2022 Air Quality Progress Report

In fulfilment of Environment (Northern Ireland) Order 2002

Local Air Quality Management

June 2022

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Executive Summary

This report follows Guidance LAQM.TG(16) issued by DEFRA and intends to identify any significant changes that have occurred since the previous stage of Review and Assessment which may have the potential to affect the localised air quality.

The findings of this assessment would indicate the following:

AQMA 3, Antrim Road, Elmfield

Results of Automatic Monitoring for nitrogen dioxide showed an annual mean concentration of 30 µg/ m^3. Results of diffusion tube monitoring on the façade of the relevant locations within the AQMA were below the annual mean objective.

Antrim and Newtownabbey Borough Council will continue to monitor and implement Action Plan measures in this AQMA.

All other diffusion tube monitoring results are below the annual mean objective.

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

Antrim and Newtownabbey Borough Council will be submitting its next Progress Report in April 2023. The Air Quality Action Plan Progress Report for 2022 is included in the report.

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1 Introduction

Description of Local Authority Area

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

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

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

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

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 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.

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 exceedance 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.

Air Quality Objectives

The air quality objectives applicable to LAQM in Northern Ireland are set out in the Air Quality Regulations (Northern Ireland) 2003, Statutory Rules of Northern Ireland 2003, no. 342, and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre µg/m^3 (milligrammes 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 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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	**Measured as**	
	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

Summary of Previous Review and Assessments

Newtownabbey Borough Council:

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

Air Quality Progress Report	Aug 2008	Yes Nitrogen Dioxide	
Air Quality Detailed Assessment Nitrogen Dioxide	Apr 2009		
Amendment of AQMA, Antrim Road, Elmfield	Jun 2009		
Updating & Screening Assessment	Aug 2009	1. Exceedances of annual mean and 1 hour objective at Antrim Road, Elmfield; 2. No exceedances at Ballyclare or Sandyknowes	
Progress Report	Sep 2010	1. Exceedances of annual mean and 1 hour objective at Antrim Road, Elmfield; 2. No exceedances at Ballyclare or Sandyknowes	
Action Plan for Antrim Road, Elmfield	Mar 2011		

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

Antrim Borough Council:

Year	Report	Outcomes
2001	1st Stage Review & Assessment	2nd/3rd Stage Assessments required for Nitrogen Dioxide, Sulphur Dioxide & Particulates (PM_{10}).
2004	2nd/3rd Stage Review & Assessment	AQMA required for domestic sulphur dioxide emissions. (Declared Oct 2004)
2005	Progress Report	Confirmed no change to local circumstances
2005	Detailed Assessment	Confirmed need for AQMA
2006	Updating & Screening Assessment	Identified need for Action Plan for AQMA. Identified need for No_2 monitoring near Belfast International Airport.
2007	Progress Report	No significant changes found
2008	Progress Report	No significant changes found
2009	Updating & Screening Assessment	No requirement for detailed assessment.

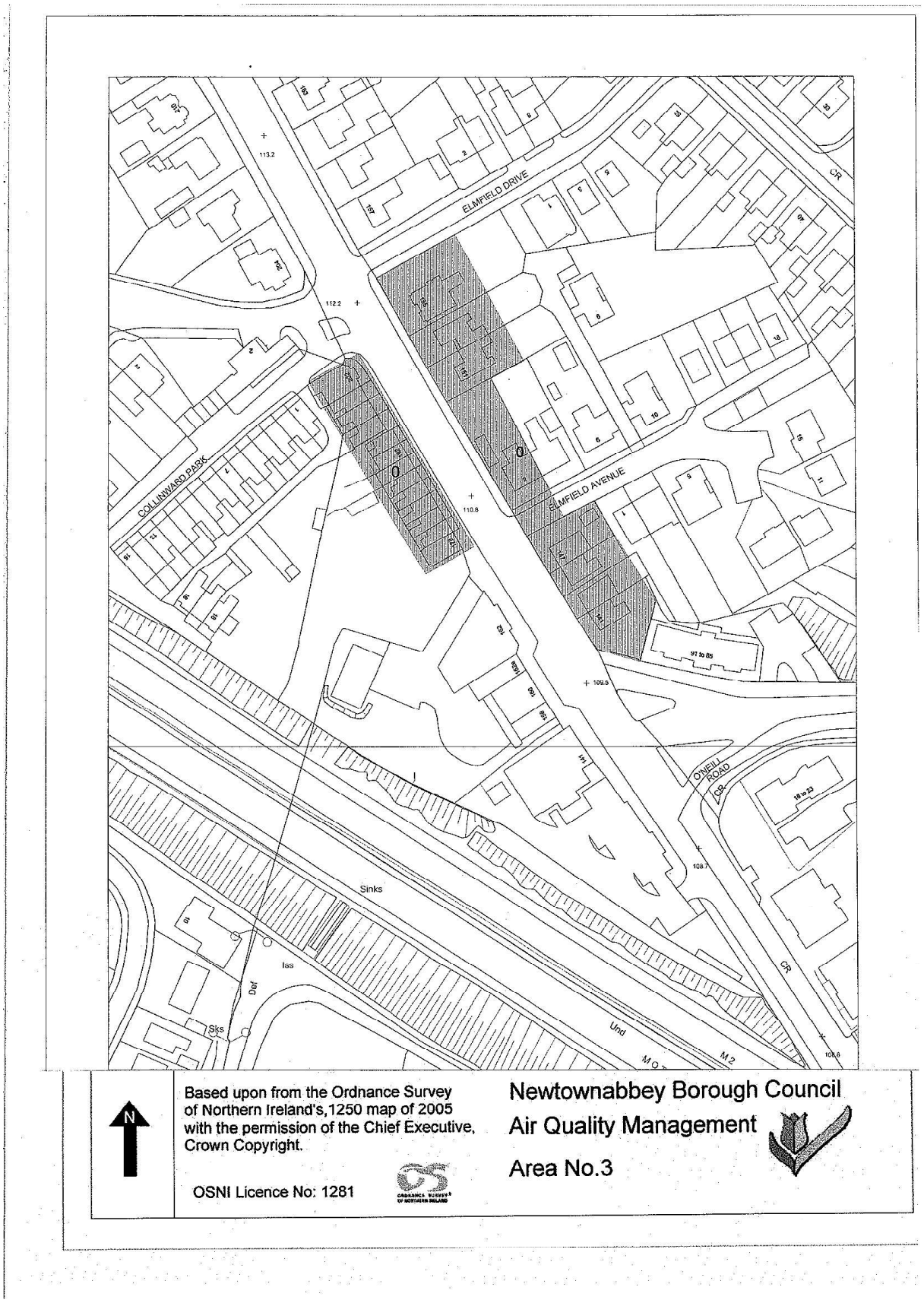
2010	Progress Report (Incorporating AQMA Action Plan Progress Report)	Report determined AQMA could be revoked. SO_2 real time analyser could be decommissioned.
2011	Progress Report	AQMA revocation came into effect on 31 January 2011. No significant changes found.
2012	Updating & Screening Assessment	No requirement for detailed assessment.
2013	Progress Report	No significant changes found
2014	Progress Report	No significant changes found

Antrim and Newtownabbey Borough Council:

Year	**Report**	**Outcomes**
2015	Updating & Screening Assessment	No requirement for detailed assessment.
2016	Progress Report	No requirement for detailed assessment.
2017	Progress Report	No requirement for detailed assessment.

2018	Updating & Screening Assessment	No requirement for detailed assessment.
2019	Progress Report	No requirement for detailed assessment.
2020	Progress Report	No requirement for detailed assessment
2021	Updating & Screening Assessment	No requirement for detailed assessment

Figure 1.1 – Figure 1.1 AQMA 3 (amended) Antrim Road



2 New Monitoring Data

Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

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

- **Antrim Road, Elmfield**

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

Table 2.1 – Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure?	Distance to kerb of nearest road	Does this location represent worst-case exposure?
Antrim Road, Elmfield	Roadside	332305	381697	NO_2	Y		Y (1m)	3m	Y

2.1.2 Non-Automatic Monitoring Sites

Antrim and Newtownabbey Borough Council operated a network of 8 nitrogen dioxide diffusion tubes in 2021.

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

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

In 2021 the diffusion tubes were analysed by Gradko Services using 20% triethylamine in water.

QA/QC details which include the bias adjustment factors for 2021 is reported in **Appendix A**.

Table 2.2 – Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X & Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*
Site 8 Braden Heights, Rathcoole	Urban Background	333898 381926	NO_2	N	N	Y (5m)	n/a
Site 46 12 Collinbridge Road	Roadside	332193 381666	NO_2	N	N	Y (located on property)	9m
Site 48 24 Sandyknowes Avenue	Roadside	330631 382729	NO_2	N	N	Y (located on property)	17m
Site 49 6 Sandyknowes Gardens	Urban Background	330641 382771	NO_2	N	N	Y (located on property)	55m
Site 58 Lamp-post, 198 Antrim Road, Elmfield	Roadside	332305 381697	NO_2	Y	N	Y (3m)	1.7m
Site 60 196 Antrim Road	Roadside	332305 381697	NO_2	Y	N	Y (located on Property	4m
Site 61 196 Antrim Road	Roadside	332305 381697	NO_2	Y	N	Y (located on property)	4m
Site 62 Shore Road, Whiteabbey Village	Urban Background	336044 383084	NO_2	N	N	Y (4.4m)	2.2m

Comparison of Monitoring Results with Air Quality Objectives

2.1.3 Nitrogen Dioxide (NO_2)

Automatic Monitoring Data

Table 2.3 provides all nitrogen dioxide continuous monitoring data collected since 2017 and **Table 2.4** compares the results with the 1 hour Mean Objective.

