/2018/0847/F
Land East of the Ballymaconaghy Road including 30 32 and 34 Ballymaconaghy Road south of 24 Ballymaconaghy Road and north of 52 Knockbracken Road.
Proposed residential development of 196 dwellings comprising 88 detached and 108 semi-detached dwellings, with associated open space (including equipped childrens play area) landscaping, pumping station and all other site and access works including new access junction from Ballymaconaghy Road, road widening of Ballymaconaghy Road and works to Four Winds roundabout. Amended Scheme.
Air Quality Impact Assessment submitted

LA05/2021/0219/F
Land approx. 200m East of 1 Thornbrook Road Moira
Proposed free range poultry shed with 4 no. feed bins, 2 no. storage sheds, a standby generator building and associated site works (poultry shed to contain 32000 free range egg laying hens)
Air Quality Impact Assessment submitted and proposal contained a biomass unit

LA05/2021/0033/F
Lands formerly occupied by the Rolls Royce factory north of Upper Newtownards south of Inspire Business Centre east of Ballyoran Lane and west of Carrowreagh Road Dundonald

Proposed mixed use development comprising 153 no residential dwellings in a mix of apartments, semi detached and detached units with associated private amenity provision and public open spaces; 28 no Class B2 and B4 industrial/employment units (4,272sqm in total); a neighbourhood centre (965sqm in total) comprising a Petrol Filling Station with associated convenience store and 4 no retail units (2 no Class A1 and 2 no Sui Generis hot food bars); associated car parking; landscaping; creation of new accesses from Carrowreagh Road and Ballyoran Lane with associated works to the public road; and other ancillary development
Air Quality Impact Assessment submitted

LA05/2018/1154/O
Lands at Blaris Lisburn (lands between existing M1 Junction 8/ A101 roundabout and Moira Road/ Knockmore Road junction)
Proposed mixed use development to include new housing (1300 dwellings) and commercial floor space (754,000 sq.ft.)1.6km M1-Knockmore link road, riverside parkland and ancillary works
Air Quality Impact Assessment submitted

LA05/2018/1155/F
Application Received Mon 12 Nov 2018
Lands at Blaris Lisburn (lands between existing M1 junction 8/A101 roundabout and Moira Road/Knockmore Road junction)
Construction of a new link road (1.6km) connecting the existing M1 junction 8/A101 roundabout to existing Moira/Knockmore Road Junction
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LA05/2019/0606/F
Carryduff Nursing Home 19 Church Road Carryduff
Retention of existing 99KW biomass boiler enclosure and associated biomass fuel stores
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Air Quality Impact Assessment submitted and proposal contained a CHP unit

No issues were identified in the reports

5 Local Transport Plans and Strategies

Lisburn & Castlereagh City Council falls within the Belfast Metropolitan Area Plan and therefore the Belfast Metropolitan Transport plan, https://www.infrastructure-ni.gov.uk/publications/regional-strategic-transport-network-transport-plan-2015 This included the development of the Belfast Rapid Transport System with one of the routes leading from the new Park & Ride in Dundonald into Belfast City Centre, which was completed in September 2018.

Department for Regional Development
www.drdni.gov.uk

Objectives of BRT

The Department for Regional Development is implementing the first phase of the new Belfast Rapid Transit (BRT) system which will help to address the current and future transport needs in Belfast and support sustainable economic growth and regeneration.

BRT will provide a modern, safe, efficient and high quality public transport service which will encourage people to travel by public transport instead of by car. It will help to integrate communities and link people to jobs, shops, leisure, health and education services. The first phase of BRT will connect East Belfast, West Belfast and Titanic Quarter via the city centre.

Belfast Rapid Transit

Key Features of BRT

Services

- Operating approximately 05:30 - 23:30 weekdays and later at weekends subject to demand.
- Faster and more reliable journey times with high frequency services.
- Integration with other forms of transport and other public transport services.
- Direct services between East and West Belfast.
- Replace Metro 4 and 10 services with feeder services connecting to residential areas in the Dundonald & Colin Areas.

Vehicles

- Modern high capacity buses with easy access.
- High quality passenger environment with advanced ticketing and information systems.
- Advanced hybrid engine technology producing less noise and emissions.

