Armagh City, Banbridge and Craigavon Borough Council

2019 Air Quality Progress Report

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

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Executive Summary

This report provides an update on the local air quality monitoring undertaken within the Borough and as part of the UK AURN network. The new data presented deals with the period from 2018 to 2022. Local authority monitoring continued throughout this period but local authority resources were reallocated to covid-response and recovery works in support of our communities and businesses during 2020, 2021 and 2022 and hence annual reporting was delayed. However, during this period the Council declared a 'Climate Emergency' in response to emissions of gases responsible for global warming, debated and provided consultation responses to public discussion papers and consultations on the Environment Strategy for NI and the NI Clean Air Strategy as well as agreeing a new Air Quality Action Plan for the Borough.

Local air quality monitoring for a range of air-borne pollutants which are harmful to health has continued from 2018 to 2023 using a network of passive diffusion tubes and one monitoring station (Lonsdale Road, Armagh) which forms part of a UK National Network. Whilst air pollution can be caused by a variety of sources, of the pollutants monitored by the Council, it is nitrogen dioxide from traffic emissions that continues to be the most significant cause of concern. In 2022 we have sought to expand our knowledge of polyaromatic hydrocarbon emissions following on from concerns raised by Government in relation to solid-fuel use for heating in NI. We are still observing a marked decrease in nitrogen dioxide emissions following covid which is highly likely to be due in part to the change in working patterns (as well as improving vehicle emissions standards and the penetration of electric vehicles into the NI fleet).

This Progress Report shows that nitrogen dioxide emissions have reduced from 2020. Delineation work undertaken to determine the extent of objective exceedances in Tandragee and Greenpark Terrace, Armagh (as well as the area of concern in Gilford) have indicated that the highest concentrations are extremely localized in the vicinity of traffic management infrastructure, narrow streets or topography and are not indicative of wide-spread pollution (as defined by an exceedance of the objective) in the area.

The Council are publishing this updated suite of data and welcome any comments or feedback from residents or interested stakeholders. The Council do not intend to revoke the AQMA at this stage. The Council's Action Plan focusses on the reduction of unnecessary nitrogen dioxide emissions across the Borough as a whole and across NI as a region. We believe this aligns closely with the Council's declaration of a Climate Emergency and the strategy and policies being developed to meet 'net zero' targets by 2050. Furthermore we believe that revoking the AQMA would be premature in the absence of a NI Clean Air Strategy and NI Energy Strategy (which it is hoped will provide a clear and supported route-map to reducing emission potential across Northern Ireland).

At the end of this document an updated review of the Council's Air Quality Action Plan is provided.

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1 Introduction

1.1 Description of Local Authority Area

The Borough is a beautiful rural, historic area served by the main motorway network in Northern Ireland, with major road links to the business capitals of Belfast and Dublin. Armagh City. Banbridge and Craigavon Borough has a mixture of heavy industry, services such as local government, the local education authority, health and social services, retail and agriculture. The greatest contribution to air quality pollution in the Borough is from road traffic, particularly in the city/town centres of Armagh, Portadown and Lurgan where the road network is frequently congested. Given the size of the rural hinterland, public transport options are limited and there is a greater tendency to rely on the private car as the primary means of transport. The road network within the Borough is regarded as a route hub to the border with the Republic Of Ireland and is a main through-route between mid-Ulster and the south-east of Northern Ireland and hence has a traffic flow higher than that which could be created by local traffic alone. Particulate Matter (PM_{10}) and NO_2 would be considered as the pollutants most at risk of breaching the objective limits in the Borough as a result of road traffic.

Domestic fuel usage throughout the Borough has historically been based on solid fuel/oil with limited use of gas. As within the province generally, the use of coal is declining although a trend of secondary or primary heating using wood or multi-fuel burning stoves is apparent giving rise to additional air quality concerns.

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 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.

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

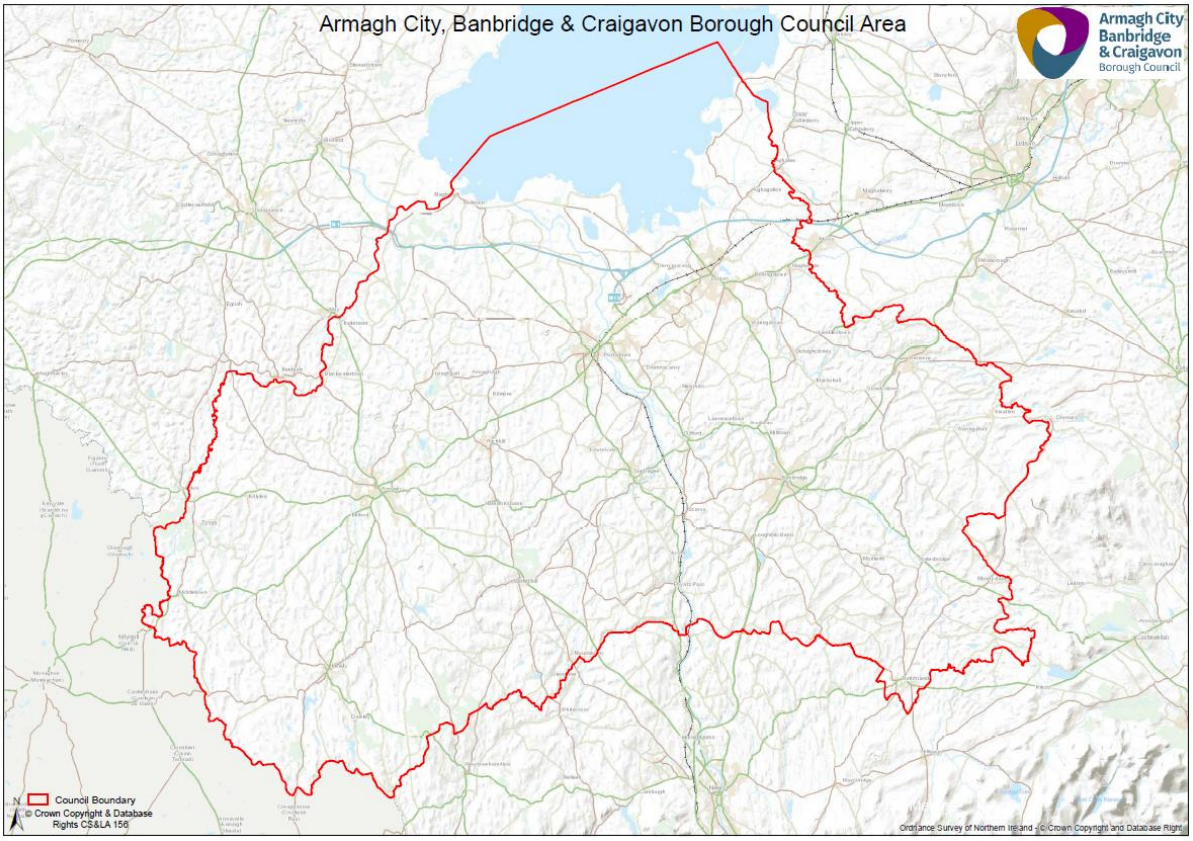
Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	3.25 µg/m^3	Running annual mean	31.12.2010
1,3-butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 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

