

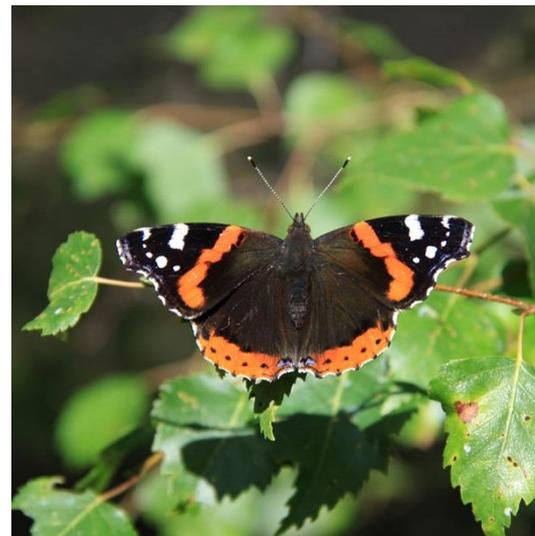


North Wales Authorities Collaborative Project

2020 Air Quality Progress Report

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management



Report for

Isle of Anglesey County Council (IACC);
Conwy County Borough Council (CCBC);
Denbighshire County Council (DCC);
Flintshire County Council (FCC);
Gwynedd Council (GC); and
Wrexham County Borough Council (WCBC).

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Doc Ref. 43042-WOOD-XX-XX-RP-OA-0002_S4_P01.1

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Document revisions

No.	Details	Date
1	Draft	September 2019
2	Final	November 2020



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ISLE OF ANGLESEY
COUNTY COUNCIL



North Wales Authorities Collaborative Project

2020 Air Quality Progress Report
In fulfillment of Part IV of the Environment Act 1995
Local Air Quality Management

September, 2020

North Wales Authorities Collaborative Report

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<p>Report Reference number</p>	<p>43042-WOOD-XX-XX-RP-OA-0002_S4_P01.1</p>
<p>Date</p>	<p>November 2020</p>

Executive Summary: Air Quality in Our Area

Air Quality in North Wales

Part IV of the Environment Act 1995 places a statutory duty on local authorities to review and assess the air quality within their area and take account of Government Guidance when undertaking such work. This Annual Progress Report is a requirement of the Seventh Round of Review and Assessment and is a requirement for all local authorities. This Progress Report has been undertaken in accordance with the Technical Guidance LAQM.TG (16) and associated tools. It covers the six local authorities which encompass the North Wales region (The North Wales Authorities). The local authorities are as follows:

- Isle of Anglesey County Council (IACC);
- Conwy County Borough Council (CCBC);
- Denbighshire County Council (DCC);
- Flintshire County Council (FCC);
- Gwynedd Council (GC); and
- Wrexham County Borough Council (WCBC).

The North Wales Authorities have not declared any Air Quality Management Areas (AQMAs) and as a result, have not published any Action Plans. Air quality monitoring is undertaken by all six local authorities with a total of five automatic monitoring stations measuring nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}) concentrations and 158 NO₂ diffusion tube monitoring sites, located at key locations within town centres and along main transport links.

Monitored concentrations are compared with Air Quality Objectives (AQO) as detailed in Appendix B. In 2019 there was one exceedance of the NO₂ annual mean AQO of 40 µg/m³, however the concentration was estimated to be well below the AQO at the nearest location of relevant exposure. Having considered each pollutant and reviewed the new developments approved in 2019, it can be concluded that there is no requirement for any of the six North Wales local authorities to undertake a detailed assessment.

Actions to Improve Air Quality

In **CCBC** new monitoring sites were introduced at A55 Conwy and Bangor Back Lane near the Traveller Site in response to local air quality concerns. The monitoring data for 2019 commenced at the start of July, and so data has been annualised in line with the LAQM TG16. This confirmed that the annual average NO₂ results for the two sites referenced CBC 048 and CBC 049 were significantly below the annual mean AQO. The sites will however be continued to be monitored to establish a longer-term trend. Further monitoring sites have also been introduced during 2019 including additional primary school locations and sensitive receptor locations in proximity to the proposed A55 dual carriageway junction improvements and road realignments between Dwygyfylchi and Llanfairfechan.

In **WCBC** a review of the monitoring network was undertaken in November 2018 to assess the relevance of the monitoring sites' current locations. This review led to the closure and opening of several sites representative of sensitive receptors including schools and residential properties near roads.

Local Priorities and Challenges

The North Wales authorities will continue to maintain their monitoring programmes and ensure new monitoring sites are installed as required. Each year new monitoring sites are introduced primarily in road traffic locations where concerns have been expressed by members of the public, locally elected members or organisations.

How to Get Involved

Further information on air quality in North Wales is available at <https://airquality.gov.wales/>

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1. Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

This Progress Report has been undertaken in accordance with the Technical Guidance LAQM.TG (16) and associated tools. It has been produced collaboratively between the six local authorities which encompass the North Wales region (The North Wales Authorities). The local authorities are Isle of Anglesey County Council (IACC), Conwy County Borough Council (CCBC), Denbighshire County Council (DCC), Flintshire County Council (FCC), Gwynedd Council (GC), and Wrexham County Borough Council (WCBC).

Previous rounds of review and assessment have identified areas in North Wales where there are potential exceedances of the various Air Quality Objectives (AQOs). Detailed assessments have been carried out when exceedances have been reported to evaluate whether there is a need to declare an Air Quality Management Area (AQMA). There are currently no AQMAs declared in North Wales.

Table 1.1 – Summary of Previous Rounds of Review and Assessment in North Wales

Year	Report Type	Detailed Assessment Recommended	AQMA Declared
2003	Updating and Screening Assessment	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2004	Progress Report	Detailed assessment carried out for PM ₁₀ and NO ₂ close to the A494 in FCC. No other detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2005	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.

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Year	Report Type	Detailed Assessment Recommended	AQMA Declared
2006	Updating and Screening Assessment	Detailed assessment required at Trimm Rock and Aberdo Limestone Quarries and at Roadrunner Waste Transfer Station in FCC. No other detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2007	Progress Report	Detailed assessment carried out for sulphur dioxide (SO ₂) 15- minute mean objective for Penrhos Coastal Park in IACC. No other detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2008	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2009	Updating and Screening Assessment	Detailed assessment no longer required at Trimm Rock and Aberdo Limestone Quarries and at Roadrunner Waste Transfer Station in FCC. Detailed assessment carried out for SO ₂ 15-minute mean objective for Holyhead Railway Station in IACC. Detailed assessment required for SO ₂ as a result of steam trains in GC. No other detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2010	Progress Report	Detailed assessment required for the area around Wrexham Road in Cefn Y Bedd in FCC. Detailed assessment carried out for SO ₂ as a result of steam trains in GC. No other detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.

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Year	Report Type	Detailed Assessment Recommended	AQMA Declared
2011	Progress Report	Detailed assessment carried out for nitrogen dioxide (NO ₂) along Vale Street, Denbigh in DCC.	No AQMA declared in any Local Authority Area.
2012	Updating and Screening Assessment	Detailed assessment no longer required for the area around Wrexham Road in Cefn Y Bedd in FCC. Detailed assessment carried out for the junction of the A5119 and A494 in Mold in FCC. No other detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2013	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2014	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2015	Updating and Screening Assessment	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2016	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2017	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2018	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.

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Year	Report Type	Detailed Assessment Recommended	AQMA Declared
2019	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.

1.2 Air Quality Management Areas

AQMAs are declared when air quality is close to or above an acceptable level of pollution, known as the AQO (See Appendix B for details).

After declaring an AQMA the authority must prepare an Air Quality Action Plan (AQAP) within 18 months setting out measures it intends to put in place to improve air quality to at least the AQOs, if not even better. AQMA(s) are seen by local authorities as the focal points to channel resources into the most pressing areas of pollution as a priority.

None of the local authorities in North Wales currently have an AQMA and therefore no AQAPs have been published.

2. Air Quality Monitoring Data and Comparison with Air Quality Objectives

2.1 Summary of Monitoring Undertaken in 2019

2.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how results compare with the AQOs. Automatic monitoring is undertaken at four sites in IACC and one site in WCBC.

Maps showing the locations of the monitoring sites are provided in Figure 2.1 and Figure 2.2. Table 2.1 presents the details of the sites. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C. National monitoring results are available at <https://airquality.gov.wales/>.

The monitoring sites were as follows:

WCBC:

- Automatic Urban and Rural Network (AURN): Victoria Road – Measuring NO₂, PM₁₀ and PM_{2.5} at a roadside location in Wrexham.

IACC:

- CM1: Llynfaes – Measuring PM₁₀ and PM_{2.5} at Gwyndy Quarry;
- CM2: Brynteg – Measuring PM₁₀ and PM_{2.5} at Rhuddlan Back Quarry;
- CM3: Felin Cafnan – Measuring PM₁₀ and PM_{2.5} at a National Trust Property located near to the Wylfa Newydd construction site; and
- CM4: IVC Penhesgyn – Measuring PM₁₀ and PM_{2.5} at Penhesgyn Recycling Centre.

Since 2017 IACC began utilising a spare Osiris monitor to fill in for other monitors when they are away for calibration. This has greatly improved the overall level of data capture.

2.1.2 Non-Automatic Monitoring Sites

In 2019 non-automatic monitoring of NO₂ using passive diffusion tubes was undertaken by all six local authorities at roadside, kerbside, industrial and urban

background locations. Table 2.2 presents the details of the sites. The number of monitoring locations within each local authority is as follows:

- IACC undertook monitoring at 12 locations in 2019, six of these sites closed at the end of January 2019 due to the end of the Wylfa Newydd project. Results of these sites are indicative only;
- CCBC undertook monitoring at 20 locations;
- DCC undertook monitoring at 26 locations;
- FCC undertook monitoring at 54 locations, including duplicate diffusion tube monitoring at 3 sites (3 Davies Cottage, 20/22 Glynne Way and Llys Alun);
- GC undertook monitoring at 12 locations; and
- WCBC undertook NO₂ monitoring at 32 locations, including one triplicate site which is co-located with the Victoria Road AURN station. Several sites were closed and opened after a review of the monitoring network in November 2018. The benzene monitoring site was closed as concentrations had been consistently well below the AQO.

Maps showing the location of the monitoring sites are provided in Figure 2.3 to Figure 2.15.

Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Table 2.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Pollutants Monitored	Monitoring Technique	Inlet Height (m)	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y					
IACC										
CM1	Llynfaes (Creigiau)	Rural	N	239692	379774	PM ₁₀ , PM _{2.5}	Light scattering	1.5	11	10
CM2	Brynteg (Chwarelau)	Rural	N	248566	381325	PM ₁₀ , PM _{2.5}	Light scattering	4.0	6	5
CM3	Felin Cafnan, Cemlyn	Rural	N	234355	393310	PM ₁₀ , PM _{2.5}	Light scattering	1.5	221	233
CM4	IVC Penhesgyn	Rural	N	253457	374348	PM ₁₀ , PM _{2.5}	Light scattering	1.5	300	200
WCBC										
AURN	Victoria Road AURN	Roadside	N	332863	349913	NO ₂	Continuous	3.0	24	4
AURN	Victoria Road AURN	Roadside	N	332863	349913	PM ₁₀ , PM _{2.5}	Daily gravimetric	3.0	24	4

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Figure 2.1 – Map of Automatic Monitoring Sites: IACC

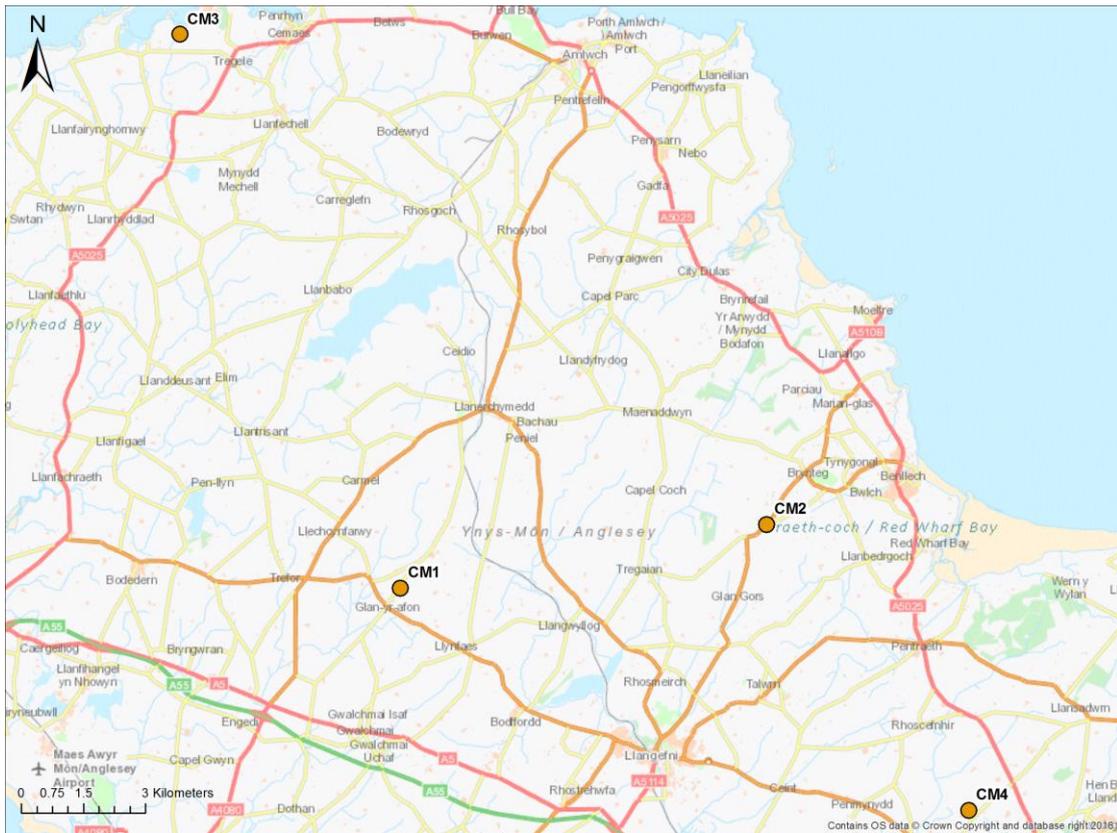


Figure 2.2 – Map of Automatic Monitoring Sites: WCBC

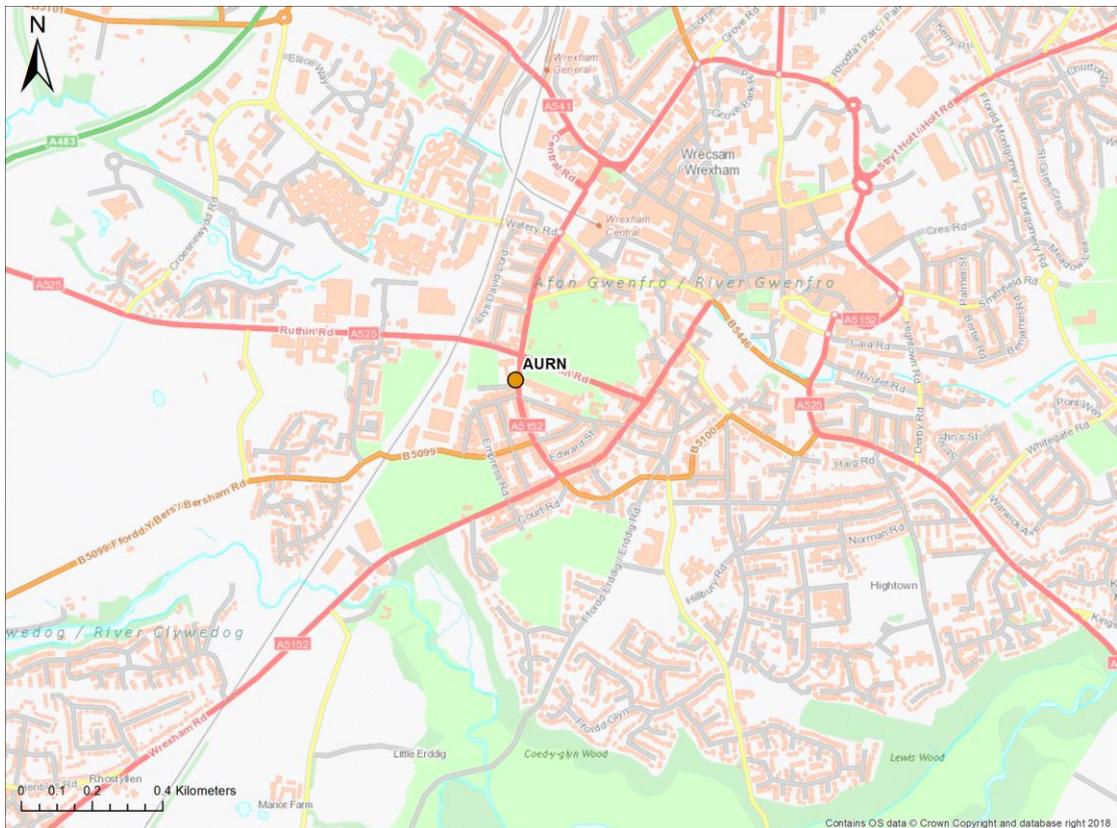


Table 2.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
IACC									
IACC-018	Llanfair P.G	Kerbside	N	252567	372057	1.2	N	21	1
IACC-046	Llanfair P.G	Roadside	N	253265	372372	1.4	N	33	3
IACC-049	Valley	Roadside	N	229513	379321	1.5	N	N/A	1
IACC-050	Llanfachraeth	Roadside	N	231593	382274	2.8	N	9.7	1.7
IACC-051	Llanfaethlu	Roadside	N	231555	387112	1.9	N	76.5	1.5
IACC-053	Tregele	Roadside	N	235575	392545	2.5	N	16.6	1.6
IACC-054	Cemaes 1	Roadside	N	236752	393090	2.7	N	11.7	1.7
IACC-055	Cemaes J	Roadside	N	236908	393378	2.6	N	11.7	1.7
IACC-081	Marine Sq. Holyhead	Roadside	N	224942	382866	3	N	17.5	2.5
IACC-082	Opp. Panton Arms, Pentraeth	Roadside	N	252360	378402	3	N	2	0.7
IACC-083	Llanfair A55 Bridge	Roadside	N	253057	372313	2	N	14	1
IACC-084	Orthios Penrhost Lodge	Roadside	N	226681	381486	3.5	N	13	7