Halts and interchanges

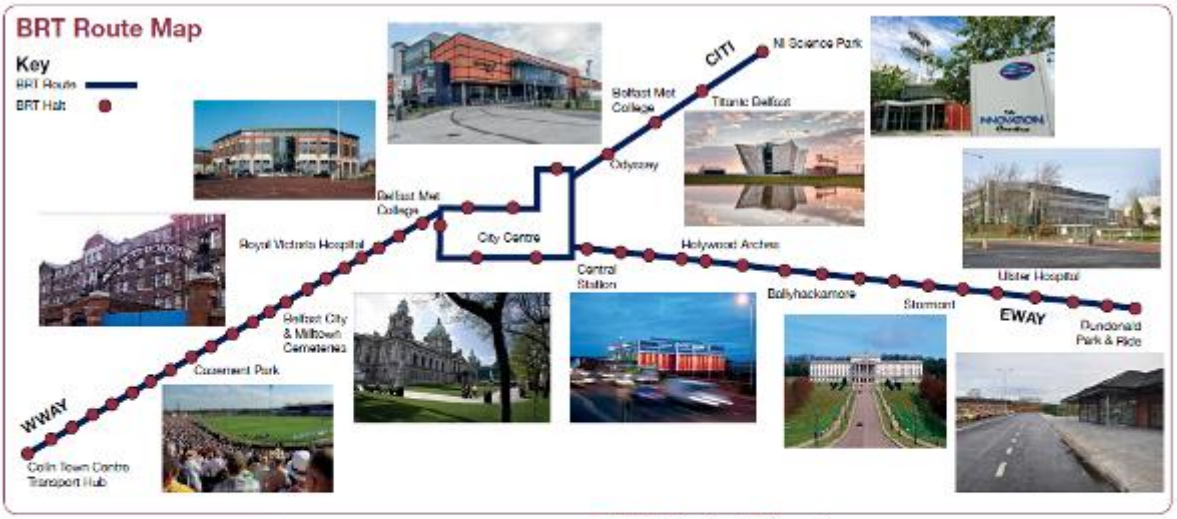
- High quality materials and appearance.
- Real time passenger information.
- CCTV for safety and security.
- Facilate easier boarding.
- Ticket machine and validator.
- Spaced approximately 400m apart on the routes.

Bus lanes

- Extensive bus lanes along the routes with anticipated operating hours of 07:00 – 19:00hrs, Monday to Saturday.
- Traffic lights giving priority for BRT vehicles at junctions.
- Improved pedestrian crossing facilities.
- Improved road surfaces for smoother journeys.

Fares and fare collection

- Use of Smartcard and new technologies.
- Off-board ticketing integrated with other public transport services.
- Concessionary fares will apply.



The Routes

CITI route - from the city centre, via Queen Elizabeth Bridge, along Queen's Quay and Queen's Road to Titanic Quarter, returning via Queen's Road, Queen's Quay, Station Street, Bridge End and Queen's Bridge.

EWAY route - from the city centre along Albertbridge Road and Upper Newtownards Road to a new park and ride site at Dunlady Road in Dundonald.

WWAY route - from the city centre along Divis Street, Falls Road, Andersonstown Road and Stewartstown Road to McKinstry Road Roundabout via a new transport hub at Colin Town Centre.

BRT Project Timeline

2013 - 2014

Detailed Design

Start work on routes and Park & Ride facilities

[This will include road widening and resurfacing along sections of the route]

2015-2018

Finish work on routes and Park & Ride facilities

Introduce bus lanes

[Bus lanes will gradually operate during morning and evening rush hours until 2018 when they will convert to 12 hour operation]

Finalise operations plan

Purchase BRT vehicles

Install halts

2018

BRT operational

6 Implementation of Action Plans

LCCC Updating and Screening Assessment 2015 explained the amalgamation of local authorities in Northern Ireland, and how LCCC was made up from the previous council areas of Lisburn City and Castlereagh Borough with a substantial portion moving into Belfast City Council.

Castlereagh Borough Council declared the AQMA within LCCC area in Dundonald village (apartments Normandy Court), in January 2011 and an Air Quality Action plan was submitted to the Department in 2013.

A survey at that time carried out by TransportNI indicated the Park & Ride situated east of the AQMA in Dundonald and the introduction of the new rapid Transport system (Glider Bus) could have a possible reduction in road traffic vehicles by 20%.