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

Table 2.3 – Results of Automatic Monitoring for Nitrogen Dioxide (2017-2021)

Site ID	Site Type	Within AQMA?	Valid Data Capture 2021 %	Annual Mean Concentration µg/m³				
				2017	2018	2019	2020	2021
Antrim Rd, Elmfield	Roadside	Y	98.3	34.91	36	37	29	30

In bold, exceedance of the NO_2 annual mean AQS objective of 40µg/m³

Figure 2.3 – Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites

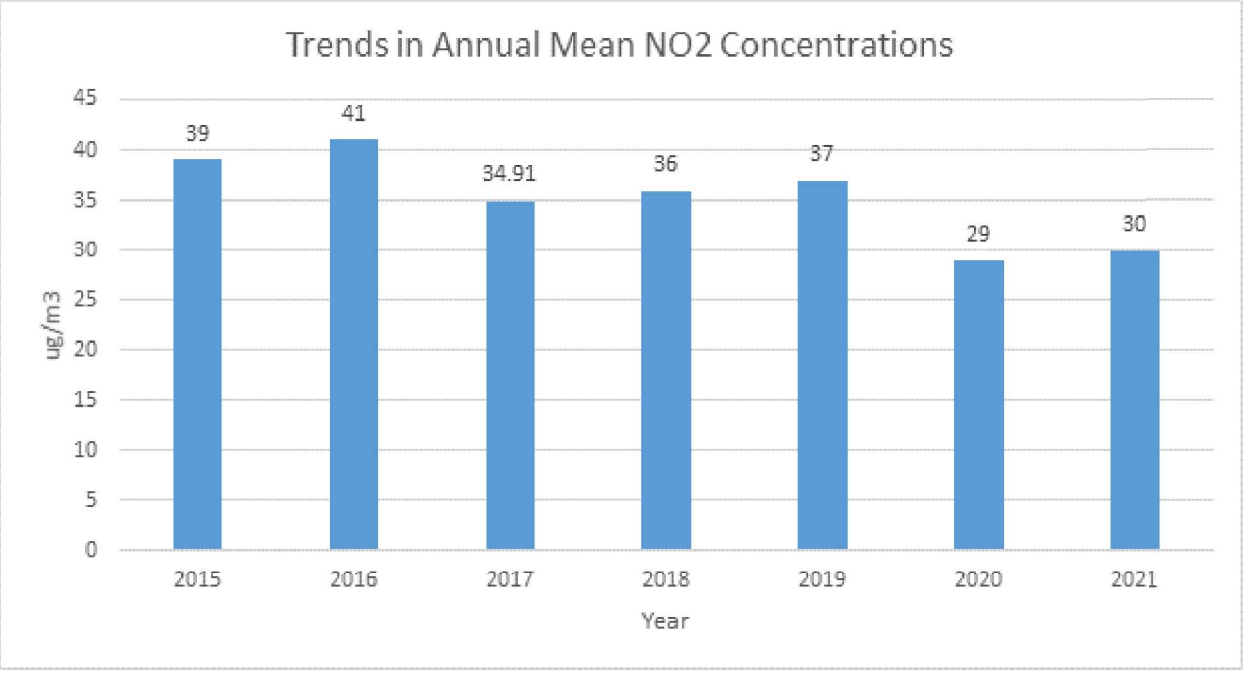


Figure 2.3 shows the Trends in Annual Mean Nitrogen Dioxide Concentrations measured at the Antrim Road, Elmfield monitoring site. In 2010 the sample inlet was moved from the roadside to within 1m of the façade of the relevant location and this resulted in a significant decrease in the concentrations. In October 2021 the sample point was moved back to the inlet cage on the analyser. The annual mean in 2021 is again below the annual average mean objective, this will have been impacted somewhat by the Covid-19 Pandemic.

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 2021 %	Number of Exceedences of Hourly Mean (200 µg/m³)				
				2017	2018	2019	2020	2021
Antrim Rd, Elmfield	Roadside	Y	98.3	0	0	0	0	0

In bold, exceedance of the NO_2 hourly mean AQS objective (200µg/m³ – not to be exceeded more than 18 times per year)

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

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] If the data capture for full calendar year is less than 85%, include the 99.8th percentile of hourly means in brackets

* Number of exceedances for previous years is optional

Diffusion Tube Monitoring Data

Antrim and Newtownabbey Borough Council operated a network of 8 nitrogen dioxide diffusion tubes in 2020. A new diffusion tube was placed in Whiteabbey Village in June 2019.

Table 2.5 provides all diffusion tube data for 2021 with exceedances of the 40 µg/m3 annual mean NO2 highlighted in bold and Table 2.6 provides all diffusion tube data collected since 2017.

Table 2.5 – Results of NO_2 Diffusion Tubes 2021

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2021 (Number of Months or %) [a]	2021 Annual Mean Concentration (µg/m³) - Bias Adjustment factor =0.84
						2021 (µg/m³)
Site 8	Braden Heights, Rathcoole	Urban Background	N		12 months	12.75
Site 46	12 Collinbridge Road	Roadside	N		12 months	26.78
Site 48	24 Sandyknowes Avenue	Roadside	N		12 months	27.06
Site 49	6 Sandyknowes Gardens	Urban Background	N		12 months	21.18
Site 58	Lamp-post, 198 Antrim Road ,Elmfield	Roadside	Y		12 months	26.30*
Site 60	196 Antrim Road	Roadside	Y	Co-located with site 61	12 months	29.41
Site 61	196 Antrim Road	Roadside	Y	Co-located with site 60	12 months	29.00
Site 62	Shore Road, Whiteabbey Village	Roadside	N		12 months	18.24

*Distanced corrected

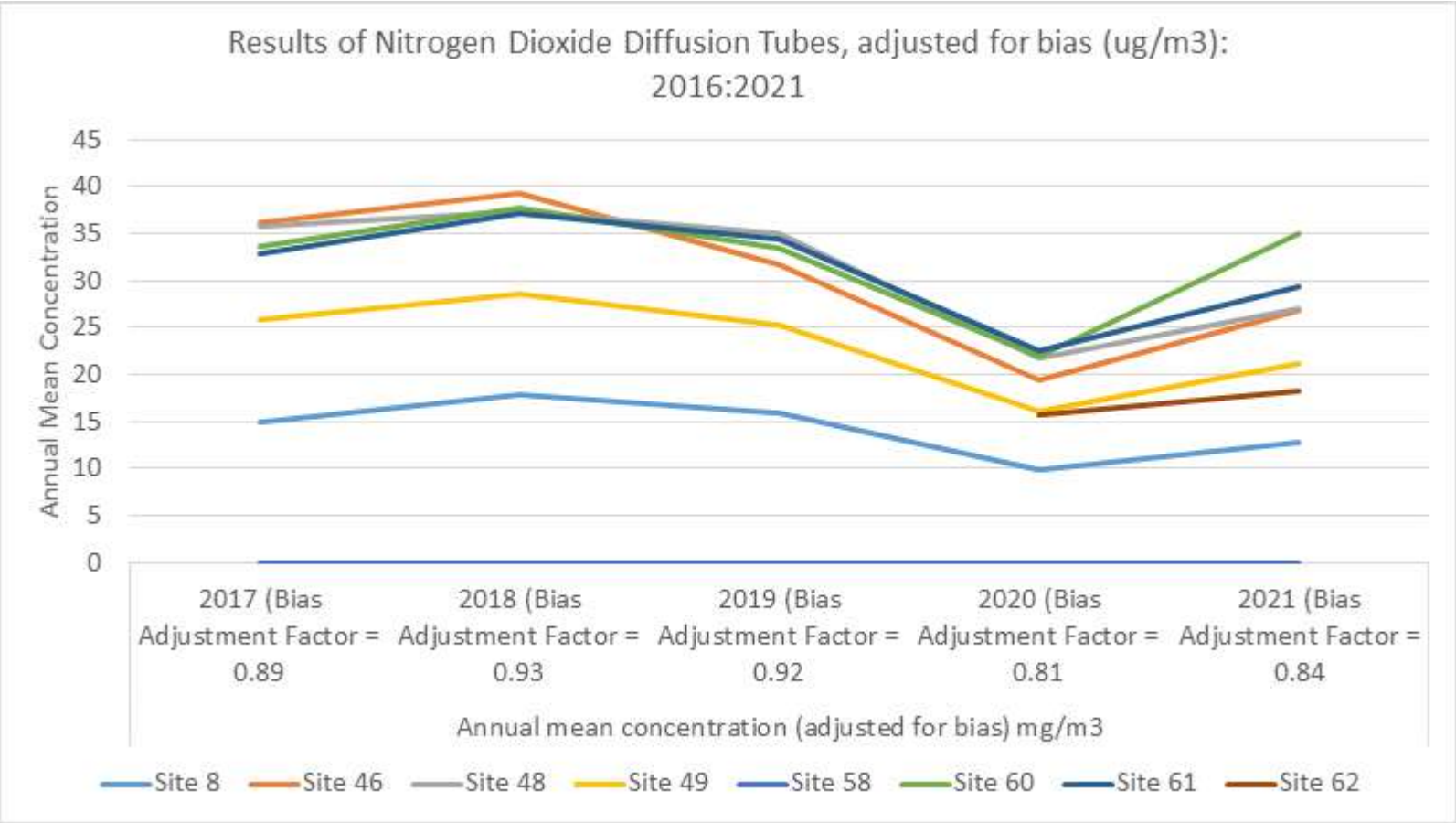
Table 2.6 – Results of NO_2 Diffusion Tubes (2017 to 2021)