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
CCBC									
DT/CCBC001	Theatre Colwyn, Colwyn Bay	Roadside	N	285119	378817	3	N	3.5	3.5
DT/CCBC017	Kingsway, Colwyn Bay	Roadside	N	284526	379417	3	N	1	1.1
DT/CCBC018	Heol Dewi, Pensarn	Roadside	N	295049	378144	2.1	N	3.5	3
DT/CCBC021	Llanfairfechan, A55	Roadside	N	268572	375472	3	N	2	1.1
DT/CCBC022	Bryn Marl, Mochdre	Roadside	N	282362	378757	3	N	2	1.5
DT/CCBC026	Chapel Street, Abergele	Roadside	N	294571	377534	3	N	1	1
DT/CCBC033	Coed Pella Rd, Colwyn Bay	Roadside	N	284789	378985	3	N	2	1
DT/CCBC034	Victoria Drive, Llandudno Jcn.	Roadside	N	279245	377995	3	N	2.5	2.2
DT/CCBC035	Ysgol Bod Alaw, Colwyn Bay	Roadside	N	285506	378295	3	N	2	2.2
DT/CCBC036	Ysgol Tudno, Llandudno	Roadside	N	278131	381907	3	N	2.5	1.5
DT/CCBC040	Rhuddlan Rd Abergele	Roadside	N	294943	377498	3	N	1.7	1.7

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
DT/CCBC041	Faenol Avenue Abergele	Roadside	N	295077	377682	3	N	3.5	2.7
DT/CCBC042	Yr Angorfa, Conwy Morfa	Roadside	N	277318	378576	3	N	30	30
DT/CCBC043	Ysgol Pant Y Rhedyn, Llanfairfechan	Kerbside	N	268425	375266	3	N	3	2.2
DT/CCBC044	Pendalar Busgate, Llanfairfechan	Roadside	N	268845	375713	3	N	2	1.3
DT/CCBC045	Parc Yr Eryr, A470 Llanrwst	Kerbside	N	280300	361013	3	N	2	2
DT/CCBC046	Eagles, A470 Llanrwst	Kerbside	N	279833	361574	2.5	N	1.5	1.2
DT/CCBC047	Maes Y Llan, Dwygyfychi	Roadside	N	273223	377460	3	N	2	1
DT/CCBC048	A55 Conwy	Roadside	N	276115	378273	2.5	N	22	22
DT/CCBC049	Bangor Back Lane, Conwy	Roadside	N	276115	378230	2.8	N	25	25
DCC									
DBK1	Wellington Road, Rhyl	Roadside	N	300846	381407	2.3	N	2.7	2.2
DBR2	10 Kinmel Street, Rhyl	Roadside	N	300903	381292	2.5	N	2.8	0.3

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
DBR55	Adj. 7 Berwyn Street, Llangollen	Roadside	N	321500	341900	3	N	1.8	1
DBR57	Adj. 48 Church Street, Llangollen	Roadside	N	321800	341900	2.3	N	0.5	0.5
DBR5	2 Pant Glas, St. Asaph	Suburban	N	302938	374638	2	N	37.1	27.5
DBR48	Adj. 1 Vale Street, Denbigh	Roadside	N	305276	366119	2.4	N	1	1
DBR23	31 Ruthin Road, Denbigh	Suburban	N	305878	366424	2.5	N	3.9	2.5
DBR8	1 Plas Elwy Orchard, The Roe, St. Asaph	Roadside	N	303270	374640	2	N	19.4	19.4
DBR9	7 Roe Park, St. Asaph	Roadside	N	303197	374830	2	N	14	14
DBR10	13 Roe Park, St. Asaph	Suburban	N	303263	374867	2	N	16	16
DBR24	Denbigh Cutters, 21 Vale Street, Denbigh	Suburban	N	305330	366160	2.2	N	3	3
DBR56	Adj. 6-7 Castle Street, Llangollen	Roadside	N	321500	342000	2.7	N	3.8	0.4
DBR20	25 Park Road, Ruthin.	Roadside	N	312106	358306	2.2	N	5.4	1.4

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
DBR43	Adj HSBC Bank, Vale Street, Denbigh	Suburban	N	305314	366153	2.6	N	8	2.5
DBR44	Opp Rowlands Pharm., Vale Street, Denbigh	Roadside	N	305386	366191	2.6	N	2.9	1.2
DBR45	Adj 50 Vale Street, Denbigh	Roadside	N	305467	366246	2.5	N	5.9	2
DBR37	Haul Fryn Depot, Ruthin	Roadside	N	312789	358231	2.3	N	4.5	3.5
DBR38	Adj 62 Rhos Street, Ruthin	Roadside	N	312913	358273	2.6	N	2.3	2.3
DBR52	Adj. Swayne Johnston Sol., Vale Street, Denbigh	Roadside	N	305308	366130	2.9	N	N/A	1.8
DBR53	7 Vale Street, Denbigh	Roadside	N	305290	366130	2.3	N	N/A	2
DBR31	2 Rhyl Road, Denbigh	Roadside	N	305805	366480	2.4	N	2.1	0.8
DBR32	47 High Street, Denbigh	Roadside	N	305193	366093	2.4	N	N/A	5.9
DBR33	Adj CO-OP, High Street, Denbigh	Kerbside	N	305229	366082	2.3	N	N/A	5.3

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
DBR34	Adj Fairyburn, Rhyl Road, Denbigh	Roadside	N	305863	366661	2.5	N	12.3	0.9
DBR49	79 High Street, Prestatyn	Roadside	N	306580	382906	2.6	N	N/A	1
DBR58	Adj. 1 Vale View, High Street, Rhuddlan	Roadside	N	302300	378000	2.3	N	4.9	0.5
FCC									
Site 1	10A Wrexham Road, Mold	Kerbside	N	323800	363856	2.2	N	1	1
Site 2	1, St.Davids Close, Ewloe CH5 3AP	Urban	N	329830	366682	1.8	N	35	35
Site 3	Aston Hill Roadside	Kerbside	N	330718	367350	2	N	11	1
Site 4	Hawarden High School CH5 3DL	Kerbside	N	330614	366195	1.6	N	10	3
Site 5	Abermorddu/Cymau Crossroads	Roadside	N	330986	356538	TBC	N	11	2.3
Site 6	Kelsterton Farm, Kelsterton Lane, Connah's Quay	Rural background	N	327307	369856	2.2	N	27	1

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 7	Kelsterton Road, Connah's Quay	Kerbside	N	327187	371243	1.8	N	10	5
Site 8	86, Kelsterton Road, Connah's Quay CH5 4BJ	Urban background	N	328032	370647	1.6	N	22	22
Site 9	Outside The Nook, Village Road, Pentre Halkyn	Roadside	N	320126	372346	TBC	N	14	0.5
Site 11/47	3 Davies Cottage, Mold Road, Alltami	Kerbside	N	326643	365550	1.6	N	4	4
Site 12/13	20/22 Glynne Way, Hawarden	Kerbside	N	331648	365730	2	N	1	1
Site 14	Sandycroft CP School Leaches Lane CH5 2EH	Kerbside	N	332500	367357	1.6	N	2	1
Site 15	Aston Hill, Roadside - Additional Tube within 12m of ADDC/085	Kerbside	N	330727	367354	2	N	11	1
Site 16	4, Belvedere Close, Queensferry CH5 1TG	Urban	N	331663	368028	1.8	N	20	20

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 17	32 Chester Road West, Shotton	Kerbside	N	330599	368922	2.3	N	4	4
Site 18	Saltney Ferry CP School CH ₄ 0BN	Kerbside	N	336904	364852	2	N	8	1
Site 19	Gwylfa, Northop Rd., Flint Mountain	Kerbside	N	323864	370368	2	N	3	3
Site 20	Coed Mawr Cott., Mostyn Road, Greenfield CH8 9DN	Kerbside	N	318669	378290	2.2	N	2	2
Site 21	Sealand CP School Welsh Road CH5 2RA	Kerbside	N	332535	368907	1.8	N	2	1
Site 22	Green Lane West, Sealand	Rural background	N	333645	370898	2.2	N	46	75
Site 23	Second Avenue, Deeside Industrial Estate (Valspar)	Industrial	N	332764	370981	2	N	N/A	1
Site 24/51	Llys Alun, Wrexham Road, Cefn Y Bedd	Kerbside	N	331079	356100	1.8	N	2	2

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 25	BASF, Deeside Industrial Park, Sealand	Industrial	N	332031	371562	1.8	N	N/A	20
Site 26	Corus rear entrance DIP, Sealand	Industrial	N	329906	370882	1.8	N	N/A	1
Site 27	89, Riverside Park, Garden City	Roadside	N	333040	369051	2.2	N	10	15
Site 28	Ysgol St John Penymynydd CH ₄ OLG	Kerbside	N	330528	362756	2	N	5	1
Site 29	Weighbridge Road, Deeside Industrial Park, Sealand	Industrial	N	330575	371802	2.2	N	N/A	1
Site 30	28, Chester Road, Pentre, Deeside CH5 2DT	Kerbside	N	332221	367723	1.8	N	5	5
Site 31	Trelawney Towers 79 Chester Road, Flint CH6 5DU	Kerbside	N	324935	372722	2	N	4	4
Site 32	Flint Town Council Buildings	Kerbside	N	324459	373141	4	N	6	6

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 33	133, Main Road, Broughton CH4 0NR	Kerbside	N	333568	363511	2.4	N	1	1
Site 34	2, Coleshill Street, Holywell CH8 7UP	Kerbside	N	318766	375758	2.4	N	1	1
Site 35	Sycamore House, Greenfield Road, Holywell CH8 7PY	Kerbside	N	318735	376611	2.2	N	1	1
Site 36	43, Station Road, Queensferry CH5 1SU	Kerbside	N	331806	368271	2	N	5	5
Site 37	Glendale Lodge, Rhydgaed, Mold A5119	Kerbside	N	324281	364926	2	N	6	6
Site 38	Castell Alun Fagl Lane Hope LL129PY	Kerbside	N	330705	358429	1.8	N	10	2
Site 39	Ysgol Y Fron Halkyn St Holywell CH8 7TX	Kerbside	N	318851	375592	1.8	N	5	1
Site 40	1 Manor Road, Sealand CH5 2SB	Kerbside	N	333731	369079	1.8	N	1	10
Site 41	Ysgol Y Llan Whitford CH8 9AN	Kerbside	N	314615	378238	2	N	5	1

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 42	RGHS Ffordd Llewelyn Flint CH6 5JZ	Kerbside	N	324838	372198	1.8	N	2	1
Site 43	Flint HS Fifth Avenue Flint CH6 5LW	Kerbside	N	324357	372008	1.8	N	5	1
Site 44	413 Chester Road, Oakenholt, Flint CH6 5SF	Kerbside	N	325961	371822	2.2	N	2	1
Site 45	Ysgol Bryn Coch Victoria Road Mold CH7 1EW	Kerbside	N	323975	363794	1.8	N	5	1
Site 46	Ewloe Green School CH5 3AU	Kerbside	N	329284	366504	1.8	N	10	1
Site 48	74, High Street, Saltney CH ₄ 8SQ	Kerbside	N	338283	365032	1.8	N	6	6
Site 49	31, The Rowans, Broughton CH ₄ 0TD	Kerbside	N	333531	363028	2	N	30	25
Site 50	Ysgol Estyn Hawarden Road Hope LL12 9NL	Kerbside	N	330898	357996	1.8	N	5	3

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 52	Westwood CP School Padeswood Rd CH7 2JT	Kerbside	N	327843	363856	2	N	5	1
Site 53	17, Mill Lane, Buckley CH7 3HA	Kerbside	N	327849	364146	2.3	N	2	1
Site 54	Elm Tree Rd Saughall	Kerbside	N	335594	369179	2.3	N	11	1
Site 55	Ferry Lane, Chester	Kerbside	N	337632	366682	2.2	N	15	2
Site 56	Deeside Lane, Sealand	Kerbside	N	335292	368346	2.2	N	50	1
Site 57	Rose Cottage Junction A5119/A494	Kerbside	N	324375	365007	2.2	N	3	1
S1	Bryn Mair 114 Chester Road Mold CH7 1UQ	Roadside	N	324530	363839	3.0	N	10	2
S2	30 High Street Mold CH7 1BH	Roadside	N	324562	363840	3.0	N	1	1
GC									
GCC 002	Roundabout A487, Caernarfon (C1)	Kerbside	N	248273	362132	2.0	N	10.0	1.0

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
GCC 003	Lon Campbell, Caernarfon (C3)	Urban Background	N	248480	363456	2.0	N	5.0	N/A
GCC 005	Ffordd Bangor, Caernarfon (C5)	Kerbside	N	248892	364120	1.8	N	7.0	1.0
GCC 008	A4087, Bangor (B3)	Kerbside	N	257587	371543	1.9	N	2.0	1.0
GCC 011	A5122, Bangor (B5)	Kerbside	N	256292	371663	1.7	N	>25.0	1.0
GCC 012	Faenol Roundabout, Bangor (B6)	Kerbside	N	254286	368835	1.8	N	>25.0	1.0
GCC 013	Bethesda (BETH 1)	Kerbside	N	261529	367380	2.0	N	10.0	1.0
GCC 015	Llanwnda (LL1)	Roadside	N	247770	358663	1.9	N	95.0	2.0
GCC 037	Poolside, Caernarfon (C6)	Kerbside	N	248022	362757	1.9	N	2.0	1.0
GCC 038	A55, Bangor (B4)	Roadside	N	256871	369493	1.3	N	>25.0	2.0
GCC 039	A55, Bangor (CO-LOC)	Roadside	N	256871	369493	1.3	N	>25.0	2.0
GCC 040	Pwllheli (PW1)	Kerbside	N	237517	335217	2.0	N	2.0	1.0
WCBC									
1	Grosvenor Road	Roadside	N	333200	350600	1.5	N	12	2

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
34	Coed Poeth	Roadside	N	329017	351002	2	N	8	9
45	Crispin Lodge	Roadside	N	332214	351503	1.6	N	0	8
36	Acrefair	Roadside	N	327630	342990	2	N	2	2
10	Ysgol Y Waun	Suburban	N	329300	338300	2	N	20	2
49	Black Lane School	Suburban	N	330221	353428	2	N	2.5	1.5
42	Llan-Y-Pwll	Roadside	N	335359	352178	1.6	N	9	5
50	Llys Y Groes	Roadside	N	331924	350638	1.5	N	9	9
51	Ysgol Yr Hafod	Suburban	N	330125	346099	1.5	N	5	1.5
52	Woodbank Court	Intermediate	N	330703	334004	1.5	N	20	20
53	Froncysyllte	Roadside	N	327263	341184	1.5	N	2	2
22	Holyhead Road	Intermediate	N	328900	338700	1.5	N	30	2
32	Sycamores	Roadside	N	333887	353222	1.5	N	25	N/A
30	Rhostyllen Rbt	Roadside	N	330950	348170	1.2	N	35	4
31	Bus Station	Roadside	N	333350	350590	3	N	3	2
33	Smithfield Road	Roadside	N	333981	350171	1.5	N	4	1
37	Rossett	Roadside	N	336635	357211	1.5	N	7	2

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
38	Pentre Bach	Roadside	N	331765	350132	1.2	N	2	2
44	Cobden Road	Roadside	N	332935	350278	2	N	5	1
40	Overton	Roadside	N	337449	341702	1.5	N	14	2
41	Marchwiell	Roadside	N	335407	347890	2	N	3	2
43	Hightown	Roadside	N	333966	349691	2	N	10	1
46	Regent Street	Roadside	N	333063	350587	2	N	15	1
48	Church Street	Roadside	N	329082	337590	1.5	N	5	1
54	Pandy Lane	Roadside	N	333628	352942	1.5	N	9	5
55	Llay	Suburban	N	333078	355649	1	N	9	9
56	Top Farm Road	Roadside	N	332944	352293	1.5	N	12	12
57	Ysgol Plas Coch	Intermediate	N	332786	351637	1.5	N	20	20
58	St Annes School	Suburban	N	334954	350090	2	N	40	1.5
59	Cross Lanes	Roadside	N	337541	346942	1.5	N	6	6
60	St Pauls School	Suburban	N	340016	349982	2	N	15	1.5
AURN (triplicate)	Victoria Road 1	Roadside	N	332900	349900	2	Y	7	5

Notes:

- (1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).
- (2) N/A if not applicable.