Report Type	Date	Exceedences	Detailed Assessment Required	AQMA's Declared
Initial Review and Assessment	Jan 2001	None	No	None
Progress Report	April 2005	None	No	None
Updating & Screening Assessment	April 2006	None	No	None
Progress Report	April 2007	None	No	None
Detailed Assessment for NO_2	Nov 2007	None	No	None
Progress Report	April 2008	NO_2	No	Yes
Updating & Screening Assessment	April 2009	NO_2	No	In the previous year
Progress Report	May 2010	NO_2	Yes	None
Progress Report	May 2011	NO2	No	Yes
Updating and Screening Assessment	April 2012	NO2	No	Yes
Progress Report	April 2013	NO2	No	No
Progress Report	April 2014	NO2	No	No new AQMAs
Updating and Screening Assessment	April 2015	NO2	Yes	No new AQMAs
Progress Report & DA (hereby presented)	April 2016 (May 2017)	NO2	Yes	To be declared
Progress Report	August 2017	NO2	Yes	Declaration prepared
Update and Screening Assessment	October 2018	NO2	No	Borough-wide declaration made

Progress Report	2019	NO2	No	Borough declared

Figure 1.1 – Map(s) of AQMA Boundaries



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

One automatic site is located at Lonsdale Road in Armagh and forms part of the AURN network and provides information for the draft Programme for Government Air Quality Indicator.

Figure 2.1 – Map(s) of Automatic Monitoring Sites

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? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
AURN1	Lonsdale Road	287520	345840	NO2 & PM10	Y	FDMS	(20m)	3m	Y

2.1.2 Non-Automatic Monitoring Sites

During 2018 – 2022 Armagh City, Banbridge and Craigavon Borough Council carried out monitoring of NO_2 by diffusion tubes at 28 sites within the Borough.

2.1.2.1 QA/QC

The NO2 diffusion tubes were prepared and analysed by Gradko.

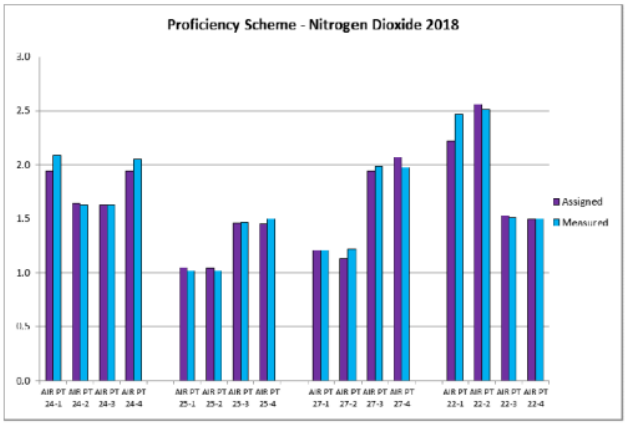
2.1.2.2 Preparation method used

Gradko - Nitrogen dioxide in diffusion tubes by UV spectrophotometry. Tubes were prepared in 20% TEA/ Water. Analysed on UV 04 Camspec M550. The Overall M.U. is 7.8% +/- and the Limit of Detection 0.017ug NO2. This anaylsis was in accordance with the Gradko documented in-house laboratory method GLM7.

2.1.2.3 Results of laboratory precision

AIR PT Nitrogen Dioxide Proficiency Scheme Results 2018
Methods: GLM 7 – CARY 60 Spectrophotometer
AIR PT Proficiency Scheme - Nitrogen Dioxide 2018

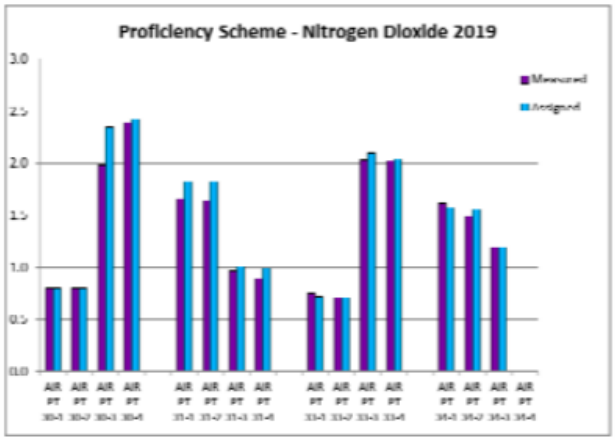
AIR PT Proficiency Scheme - Nitrogen Dioxide 2018					
Date	Round	Assigned value	Procedure GLM 7		
			Measured concentration	z-Score	% Bias
Feb-18	AIR PT 24-1	2.09	1.94	-0.91	-7.2%
Feb-18	AIR PT 24-2	1.63	1.64	0.08	0.6%
Feb-18	AIR PT 24-3	1.63	1.63	0	0.0%
Feb-18	AIR PT 24-4	2.05	1.94	-0.72	-5.4%
May-18	AIR PT 25-1	1.02	1.05	0.39	2.9%
May-18	AIR PT 25-2	1.02	1.04	0.26	2.0%
May-18	AIR PT 25-3	1.47	1.46	-0.09	-0.7%
May-18	AIR PT 25-4	1.5	1.45	-0.44	-3.3%
Aug-18	AIR PT 27-1	1.21	1.21	0.00	0.0%
Aug-18	AIR PT 27-2	1.22	1.13	-0.99	-7.4%
Aug-18	AIR PT 27-3	1.99	1.94	-0.34	-2.5%
Aug-18	AIR PT 27-4	1.98	2.07	0.60	4.5%
Oct-18	AIR PT 22-1	2.47	2.22	-1.35	-10.1%
Oct-18	AIR PT 22-2	2.51	2.56	0.27	2.0%
Oct-18	AIR PT 22-3	1.51	1.53	0.18	1.3%
Oct-18	AIR PT 22-4	1.5	1.49	-0.1	-0.7%