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)
Site 8 Braden Heights, Rathcoole	Urban Background	N	15.05	17.84	15.89	9.86	12.75
Site 46 12 Collinbridge Road	Roadside	N	36.22	39.40	31.69	19.38	26.78
Site 48 24 Sandyknowes Avenue	Roadside	N	35.88	37.40	35.12	21.74	29.52
Site 49 6 Sandyknowes Gardens	Urban Background	N	25.93	28.56	25.24	16.22	21.18
Site 58 Lamp-post, 198 Antrim Road ,Elmfield	Roadside	Y	32.93*	37.2*	31.8*	21.2*	26.3*
Site 60 196 Antrim Road	Roadside	Y	33.75	37.71	33.55	21.93	29.4
Site 61 196 Antrim Rd	Roadside	Y	32.81	37.15	34.44	22.49	29.00

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)
Site 62 Shore Road, Whiteabbey Village	Urban Background	N				15.75	18.24

*Distance corrected

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


Results of Nitrogen Dioxide Diffusion Tubes, adjusted for bias (ug/m3): 2016:2021
Annual Mean Concentration
45
40
35
30
25
20
15
10
5
0
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
Annual mean concentration (adjusted for bias) mg/m3
Site 8
Site 46
Site 48
Site 49
Site 58
Site 60
Site 61
Site 62

2.1.4 Particulate Matter (PM_{10})

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

2.1.5 Sulphur Dioxide (SO_2)

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

2.1.6 Benzene

Antrim and Newtownabbey does not carry out any Benzene monitoring

2.1.7 Other Pollutants Monitored

There were no other pollutants monitored.

2.1.8 Summary of Compliance with AQS Objectives

Antrim and Newtownabbey Borough Council has examined the results from monitoring in the Borough. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

Road Traffic Sources

No new roads have been opened since the last Updating and Screening Assessment, however the Ballyclare Relief Road is due for completion in December 2022.

Other Transport Sources

No new airports, railway stations or ports have opened since the last Updating and Screening Assessment took place.

In 2021, 2,328,276 passengers passed though the airport, compared to 1,747,086 in 2020. In addition, the airport handled 28,225 tonnes of freight. If it is assumed that all freight arrives in "freight-only" then using the method given in the technical guidance this is equivalent to a further 0.282 mppa which is well under the 10 million passengers per annum threshold for relevant exposure.

Industrial Sources

There are no new industrial installations within the borough or substantial changes to existing installations.

There are no new major fuel storage depots storing petrol within the borough.

One new petrol station has opened since the last Updating and Screening Assessment.

Commercial and Domestic Sources

No new biomass installations have been identified in the borough since the last Updating and Screening Assessment.

Antrim and Newtownabbey Borough Council confirms that there are no areas of significant domestic fuel use in the Local Authority area. Fuel Use Surveys were completed

in the previous Newtownabbey Borough Council Area in 2003 and 2004. The predominant primary fuel was found to be oil with one area in Ballyclare having solid fuel as a secondary source. An AQMA was declared for PM10 in Ballyclare in October 2004 with a continuous PM10 Analyser installed however the AQMA was revoked in November 2006 because of the consistent low levels recorded.

Since 2006 Antrim town has had access to a natural gas supply and all major housing developments since then have been connected to this supply. NIHE has also implemented a major programme of replacing solid fuel systems within their properties with gas. This commenced in Antrim in 2008 and was completed 2 years later. The completion of this programme has meant that there are no longer any areas in the borough with significant solid fuel use. There has been a similar installation of gas within the previous Newtownabbey Borough Council area.

In addition there are 17 smoke control areas in the previous Newtownabbey Borough Council area and 5 in the previous Antrim Borough Council. In 2021 only 2 complaints about burning smoke in smoke control areas were received.

Antrim and Newtownabbey Borough Council are currently awaiting data from the 2021 Northern Ireland Census for exact figures on domestic fuel use and will provide this once it is available in 2023. 2011 Census results indicated that 1.9% of properties in the Borough had solid fuel as the primary fuel source.

No Combined Heat and Power (CHP) plants have been identified.

New Developments with Fugitive or Uncontrolled Sources

No new landfill sites, quarries or other potential sources of fugitive particulate emissions have been identified since the last Updating and Screening Assessment.

Antrim and Newtownabbey Borough Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Antrim and Newtownabbey Borough 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.**

4 Planning Applications

There have been a number of applications received that have required an air quality assessment to be submitted in support of their application:

Four applications were received and approved for new poultry farms. Air quality assessments submitted alongside these applications demonstrated the relevant air quality objectives would be met.

5 Air Quality Planning Policies

Local Development Plan 2030

The Council is working on a new plan for the entire Borough that will look forward to 2030. It will be prepared in two parts starting with the Plan Strategy which once adopted will be followed by the Local Policies Plan. These will be prepared in the context of the Council's overall Corporate Plan and wider government policy including the Regional Development Strategy and Strategic Planning Policy Statement.

Current Development Plans

Until a new Plan is adopted, planning decisions must be taken in accordance with the provisions of the development plans and planning policy publications that were prepared by the Department of the Environment (DOE), unless material considerations indicate otherwise.

In this context, the current development plans for the Borough are the Antrim Area Plan 1984-2001 (including Alterations 1, 2 and 3) and the Belfast Metropolitan Area Plan 2015.

Additionally, the operational planning policies contained in the relevant DAERA planning policy publications will continue in force until our new Plan Strategy is adopted.

6 Local Transport Plans and Strategies

Regional Development Strategy

The Regional Development Strategy (RDS) is a strategy to guide the future development of Northern Ireland to 2025. The RDS will influence the future distribution of activities throughout the region and recognises that development policies will have a significant impact on the environment and the health of individuals.

Spatial Development Strategy for Northern Ireland

The Spatial Development Strategy (SDS) guides the physical development of the Region to 2025. The SDS will contribute to meeting a number of key regional challenges emerging from the significant local, national and international forces, which will drive change over the next 25 years, including:

Transport:

- Promote a change in travel culture and particularly manage the effects of a possible 100% growth in the number of vehicles by 2025;
- Contribute to the creation of a modern, sustainable, safe transportation system for the Region, meeting the travel needs of all groups in society;
- Accommodate the growing volume of freight moving to and from the regional gateways; and
- Strengthen the regional gateways to handle the increasing flow of people and goods in and out of the Region.

Environment:

- Accommodate future development growth while protecting and caring for the environment;
- Reduce the consumption of resources;
- Continue to maintain or, where needed, improve the quality of air, water and land resources within the Region;
- Seek to maintain local landscape character and to conserve cultural assets; and

- Take particular care to sustain and, where required, to enhance the biodiversity of the Region, its natural habitats, high quality landscapes and built heritage.

Developing a Regional Transportation System

Creating an upgraded and integrated transport system, built around the Regional Strategic Transport Network of the key transport corridors with their main public transport services providing the framework for future development is recognised as one of the key assets to accommodate growth. Strategic planning guidelines relating to the development of a Regional Transport System (RTS) are as follows:

- **SPG-TRAN 1:** To develop a Regional Strategic Transport Network (RSTN), based on Key Transport Corridors (KTCs), to enhance accessibility to regional facilities and services.

- **SPG-TRAN 2:** To extend travel choice for all sections of the community by enhancing public transport, including the strengthening of the regional bus network (including the promotion of public transport routes and Park and Ride schemes) and the regional rail system;

- **SPG-TRAN 3:** To integrate land use and transportation to provide a much better range of travel choices for all, and reduce the demand for travel; and

- **SPG-TRAN 4:** To change the regional travel culture and contribute to healthier lifestyles, such as giving greater priority to encouraging more walking and cycling.

Regional Transportation Strategy

The Regional Transportation Strategy (RTS) for Northern Ireland 2002- 2012 identifies strategic transportation investment priorities and considers potential funding sources and affordability of planned initiatives. The RTS focuses on 3 geographic areas and one overlying Network. These are as follows:

- Belfast Metropolitan Area (BMA), containing the continuous area comprising Belfast City Council and the built-up areas within the Council areas of Carrickfergus, Castlereagh, Lisburn, Newtownabbey and North Down;

- Other Urban Areas (OUAs): collectively those towns described as main or local hubs in the RDS;

- Rural Area – the remainder of Northern Ireland; and

- Regional Strategic Transport Network (RSTN) comprising the complete rail network and all motorway and trunk road links (including the Key Transport Corridors and Link Corridors).

The RTS is a "daughter document" of the Regional Development Strategy (RDS), which sets out the spatial development framework for Northern Ireland up to 2025. Implementation of the Strategy will be through three Transport Plans covering the Regional Strategic Transport Network (RSTN), the Belfast Metropolitan Area (BMA), and the Sub-Regional Transport Plan (SRTP).

Regional Strategic Transport Network Transport Plan

The Regional Strategic Transport Network (RSTN) Transport Plan prepared by the Department for Regional Development (DRD) covers the complete rail network, 5 Key Transport Corridors (KTCs), 4 Link Corridors, the Belfast Metropolitan Transport Corridors and the remaining trunk network across Northern Ireland. The Plan is based on the guidance set out in the Regional Development Strategy (RDS) and the Regional Transportation Strategy (RTS), as described in Sections 3.1 and 3.2, above.

The RSTN Transport Plan consists of proposals for transport schemes and measures for the maintenance, management and development of the RSTN until 2015. The RSTN Transport Plan also includes a number of measures for rail, bus, roads, walking and cycling.