The new Rapid Transport System which came into operation in September 2018, and there was a noticeable reduction in NO_2, the opening times of the Park & Ride were extended to midnight at this time and in 2019 it continued to grow in popularity and was at capacity during working hours, the 2019 recorded NO_2 annual mean was 31ug/m^3 within the AQMA Normandy Court showing a further 10% reduction. A further trend in reductions in NO_2 within the AQMA has not been established due to the extensive reduction in traffic due to the COVID pandemic, therefore although levels of NO_2 were greatly reduced in 2020 with only a slight increase in 2021 LCCC will not revoke the AQMA until normal traffic flows are resumed and a conclusive trend can be established.

The 2013 Action Plan is presently being updated and will be finalised and submitted before the 2023 progress report

Pictures the Park & Ride Dundonald

Table 6.1 – Action Plan Progress

Actions in 2012	Lead Authority	Impact	Time Scale	Status	Impact	Cost	Cost Effective Score	2012 Update on actions	2022 Update on actions
1. Investigate the efficiency of the traffic lights at the junctions of Upper Newtownards Road and Church Road	2012 DRD Roads Service (NI) 2022 DFI	Less congestion and faster speeds at junctions leading to a reduction in NO2 levels	S	I	3	7	21	Roads service responded to this action. Response indicated a change in times may well have a detrimental affect elsewhere and that the timings were already at its most optimum.	This has not changed and timings remain at their optimum
2. Investigate the efficiency of having both lanes of traffic operational at all times and not just peak times.	2012 DRD Roads (NI) 2022 DFI	Reduction of traffic building up around Normandy Court and therefore reducing NO2 levels	S	I	2	7	14	Roads Service investigated this option and indicated that traffic during off peak times does not present an issue.	This action is no longer relevant as parking on the road is not permitted at any time as the inside lanes are now a designated bus lane and traffic is mostly restricted to the outside lane.
3. Alternative planning routes/bypass of Dundonald village	2012 DRD Roads (NI) 2022 DFI	Reduction in traffic and therefore reduction in NO2 levels	L	O	3	5	15	Roads Service indicated that no immediate or long term plans to develop a bypass or improve traffic lanes.	There are still no immediate or long term plans to develop a bypass, with the introduction of the Rapid transport System the most efficent road layout has been constructed
4. Council vehicle fleet- Improving Euro Emissions	2012 Castlereagh Borough Council 2022 LCCC	Improving air quality with Euro 5 Vehicles and consideration of alternative environmentally friendly fuels	M	O	2	6	12	Castlereagh Borough Council will continue to try and improve vehicle emissions when purchasing new vehicles	In 2015 Councils amalgamated and the Castlereagh Borough Councils AQMA now falls within Lisburn & Castlereagh City Council who continue to try and improve vehicle emissions when purchasing new vehicles

5. Continue to improve the bus fleet by providing Eco- driver training an installation of driver monitoring devices	Translink	Reduced	M	O	1	7	7	Translink will continue to replacement/renewal. CBC will continue with air quality monitoring	Translink continue to provide Eco-driver training and roll out a mentor programme. LCCC will continue with air quality monitoring
6.Improve the bus fleet by providing Eco-driver training an installation of driver monitoring devices Continue current practice of purchasing Euro 5 vehicles on fleet renewal	Translink	Emissions from buses in AQMA	M	O	1	7	7	Purchase Euro 5 vehicles on replacement/renewal. CBC will continue with air quality monitoring	Purchase Euro 5 vehicles on replacement/renewal. LCCC will continue with air quality monitoring
7. Council to implement a sustainable transport method scheme for employees	2012 Castlereagh Borough Council 2022 LCCC	Reduced Vehicle emissions	S	O	1	7	7	Castlereagh Borough Council will assess employee's needs and suggest other sustainable means of transport.	Lisburn & Castlereagh City Council will continue to promote sustainable means of transport
8. Park & Ride Scheme at Quarry Corner Dundonald	2012 DRD Roads Service (NI 2022 DFI	Reduced Vehicle emissions as better use of Public transport	S	O	4	4	16	DRD Roads to purchase land and operate P&R scheme. This is hoped to be in operation within the next 2 years	DRD Roads completed the Park & Ride at Quarry corner on 1st December 2014 which now falls under The Department for Infrastructure.