AIR PT Nitrogen Dioxide Proficiency Scheme Results 2019

Methods: GLM 7 – CARY 60 Spectrophotometer

AIR PT Proficiency Scheme - Nitrogen Dioxide 2019					
Date	Round	Assigned value	Procedure GLM 7		
			Measured concentration	z-Score	% Bias
Feb-19	AIR PT 30-1	0.8	0.8	0	0.0%
Feb-19	AIR PT 30-2	0.8	0.8	0	0.0%
Feb-19	AIR PT 30-3	2.35	1.98	-2.1	-15.7%
Feb-19	AIR PT 30-4	2.42	2.39	-0.16	-1.2%
May-19	AIR PT 31-1	1.82	1.65	-1.24	-9.3%
May-19	AIR PT 31-2	1.82	1.64	-1.31	-9.9%
May-19	AIR PT 31-3	1.01	0.97	-0.53	-4.0%
May-19	AIR PT 31-4	0.99	0.89	-1.35	-10.1%
Aug-19	AIR PT 33-1	0.72	0.75	0.56	4.2%
Aug-19	AIR PT 33-2	0.71	0.71	0	0.0%
Aug-19	AIR PT 33-3	2.09	2.03	-0.38	-2.9%
Aug-19	AIR PT 33-4	2.04	2.02	-0.13	-1.0%
Oct-19	AIR PT 34-1	1.57	1.61	0.38	2.5%
Oct-19	AIR PT 34-2	1.56	1.49	-0.56	-4.5%
Oct-19	AIR PT 34-3	1.19	1.19	0	0.0%
Oct-19	AIR PT 34-4	Sample wasted not submitted			



Precision Summary Table

Diffusion Tube Preparation Method	2020 Good	2020 Bad	2021 Good	2021 Bad	2022 Good	2022 Bad
Gradko, 50% TEA in Acetone	19	1	16	0	14	0
Gradko, 20% TEA in Water	27	0	34	0	27	0

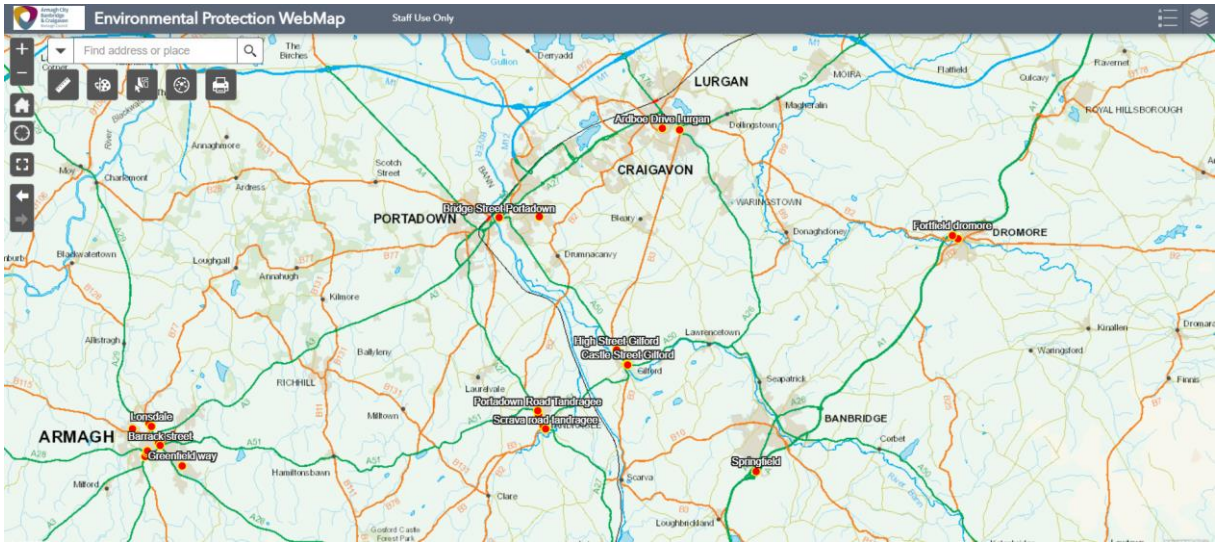
2.1.2.4. The bias adjustment factor being applied to the annual means from the diffusion tubes

The NO_2 diffusion tubes were prepared and analysed by Gradko. The Council obtained the appropriate bias factor from the DEFRA Website.

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

Gradko	20% TEA in water	2017		**Overall Factor3 (39 studies)**	**Use**	**0.87**
Gradko	20% TEA in water	2018		**Overall Factor3 (40 studies)**	**Use**	**0.92**
Gradko	20% TEA in water	2019		**Overall Factor3 (31 studies)**	**Use**	**0.91**
Gradko	20% TEA in water	2020		**Overall Factor3 (27 studies)**	**Use**	**0.81**
Gradko	20% TEA in water	2021		**Overall Factor3 (34 studies)**	**Use**	**0.84**
Gradko	20% TEA in water	2022		**Overall Factor3 (27 studies)**	**Use**	**0.83**

Figure 2.2 – Map(s) of Non-Automatic Monitoring Sites



Site Name	SiteType	x	y
Ardboe Drive Lurgan	Urban Background	-6.3335018	54.4573701
Ballyhannon Road	Urban Background	-6.411115	54.42664
Barrack street	Roadside	-6.6493291	54.3466359
Bridge Street Portadown	Roadside	-6.4360087	54.4265305
Castle Street Gilford	Roadside	-6.358574	54.3722754
Church Road Dromore	Roadside	-6.1521407	54.4149994
Church street tandragee	Roadside	-6.414741	54.3550848
Desaert lane	Urban Background	-6.6659737	54.3530617
Flush Place Lurgan	Roadside	-6.3227562	54.4567986
Fortfield dromore	Urban Background	-6.1553061	54.416127
Greenfield way	Urban Background	-6.6355648	54.3393258
Greenpark terrace	Roadside	-6.6577487	54.3441884
High Street Gilford	Roadside	-6.3654988	54.3777238
Irish Street	Roadside	-6.6585615	54.3428862
Lonsdale x 3 TRIPLICATE	Roadside	-6.6545402	54.3537507
Mall west	Roadside	-6.650022	54.3475479
Market Street Tandragee	Roadside	-6.412982299	54.353035
Mill st Gilford	Roadside	-6.3593652	54.3726929
Mill Street Tandragee x3 TRIPLICATE	Roadside	-6.411746591	54.35104843
Portadown Road Tandragee	Roadside	-6.4149751	54.3564174
Railway street	Roadside	-6.6557012	54.3548397
Scrava road tandragee	Roadside	-6.410403425	54.34971967
Springfield	Urban Background	-6.2804534	54.332694
Upper Irish Street	Roadside	-6.6570051	54.3449282