Figure 2.3 – Map of Non-Automatic Monitoring Sites: IACC

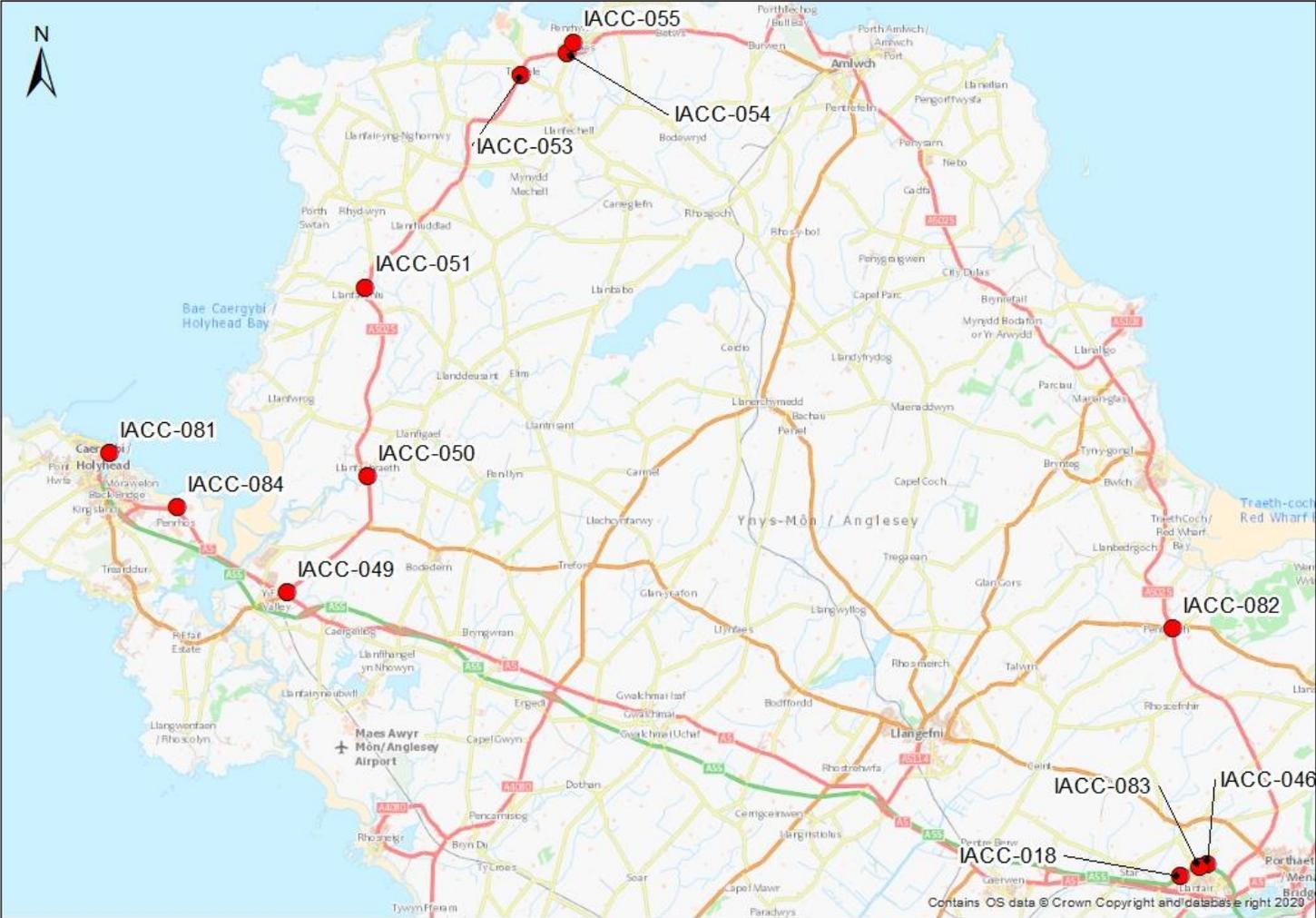


Figure 2.4 – Map of Non-Automatic Monitoring Sites: CBC

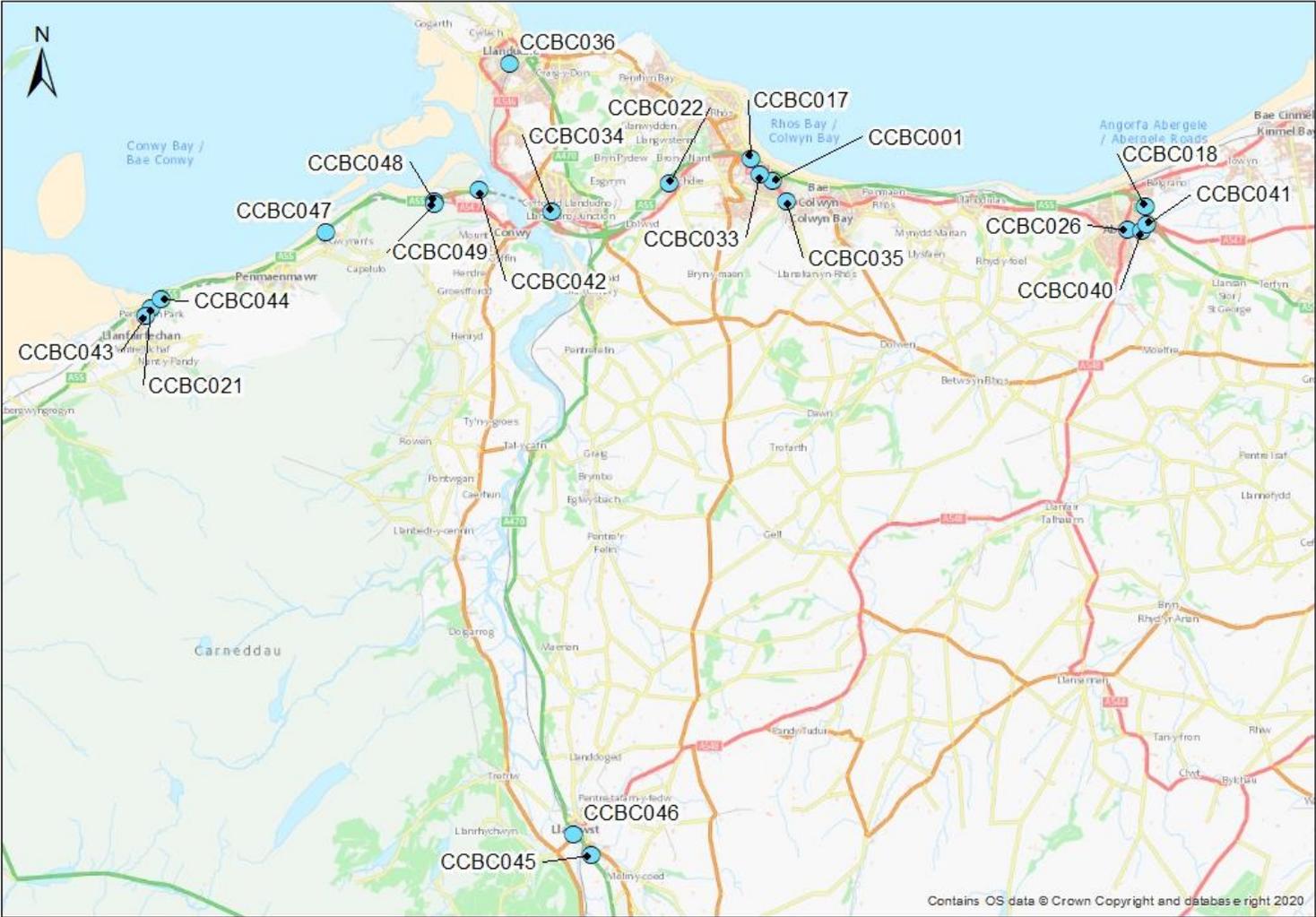


Figure 2.5 – Map of Non-Automatic Monitoring Sites: DCC Ruthin

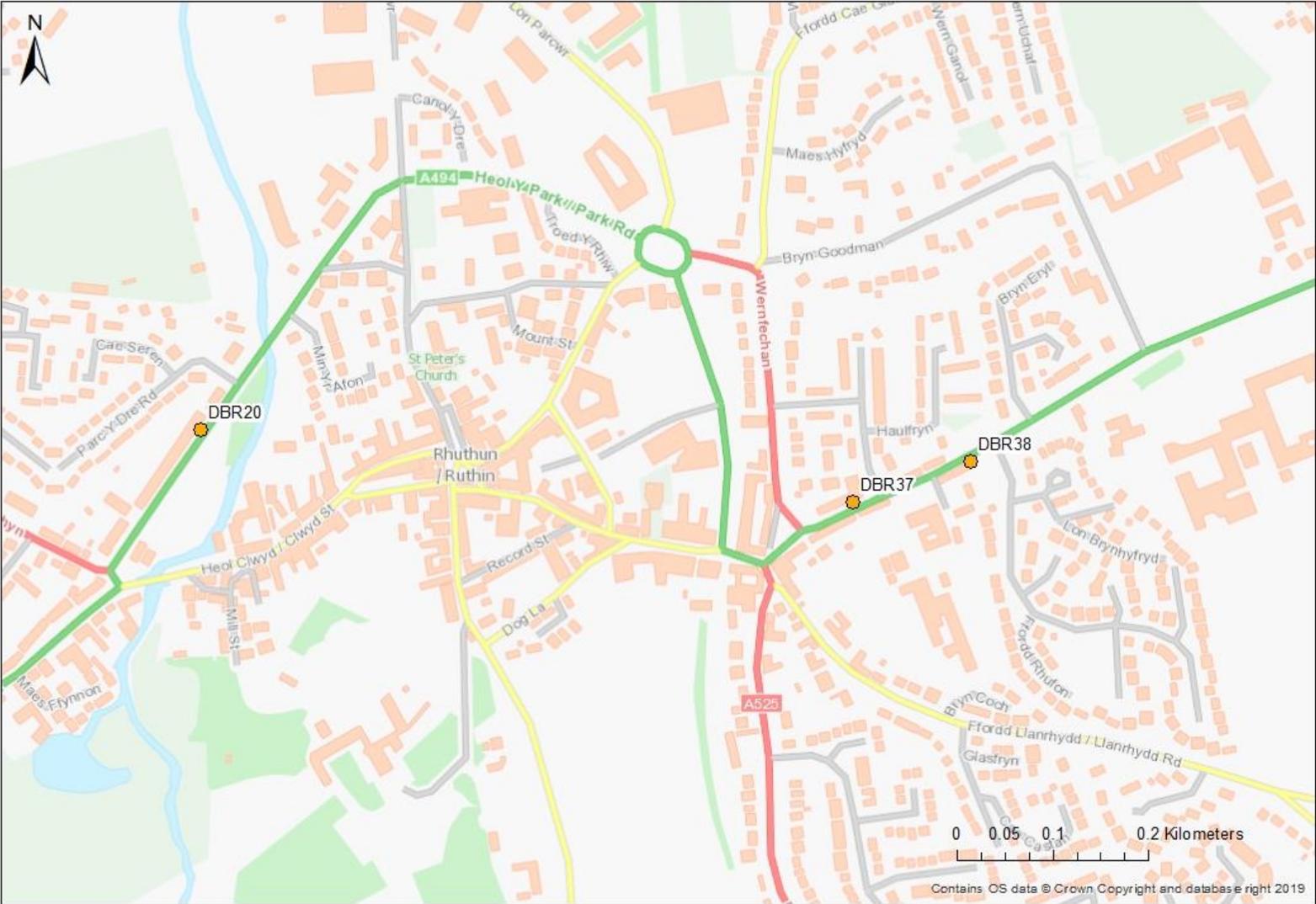


Figure 2.6 – Map of Non-Automatic Monitoring Sites: DCC North

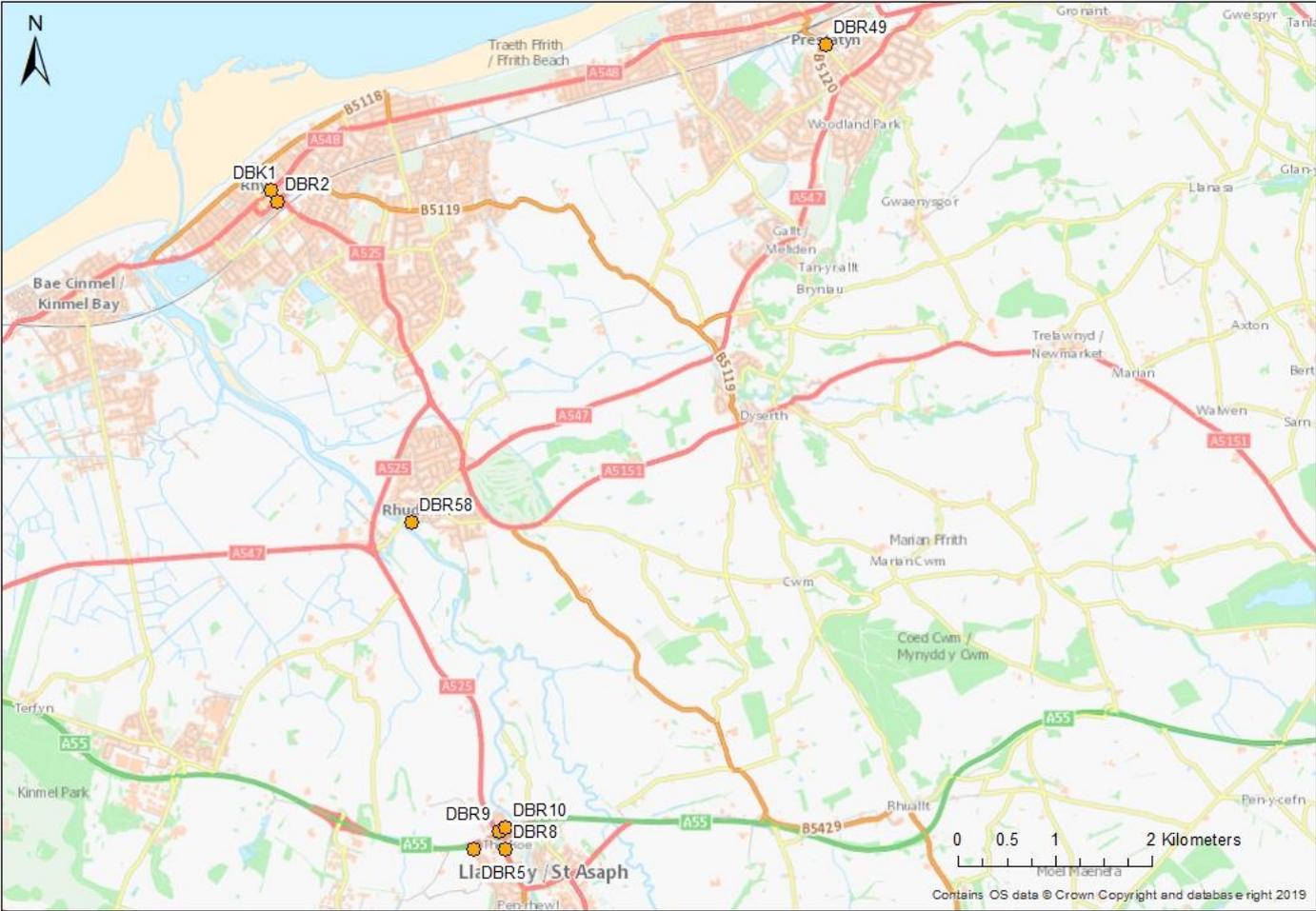


Figure 2.8 – Map of Non-Automatic Monitoring Sites: DCC Llangollen

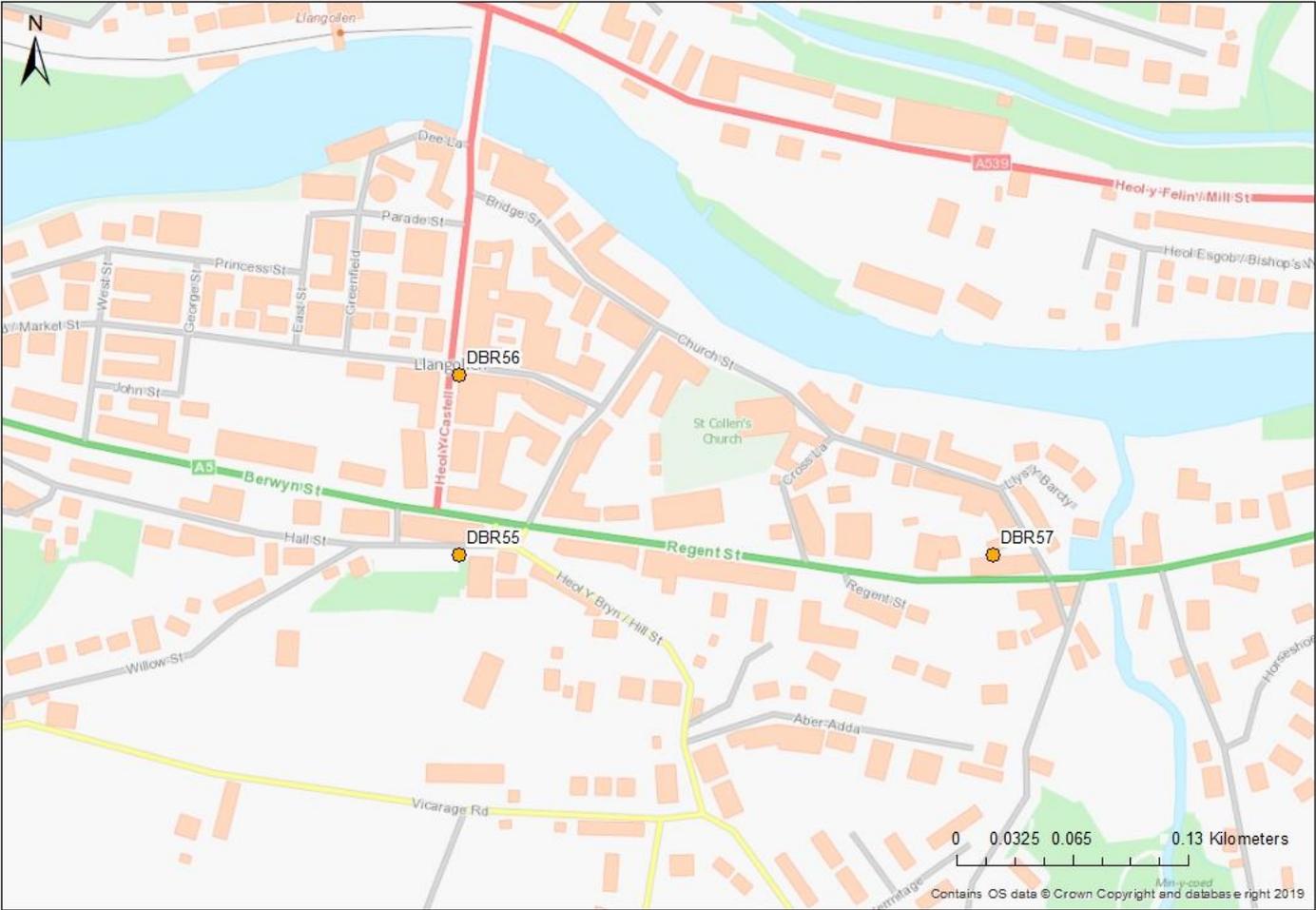


Figure 2.9 – Map of Non-Automatic Monitoring Site: FCC North East

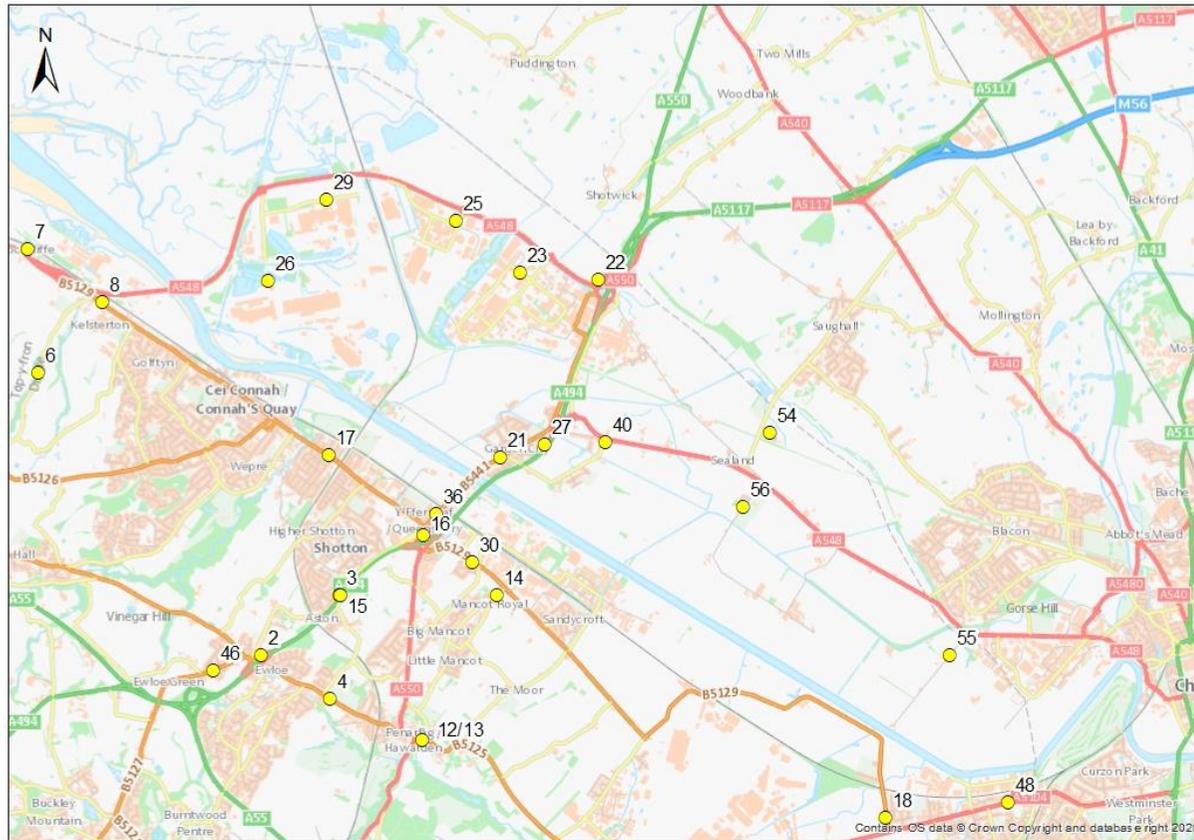


Figure 2.10 – Map of Non-Automatic Monitoring Site: FCC North West

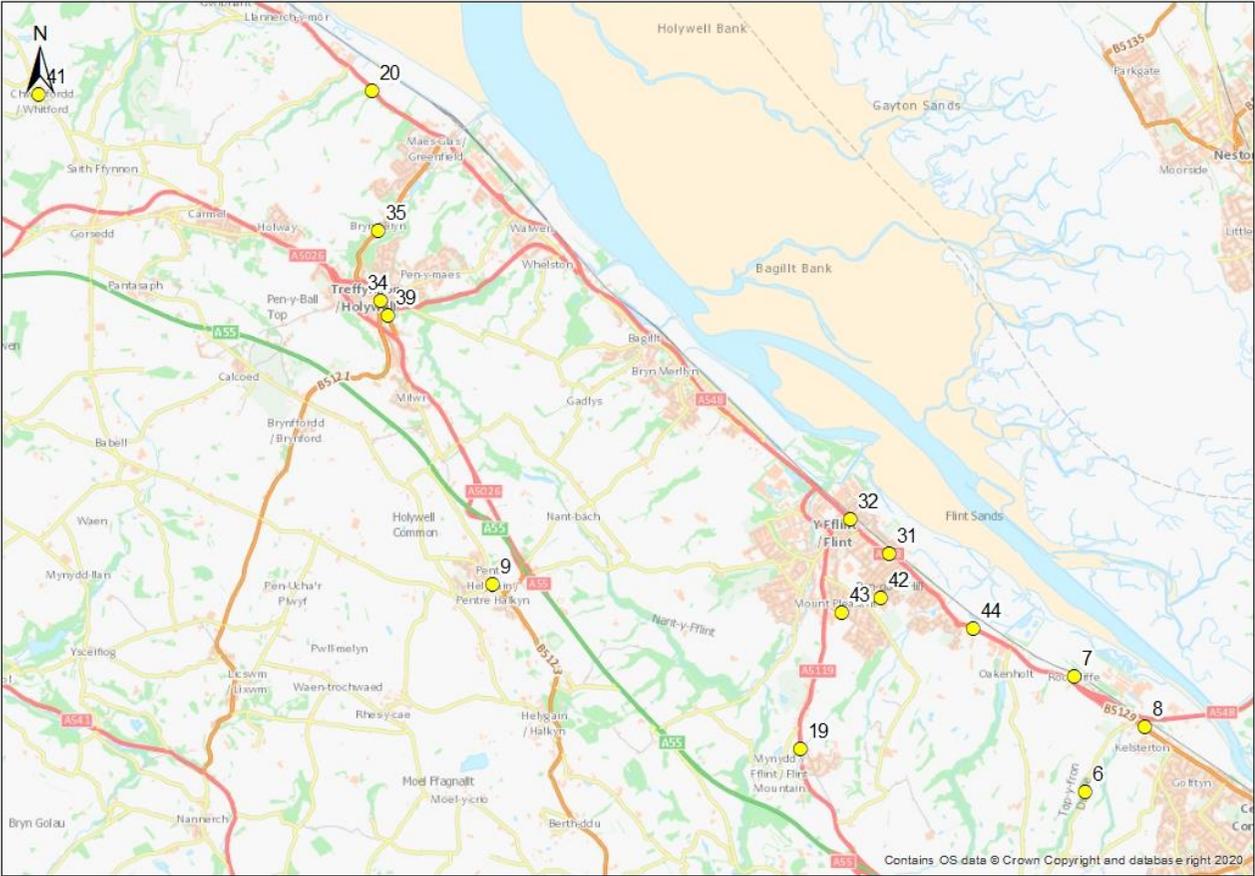


Figure 2.11 – Map of Non-Automatic Monitoring Site: FCC South East

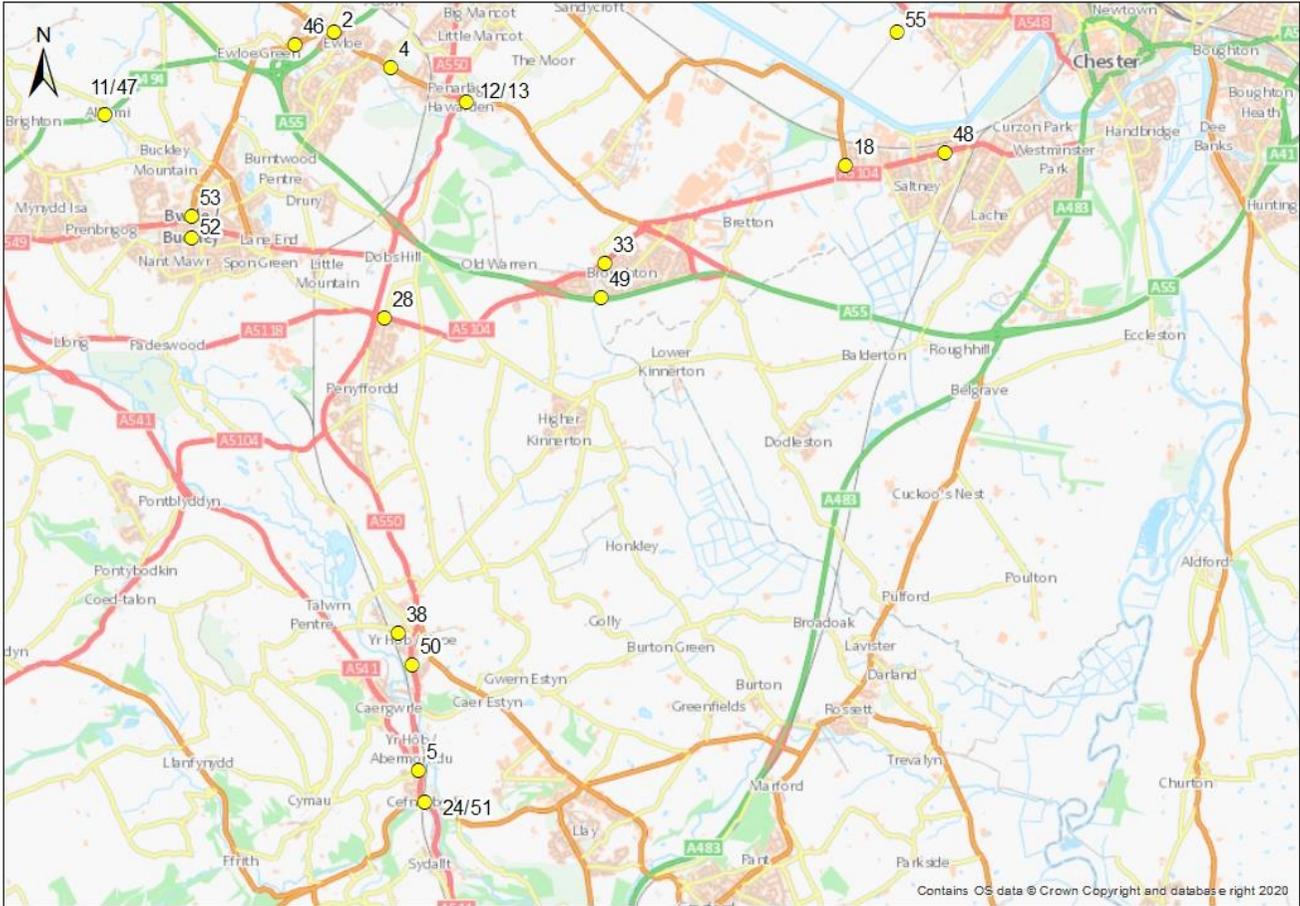


Figure 2.13 – Map of Non-Automatic Monitoring Sites: GC

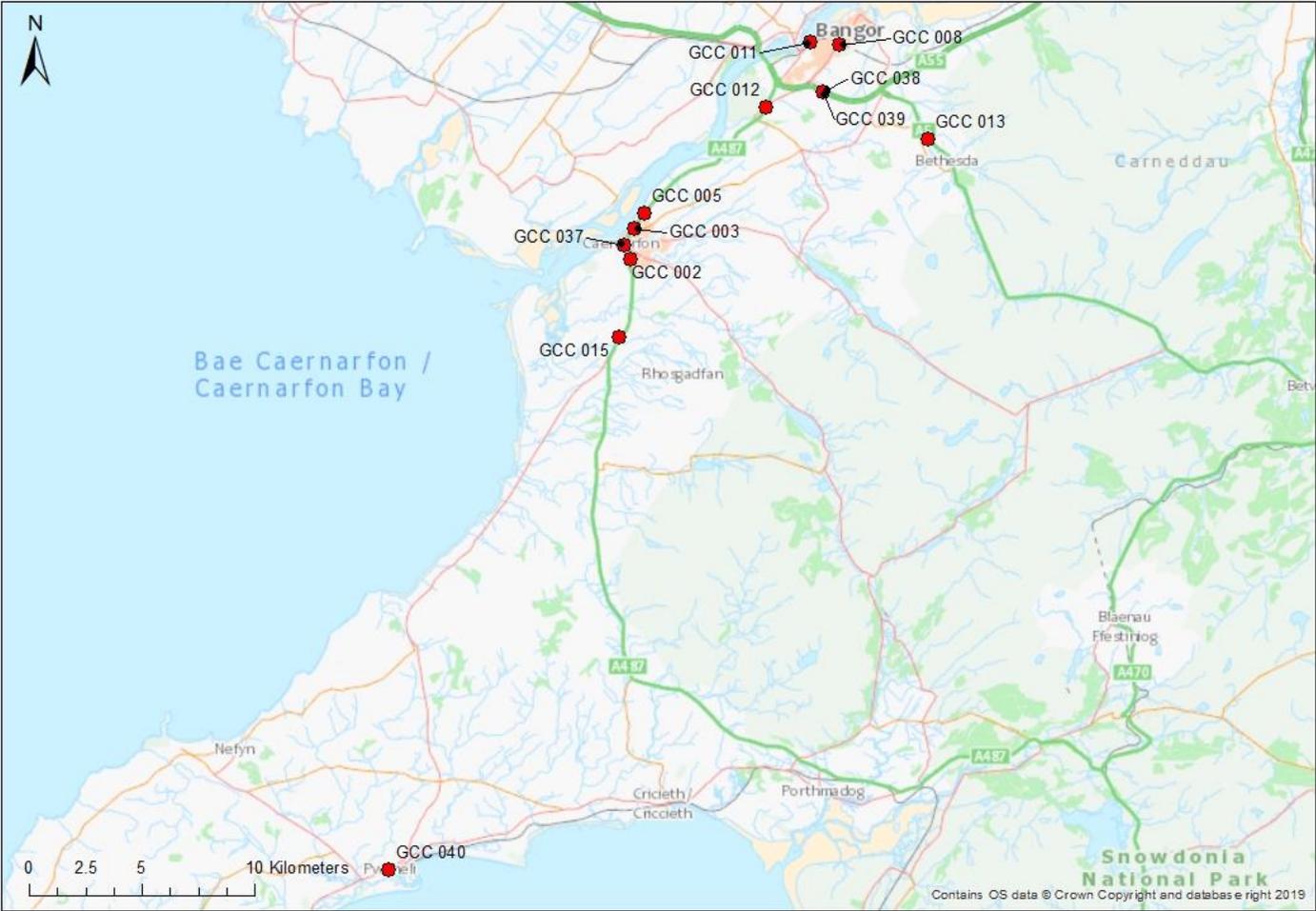


Figure 2.14 – Map of Non-Automatic Monitoring Sites: WCBC North

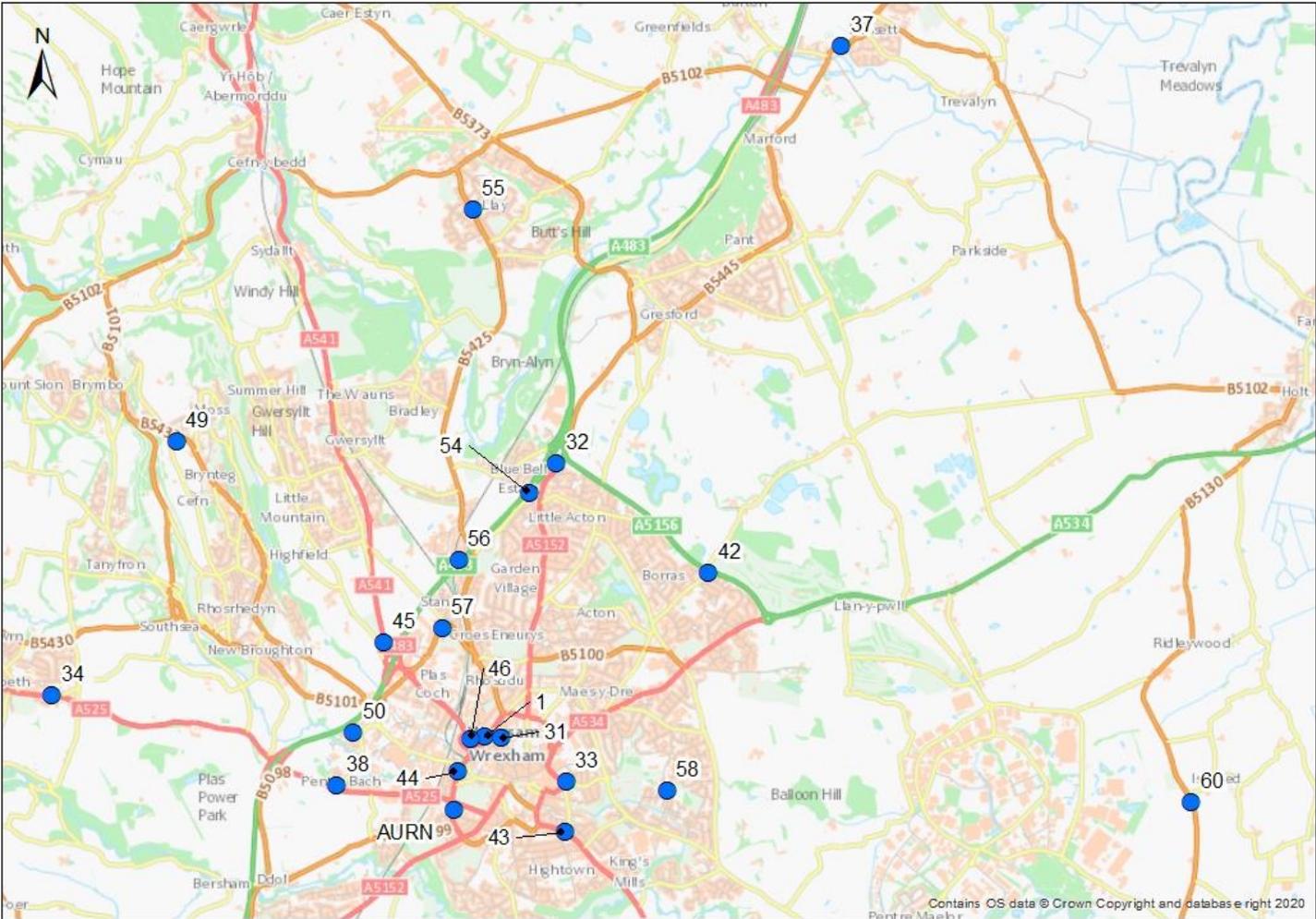
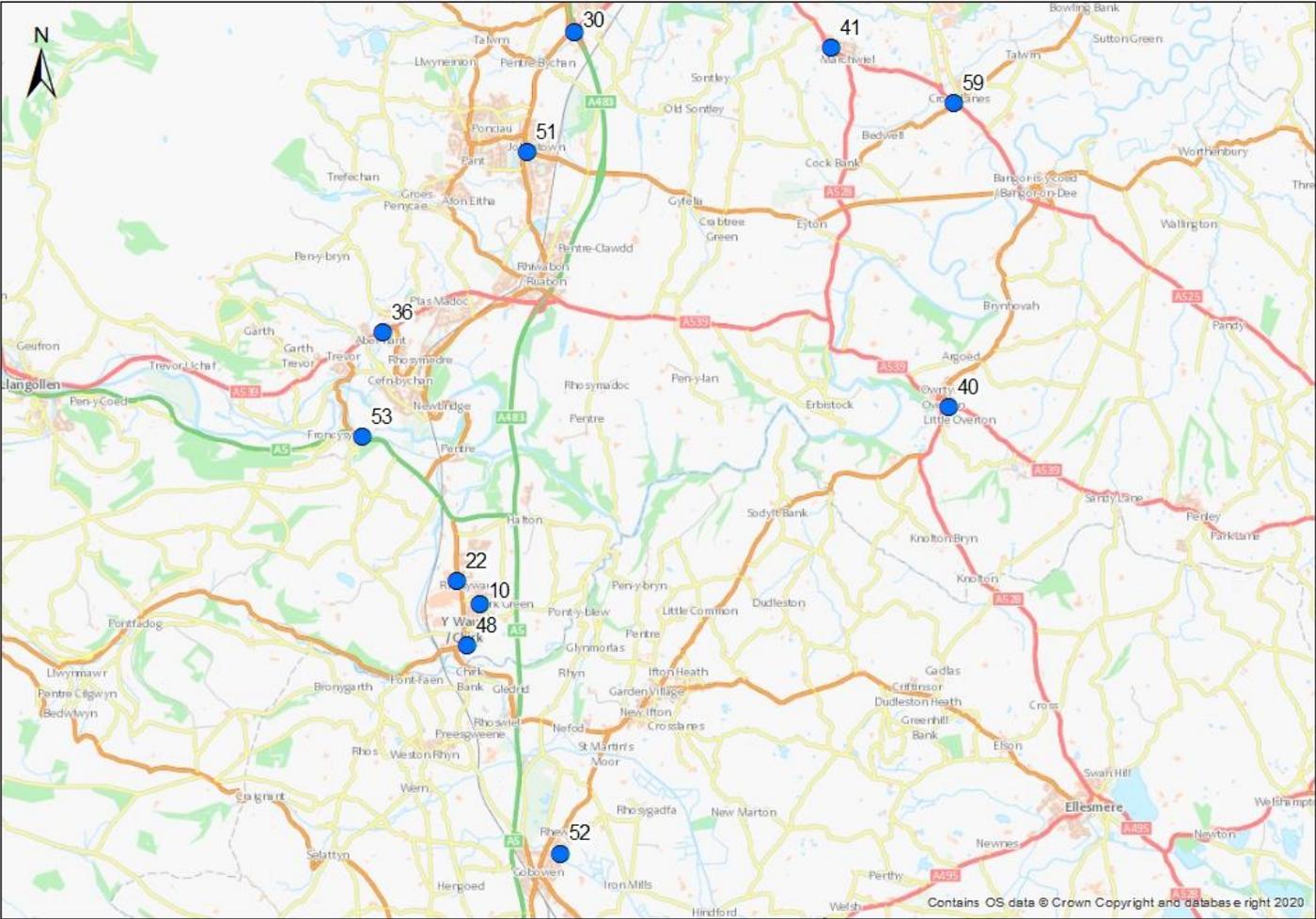


Figure 2.15 – Map of Non-Automatic Monitoring Sites: WCBC South



2.2 Comparison of 2019 Monitoring Results with Previous Years and the Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO₂)

Table 2.3. presents the annual mean NO₂ concentrations monitored in 2019. Figure 2.16 to Figure 2.21 represent the annual trends in NO₂ concentrations. These show a general decrease in NO₂ concentration at the majority of sites. Comparison with the 1-hour mean AQO at the AURN station is included in Table 2.4.

Annual means at sites which recorded a data capture between 25% and 75% (i.e. 3 to 8 months) were annualised according to the method set out in Boxes 7.9 and 7.10 of LAQM.TG16. Several sites which were discontinued in early 2019 or opened in late 2019, and therefore had less than 3 months of data could not be annualised. Means are presented for indicative purpose.

In 2019 NO₂ was monitored by all six local authorities at 158 diffusion tube sites and at one automatic monitoring site in WCBC. A single exceedance of the NO₂ annual mean was recorded at IACCs Site 46. The site had however only one month of valid and so could not be annualised. The concentration at Site 46 was used to estimate the concentration at the nearest location of relevant exposure and resulting concentration was well below the annual mean AQO (See Appendix C).