Sub-Regional Transport Plan 2015

The Sub-Regional Transport Plan (SRTP) was prepared by the Department for Regional Development (DRD) and completed in 2007. The SRTP is based upon the guidance provided by the Regional Development Strategy (RDS) and the Regional Transportation Strategy (RTS).

7 Implementation of Action Plans

Progress of Antrim and Newtownabbey Borough Council's Action Plan which was produced in 2011, is provided in Table 9.1

Table 9.1 – Action Plan Progress

Action Plan Progress Report 2021

Action Plan Measure	Lead Authority	Original Timescale	Implementation	On Target?	Progress in last 12 months (Jan – Dec 2021)
1. To investigate options for moving to cleaner fuels and purchase vehicles that comply with the prevailing EURO standard	Antrim and Newtownabbey Borough Council	March 2012 & Ongoing	No of vehicles purchased in compliance and cleaner fuels being used	Ongoing	Council continues to actively review vehicle specifications and acquisitions with regard to emission levels and options for transitioning its fleet from diesel powered vehicles to alternative fuel sources. The Council's Fleet Management Strategy 2022 – 2027 sets out a blueprint for the decarbonisation of the fleet. Pilots of alternative fuelled vehicles continue to be explored in order to assess their potential suitability for implementation into the fleet. Council has also been exploring options for hydrogen fuelled vehicles within the fleet. A Hydrotreated Vegetable Oil (HVO) pilot is presently underway involving 15 of Councils fleet vehicles and the outcome of this pilot will assist Council to make further decisions on its way forward in its fleet decarbonisation.
2.To continue to improve the bus fleet by providing	Translink	Ongoing	No of drivers trained and devices fitted	Ongoing	Translink has launched their Climate Positive Strategy, with supporting Net Zero Emissions Fleet Strategy.

<table>
<tr>
<td>Eco-Driving Training and installing Driver Monitoring Devices

To continue the current practice of cleaning up the bus fleet as part of the planned fleet renewal</td>
<td></td>
<td></td>
<td>Bus Fleet: Approximately 2000 drivers have been trained in Eco-Driving (100% of drivers). All drivers took part in a driver training programme as part of the initial roll out and all new drivers employed since this will undergo this training as standard as part of the driver training programme.

100% of vehicles (c.1300 vehicles) are fitted with Driver Monitoring Devices and all new vehicles are fitted with these devices as standard.

Other Divisions:</td>
<td></td>
<td>The strategy states that they want to achieve this responsibly by:
• Achieving at least 50% reduction in our current emissions by 2030 in line with our Climate Action Pledge (baseline 2018/19)
• Placing Translink at the forefront in the journey towards zero emission public transportation, and for all our buses, trains and buildings to be Net Zero by 2040.
• Being Climate Positive by 2050, going beyond achieving net zero to create and an environmental benefit by removing additional carbon dioxide from the environment while growing our business.

Below is the latest fleet breakdown, with 2020-21 data included for comparison purposes. There is an ongoing programme of procurement of zero emission and low emission vehicles.

<table>
<tr><th></th><th colspan="2">2020-21</th><th colspan="2">2021-22</th></tr>
<tr><th>Euro Class</th><th>Number of Vehicles</th><th>% of Fleet</th><th>Number of Vehicles</th><th>% of Fleet</th></tr>
<tr><td>3</td><td>49</td><td>15.22%</td><td>32</td><td>9.91%</td></tr>
<tr><td>4</td><td>46</td><td>14.29%</td><td>9</td><td>2.79%</td></tr>
<tr><td>5</td><td>66</td><td>20.50%</td><td>8</td><td>2.48%</td></tr>
<tr><td>6</td><td>159</td><td>49.38%</td><td>255</td><td>78.95%</td></tr>
<tr><td>Zero Emissions</td><td>2</td><td>0.62%</td><td>19</td><td>5.88%</td></tr>
<tr><td>Total</td><td>322</td><td>100.00%</td><td>323</td><td>100.00%</td></tr>
</table>
</td>
</tr>
</table>

			All support vehicles (across all divisions) have undergone Eco-Driving training. This is refreshed every 5 years (next schedule early 2023). 102 vehicles are currently fitted with ECO driving systems (60% of support fleet) with an ongoing programme for continued rollout.		

3. Carry out vehicle emission testing	Antrim and Newtownabbey Borough Council	October 2011 & ongoing	No of Vehicle Emission Testing Events	Ongoing	Due to Covid 19 no Vehicle Emission Testing was carried out in 2021
4. Introduce a Park and Ride Scheme at Ballyhenry Road	DFI TransportNI	1-2 years (depending on approval)	Park & Ride Scheme implemented	No	Approval granted but scheme not going ahead at the present time.
Introduce a Park and Ride Scheme at Ballynure		Not yet in programme	2016/17	Completed	Completed (24 spaces)
Introduce a Park and Ride Scheme in New Street/John Street Randalstown		2015/16 subject to finance	2016/17	Completed	Extension to existing car park in John Street with access off New Street adjacent to existing bus stops – Car Park Completed July 2016 (44 spaces)
5. Promote sustainable modes of transport to Newtownabbey Borough Council employees, residents/commuters within the AQMA and St Bernard's Primary School	Travelwise	March 2012 & ongoing	No of initiatives implemented	Completed	DfI has discontinued the Travelwise NI initiative and no longer provides support for workplace travel plans.

6. Develop a Green Travel Plan for borough	Antrim and Newtownabbey Borough Council	October 2011	Production of Green Travel Plan for council employees initially	Ongoing	Newtownabbey Borough Council's Workplace Travel Plan was launched October 2011 and the action plan is currently being implemented by ANBC. Actions in 2021 included: •Staff and Council Members able to avail of Council Bike to Work Scheme all year round. In the period January – December 2021 a total of 4 ANBC employees purchased a new bike through the scheme. • cycle stands have been installed throughout the Borough • The Council has submitted 6 No. expression of interest forms to DfI – for greenways and active travel routes **<u>Expressions of Interest (Greenways):</u>** Doagh to Larne Greenway: Bqllyclare Town Route- 2 sections of path in construction circa 750 metres, part DfI and part DAERA Mallusk/Hightown to Gideon's Green Greenway-circa 2 km completed – not fully connected as yet – part DfI and part DAERA

					Expressions of Interest (Active Travel Routes): Steeple Park: Active Travel Project Global Point: Active Travel Project Supporting Cycling in Glengormley Secure cycle parking for Edmund Rice College Belfast High School Bicycle shelter and repair station
7. Deliver the 'Air Quality Schools Initiative' to St Bernard's Primary School	Antrim and Newtownabbey Borough Council	March 2012	Air Quality Initiative delivered	Completed	
8. Organise an Information Event for residents in the AQMA	Antrim and Newtownabbey Borough Council	March 2012	Information Event organised	Ongoing	Information provided on Council Website. No specific Information Event to be organised at present.
9. Provide information on the Council Website to encourage people to change their travel behaviour	Antrim and Newtownabbey Borough Council	October 2011 and ongoing	Information provided	Ongoing	Ongoing information on website and new facebook page

10. Comment on planning applications to ensure that all relevant air quality issues are highlighted and mitigation measures are considered wherever possible	Antrim and Newtownabbey Borough Council	ongoing	No of plans commented	Ongoing	533 Planning Applications were commented on

8 Conclusions and Proposed Actions

Conclusions from New Monitoring Data AQMA 3, Antrim Road, Elmfield

Results of the Automatic Monitor, whose inlet is 1m from the façade of the relevant location, for nitrogen dioxide in 2021 showed an annual mean concentration of 30µg/m^3.

All diffusion tubes within this AQMA were below the annual mean objective.

Diffusion tube 58 is located on a lamp post adjacent to the road, within 3m from the relevant location, had an annual mean concentration of 26.3µg/m^3.

Diffusion tubes 60 and 61 are located on the façade of the relevant location and they showed annual mean concentrations of 29.41and 29.00 µg/m^3 respectively.

Although the results of diffusion tubes are below the annual mean objective the automatic monitor has shown a slight increase and therefore Antrim and Newtownabbey Borough Council will continue to carry out monitoring in 2022/2023.

Conclusions relating to New Local Developments

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

Other Conclusions

As society continues to exit from the Covid-19 Pandemic, it is anticipated that as more people return to the traditional office working environment and as traffic increases, the levels of NO2 will increase close to pre Pandemic levels again

Proposed Actions

- AQMA 3, Antrim Road, Elmfield

  Continue monitoring and implement Action Plan Measures.

- Submit Progress Report in 2023.

9 References

Defra (2009) Part IV of the Environment Act 1995. Local Air Quality Management. Technical Guidance LAQM.TG(16).