Table 2.2 – Details of Non- Automatic Monitoring Sites

Site Id	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height	Pollutants Monitored	In AQMA?	Is monitoring co-located with a continuous analyser? Y/N	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent Worst-case exposure?
1	Ardboe Drive Lurgan	Urban background	-6.3335018	54.4573701	2m	NO2	Y	Y	Y (1m)	3m	Y
2	Ballyhannon Road	Urban background	-6.411115	54.42664	2m	NO2	Y	N	Y (5m)	4m	Y
3	Barrack street	Roadside	-6.6493291	54.3466359	2m	NO2	Y	N	Y(1m)	3m	Y
4	Bridge Street Portadown	Roadside	-6.4360087	54.4265305	2m	NO2	Y	N	Y(1m)	1m	Y
5	Castle Street Gilford	Roadside	-6.358574	54.3722754	2m	NO2	Y	N	Y(1m)	1m	Y
6	Church Road Dromore	Roadside	-6.1521407	54.4149994	2m	NO2	Y	N	Y(1m)	1m	Y
7	Church street tandragee	Roadside	-6.414741	54.3550848	2m	NO2	Y	N	Y(1m)	1m	Y
8	Desart lane	Urban background	-6.6659737	54.3530617	2m	NO2	Y	N	Y(5m)	1m	Y
9	Flush Place Lurgan	Roadside	-6.3227562	54.4567986	2m	NO2	Y	N	Y(1m)	2m	Y
10	Fortfield dromore	Urban Background	-6.1553061	54.416127	2m	NO2	Y	N	Y(5m)	5m	Y
11	Greenfield way	Urban Background	-6.6355648	54.3393258	2m	NO2	y	N	Y(5m)	2m	Y
12	Greenpark terrace	Roadside	-6.6577487	54.3441884	2m	NO2	Y	N	Y(<m)	1m	Y
13	High Street Gilford	Roadside	-6.3654988	54.3777238	2m	NO2	Y	N	Y(1m)	1m	Y
14	Irish Street	Roadside	-6.6585615	54.3428862	2m	NO2	Y	N	Y(1m)	1m	Y

15, 16 & 17	Lonsdale x 3 TRIPLICATE	Roadside	-6.6545402	54.3537507	2m	NO2	y	N	Y(15m)	2m	Y
18	Mall west	Roadside	-6.650022	54.3475479	2m	NO2	Y	N	Y(1m)	1m	Y
19	Market Street Tandragee	Roadside	-6.412982299	54.353035	2m	NO2	Y	N	Y (1m)	1m	Y
20	Mill st Gilford	Roadside	-6.3593652	54.3726929	2m	NO2	Y	N	Y (1m)	1m	Y
21, 22 & 23	Mill Street Tandragee x3 TRIPLICATE	Roadside	-6.411746591	54.35104843	2m	NO2	Y	N	Y (1m)	1m	Y
24	Portadown Road Tandragee	Roadside	-6.4149751	54.3564174	2m	NO2	Y	N	Y (1m)	1m	Y
25	Railway street	Roadside	-6.6557012	54.3548397	2m	NO2	Y	N	Y (1m)	1m	Y
26	Scrava road tandragee	Roadside	-6.410403425	54.34971967	2m	NO2	Y	N	Y (1m)	1m	Y
27	Springfield	Urban background	-6.2804534	54.332694	2m	NO2	Y	N	Y (5m)	5m	Y
28	Upper Irish Street	Roadside	-6.6570051	54.3449282	2m	NO2	Y	N	Y (1m)	1m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

Automatic Monitoring Data

The AURN site at Lonsdale Road has continued to be supported by DAERA and hence is maintained by ACBCBC to provide data to support the draft Programme for Government (Northern Ireland) air quality indicator.

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 % [a]	Valid Data Capture 2018 % [b]	Annual Mean Concentration (µg/m^3)				
					2014* [c]	2015* [c]	2016* [c]	2017* [c]	2018 [c]
AURN1	Roadside	Y	94	94	28	28	21	24	25

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

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

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

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

* Annual mean concentrations for previous years are optional

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 2018 % [b]	Number of Hourly Means > 200µg/m^3				
					2014* [c]	2015* [c]	2016* [c]	2017* [c]	2018 [c]
AURN1	Roadside	Y	94	94	0	0	0	0	0

In bold, exceedence of the NO_2 hourly mean AQS objective (200µg/m^3 – 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 exceedences for previous years is optional

Diffusion Tube Monitoring Data

The following table details the monitoring locations and results.

Key findings in 2018:

The general trend in nitrogen dioxide concentrations is downward without any large scale, local public sector investment.

Greenpark Terrace in Armagh remains above the objective value, albeit by a small amount.

The additional monitoring locations at Irish Street and Upper Irish Street at either side of the Greenpark Terrace location have indicated that the area of exceedance is very, very small comprising approximately 5 dwellings and likely due to the presence of the overpass at that precise location.

Mill Street in Tandragee remains above the objective value, again by a relatively small margin.

The additional monitoring in Tandragee has shown that the area of exceedance is very small and comprises approximately 10 dwellings. This is the point at which the road narrows, has a shop access and a steep incline.