There was no other concentration above or within 10% of the annual mean AQO.

The 2019 annual mean concentration at the Automatic Urban and Rural Network (AURN) automatic monitoring station in WCBC was 16 µg/m³ with a data capture of 80%. This is well below the annual mean AQO of 40 µg/m³. There was also no exceedance of the 1-hour mean AQO of 200 µg/m³ (not to be exceeded more than 18 times per year).

2.2.2 Particulate Matter (PM₁₀)

In 2019 PM₁₀ was monitored at four automatic monitoring stations in IACC and at one in WCBC. The annual means recorded at all stations were well below the annual mean AQO of 40 µg/m³. The highest concentration recorded was 17 µg/m³ at IACC's CM1.

There were no exceedances of the 24-hour mean AQO of 50 µg/m³ at any monitoring sites.

Annual mean PM₁₀ concentrations are included in Table 2.6 and comparison with 24-hour mean AQO are included in Table 2.7. Figure 2.22 represents the annual trends in annual mean PM₁₀.

2.2.3 Particulate Matter (PM_{2.5})

In 2019 PM_{2.5} was monitored at four automatic monitoring stations in IACC and at one in WCBC. The annual mean recorded at all stations were below the annual mean standard of 25 µg/m³. The highest concentration recorded was 9 µg/m³ at IACC's CM1. Table 2.7 includes the annual mean PM_{2.5} concentrations and Figure 2.23 represents the trend in annual mean concentrations.

2.3 2019 Air Quality Monitoring Results

Table 2.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
IACC									
IACC-018	Kerbside	Diffusion tube	83	83	38.1	39.7	37.8	35.3	32.8
IACC-046	Roadside	Diffusion tube	100	8	-	-	44.8	37.9	46.4 ⁽⁵⁾
IACC-049	Roadside	Diffusion tube	100	8	-	11.3	14.0	13.1	14.5 ⁽⁵⁾
IACC-050	Roadside	Diffusion tube	100	8	-	15.3	8.3	8.8	8.9 ⁽⁵⁾
IACC-051	Roadside	Diffusion tube	100	8	-	9.9	8.0	7.9	7.7 ⁽⁵⁾
IACC-053	Roadside	Diffusion tube	100	8	-	7.0	8.6	8.7	8.2 ⁽⁵⁾
IACC-054	Roadside	Diffusion tube	100	8	-	10.2	7.6	8.2	9.5 ⁽⁵⁾
IACC-055	Roadside	Diffusion tube	100	8	-	9.0	4.7	5.7	5.1 ⁽⁵⁾
IACC-081	Roadside	Diffusion tube	100	100	-	-	-	19.7 ⁽⁴⁾	18.7