AEA Energy & Environment (2008). Diffusion Tubes for Ambient NO2 Monitoring: A Practical Guide for Laboratories and Users.

https://en.wikipedia.org/wiki/Belfast_International_Airport

for passenger numbers, freight tonnage at Belfast International Airport

10 Appendices

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

Appendix B: **Impact of COVID-19 upon LAQM**

Appendix C: **Location of AQMA**

Appendix D: **Locations of Monitoring Sites**

Appendix E: **Monthly Diffusion Tube Results**

Appendix A: QA/QC Data

QA/QC Diffusion Tube Monitoring

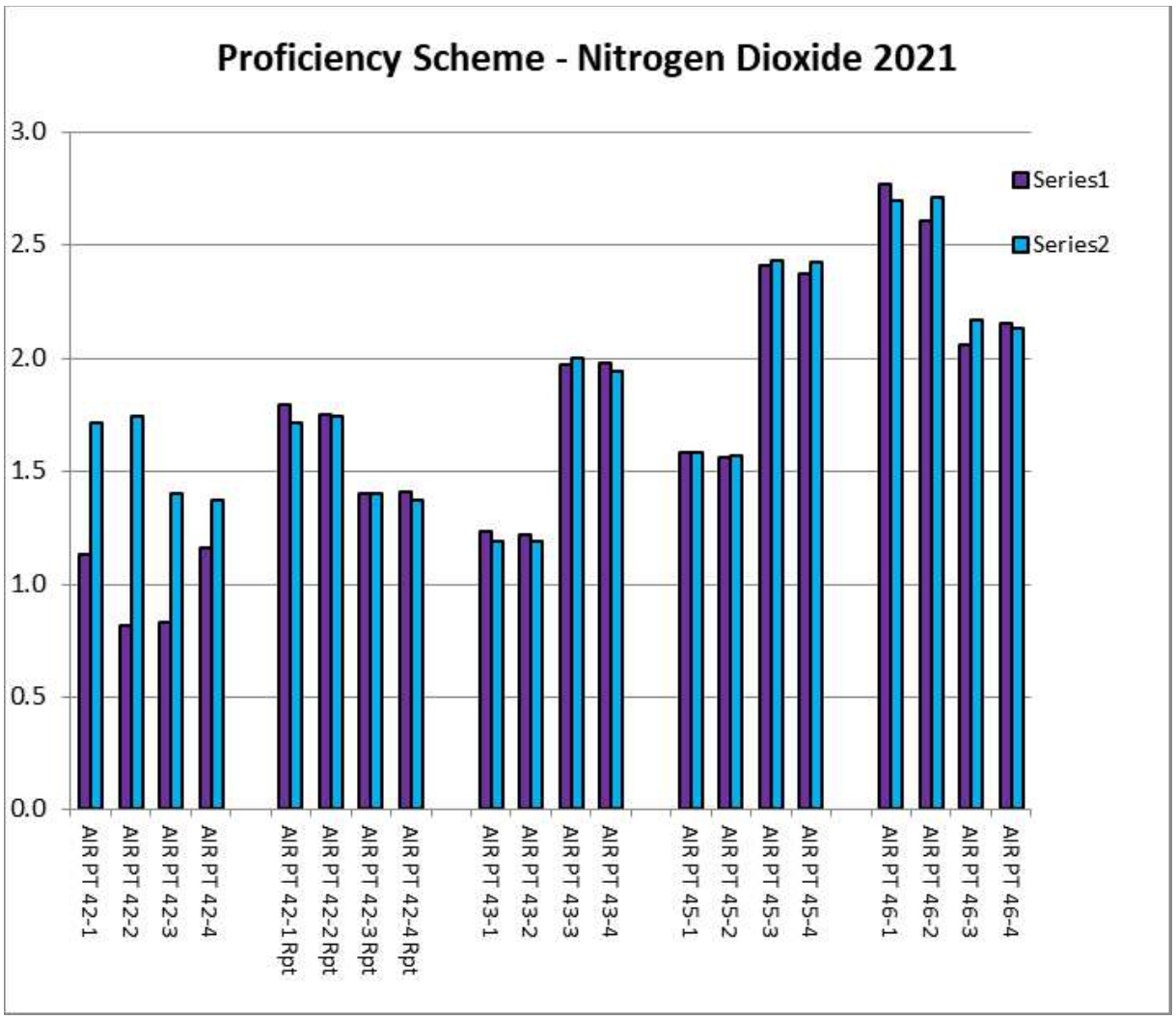
Diffusion tubes were analysed by Gradko Services using 20% triethylamine in water.

Gradko have confirmed that their laboratory complies with the procedures detailed in the DEFRA Harmonisation Practical Guidance and their AIR-PT results for 2021 were satisfactory.

AIR PT Nitrogen Dioxide Proficiency Scheme Results 2021

Methods: GLM 7 – CARY 60 Spectrophotometer

AIR PT Proficiency Scheme - Nitrogen Dioxide 2021					
Date			Procedure GLM 7		
	Round	Assigned value	Measured concentration	z-Score	% Bias
Feb-21	AIR PT 42-1	1.71	1.13	-4.17	-33.9%
Feb-21	AIR PT 42-2	1.74	0.81	-6.29	-53.4%
Feb-21	AIR PT 42-3	1.40	0.83	-5.43	-40.7%
Feb-21	AIR PT 42-4	1.37	1.16	-1.91	-15.3%
Mar-21	AIR PT 42-1 Rpt	1.71	1.79	0.62	4.7%
Mar-21	AIR PT 42-2 Rpt	1.74	1.75	0.08	0.6%
Mar-21	AIR PT 42-3 Rpt	1.40	1.40	0	0.0%
Mar-21	AIR PT 42-4 Rpt	1.37	1.41	0.39	2.9%
May-21	AIR PT 43-1	1.19	1.23	0.35	3.4%
May-21	AIR PT 43-2	1.19	1.22	0.26	2.5%
May-21	AIR PT 43-3	2.00	1.97	-0.2	-1.5%
May-21	AIR PT 43-4	1.94	1.98	0.26	2.1%
Aug-21	AIR PT 45-1	1.58	1.58	0	0.0%
Aug-21	AIR PT 45-2	1.57	1.56	-0.08	-0.6%
Aug-21	AIR PT 45-3	2.43	2.41	-0.08	-0.8%
Aug-21	AIR PT 45-4	2.42	2.37	-0.28	-2.1%
Oct-21	AIR PT 46-1	2.7	2.77	0.33	2.6%
Oct-21	AIR PT 46-2	2.71	2.6	-0.49	-4.1%
Oct-21	AIR PT 46-3	2.17	2.06	-0.65	-5.1%
Oct-21	AIR PT 46-4	2.13	2.15	0.13	0.9%



Diffusion Tube Annualisation

All diffusion tube monitoring locations within Antrim and Newtownabbey Borough Council recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

Antrim and Newtownabbey Borough Council have applied a national bias adjustment factor of 0.84 to the 2021 monitoring data. A summary of bias adjustment factors used by Antrim and Newtownabbey Borough Council over the past five years is presented in Table A.1.

In 2021 the diffusion tubes were analysed by Gradko Services using 20% TEA in water.

There are no co-located diffusion tubes at the inlet of the continuous monitor therefore the national bias adjustment factor was used. The laboratory bias correction factor was

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

The bias adjustment factor of 0.84 was calculated from 32 studies from Gradko Services for 2021 using the diffusion tube spreadsheet tool, for the diffusion tubes study.

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	Year[2]	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
2898	Gradko	20% TEA in water	2021	R	Gedling Borough Council	12	32	26	23.1%	G	**0.81**
2920	Gradko	20% TEA in water	2021	UB	West Northamptonshire Council	11	14	10	32.1%	G	**0.76**
2921	Gradko	20% TEA in water	2021	R	Ards and North Down Borough Council	10	30	22	38.4%	G	**0.72**
2922	Gradko	20% TEA in water	2021	R	Birmingham City Council	10	33	25	35.2%	G	**0.74**
2923	Gradko	20% TEA in water	2021	R	Cheshire West and Chester	12	34	29	14.1%	G	**0.88**
2924	Gradko	20% TEA in water	2021	R	Cheshire West and Chester	12	33	29	12.6%	G	**0.89**
2929	Gradko	20% TEA in water	2021	R	Lisburn & Castlereagh City Council	12	25	19	31.9%	G	**0.76**
2932	Gradko	20% TEA in water	2021	R	Nottingham City Council	12	32	35	-8.1%	G	**1.09**
2934	Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	32	5.2%	G	**0.95**
2935	Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	27	28.6%	G	**0.78**
2937	Gradko	20% TEA in water	2021	R	Bath & North East Somerset	12	31	27	15.1%	G	**0.87**
2938	Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	34	31	7.6%	G	**0.93**
2939	Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	19	17	11.7%	G	**0.90**
2940	Gradko	20% TEA in water	2021	R	Blackburn with Darwen Borough Council	12	27	20	32.3%	G	**0.76**
2941	Gradko	20% TEA in water	2021	R	Brent Council	12	51	46	9.9%	G	**0.91**
2946	Gradko	20% TEA in water	2021	R	Gateshead Council	10	23	19	23.8%	G	**0.81**
2947	Gradko	20% TEA in water	2021	R	Gateshead Council	12	25	22	13.7%	G	**0.88**
2948	Gradko	20% TEA in water	2021	R	Gateshead Council	11	27	25	9.8%	G	**0.91**
2949	Gradko	20% TEA in water	2021	R	Gateshead Council	12	31	25	26.6%	G	**0.79**
2950	Gradko	20% TEA in water	2021	R	Gateshead Council	12	32	34	-4.1%	G	**1.04**
2970	Gradko	20% TEA in water	2021	KS	Marylebone Road Intercomparison	11	53	42	25.0%	G	**0.80**
2976	Gradko	20% TEA in Water	2021	R	Monmouthshire County Concil	11	35	29	21.8%	G	**0.82**
2984	Gradko	20% TEA in water	2021	R	Belfast City Council	12	25	20	24.3%	G	**0.80**
2985	Gradko	20% TEA in water	2021	UC	Belfast City Council	12	25	20	28.5%	G	**0.78**
2986	Gradko	20% TEA in water	2021	R	Belfast City Council	12	42	35	19.8%	G	**0.84**
2987	Gradko	20% TEA in water	2021	R	Belfast City Council	12	38	27	39.4%	G	**0.72**
2988	Gradko	20% TEA in water	2021	UB	Dudley MBC	12	20	15	36.0%	G	**0.74**
2989	Gradko	20% TEA in water	2021	R	Dudley MBC	12	30	29	4.2%	G	**0.96**
2990	Gradko	20% TEA in water	2021	R	Dudley MBC	12	42	40	5.5%	G	**0.95**
2991	Gradko	20% TEA in Water	2021	R	Lambeth	10	91	62	46.6%	G	**0.68**
2992	Gradko	20% TEA in water	2021	R	Lancaster City Council	13	38	32	18.4%	G	**0.84**
2993	Gradko	20% TEA in water	2021	R	Lancaster City Council	13	28	27	4.9%	G	**0.95**
3349	Gradko	20% TEA in water	2021		**Overall Factor[3] (32 studies)**				**Use**		**0.84**