7 Conclusions and Proposed Actions

7.1 Conclusions from New Monitoring Data

All monitoring at relevant exposure within the Council Area have not shown an increase at key locations in 2021 and are below the objective. The COVID lockdown and change in patterns of living showed no impact on the PM_{10} results but with the reduction in traffic flows did have an impact on the reduction of the NO_2 levels across the area.

The NO_2 levels within the AQMA in Dundonald continued to reduce in 2019, which was a positive early indicator of a trend in reduced vehicle emissions in the village since the new Rapid Transport System (Glider Bus) commenced in 2018 from the Park & Ride. There was a further 19% reduction in 2020 however, it would be difficult to determine how much of this was due to COVID in 2020. In 2021 NO_2 levels did increase at most monitoring locations within the Council Area, traffic increased as restrictions eased but still remain at reduced from levels compared with pre covid. Lisburn & Castlereagh City Council shall continue monitoring at the AQMA location in 2021 to establish a further trend in NO_2 levels before a review of the AQMA is carried out.

7.2 Conclusions relating to New Local Developments

Lisburn & Castlereagh City Council assessed the NO_2 diffusion tube sites in 2018 and in 2019 three new site was established one at Knockmore Road where there is likely to be increased traffic in the future with the proposed development of a new road layout and two on the Blaris Road where new developments have been completed and further planned. In addition, a new site was identified at Cairnshill Park & ride on the Saintfield Road in Castlereagh, this will assist LCCC in commenting on any future planning application to extend the Park & Ride facilities.

7.3 Proposed Actions

This 2022 Progress Report has identified there is no need to proceed to a detailed assessment for any of the pollutants. Lisburn & Castlereagh City Council is focused upon improving air quality as a whole, therefore all existing monitoring sites shall continue in 2022

Lisburn & Castlereagh City Council jointly with Ards and North Down Borough Council initiated a no idling outside schools campaign in 2019, this initiative was halted in 2020 and 2021 due to COVID but will be re-launched in 2022 and was widely promoted on our social media over Clean Air Day 2022.

Although the reduction of NO_2 levels in Dundonald have remained the Air Quality Management Area shall remain in place until an accurate trend in NO_2 levels can be established.

The Action Plan published in 2013 is presently being updated and shall be submitted before the submission of the 2023 Progress Report.

8 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 and the Devolved Administrations, February 2009

Appendices

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 Environmental Monitoring Services were contracted to service the sites.

Automatic station reports produced by the data Management Company

Air Quality Report

Produced by AQDM on behalf of Lisburn

LISBURN DUNMURRY SEYMOUR HILL 2021

Fully ratified by AQDM to the LAQM (TG16) standards using the AURN methodology

Site Environment and Description

URBAN BACKGROUND: Kilmakee Activity Centre

Map Photo Dashboard

Statistical Summary Report

This 2021 report contains all the statistics required for the LAQM reporting.

The full results and statistics are available from the Northern Ireland website https://www.airqualityni.co.uk.

Gravimetric PM_{10}

The Gravimetric PM_{10} is the following.

- 1st to 20th January 2021. TEOM PM_{10} after running the Volatile Correction Model (VCM) to calculate the EU Reference Equivalent PM_{10} required for the LAQM reports. This uses data from FDMS instruments http://www.volatile-correction-model.info.
- 20th January to 31st December 2021. PM_{10} concentrations from the FIDAS instrument.

Gravimetric $PM_{2.5}$

The Gravimetric $PM_{2.5}$ is the FIDAS $PM_{2.5}$ / 1.06

Daily Air Quality Index (DAQI)

The table below shows the duration within the bands of the Daily Air Quality Index (DAQI).
The DAQI was introduced by Defra in January 2012 and revised April 2013.

DAQI Pollutant	Moderate	High	Very High
PM_{10} Particulate Matter	0 days	0	0
$PM_{2.5}$ Particulate Matter	0 days	0	0
Sulphur Dioxide	0 15-minutes	0	0