IACC-082	Roadside	Diffusion tube	100	100	-	-	-	18.6 ⁽⁴⁾	18.1
IACC-083	Roadside	Diffusion tube	75	75	-	-	-	-	10.8
IACC-084	Roadside	Diffusion tube	100	17	-	-	-	-	7.8 ⁵

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
CCBC									
DT/CCBC001	Roadside	Diffusion tube	67	67	17.3	19.1	16.9	18.6	17.4 ⁽⁴⁾
DT/CCBC017	Roadside	Diffusion tube	100	100	19.1	24.4	16.5	17.3	16.3
DT/CCBC018	Roadside	Diffusion tube	100	100	22.6	20.7	19.8	18.0	17.2
DT/CCBC021	Roadside	Diffusion tube	100	100	16.8	17.5	14.2	16.3	15.9
DT/CCBC022	Roadside	Diffusion tube	100	100	19.3	20.4	18.7	18.3	16.7
DT/CCBC026	Roadside	Diffusion tube	67	67	25.2	27.4	23.0	24.2	22.2 ⁽⁴⁾
DT/CCBC033	Roadside	Diffusion tube	100	100	-	13.7	13.0	14.0	12.4
DT/CCBC034	Roadside	Diffusion tube	100	100	-	20.8	22.0	20.0	20.0
DT/CCBC035	Roadside	Diffusion tube	100	100	-	-	15.5	16.5	16.1
DT/CCBC036	Roadside	Diffusion tube	100	100	-	-	10.8	11.6	11.1
DT/CCBC040	Roadside	Diffusion tube	92	92	-	-	-	15.8	14.2
DT/CCBC041	Roadside	Diffusion tube	100	100	-	-	-	14.1	14.0
DT/CCBC042	Roadside	Diffusion tube	100	100	-	-	-	-	15.8
DT/CCBC043	Kerbside	Diffusion tube	100	100	-	-	-	-	11.4
DT/CCBC044	Roadside	Diffusion tube	100	100	-	-	-	-	18.5
DT/CCBC045	Kerbside	Diffusion tube	92	92	-	-	-	-	10.8

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
DT/CCBC046	Kerbside	Diffusion tube	83	83	-	-	-	-	21.3
DT/CCBC047	Roadside	Diffusion tube	100	100	-	-	-	-	15.4
DT/CCBC048	Roadside	Diffusion tube	50	50	-	-	-	-	18.9 ⁽⁴⁾
DT/CCBC049	Roadside	Diffusion tube	50	50	-	-	-	-	15.9 ⁽⁴⁾
DCC									
DBK1	Roadside	Diffusion tube	100	100	23.1	23.5	24.9	25.3	23.6
DBR2	Roadside	Diffusion tube	100	100	26.7	26.4	25.7	25.1	23.4
DBR55	Roadside	Diffusion tube	100	100	-	-	-	32.7	34.2
DBR57	Roadside	Diffusion tube	100	100	-	-	-	10.8	10.4
DBR5	Suburban	Diffusion tube	100	100	14	15.5	14.1	14.5	12.9
DBR48	Roadside	Diffusion tube	100	100	25.7	26.7	24.8	24.2	21.8
DBR23	Suburban	Diffusion tube	100	100	17.2	18.6	19.1	17.0	16.7
DBR8	Roadside	Diffusion tube	100	100	14.7	15.5	15.2	14.2	11.8
DBR9	Roadside	Diffusion tube	100	100	21.2	21.1	21.3	19.8	18.6
DBR10	Suburban	Diffusion tube	92	92	14.5	16.1	15.3	14.0	13.8
DBR24	Suburban	Diffusion tube	83	83	32.5	33.1	33.1	32.5	30.0
DBR56	Roadside	Diffusion tube	100	100	-	-	-	13.7	14.4