Table A.1 - Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	**Adjustment Factor**
2021	National	03/22	0.84
2020	National	09/20	0.81
2019	National	06/19	0.92
2018	National	09/18	0.93
2017	National	06/17	0.89

NO_2 Fall-off with Distance from the Road

Diffusion Tube 58- Lamp post Antrim Road

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.7	metres
Step 2	How far from the KERB is your receptor (in metres)?	4.7	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	9.922737	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	31.22	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	26.3	µg/m^3

QA/QC of Automatic Monitoring

In 2021 Air Quality Data Management for the Automatic Analyser was carried out by Air Quality Data Management (AQDM). The measured data was ratified using the techniques developed for the AURN and AEA Calibration Club as specified in LAQM TG(16). Bi-annual Quality Control audits were carried out by NPL.

Routine calibration of the NOx analyser is undertaken by Antrim and Newtownabbey Borough Council fortnightly, using on-site certified calibration gas cylinders traceable to National Calibration Standards. The data capture was 98.3% in 2021.

The 2021 summary for the Antrim Road, Elmfield monitor is provided below:

Air Quality Report

NEWTOWNABBEY ANTRIM ROAD 2021

Air Quality Statistics

Pollutant	NO_2	NO	NO_X
Number Very High #	0	-	-
Number High #	0	-	-
Number Moderate #	0	-	-
Number Low #	8613	-	-
Maximum 15-min mean	178 µg m^{-3}	446 µg m^{-3}	711 µg m^{-3}
Maximum hourly mean	157 µg m^{-3}	390 µg m^{-3}	614 µg m^{-3}
Maximum running 8-hr mean	118 µg m^{-3}	187 µg m^{-3}	405 µg m^{-3}
Maximum running 24-hr mean	78 µg m^{-3}	133 µg m^{-3}	231 µg m^{-3}
Maximum daily mean	72 µg m^{-3}	112 µg m^{-3}	216 µg m^{-3}
Average	30 µg m^{-3}	31 µg m^{-3}	77 µg m^{-3}
Data capture	98.3 %	98.3 %	98.3 %

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}	30 µg m^{-3}	0	-	-	No
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	157 µg m^{-3}	0	0	18 hours	No

Air Quality Report

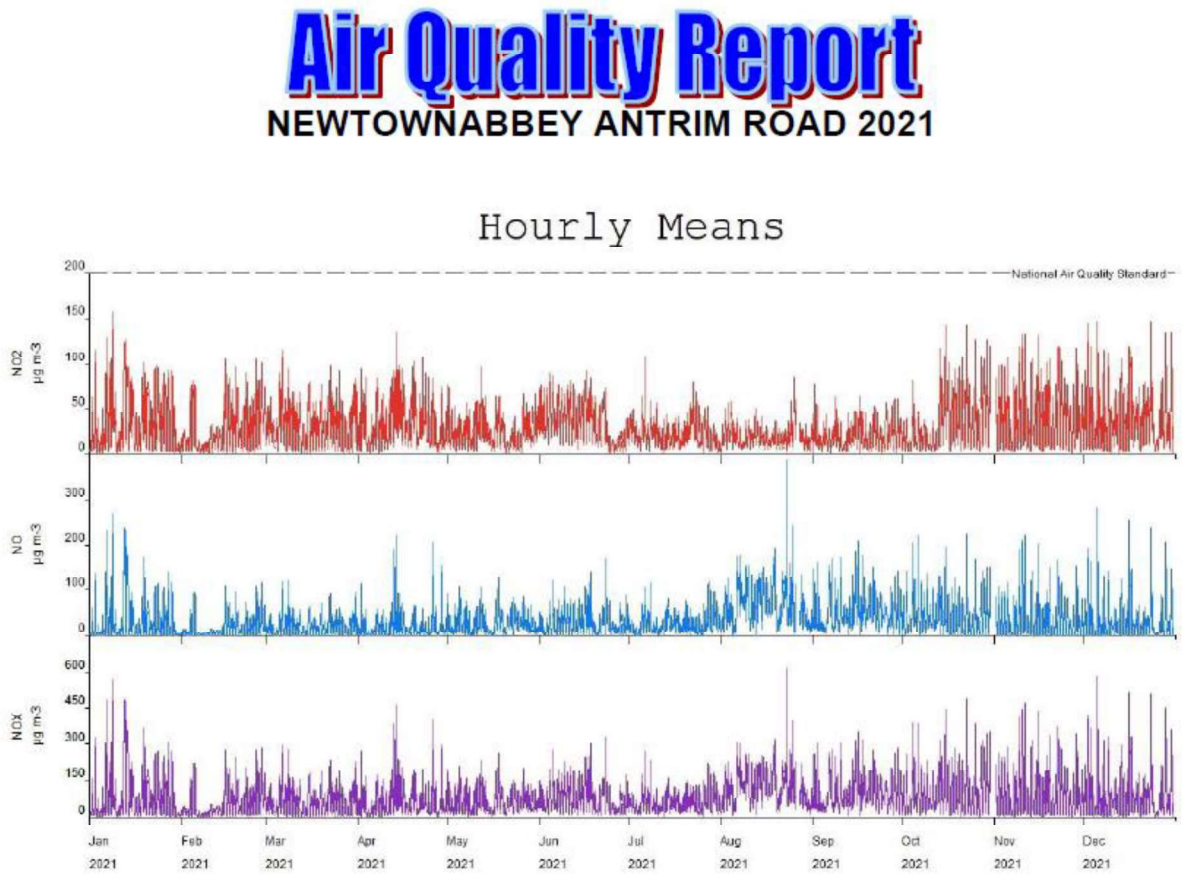
NEWTOWNABBEY ANTRIM ROAD 2021

Monthly Data Captures %

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nitrogen Dioxide	99.5	100.0	98.8	99.9	99.5	98.6	98.7	95.0	98.9	95.4	98.3	97.6

Monthly Means

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nitrogen Dioxide µg m^{-3}	32	26	31	32	24	35	22	19	21	34	41	39



NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Antrim and Newtownabbey required distance correction during 2021

Table A.2 - NO_2 Fall-off with Distance Calculations (concentrations presented in µg/m³)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted)	Background Concentration	Concentration Predicted at Receptor	Comments
58	1.7	4.7	31.22	9.922737	26.3	

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 continued to present 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, it has 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.

Antrim and Newtownabbey maintained diffusion tube monitoring during 2021. Automatic air quality monitoring sites were also maintained. No additional monitoring was carried out in 2021

Results from 2021 would indicate that air quality is starting to return gradually to pre COVID-19 levels.