Air Quality Report

LISBURN DUNMURRY SEYMOUR HILL 2021

Air Quality Statistics

Pollutant	Grav PM_{10}*	Grav $PM_{2.5}$~	$PM_1$$	SO_2	Wind Dir	Wind Speed
Number Very High #	0	0	-	0	-	-
Number High #	0	0	-	0	-	-
Number Moderate #	0	0	-	0	-	-
Number Low #	365	345	-	31414	-	-
Maximum 15-min mean	-	-	135 µg m^{-3}	11 µg m^{-3}	-	2.0 m/s
Maximum hourly mean	177 µg m^{-3}	131 µg m^{-3}	127 µg m^{-3}	11 µg m^{-3}	-	1.9 m/s
Maximum running 8-hr mean	119 µg m^{-3}	87 µg m^{-3}	84 µg m^{-3}	11 µg m^{-3}	-	0.7 m/s
Maximum running 24-hr mean	57 µg m^{-3}	41 µg m^{-3}	40 µg m^{-3}	8 µg m^{-3}	-	0.7 m/s
Maximum daily mean	47 µg m^{-3}	31 µg m^{-3}	30 µg m^{-3}	8 µg m^{-3}	-	-
Average	14 µg m^{-3}	7 µg m^{-3}	6 µg m^{-3}	2 µg m^{-3}	-	0.5 m/s
Data capture	99.9 %	94.6 %	94.6 %	89.6 %	1.5 %	1.5 %

Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013
* Grav PM_{10} instruments:
FIDAS using 1 gravimetric factor from 20 January 2021
TEOM using the VCM for Indicative Gravimetric Equivalent from 1 January 2021 to 20 January 2021
~ Grav $PM_{2.5}$ instruments:
FIDAS using 0.94 gravimetric factor from 20 January 2021
$ PM_1 as measured by a FIDAS
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)	Annual mean > 40 µg m^{-3}	14 µg m^{-3}	0	-	-	No
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	47 µg m^{-3}	0	0	35 days	No
$PM_{2.5}$ Particulate Matter (Gravimetric) *	Annual mean > 25 µg m^{-3}	7 µg m^{-3}	0	-	-	No
Sulphur Dioxide	15-minute mean > 266 µg m^{-3}	11 µg m^{-3}	0	0	35 15 mins	No
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	11 µg m^{-3}	0	0	24 hours	No
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	8 µg m^{-3}	0	0	3 days	No
Sulphur Dioxide	Annual mean > 20 µg m^{-3}	2 µg m^{-3}	0	-	-	No

* Not set in regulations

Air Quality Report

Produced by AQDM on behalf of Castlereagh

CASTLEREAGH DUNDONALD 2021

Fully ratified by AQDM to the LAQM (TG16) standards using the AURN methodology

Site Environment and Description

ROADSIDE: Upper Newtownards Road

Map Photo Dashboard

Statistical Summary Report

This 2021 report contains all the statistics required for the LAQM reporting.

The full results and statistics are available from the Northern Ireland website https://www.airqualityni.co.uk.

Daily Air Quality Index (DAQI)

The table below shows the duration within the bands of the Daily Air Quality Index (DAQI). The DAQI was introduced by Defra in January 2012 and revised April 2013.

DAQI Pollutant	Moderate	High	Very High
Nitrogen Dioxide	0 hours	0	0

Air Quality Exceedences of the AQS Objectives

NO_2 - annual data capture was 100.0 %

The annual mean was 19 µg m^{-3} which did not exceed the 40 µg m^{-3} Objective.

The maximum hourly mean was 86 µg m^{-3} so there were no exceedences of the NO_2 hourly limit of 200 µg m^{-3}. There is an annual allowance of 18 hours so the Objective was not exceeded.

Air Quality Report

CASTLEREAGH DUNDONALD 2021

Air Quality Statistics

Pollutant	NO_2	NO	NOx
Number Very High #	0	-	-
Number High #	0	-	-
Number Moderate #	0	-	-
Number Low #	8756	-	-
Maximum 15-min mean	101 µg m^{-3}	375 µg m^{-3}	677 µg m^{-3}
Maximum hourly mean	86 µg m^{-3}	277 µg m^{-3}	501 µg m^{-3}
Maximum running 8-hr mean	69 µg m^{-3}	136 µg m^{-3}	269 µg m^{-3}
Maximum running 24-hr mean	54 µg m^{-3}	84 µg m^{-3}	175 µg m^{-3}
Maximum daily mean	48 µg m^{-3}	82 µg m^{-3}	172 µg m^{-3}
Average	19 µg m^{-3}	14 µg m^{-3}	41 µg m^{-3}
Data capture	100.0 %	100.0 %	100.0 %

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

NOx mass units are NOx 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}	19 µg m^{-3}	0	-	-	No
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	86 µg m^{-3}	0	0	18 hours	No

QA/QC of Diffusion Tube Monitoring

In 2021 the NO_2 tubes were supplied, prepared and analysed by Gradko International Limited, using the preparation method 20%TEA/Water.