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
DBR20	Roadside	Diffusion tube	100	100	21.2	19.8	21.3	20.5	20.3
DBR43	Suburban	Diffusion tube	100	100	32.8	29.1	32.4	28.0	28.6
DBR44	Roadside	Diffusion tube	92	92	24.2	25.0	26.3	24.5	22.3
DBR45	Roadside	Diffusion tube	100	100	21.6	23.3	22.3	21.0	21.3
DBR37	Roadside	Diffusion tube	100	100	28.0	26.6	26.2	23.7	26.4
DBR38	Roadside	Diffusion tube	100	100	16.5	16.8	17.2	14.6	14.1
DBR52	Roadside	Diffusion tube	100	100	21.7	24.1	22.2	21.7	19.7
DBR53	Roadside	Diffusion tube	100	100	28.2	31.2	29.3	28.7	26.1
DBR31	Roadside	Diffusion tube	100	100	17.0	18.9	17.6	14.7	16.2
DBR32	Roadside	Diffusion tube	100	100	18.5	18.9	17.8	18.2	16.8
DBR33	Kerbside	Diffusion tube	100	100	29.0	28.2	25.2	25.1	24.8
DBR34	Roadside	Diffusion tube	100	100	13.6	15.2	14.1	13.2	14.1
DBR49	Roadside	Diffusion tube	100	100	16.0	17.1	15.7	14.8	14.8
DBR58	Roadside	Diffusion tube	100	100	-	-	-	16.4	14.5
FCC									
Site 1	Kerbside	Diffusion tube	83	83	21.1	25.6	23.7	24.4	20.8
Site 2	Urban	Diffusion tube	100	100	17.4	20.6	17.4	17.2	17.5

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
Site 3	Kerbside	Diffusion tube	100	100	26.3	33.7	24.4	28.2	25.2
Site 4	Kerbside	Diffusion tube	92	92	15.9	18.0	16.0	16.0	16.0
Site 5	Roadside	Diffusion tube	100	100	-	-	-	-	14.5
Site 6	Rural background	Diffusion tube	92	92	9.3	14.0	8.1	10.5	10.5
Site 7	Kerbside	Diffusion tube	100	100	14.9	15.0	13.2	14.9	14.8
Site 8	Urban background	Diffusion tube	100	100	12.9	14.5	11.7	12.6	12.3
Site 9	Roadside	Diffusion tube	83	83	-	-	-	-	12.5
Site 11/47	Kerbside	Diffusion tube	100	100	32.9	35.6	29.3	28.2	28.2
Site 12/13	Kerbside	Diffusion tube	100	100	35.4	34.0	34.5	33.9	32.5
Site 14	Kerbside	Diffusion tube	83	83	8.6	12.7	13.4	14.7	13.9
Site 15	Kerbside	Diffusion tube	100	100	27.9	27.9	25.9	26.7	27.8
Site 16	Urban	Diffusion tube	100	100	26.2	26.7	24.4	24.7	24.3
Site 17	Kerbside	Diffusion tube	100	100	24.8	29.2	23.8	24.8	23.6
Site 18	Kerbside	Diffusion tube	83	83	11.5	14.5	13.9	14.5	13.6
Site 19	Kerbside	Diffusion tube	92	92	20.7	25.0	19.5	22.6	19.3
Site 20	Kerbside	Diffusion tube	100	100	20.7	23.4	22.0	20.7	22.1

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
Site 21	Kerbside	Diffusion tube	92	92	13.0	15.2	18.0	20.0	19.1
Site 22	Rural background	Diffusion tube	100	100	18.7	18.6	14.6	17.6	17.2
Site 23	Industrial	Diffusion tube	75	75	21.4	24.4	23.2	24.4	24.3
Site 24/51	Kerbside	Diffusion tube	96	96	34.9	31.4	31.1	32.0	31.8
Site 25	Industrial	Diffusion tube	100	100	18.1	21.3	16.0	17.2	16.6
Site 26	Industrial	Diffusion tube	100	100	15.0	16.3	13.8	14.2	14.4
Site 27	Roadside	Diffusion tube	83	83	21.7	21.3	20.0	20.8	17.1
Site 28	Kerbside	Diffusion tube	100	100	17.4	15.5	18.6	17.9	18.3
Site 29	Industrial	Diffusion tube	100	100	15.8	18.0	16.6	16.6	16.6
Site 30	Kerbside	Diffusion tube	100	100	23.2	24.9	23.9	24.0	24.3
Site 31	Kerbside	Diffusion tube	100	100	20.3	23.6	21.3	20.2	20.3
Site 32	Kerbside	Diffusion tube	67	67	24.6	20.2	18.2	-	16.4 ⁽⁴⁾
Site 33	Kerbside	Diffusion tube	92	92	25.1	26.9	23.8	24.8	24.4
Site 34	Kerbside	Diffusion tube	100	100	24.7	25.3	21.4	21.3	21.2
Site 35	Kerbside	Diffusion tube	100	100	18.3	21.0	18.4	19.8	17.6
Site 36	Kerbside	Diffusion tube	100	100	21.5	23.2	20.8	20.9	20.8

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
Site 37	Kerbside	Diffusion tube	58	58	26.2	26.3	21.3	21.5 ⁽⁴⁾	24.8 ⁽⁴⁾
Site 38	Kerbside	Diffusion tube	100	100	16.8	19.1	12.9	11.6	11.7
Site 39	Kerbside	Diffusion tube	83	83	15.9	17.2	16.2	17.3	16.7
Site 40	Kerbside	Diffusion tube	100	100	15.7	16.8	14.9	14.9	13.4
Site 41	Kerbside	Diffusion tube	75	75	9.9	12.0	8.9	8.6	8.8
Site 42	Kerbside	Diffusion tube	83	83	10.6	12.3	9.9 ⁽⁴⁾	11.9	11.9
Site 43	Kerbside	Diffusion tube	83	83	9.3	9.2	9.6*	12.2*	11.2
Site 44	Kerbside	Diffusion tube	83	83	25.6	25.5	27.9*	22.3*	21.8
Site 45	Kerbside	Diffusion tube	58	58	16.1	17.8	11.4	9.5*	10.0 ⁽⁴⁾
Site 46	Kerbside	Diffusion tube	83	83	12.5	12.7	17.5	17.8	17.8
Site 48	Kerbside	Diffusion tube	92	92	23.0	36.6	18.4	18.4	16.7
Site 49	Kerbside	Diffusion tube	100	100	17.8	18.8	16.2	16.6	16.6
Site 50	Kerbside	Diffusion tube	100	100	15.1	16.9	15.3	16.6	16.4
Site 52	Kerbside	Diffusion tube	75	75	15.1	16.6	9.3	12.2	10.4
Site 53	Kerbside	Diffusion tube	100	100	25.3	26.7	23.4	23.3	21.2
Site 54	Kerbside	Diffusion tube	92	92	10.5	13.2	10.9	11.2	11.0
Site 55	Kerbside	Diffusion tube	100	100	10.5	13.0	8.2	10.3	9.8

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
Site 56	Kerbside	Diffusion tube	92	92	12.7	13.2	10.3 ⁽⁴⁾	11.3(4)	11.1
Site 57	Kerbside	Diffusion tube	100	100	35.9	37.8	37.4	37.6	35.9
S1	Roadside	Diffusion tube	100	100	-	-	34.8 ⁽⁴⁾	27.0	26.5
S2	Roadside	Diffusion tube	75	75	-	-	29.1 ⁽⁴⁾	18.7	23.2
GC									
GCC 002	Kerbside	Diffusion tube	100	100	31.1	31.4	31.4	31.2	30.1
GCC 003	Urban background	Diffusion tube	100	100	11.3	10.5	9.9 ⁽⁴⁾	10.2	9.3
GCC 005	Kerbside	Diffusion tube	100	100	29.6	27.6	27.1	27.9	28.5
GCC 008	Kerbside	Diffusion tube	100	100	23.4	22.8	22.5	23.4	22.2
GCC 011	Kerbside	Diffusion tube	100	100	21.8	23.8	21.5	25.1	22.8
GCC 012	Kerbside	Diffusion tube	100	100	25.3	26.9	26.1	26.8	24.6
GCC 013	Kerbside	Diffusion tube	92%	92	19.6	21.9	20.3	20.0	19.9
GCC 015	Roadside	Diffusion tube	100%	100	21.4	24.8	21.7	22.3	21.3
GCC 037	Kerbside	Diffusion tube	67	67	27.1	25.5	32.6 ⁽⁴⁾	25.2	21.6 ⁽⁴⁾
GCC 038	Roadside	Diffusion tube	100	100	27.5	28.6	27.5	28.1	27.5
GCC 039	Roadside	Diffusion tube	92	92	27.7	28.4	27.1	28.6	26.1

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
GCC 040	Kerbside	Diffusion tube	100%	100	18.9	19.1	18.0	18.5	16.7
WCBC									
AURN	Roadside	Automatic	80	80	19.1	18.8	16.5	18.2	16.0
1	Roadside	Diffusion tube	100	100	18.4	27.8	27.3	24.9	24.2
34	Roadside	Diffusion tube	100	100	14.5	14.6	14.2	14.5	13.9
45	Roadside	Diffusion tube	100	100	18.8	19.8	17.6	19.4	17.3
36	Roadside	Diffusion tube	100	100	19.6	20	19.5	17.3	17.7
10	Suburban	Diffusion tube	100	100	12.2	13.2	12.5	11.8	12.4
49	Suburban	Diffusion tube	100	100	-	-	-	-	9.7
42	Roadside	Diffusion tube	100	100	24.6	25.6	24.4	23.2	20.6
50	Roadside	Diffusion tube	100	100	-	-	-	-	19.6
51	Suburban	Diffusion tube	100	100	-	-	-	-	16.8
52	Intermediate	Diffusion tube	100	100	-	-	-	-	21.4
53	Roadside	Diffusion tube	100	100	-	-	-	-	20.1
22	Intermediate	Diffusion tube	100	100	16.4	16.3	15.9	15.7	14.7
32	Roadside	Diffusion tube	100	100	25.7	29.1	26.7	27.2	23.7
30	Roadside	Diffusion tube	100	100	36.9	35.8	33.1	34.9	31.7

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
31	Roadside	Diffusion tube	100	100	37.5	35.9	31.8	28.6	27.3
33	Roadside	Diffusion tube	100	100	17.8	19.2	17.5	18.5	15.6
37	Roadside	Diffusion tube	100	100	24.3	22.3	20.8	20.3	16.9
38	Roadside	Diffusion tube	100	100	-	-	-	-	16.5
44	Roadside	Diffusion tube	100	100	22.7	23.6	21.9	22.7	20.5
40	Roadside	Diffusion tube	100	100	11.4	11.9	10.9	12.1	9.7
41	Roadside	Diffusion tube	100	100	14.3	15.2	15	15.4	13.9
43	Roadside	Diffusion tube	100	100	19.1	17.9	18.4	19.3	17.0
46	Roadside	Diffusion tube	100	100	22.4	24.1	23	24.4	22.7
48	Roadside	Diffusion tube	92	92	-	-	-	18.3	14.3
54	Roadside	Diffusion tube	100	100	-	-	-	-	22.7
55	Suburban	Diffusion tube	100	100	-	-	-	-	11.8
56	Roadside	Diffusion tube	100	100	-	-	-	-	18.8
57	Intermediate	Diffusion tube	83	83	-	-	-	-	17.7
58	Suburban	Diffusion tube	100	100	-	-	-	-	12.7
59	Roadside	Diffusion tube	100	100	-	-	-	-	11.2
60	Suburban	Diffusion tube	100	100	-	-	-	-	7.7

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
AURN (triplicate)	Roadside	Diffusion tube	100	100	15.6	16.7	15.1	16.3	16.1

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias.

(4) Means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 as valid data capture for the full calendar year was less than 75%. See Appendix C for details.

(5) Site had less than 3 months worth of data and could not be annualised. Mean presented is for the period of monitoring rather than for the whole year.