Table 2.5 – Results of NO_2 Diffusion Tubes 2018

Location	µg/m³ *	µg/m³ *	µg/m³ *	µg/m³ *	µg/m³ *	µg/m³ *	µg/m³ *	µg/m³ *	µg/m³ *	µg/m³ *	µg/m³ *	µg/m³ *	Average	Adjusted	Arithmetic average where triplica	
	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18		(x0.92)		
Lonsdale Rd 1	39.99	38.11	31.75		31.90	25.17	28.42	28.23	33.96	40.45	39.06	35.88	33.90	31.19043841		
Lonsdale Rd 2	38.96	41.61	<0.33		31.11	25.11	28.90	28.47	29.48	42.40	43.18	39.52	31.73	29.19334839		
Lonsdale Rd 3	39.44	39.56	32.82		31.06	24.45	28.42	27.27	32.46	37.75	40.01	39.69	33.90	31.19077181	30.7	
Mall West 1	41.86	47.00	39.93		40.15	34.01	34.39	32.38	37.23	41.70	43.64	42.22	39.50	36.34052789		
Railway St 1	44.29	50.20	36.63		37.77	33.69	40.67	42.03		53.46	48.76	48.58	43.61	40.12010988		
Green Park Terrace 1	48.55	53.45	37.10		48.36	41.93	36.98	43.62	30.40	56.45	51.11	48.27	45.11	41.50263037		
Greenfield Way	12.88	16.77	<0.33		6.71	6.17	5.96	5.81	6.97	8.04	12.23	12.11	8.54	7.85913182		
Desert Lane	17.96	18.69	15.62		12.70	10.99	8.78	9.29	9.68	<0.61	32.29	19.48	14.19	13.05383391		
Mill St Tandragee 1	50.22	44.96	36.73		42.23	37.91	45.84	46.87	47.56	55.02	46.26	44.57	45.29	41.66307222		
Mill St Tandragee 2	49.79	55.27	<0.33		43.84	38.58	42.63	44.24	45.93	58.39	50.96	49.12	43.55	40.06891536		
Mill St Tandragee 3	45.98	54.53	39.00		46.37	37.87	46.02	40.89	48.98	58.82	51.68	42.59	46.61	42.88376898	42.8	
Barrack St	35.05	39.29	39.24		39.12	32.48	28.38	25.75	25.33	36.40		38.79	33.98	31.26469399		
Scarva Rd Tandragee	0.00	22.4	10.51		20.87	20.83	15.47	16.94	16.16	20.96	23.51	19.79	17.04	15.6770469		
Market St Tandragee	27.63	24.66	23.31		20.23	17.09	16.81	18.52	19.35	23.61	24.27	21.75	21.57	19.84087716		
Church St Tandragee	39.14	35.76	32.51		37.75	28.62	30.10	29.66	34.82	38.47	41.53	33.80	34.74	31.96323535		
Portadown Rd Tandragee	32.91	37.02	30.01		32.52	28.17	30.77	27.84	27.42	39.79	42.64	36.57	33.24	30.58246188		
Irish St Armagh	32.75	42.2	45.53		44.24	35.52	34.45	30.58	44.37	41.73	49.26	39.62	40.02	36.82083378		
Bridge St Portadown	39.15	36.66	36.79		37.42	31.98	37.65	35.99	40.23	39.73	45.40	38.49	38.14	35.08556296		
Ardboe Dr Lurgan	14.90	15.49	11.68		9.00	6.72	6.52	6.83	8.05	11.50	15.52	14.14	10.94	10.06595513		
Ballyhannon Rd	12.92	13.42	10.06		8.14	7.45	5.38	5.63	6.97	9.85	13.77	10.66	9.48	8.719907581		
Flush Place 1	38.38	39.8	25.17		32.49	27.65	33.53	29.12	35.67	34.37	27.93	37.79	32.90	30.26859348		
Springfields Banbridge	17.33	16.51	18.13		13.92	11.47	10.98	11.09	9.80	14.38	21.15	16.17	14.63	13.46014282		
Upper Irish St Armagh	44.84	48.19				32.88	30.17	28.14	32.01	41.36	43.98	40.17	37.97	34.93226382		
Fortfield Dromore	15.79	16.14	14.99		9.83	9.53	8.95	9.91	9.50	13.98	15.93	14.50	12.64	11.62874545		
Lurgan Rd Dromore	28.49	30.64	32.32		29.50	26.86	21.08	23.65	21.29	30.47	31.72	27.54	27.60	25.38925116		
Mill St Gilford	37.31	38.53	26.25		40.75	34.48	29.82	28.46	26.07	34.84	44.34	37.32	34.38	31.62789692		
High Street Gilford	26.49	26.58	41.93		15.40	20.93	17.16	18.13	17.89	24.54	25.93		23.50	21.6185904		
Castle Street Gilford **	28.56	25.02	24.83		24.68		18.36			24.78	27.94	24.14	26.52	24.3984		
** annualised	Ra =1.07															

In red, exceedance of the NO_2 annual mean AQS objective of 40µg/m^3

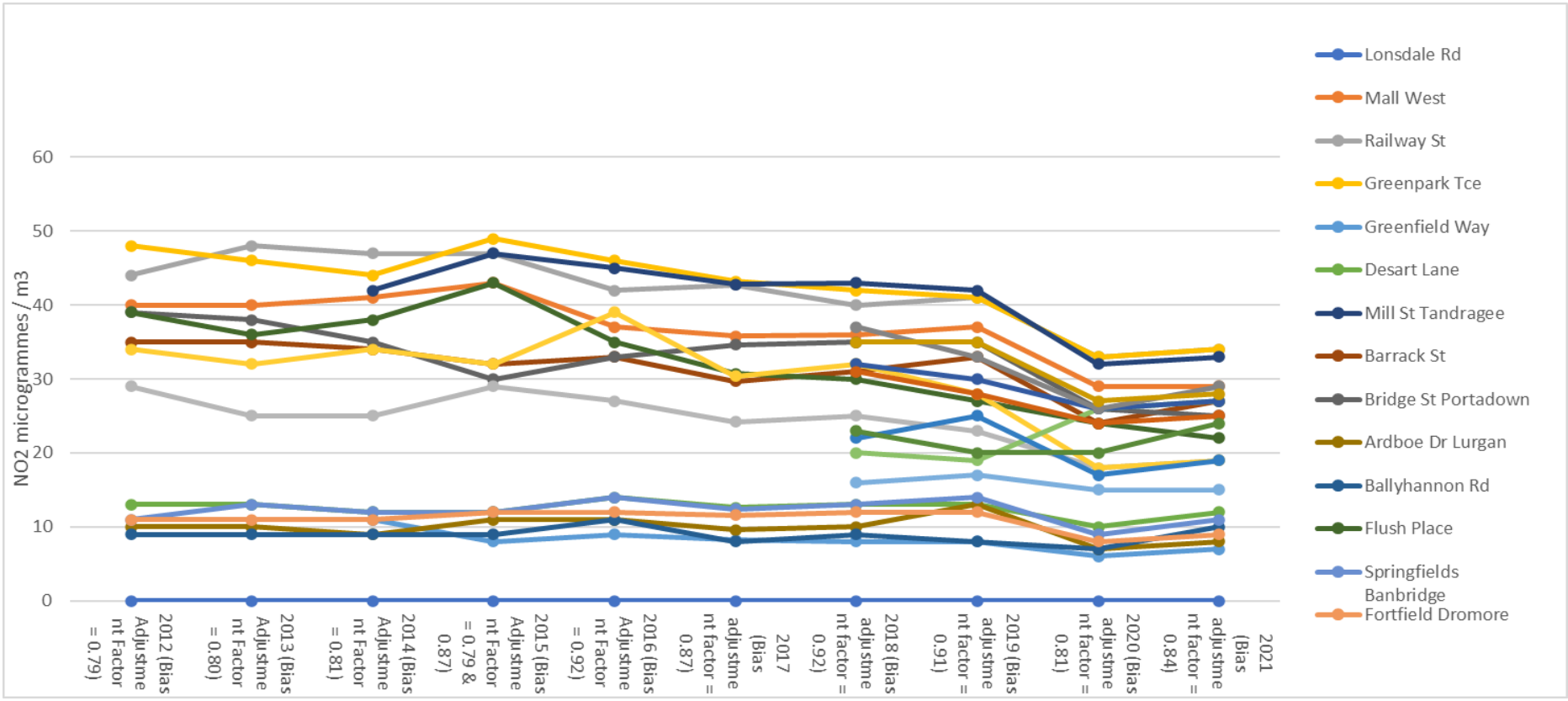
Underlined, annual mean > 60µg/m^3, indicating a potential exceedance of the NO_2 hourly mean AQS objective

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

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

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites

The following figure shows the most complete set of data available at the time of writing. The impact of covid-19 related restrictions can be clearly seen in 2020 with an increase in 2021. It is also notable that the Council introduced a series of new monitoring locations in 2018 hence why no trend analysis is available for those sites.