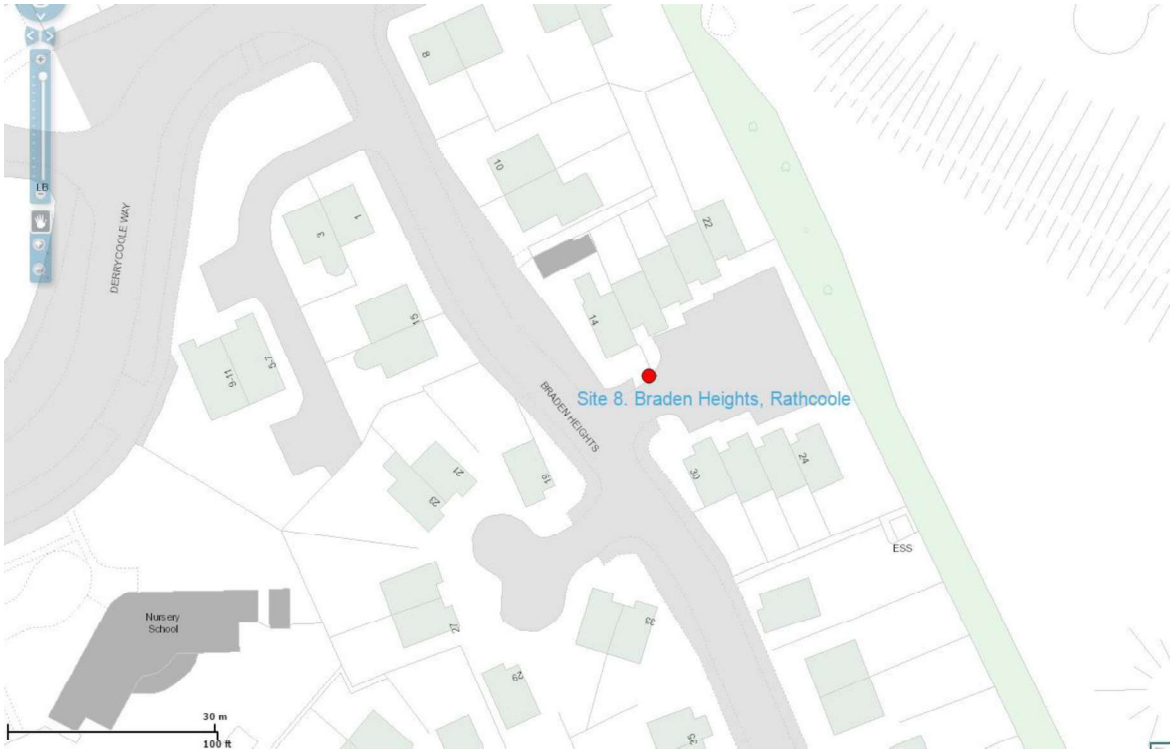
Appendix C: Location of AQMA

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

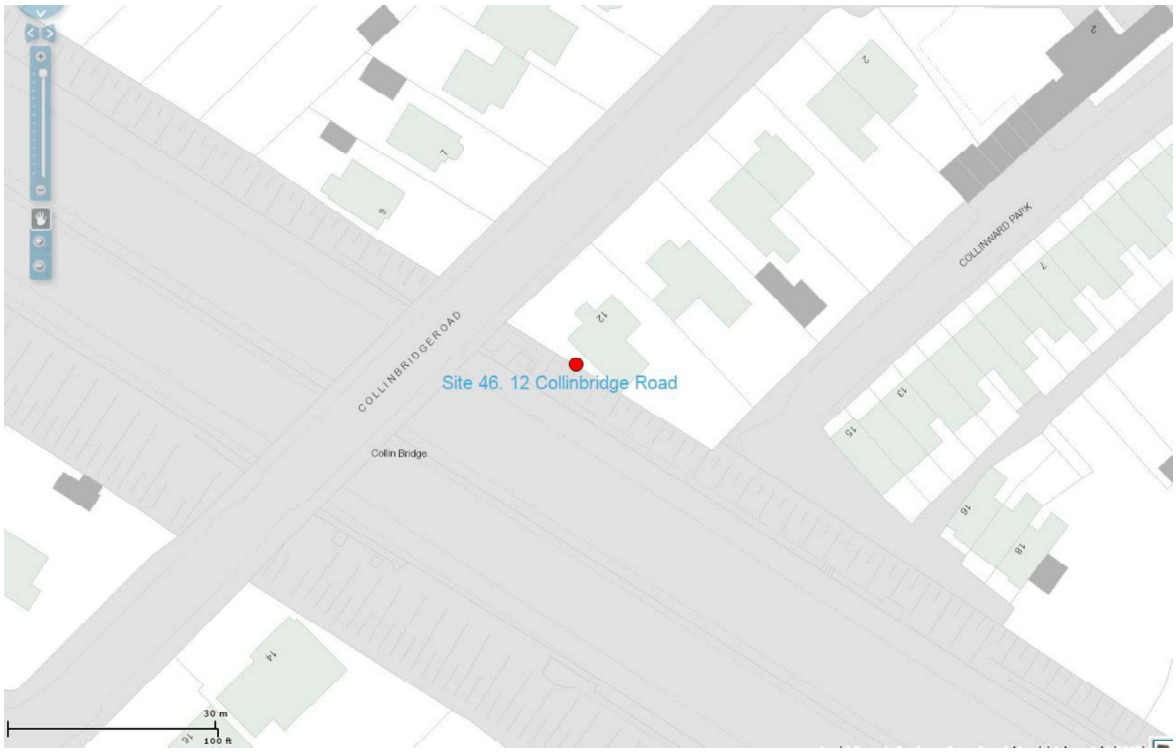
Appendix D: Location of Monitoring Sites