Figure 2.16 – Trends in Annual Mean NO₂ Concentrations: IACC

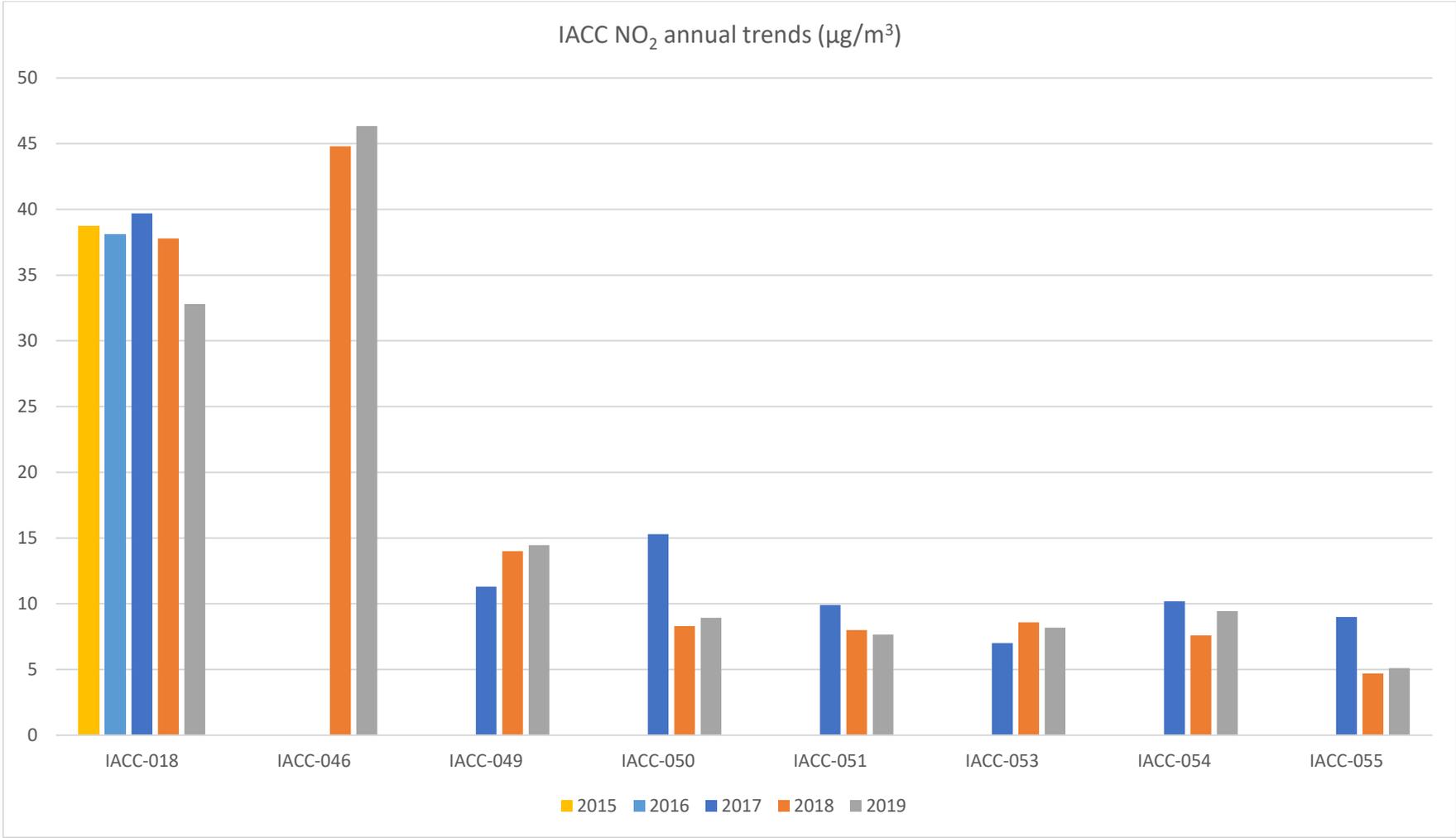


Figure 2.17 – Trends in Annual Mean NO₂ Concentrations: CCBC

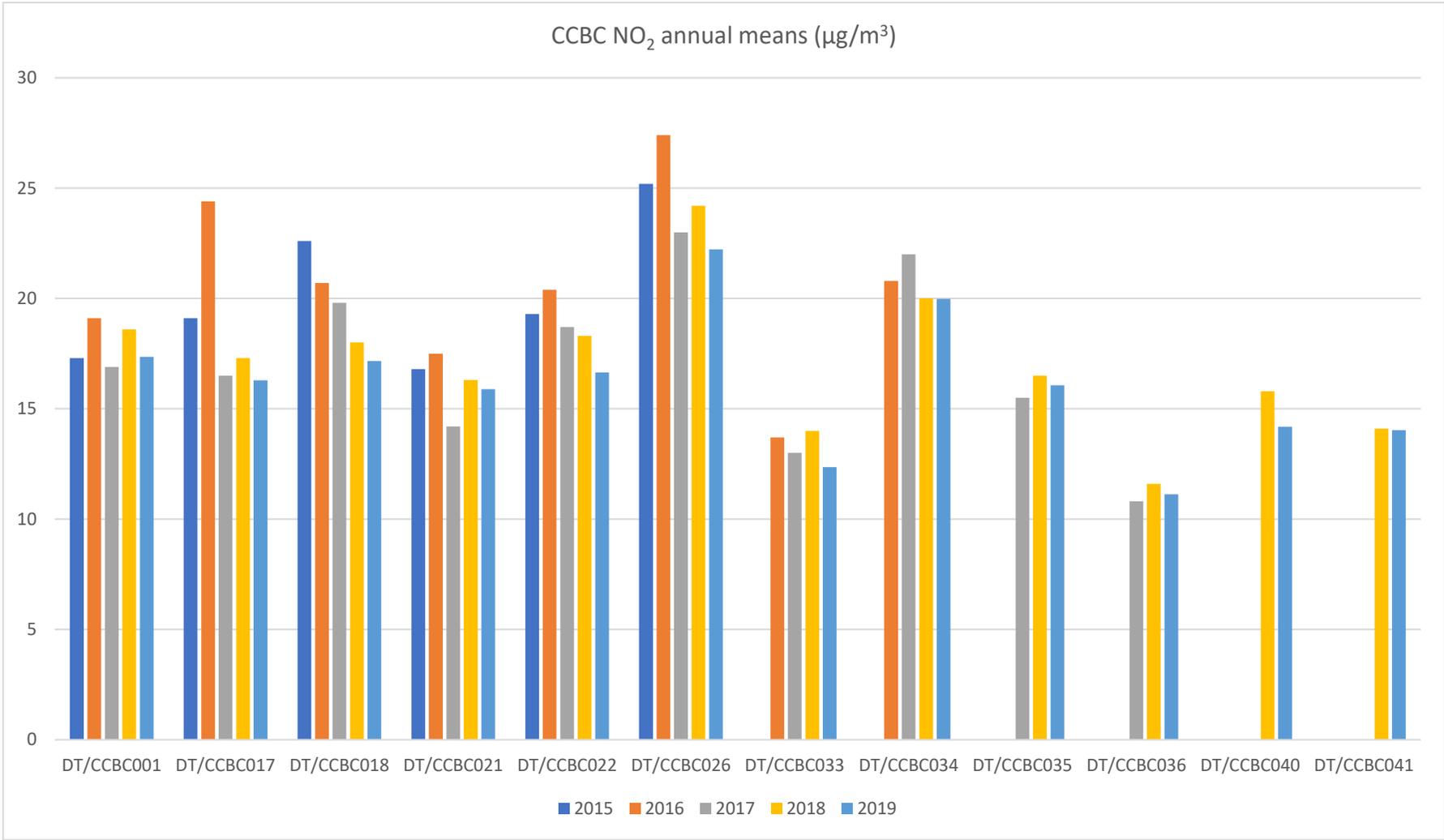


Figure 2.18 – Trends in Annual Mean NO₂ Concentrations: DCC

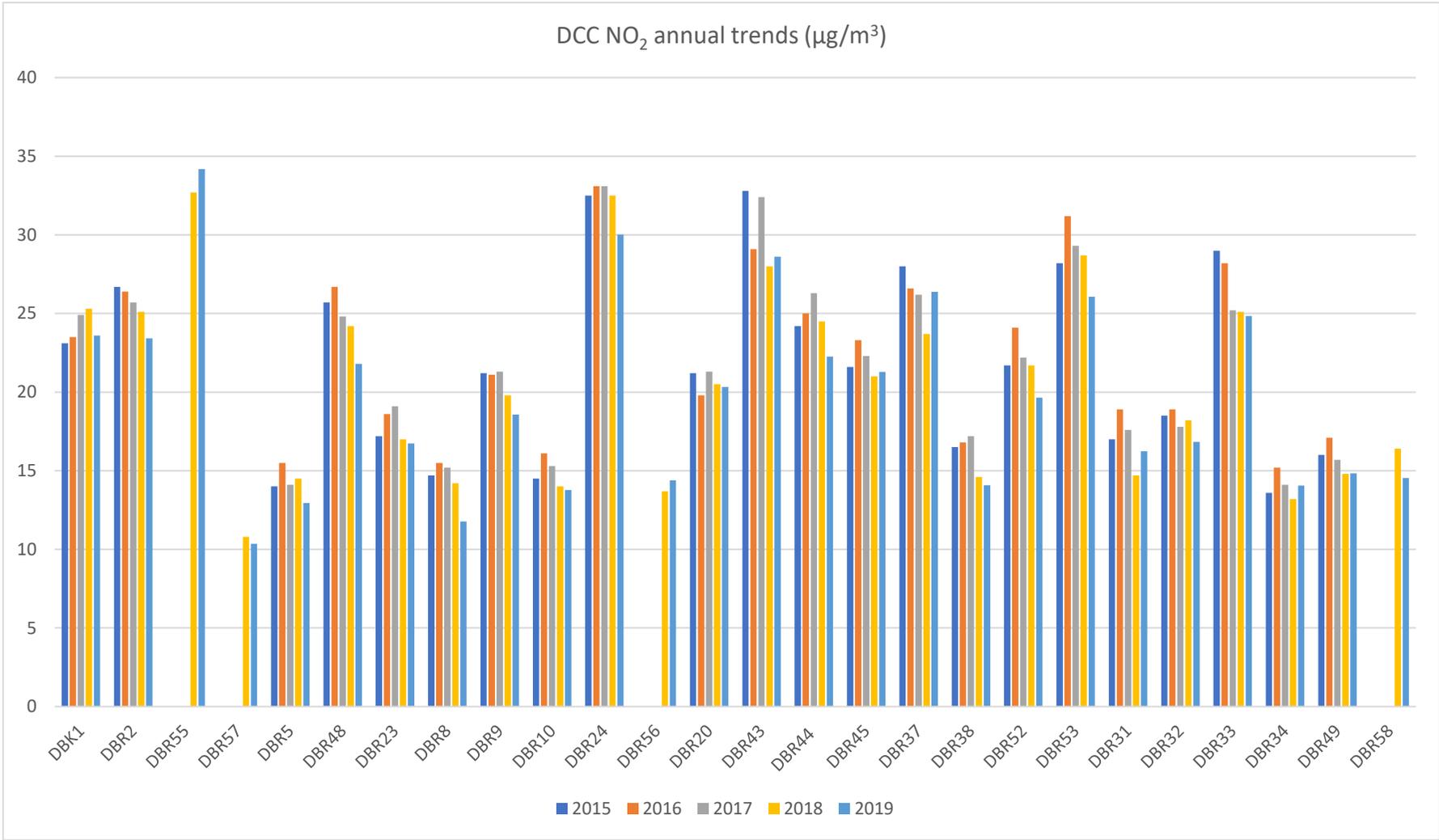
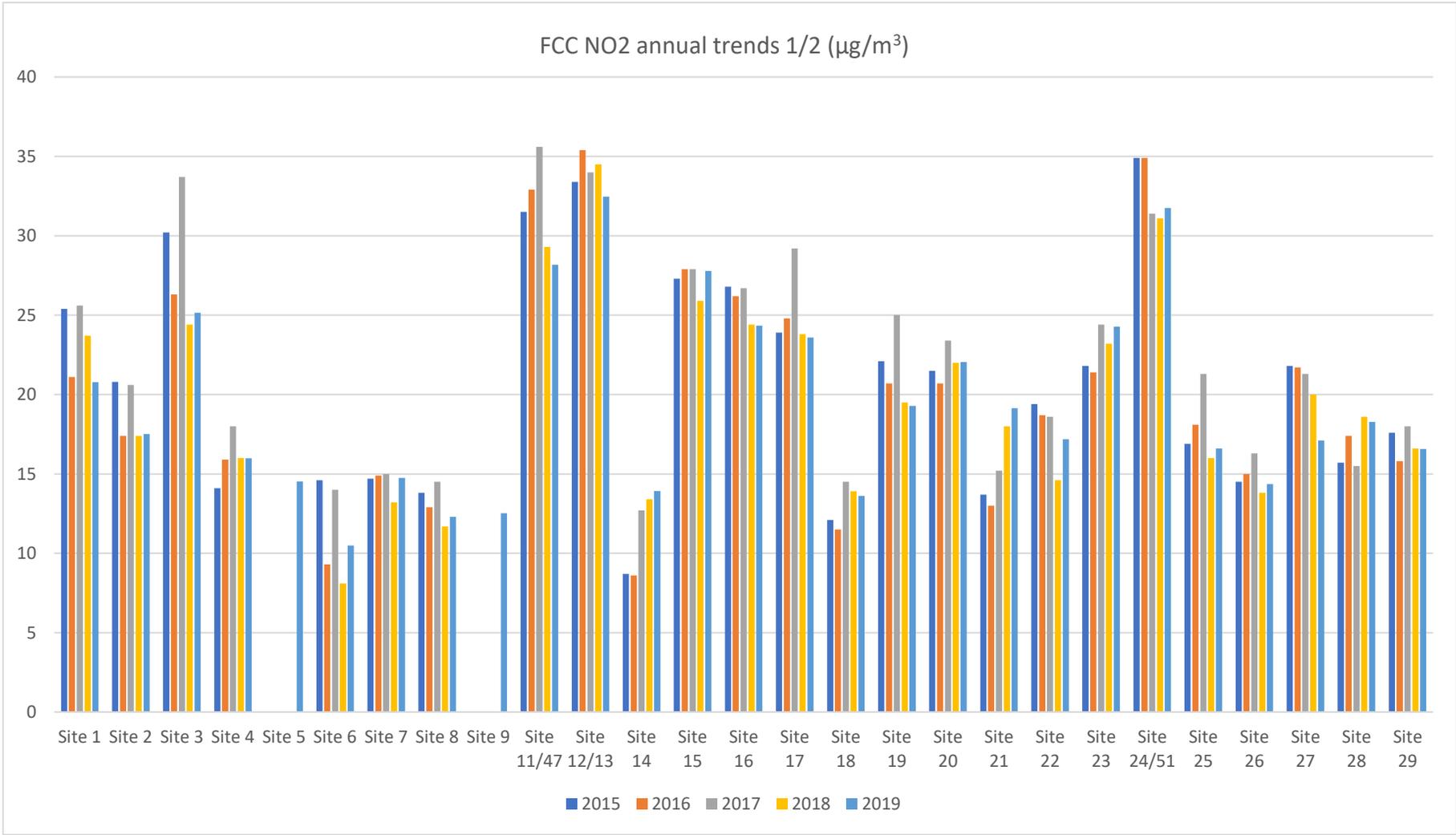