2.2.2 Particulate Matter (PM_{10})

Particulate matter is monitored at the Lonsdale Road AURN station wholly for the purposes of DAERA / DEFRA data collection. PM10 concentrations have never exceeded the objectives at this location despite its situation within an AQMA declared for traffic source NO2

The following tables provide information on particulate matter which is monitored at the automatic station on Lonsdale Road, Armagh only.

Table 2.6 – 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 2018 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)				
						2014* [c]	2015* [c]	2016* [c]	2017* [c]	2018 [c]
AURN 1	Roadside	Y	NA	95	Y	21	15	18	14	19

In bold, exceedance of the PM_{10} annual mean AQS objective of 40µg/m^3

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

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

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

* Annual mean concentrations for previous years are optional

Table 2.7 – 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 2018 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3				
						2014* [c]	2015* [c]	2016* [c]	2017* [c]	2018 [c]
AURN1	Roadside	Y	NA	95	Y	1	3	2	1	3

In bold, exceedance of the PM_{10} daily mean AQS objective (50µg/m^3 – not to be exceeded more than 35 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 data capture for full calendar year is less than 85%, include the 90.4th percentile of 24-hour means in brackets

* Number of exceedances for previous years is optional

2.2.3 Summary of Compliance with AQS Objectives

Armagh City, Banbridge and Craigavon Borough Council has examined the results from monitoring in the Borough.

Concentrations within the AQMA still exceed the objective for nitrogen dioxide in Armagh and Tandragee and the AQMA should remain.

This Borough takes an exposure reduction approach to Local Air Quality Management.

3 New Local Developments

Every development with an air quality impact potential consulted upon by the Planning Department is screened by Environmental Health.

3.1 Road Traffic Sources

No new road sources.

3.2 Other Transport Sources

No new transport sources.

3.3 Industrial Sources

A small pet crematorium in Lurgan was screened. Three quarry sites (extensions) were screened.

3.4 Commercial and Domestic Sources

Southern Regional College site in Armagh and Marlborough Retail Park in Craigavon were both screened and mitigation measures incorporated into the design. A new 'Game of Thrones' visitor attraction in Banbridge was also screened.

3.5 New Developments with Fugitive or Uncontrolled Sources

No new relevant developments.

Armagh City, Banbridge and Craigavon 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.

Armagh City, Banbridge and Craigavon 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 Local / Regional Air Quality Strategy

The Council is aware that Government intends to produce an Air Quality Strategy for Northern Ireland – we would strongly welcome such a strategy. This should sit along with an Energy Strategy and lead to a replacement for the Clean Air (NI) Order 1981 which takes the focus of enforcement away from furnaces and chimney heights to ensuring that biomass plant and transport emissions can be adequately considered.

5 Planning Applications

All relevant planning applications are screened by the Environmental Health Department and control measures are included to mitigate adverse impacts on local air quality following EPUK guidance.

6 Air Quality Planning Policies

The Council does not have any local planning policies related to air quality. Air quality gets some reference in the Strategic Planning Policy Statement for NI. The Council does not yet have a Local Development Plan.

7 Local Transport Plans and Strategies

Transport Plans and Strategies are a matter for central Government. The Council are aware of the Regional Development Strategy for Northern Ireland 2035 and its daughter strategies. The Council have responded to numerous consultations over recent years highlighting the need for greater public transport investment – including the re-establishment of rail links – as well as new roads and electric vehicle infrastructure. The Armagh rail link remains closed. The Armagh ring-road has not yet been planned. Development of electric vehicle infrastructure is slow.

8 Climate Change Strategies

Armagh City, Banbridge and Craigavon Borough Council has declared a ‘Climate Emergency’. As an organisation the Council has long-established environmental management systems. The Council is presently preparing (2023) a net zero roadmap which will address the climate change impact of activities throughout the Borough. Local Air Quality Management is recognised as congruent with the aims of the net zero strategy under development and the health benefits that can be realised through a reduction in fossil fuel combustions in local areas will be a positive selling point for any measures that may emerge.

9 Implementation of Action Plans

ACTION	LEAD	COUNCIL ACTION	WHEN
1. *Undertake sampling and analysis of solid fuel for sale within the Borough to address suspected non-compliance with the Sulphur Content of Solid Fuels Regulations*	*Armagh City Banbridge and Craigavon Borough Council*	*Participate in regional exercise to address suspected non-compliance. Advisory messages to import, supply and retail sectors. Test-purchasing to follow.*	*June 2023*
2. *Build a consensus for action to improve air quality throughout the Borough and nationally*	*Armagh City, Banbridge and Craigavon Borough Council*	*Annual reporting to Members Liaison with other Council Departments Liaison with central Government. Liaison with professional bodies and academics. Use of media requests/publicity to highlight air quality issues*	*2023 and annually thereafter*
3. *Road infrastructure development in*	*HM Treasury & Dfl. Mid South West region Growth Deal*	*Support and lobby for same Infrastructure development*	*On-going*

Armagh and improved rail connectivity for the Borough		***included in Regional Growth Deal.***	
4. ***Provision of new efficient public transport services for NI***	***HM Treasury & DfI***	***Support and lobby for same***	***On-going***
5. ***New Clean Air Order to address new emission sources including road traffic***	***UK Government & DAERA***	***Lobby for same***	***On-going***
6. ***New Air Quality Strategy for Northern Ireland***	***NI Executive & DAERA & Councils***	***Lobby for same***	***On-going***
7. ***New legislation to facilitate domestic users away from solid fuel heating where affordable and supported by other measures***	***NI Executive & DfE***	***Lobby for same***	***On-going***
8. ***Air pollution monitoring to provide evidence-base for policy change***	***Councils & DAERA***	***Deliver high quality monitoring and reporting***	***On-going***
9. ***Maintenance of AURN monitoring***	***Councils & DAERA***	***Deliver high quality monitoring and reporting***	***On-going***