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.
https://laqm.defra.gov.uk/air-quality/air-quality-assessment/national-bias/

The local bias adjustment figure has been calculated as **0.76.**

Individual Period (monthly) Mean Nitrogen Dioxide Data from the Diffusion Tubes (ug/m^3)					
Period		Tube 1	Tube 2 (if available)	Tube 3 (if available)	Tube 4 (if available)
1		35	35	34	
2		28	27	30	
3		24	24	24	
4		24	25		
5		23	23	24	
6		18	18	17	
7		20	19	19	
8		21	23	21	
9		27	25	26	
10		23	24	24	
11		27	26	25	
12		28	28	28	
13					

Data from the Automatic Analyser (Matching Individual Diffusion Tube Periods)						
Period	Start Date (dd/mm/yy)	End Date (dd/mm/yy)	% Data Capture	Ratified / Provisional	NOx (if available) (ug/m^3)	Nitrogen Dioxide (ug/m^3)
1	05/01/2021	02/02/2021	99.9	Ratified	69.6	28.5
2	02/02/2021	03/03/2021	99.9	Ratified	45.2	19.4
3	03/03/2021	30/03/2021	99.5	Ratified	35.1	17.5
4	30/03/2021	06/05/2021	99.9	Ratified	42.6	20.9
5	06/05/2021	02/06/2021	99.8	Ratified	28.3	14.9
6	02/06/2021	01/07/2021	99.9	Ratified	22	10.9
7	01/07/2021	02/08/2021	99.9	Ratified	28.9	14.7
8	02/08/2021	01/09/2021	99.9	Ratified	32.9	15.4
9	01/09/2021	30/09/2021	99.6	Ratified	42	20.1
10	30/09/2021	01/11/2021	99.9	Ratified	39.5	18.7
11	01/11/2021	30/11/2021	99.9	Ratified	41.7	21.1
12	30/11/2021	04/01/2022	99.9	Ratified	54	23.2

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/22

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 2022

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@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/m^3)	Automatic Monitor Mean Conc. (Cm) (µg/m^3)	Bias (B)	Tube Precision[4]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2021	R	Cheshire West and Chester	12	34	29	14.1%	G	**0.88**
Gradko	20% TEA in water	2021	R	Cheshire West and Chester	12	33	29	12.6%	G	**0.89**
Gradko	20% TEA in water	2021	R	Lisburn & Castlereagh City Council	12	25	19	31.9%	G	**0.76**
Gradko	20% TEA in water	2021	R	Nottingham City Council	12	32	35	-8.1%	G	**1.09**
Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	32	5.2%	G	**0.95**
Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	27	28.6%	G	**0.78**

Decision to use the bias adjustment factor 0.84

The results of the local co-location study at the Dundonald site were submitted to the national data base, the Dundonald local bias adjustment factor was calculated at **0.76,** this co-location study is 30M from the AQMA in Dundonald and is on one of the main arterial routes into Belfast City centre.

The June 2022 National bias adjustment figure for Gradko in 2021 is **0.84.**

As in recent years a decision was made to apply the national figure of **0.84** as 32 studies were included in this and therefore deemed to be a more realistic figure and therefore will show a more accurate trend. .

A copy of the National bias adjustment spread sheet can be found below:

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/22

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 2022
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@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	2021	R	Gedling Borough Council	12	32	26	23.1%	G	**0.81**
Gradko	20% TEA in water	2021	UB	West Northamptonshire Council	11	14	10	32.1%	G	**0.76**
Gradko	20% TEA in water	2021	R	Ards and North Down Borough Council	10	30	22	38.4%	G	**0.72**
Gradko	20% TEA in water	2021	R	Birmingham City Council	10	33	25	35.2%	G	**0.74**
Gradko	20% TEA in water	2021	R	Cheshire West and Chester	12	34	29	14.1%	G	**0.88**
Gradko	20% TEA in water	2021	R	Cheshire West and Chester	12	33	29	12.6%	G	**0.89**
Gradko	20% TEA in water	2021	R	Lisburn & Castlereagh City Council	12	25	19	31.9%	G	**0.76**
Gradko	20% TEA in water	2021	R	Nottingham City Council	12	32	35	-8.1%	G	**1.09**
Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	32	5.2%	G	**0.95**
Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	27	28.6%	G	**0.78**
Gradko	20% TEA in water	2021	R	Bath & North East Somerset	12	31	27	15.1%	G	**0.87**
Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	34	31	7.6%	G	**0.93**
Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	19	17	11.7%	G	**0.90**
Gradko	20% TEA in water	2021	R	Blackburn with Darwen Borough Council	12	27	20	32.3%	G	**0.76**
Gradko	20% TEA in water	2021	R	Brent Council	12	51	46	9.9%	G	**0.91**
Gradko	20% TEA in water	2021	R	Gateshead Council	10	23	19	23.8%	G	**0.81**
Gradko	20% TEA in water	2021	R	Gateshead Council	12	25	22	13.7%	G	**0.88**
Gradko	20% TEA in water	2021	R	Gateshead Council	11	27	25	9.8%	G	**0.91**
Gradko	20% TEA in water	2021	R	Gateshead Council	12	31	25	26.6%	G	**0.79**
Gradko	20% TEA in water	2021	R	Gateshead Council	12	32	34	-4.1%	G	**1.04**
Gradko	20% TEA in water	2021	KS	Marylebone Road Intercomparison	11	53	42	25.0%	G	**0.80**
Gradko	20% TEA in Water	2021	R	Monmouthshire County Concil	11	35	29	21.8%	G	**0.82**
Gradko	20% TEA in water	2021	R	Belfast City Council	12	25	20	24.3%	G	**0.80**
Gradko	20% TEA in water	2021	UC	Belfast City Council	12	25	20	28.5%	G	**0.78**
Gradko	20% TEA in water	2021	R	Belfast City Council	12	42	35	19.8%	G	**0.84**
Gradko	20% TEA in water	2021	R	Belfast City Council	12	38	27	39.4%	G	**0.72**
Gradko	20% TEA in water	2021	UB	Dudley MBC	12	20	15	36.0%	G	**0.74**
Gradko	20% TEA in water	2021	R	Dudley MBC	12	30	29	4.2%	G	**0.96**
Gradko	20% TEA in water	2021	R	Dudley MBC	12	42	40	5.5%	G	**0.95**
Gradko	20% TEA in Water	2021	R	Lambeth	10	91	62	46.6%	G	**0.68**
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	38	32	18.4%	G	**0.84**
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	28	27	4.9%	G	**0.95**
Gradko	20% TEA in water	2021		**Overall Factor[3] (32 studies)**				**Use**		**0.84**

Appendix B: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional, and national scales. COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities and other organisations with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention and changes in behaviour such as reduced road traffic and working from home.

DAERA deemed air quality to be an essential service during lockdown. The LCCC air quality monitoring sites do not require access to any premises and therefore it was possible to continue monitoring both the automatic sites and all the NO_2 diffusion tubes sites, with the loss of only one months data in 2020 due to a postal issue during the lockdown period. LCCC employs a dedicated air quality officer which made restrictions easier to comply with as this was the only officer requiring permission to visit the sites, maintaining good QA/QC.

There was a noticeable reduction in NO_2 due to the reduction in traffic flows this can been seen in table 2.3 and table 2.6, there was a possibility PM_{10} may have risen due to lockdown and home working but there was no evidence of this, which most likely was due to the unusual mild climate during this period.

There was a greatly reduced use of public transport and the Park & Rides were seldom used, but home working and schooling did continue throughout 2020 to keep the traffic greatly reduced. In 2021 restrictions eased and traffic increased however guidance still recommended home working where possible so traffic flows were still reduced from pre-COVID.

Cycling had become very popular as a recreational activity during lockdown and the Blaris Greenway cycle and walking path was completed in 2020 giving a designated route to and from the Sprucefield shopping centre and Park & Ride, linking with the existing cycle routes within LCCC.

During 2020/2021 and the pandemic, analysing the results and considering the DAERA COVID report LCCC has concluded the large reduction was due to reduced traffic flows, consideration was to be given to revoking the AQMA in Dundonald in

2021 when a trend was established that the completion of the Rapid Transport System through Dundonald had the desired 20% reduction in NO_2, however as the 2020/2021 results have been greatly affected by COVID, LCCC have concluded continued monitoring at the AQMA and the other sites within the city council area is necessary.