Diffusion Tube sites

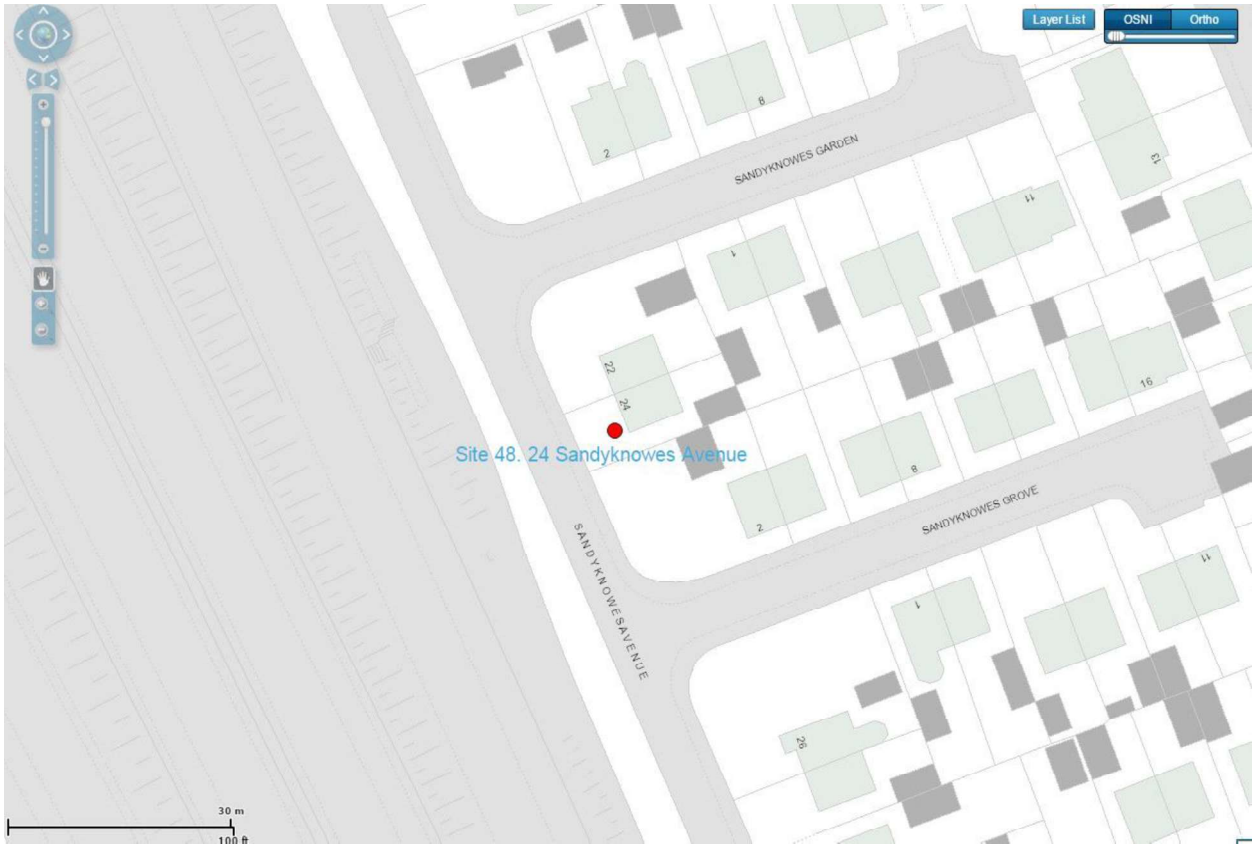
Site 8 -Braden Heights, Rathcoole



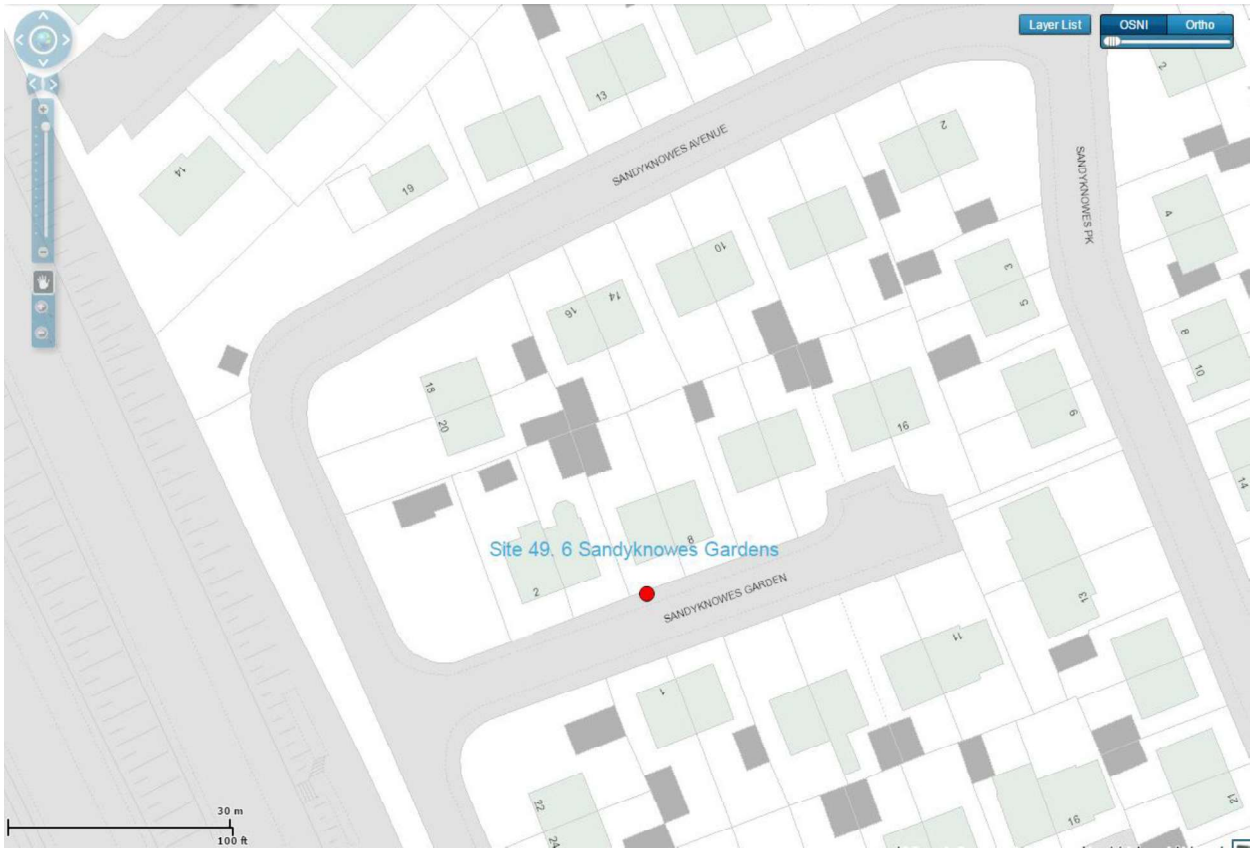
Site 46 - 12 Collinbridge Road



Site 48 - 24 Sandyknowes Avenue



Site 49 - 6 Sandyknowes Gardens



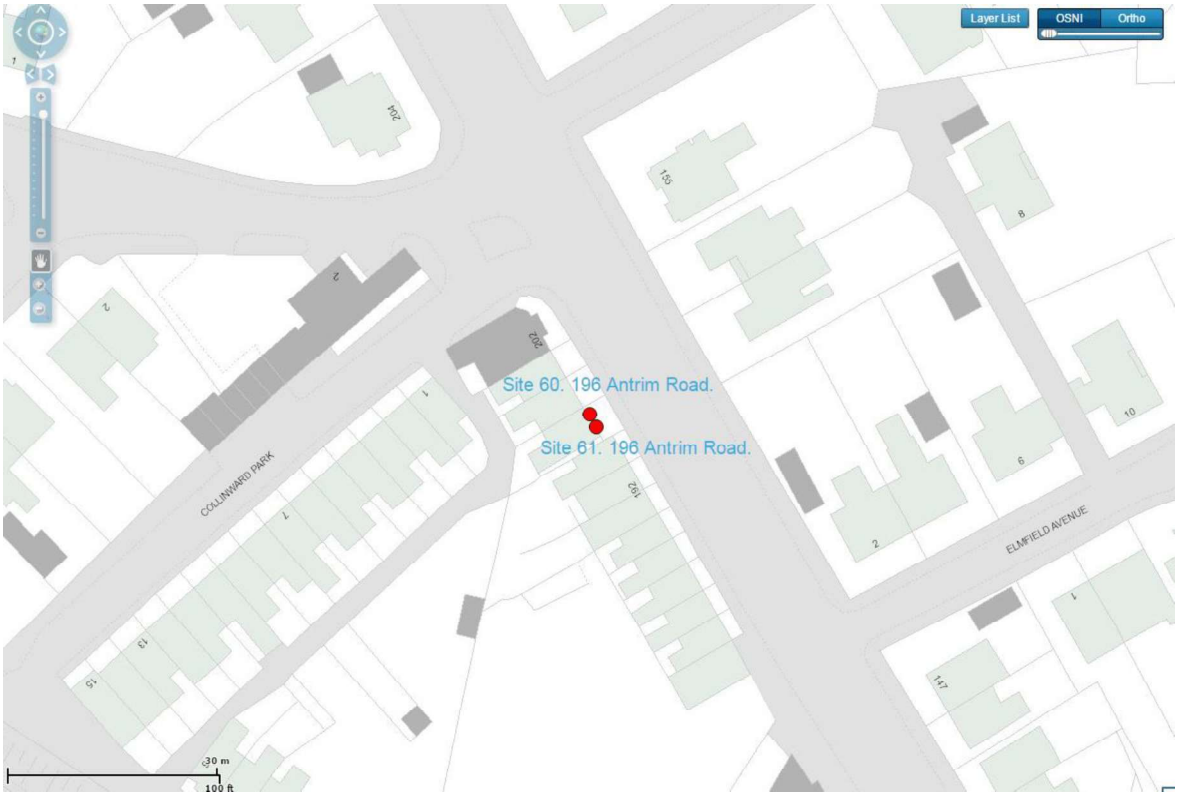
Site 58 - 198 Antrim Road

Site 62 Whiteabbey Village (commenced June 2019)

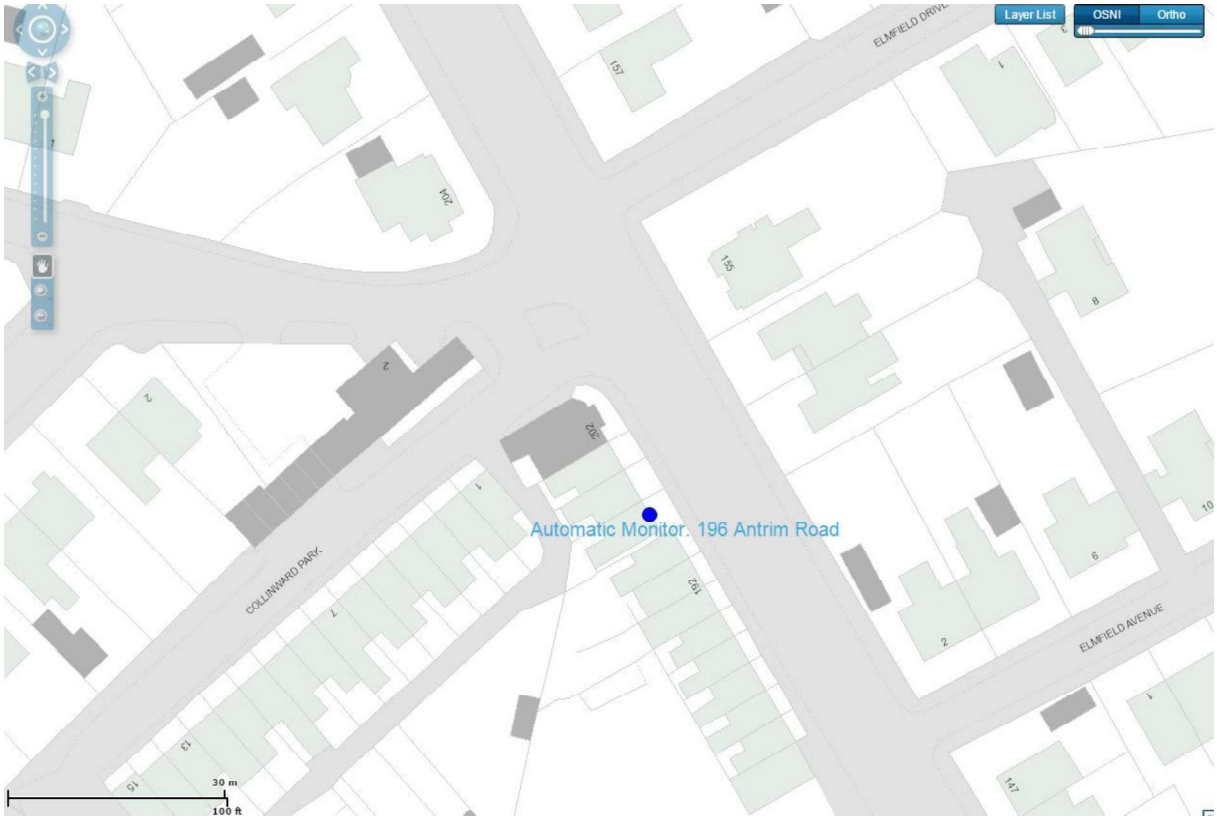
Old Manse Road, Whiteabbey

LOUGHSHORE COURTYARD
LOUGHSHORE COURTYARD
Jordanstown Private Nursing Home
OLD MANSE COURT
THE CEDARS
The Cedars
The Firs
SEQUOIA HEIGHTS
Old Manse Road, Whiteabbey
GLENAVNA MANOR
The Pines
THE PINES
SHORE ROAD
Whiteabbey Presb Ch

Site 60 and Site 61 -196 Antrim Road



Automatic Monitoring Site -196 Antrim Road



Appendix E: Monthly Diffusion Tube Results 2021

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1		Location	Grid Ref	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Average	Bias Adjustment Factor 0.84
2	Site 8	Braden Hei	339819	22.18	18.58	11.89	12.94	11.83	9.03	13.42	13.52	16.9	15.71	15.95	20.25	15.18	12.75
3	Site 58	Lampost at	323817	40.56	35.78	37.48	35.98	38.47	27.8	30.73	35.55	43.95	43.56	37.65	38.49	37.17	31.22
4	Site 46	12 Collinbri	322817	31.27	29.11	28.79	31.06	33.84	20.99	33.46	35.41	36.52	34.87	35.22	31.98	31.88	26.78
5	Site 48	24 Sandykn	306827	38.73		39.31	30.77	29.87	25.61	29.09	29.44	40.77	43.27	43.3	36.41	35.14	29.52
6	Site 49	6 Sandyknc	306827	30.85	21.27	26.42	22.54	21.90	17.92	20.58	21.26	29.60	29.14	33.46	27.70	25.22	21.18
7	Site 60	On downpipe	196 Antri	36.61	29.68	34.54	32.09	34.32	28.66	30.56	34.35	39.61	40.56	41.09	38.07	35.01	29.41
8	Site 61	On downpipe	196 Antri	31.06	30.27	34.92	33.4	32.7	24.47	30.17	34.49	42.94	40.11	42.06	37.79	34.53	29
9	Site 62	On lamppost in Whiteal		25.38	25.87	21.62	18.12	18.06	16.42	18.59	19.09	22.97	26.12	25.37	23.08	21.72	18.24
10																	