station within the Borough for the purposes of UK compliance with Air Quality Standards			
10. ***Seek to expand monitoring network to include Poly Aromatic Hydrocarbon monitoring in Armagh as an indicator of household solid fuel emissions***	***Councils & DAERA***	***Deliver high quality monitoring and reporting***	***2023***
11. ***Emerging actions to support UK Government move to zero emission by 2030***	***HM Treasury, UK Government, NI Executive & Councils***	***Assist in development and implementation of same***	***Awaited from UK Government***
12. ***Measures to achieve Indicator 37 in the NI Executive draft PfG – or its successor from a newly formed administration***	***NI Executive, HM Treasury & Councils***	***Assist in the development and implementation of same***	***Awaited from NI Executive***
13. ***Incorporate air quality considerations***	***Armagh City, Banbridge and Craigavon Borough***	***Have regard to the improvement in air quality with the LDP***	***By 2023***

into Local Development Plan	*Council*		
14. *Regulate emissions from all Part C prescribed industrial processes in the Borough*	*Armagh City, Banbridge and Craigavon Borough Council*	*Ensure emissions within compliance*	*2023 and Annually*
15. *Regulate emissions from all relevant medium-scale combustion plant and generators in the Borough*	*Armagh City, Banbridge and Craigavon Borough Council*	*Ensure emissions within compliance*	*2023 onwards*
16. *Have regard to air quality impacts in all development control applications within the Borough*	*Armagh City, Banbridge and Craigavon Borough Council*	*Have regard to planning policy and best practice in minimising adverse impact*	*On-going*
17. *Enforce all smoke control provisions within the Borough*	*Armagh City, Banbridge and Craigavon Borough Council*	*Minimise emissions*	*On-going*
18. *Prevent smoke or other air quality nuisances within the Borough*	*Armagh City, Banbridge and Craigavon Borough Council*	*Minimise emissions*	*On-going*

19. ***Adhere to regulatory requirements and have regard to guidance and best practice in minimising emissions from Council-owned fleet***	***Armagh City, Banbridge and Craigavon Borough Council***	***Adhere to purchasing requirements and vehicle maintenance and emissions standards***	***On-going***
20. ***Ensure the phasing-out and control of use of Ozone-Depleting Substances and Fluorinated Gases in accordance with Council's statutory duties.***	***Armagh City, Banbridge and Craigavon Borough Council***	***Minimise release of powerful climate change gases into the atmosphere***	***On-going***

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

New monitoring data indicates that nitrogen dioxide concentrations have decreased post-covid-19 restrictions but are rising. It is unclear what the extent of increase will be but the Council are optimistic that new ways of working and a less-polluting vehicle fleet will mean that objective values for NO2 are no longer exceeded. However we note and retain concerns regarding potential adverse health impacts at concentrations below the objective value and will continue to monitor throughout our Borough with an increased focus on centres of population (alongside existing sites based on roadside exposure).

10.2 Conclusions relating to New Local Developments

No new local developments require a Detailed Assessment.

10.3 Other Conclusions

Northern Ireland is in significant need of a Clean Air Strategy and Energy Strategy to address air pollution issues – both in terms of an update to Local Air Quality Management but also in relation to the way people heat their homes and power their vehicles. Armagh City, Banbridge and Craigavon Borough Council retain concerns regards the impact of solid fuel burning in domestic settings and have commenced PAH monitoring to provide additional details. Armagh City, Banbridge and Craigavon Borough Council are firmly committed to the reduction of unnecessary uses of fossil fuel combustion anywhere throughout the Borough with the aim of reducing pollution to the lowest practicable level.

10.4 Proposed Actions

Armagh City, Banbridge and Craigavon Borough Council will continue to monitor nitrogen dioxide levels throughout the Borough and will expand the monitoring network to gain a better understanding of the exposure in local towns and villages. Focus will also be given to PAH concentrations to try to understand why the levels modelled by Ricardo for DAERA are disproportionately high in NI. Action Plan measures will be progressed throughout the year and are reported upon annually to the Environmental Services Committee of the Council. Solid fuel sampling is

proposed to be undertaken this year to determine the impact of that fuel upon emissions.

11 References

- Local Air Quality Management Guidance – TG16
- Local Air Quality Management Guidance – TG22 https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

- Department for Infrastructure (DfI) – Regional Development Strategy for NI 2035 https://www.infrastructure-ni.gov.uk/publications/regional-development-strategy-2035

- DAERA – Environment Strategy https://www.daera-ni.gov.uk/news/poots-approves-finalised-environment-strategy

- DfI – Strategic Planning Policy Statement https://www.infrastructure-ni.gov.uk/publications/strategic-planning-policy-statement

Appendices

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

Appendix B: …..

Appendices may include maps, tables, lists of processes, etc. Include as many as necessary.

Delete this box when the document is finished

Appendix A: QA/QC Data

QA/QC of Automatic Monitoring

The automatic monitoring site at Lonsdale Road is part of the AURN network of roadside sites. The AURN network is administered on behalf of DEFRA by Bureau Veritas. The QA/QC of data management is carried out by Ricardo who visit the site to complete audits twice per year. Maintenance of the automatic monitoring equipment was carried out by ET under contract from this Council. ET performed site maintenance twice per year and are available for any urgent call outs with 24 hours' notice. Calibrations and minor maintenance were completed on a fortnightly basis by the Environmental Health Manager (Environmental Protection) and Senior Environmental Health Officer acting as a Local Site Operators (LSOs) under contract from Bureau Veritas.

Diffusion Tube Bias Adjustment Factors

Spreadsheet 9/18 has been used and the national factor chosen.

QA/QC of Diffusion Tube Monitoring

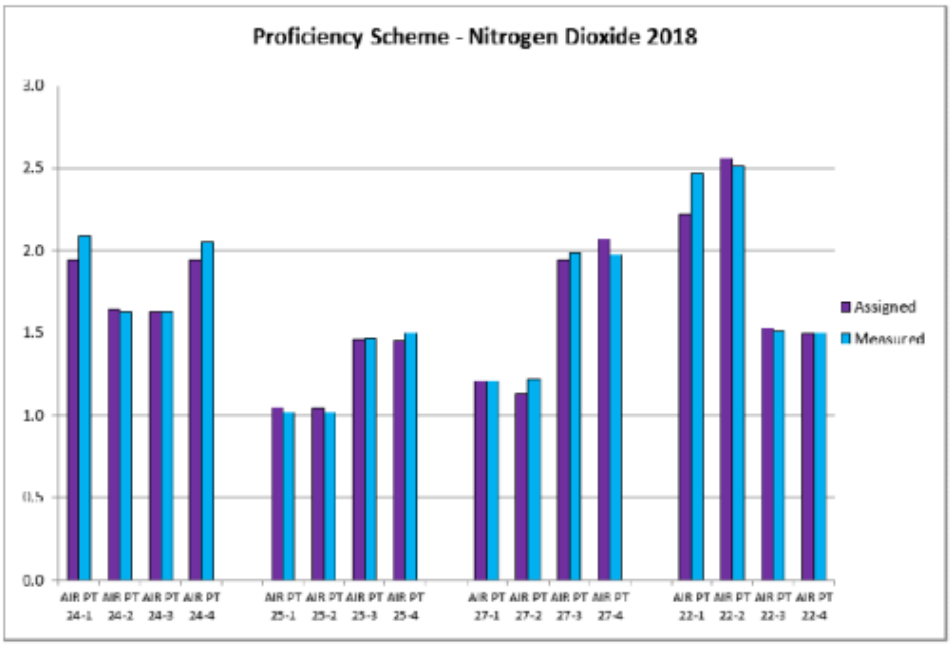
Preparation method used:

Gradko - Nitrogen dioxide in diffusion tubes by UV spectrophotometry. Tubes were prepared in 20% TEA/ Water. Analysed on UV 04 Camspec M550. The Overall M.U. is 7.8% +/- and the Limit of Detection 0.017ug NO2. This anaylsis was in accordance with the Gradko documented in-house laboratory method GLM7.

The following precision tables are presented for all the data given in this report.

AIR PT Nitrogen Dioxide Proficiency Scheme Results 2018
Methods: GLM 7 – CARY 60 Spectrophotometer
AIR PT Proficiency Scheme - Nitrogen Dioxide 2018

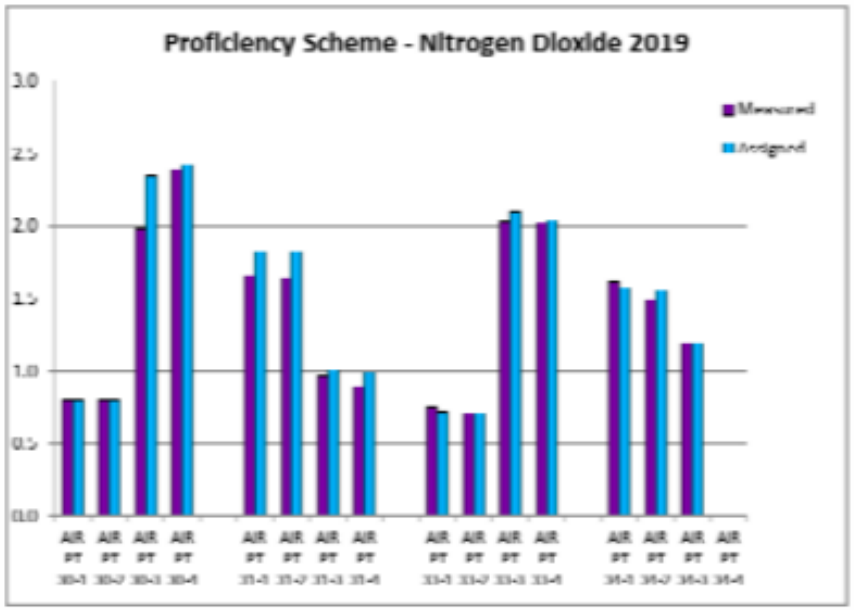
AIR PT Proficiency Scheme - Nitrogen Dioxide 2018					
Date	Round	Assigned value	Procedure GLM 7		
			Measured concentration	z-Score	% Bias
Feb-18	AIR PT 24-1	2.09	1.94	-0.91	-7.2%
Feb-18	AIR PT 24-2	1.63	1.64	0.08	0.6%
Feb-18	AIR PT 24-3	1.63	1.63	0	0.0%
Feb-18	AIR PT 24-4	2.05	1.94	-0.72	-5.4%
May-18	AIR PT 25-1	1.02	1.05	0.39	2.9%
May-18	AIR PT 25-2	1.02	1.04	0.26	2.0%
May-18	AIR PT 25-3	1.47	1.46	-0.09	-0.7%
May-18	AIR PT 25-4	1.5	1.45	-0.44	-3.3%
Aug-18	AIR PT 27-1	1.21	1.21	0.00	0.0%
Aug-18	AIR PT 27-2	1.22	1.13	-0.99	-7.4%
Aug-18	AIR PT 27-3	1.99	1.94	-0.34	-2.5%
Aug-18	AIR PT 27-4	1.98	2.07	0.60	4.5%
Oct-18	AIR PT 22-1	2.47	2.22	-1.35	-10.1%
Oct-18	AIR PT 22-2	2.51	2.56	0.27	2.0%
Oct-18	AIR PT 22-3	1.51	1.53	0.18	1.3%
Oct-18	AIR PT 22-4	1.5	1.49	-0.1	-0.7%



AIR PT Nitrogen Dioxide Proficiency Scheme Results 2019

Methods: GLM 7 – CARY 60 Spectrophotometer

AIR PT Proficiency Scheme - Nitrogen Dioxide 2019					
Date	Round	Assigned value	Procedure GLM 7		
			Measured concentration	z-Score	% Bias
Feb-19	AIR PT 30-1	0.8	0.8	0	0.0%
Feb-19	AIR PT 30-2	0.8	0.8	0	0.0%
Feb-19	AIR PT 30-3	2.35	1.98	-2.1	-15.7%
Feb-19	AIR PT 30-4	2.42	2.39	-0.16	-1.2%
May-19	AIR PT 31-1	1.82	1.65	-1.24	-9.3%
May-19	AIR PT 31-2	1.82	1.64	-1.31	-9.9%
May-19	AIR PT 31-3	1.01	0.97	-0.53	-4.0%
May-19	AIR PT 31-4	0.99	0.89	-1.35	-10.1%
Aug-19	AIR PT 33-1	0.72	0.75	0.56	4.2%
Aug-19	AIR PT 33-2	0.71	0.71	0	0.0%
Aug-19	AIR PT 33-3	2.09	2.03	-0.38	-2.9%
Aug-19	AIR PT 33-4	2.04	2.02	-0.13	-1.0%
Oct-19	AIR PT 34-1	1.57	1.61	0.38	2.5%
Oct-19	AIR PT 34-2	1.56	1.49	-0.56	-4.5%
Oct-19	AIR PT 34-3	1.19	1.19	0	0.0%
Oct-19	AIR PT 34-4		Sample wasted not submitted		



Precision Summary Table

Diffusion Tube Preparation Method	2020 Good	2020 Bad	2021 Good	2021 Bad	2022 Good	2022 Bad
Gradko, 50% TEA in Acetone	19	1	16	0	14	0
Gradko, 20% TEA in Water	27	0	34	0	27	0

Gradko are currently related as good for the 20%TEA/Water method.