Figure 2.19 – Trends in Annual Mean NO₂ Concentrations: FCC



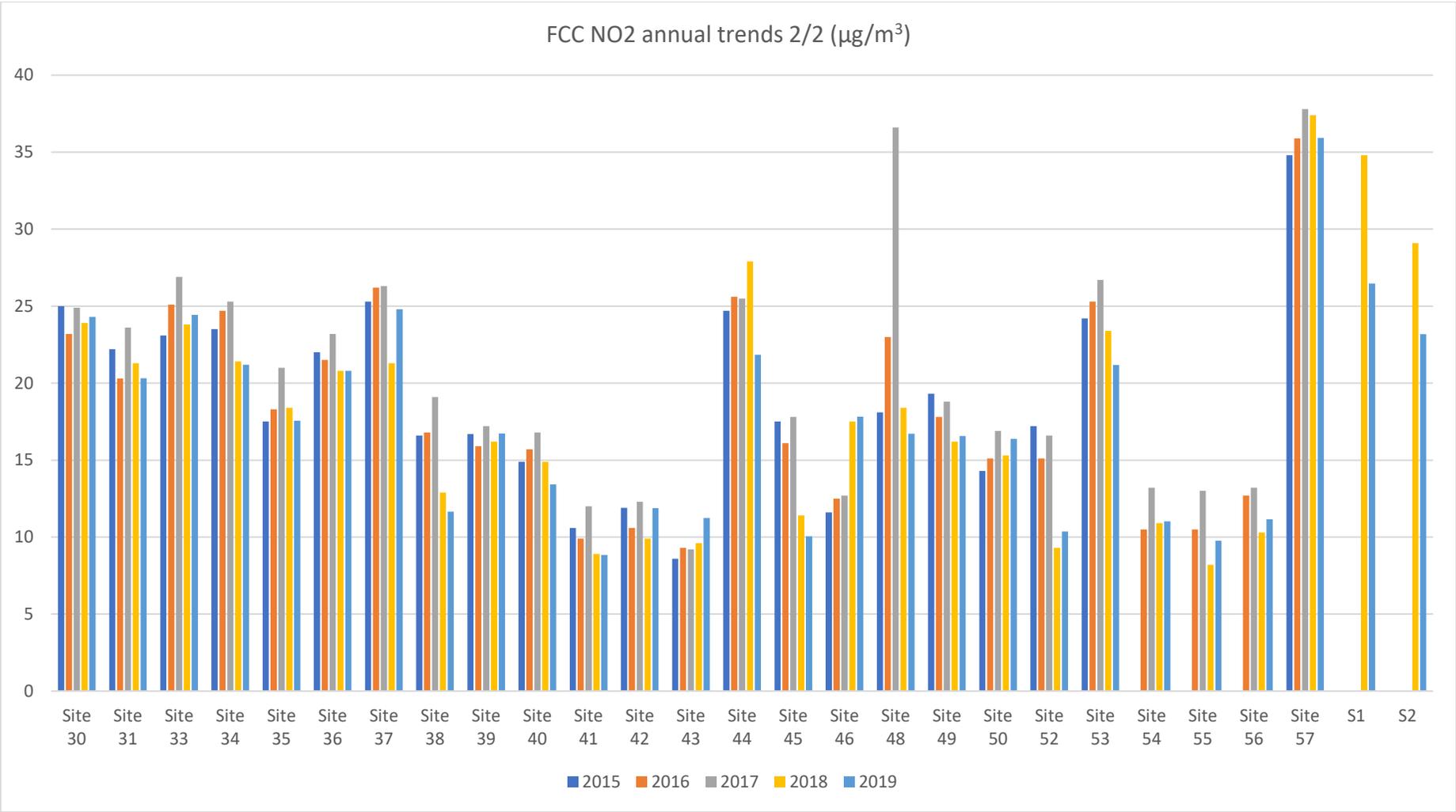


Figure 2.20 – Trends in Annual Mean NO₂ Concentrations: GC

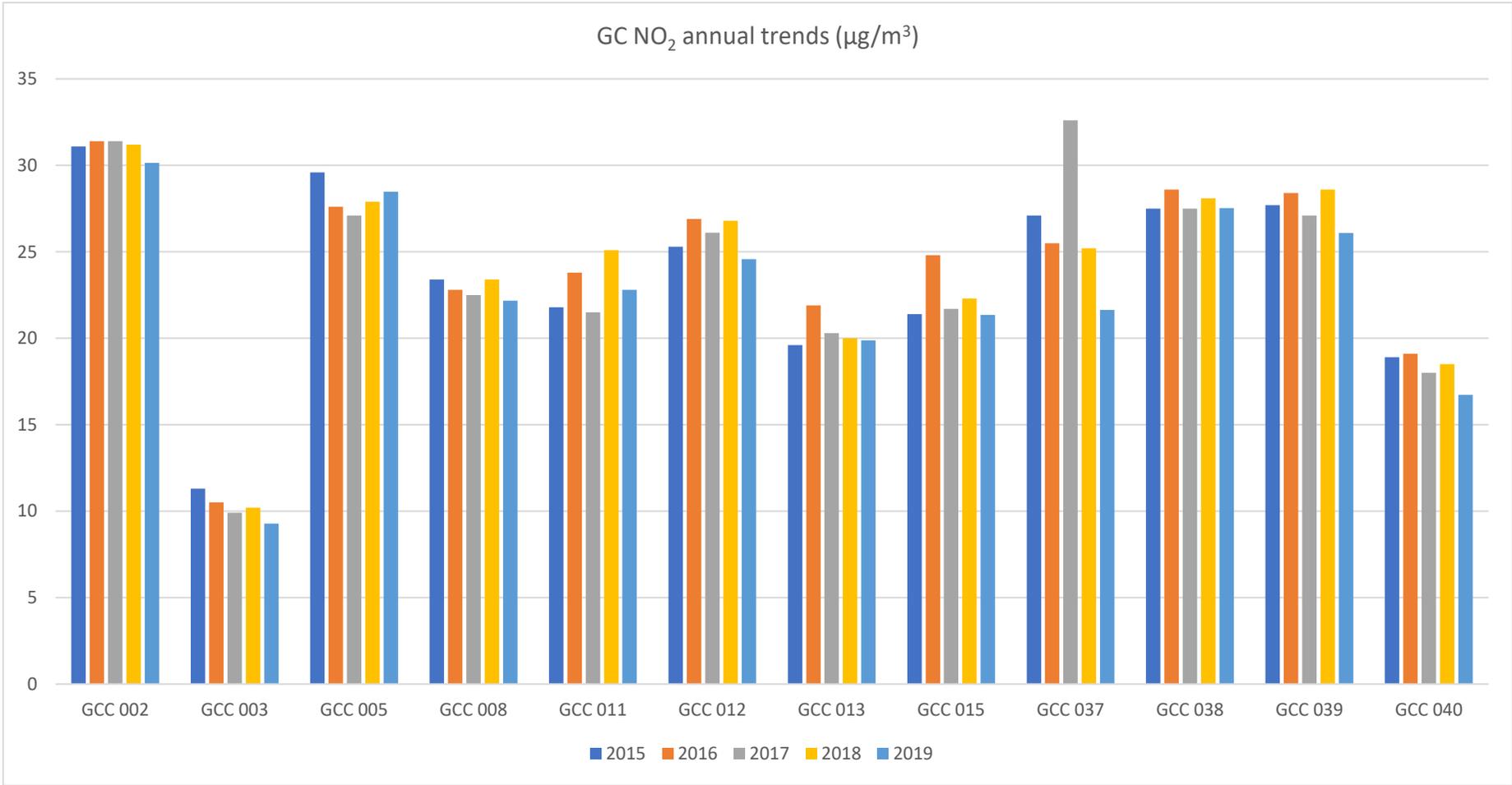


Figure 2.21 – Trends in Annual Mean NO₂ Concentrations: WCBC

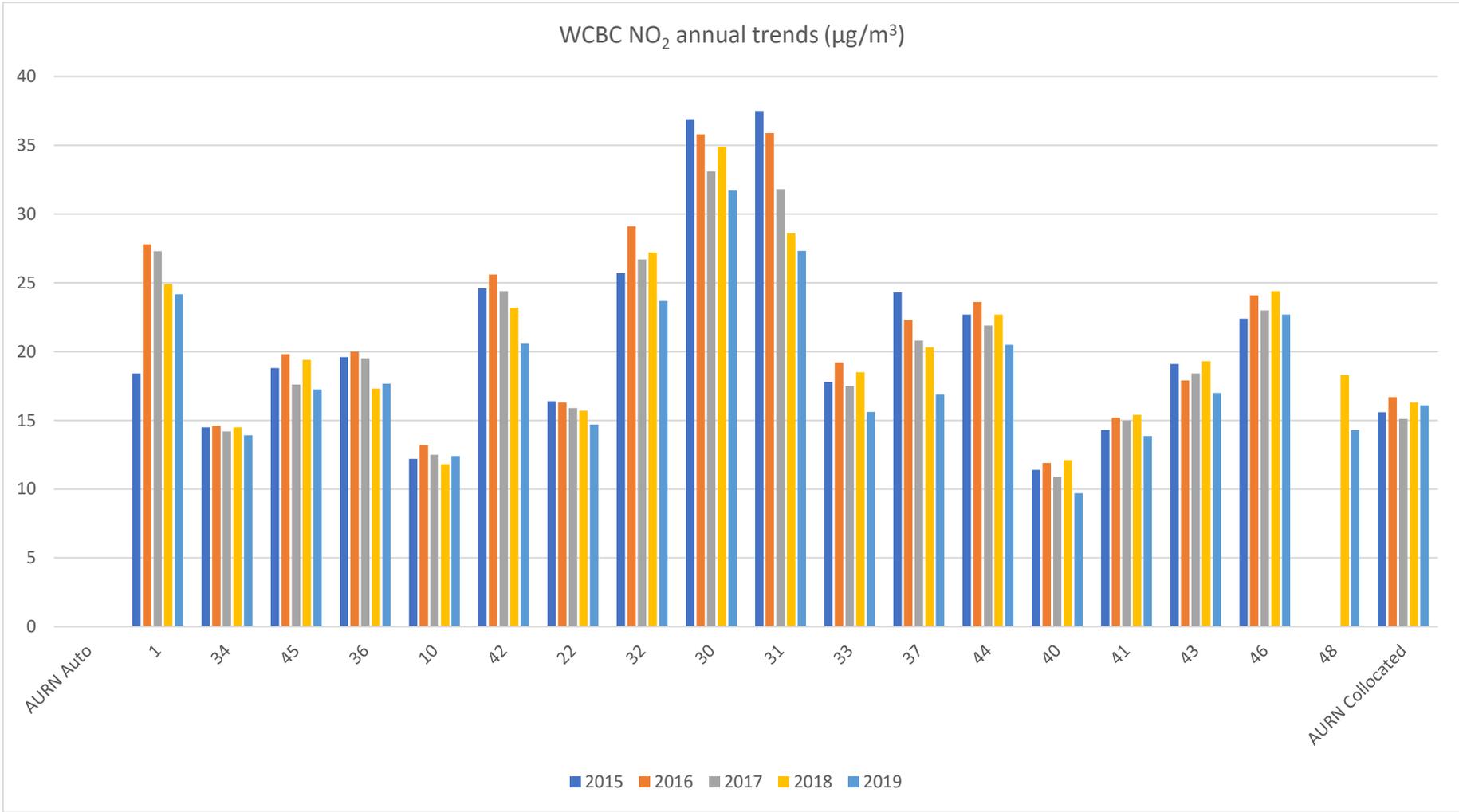


Table 2.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2015	2016	2017	2018	2019
AURN	Roadside	Continuous	80	80	0	0	0	0	0

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Table 2.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2015	2016	2017	2018	2019
IACC								
CM1	Rural	98	98	17.2	18.8	13.2	13.0	17.0
CM2	Rural	96	96	13.1	8.1	11.0	10.1	14.0
CM3	Rural	33	33	34.8	14.9	13.3	14.1	13.6 ⁽³⁾
CM4	Rural	100	100	-	-	8.1*	9.5	13.0
WCBC								
AURN	Roadside	80	80	13.3	12.2	11.5	13.1	12.0

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

*Site was opened in November 2017.

Figure 2.22 – Trends in Annual Mean PM₁₀ Concentrations

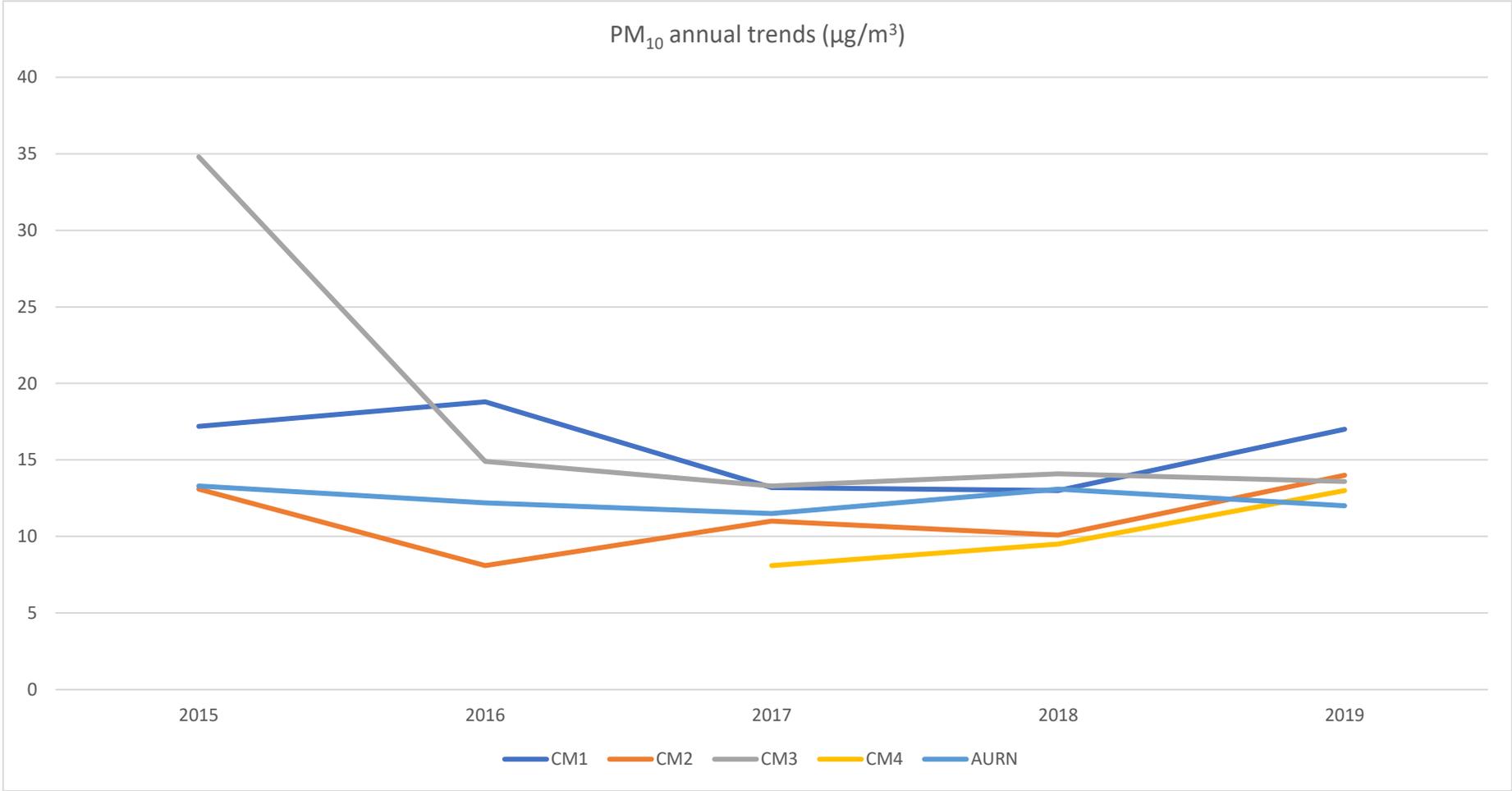


Table 2.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾				
				2015	2016	2017	2018	2019
IACC								
CM1	Rural	98	98	2	4	0	0	0
CM2	Rural	96	96	3	0	0	2	0
CM3	Rural	33	33	3	4	0	0	0
CM4	Rural	100	100	-	-	0	0	0
WCBC								
AURN	Roadside	80	80	3	0	4	1	0

Notes:

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

Table 2.7 – PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2015	2016	2017	2018	2019
IACC								
CM1	Rural	98	98	6.1	8.6	8.4	9.0	9.0
CM2	Rural	96	96	4.0	6.4	6.8	6.0	6.0
CM3	Rural	33	33	7.4	8.5	8.8	8.9	7.1 ⁽³⁾
CM4	Rural	100	100	5.4	6.7 ⁽³⁾	6.5	7.0	7.0
WCBC								
AURN	Roadside	80	80	7.8	6.6	7.1	8.0	8.0

Notes:

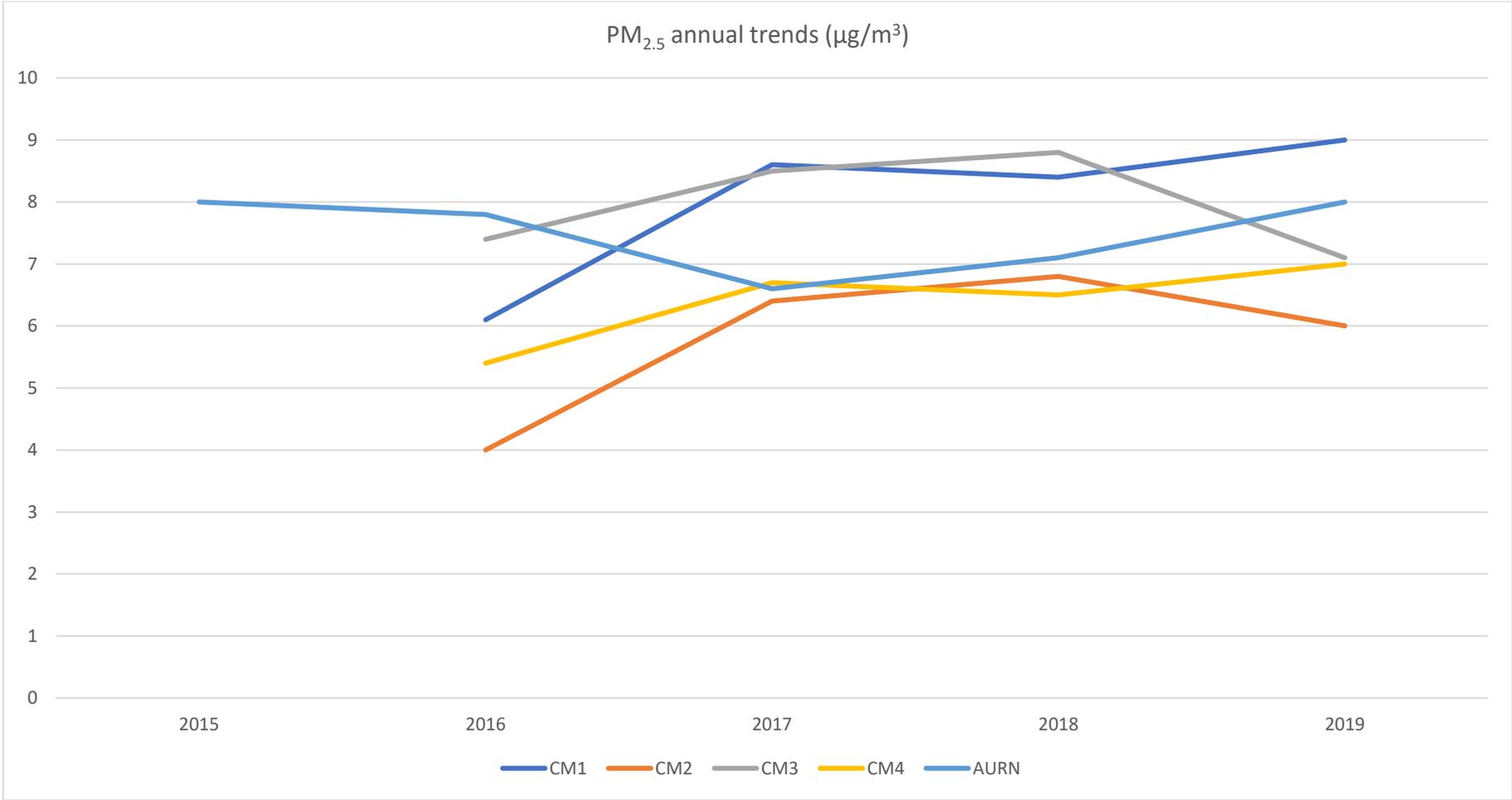
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

*Site was opened in November 2017

Figure 2.23 – Trends in Annual Mean PM_{2.5} Concentrations



2.4 Summary of Compliance with AQS Objectives as of 2019

The local authorities in North Wales (IACC, DCC, FCC, CBC, GC, WCBC) have examined the results from monitoring in 2019. Concentrations at all sites are below the Air Quality Objectives, therefore no further action is required.

3. New Local Developments

3.1 Road Traffic Sources (& other transport)

None identified.

3.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

In WCBC, there are three new Part B facilities in operation, an asphalt plant operated by Roadway Civil Engineering & Surfacing Ltd, a dry cleaner operated by BDC Laundry Ltd, and Ruabon Park Service Station operated by Shell.

3.3 Planning Applications

In **WCBC**, Kronospan submitted an application (P/2019/0505) for the development of a building containing 2 No. gas engines each with a maximum electricity generating capacity of 9.73 MW, 2 No. steam boilers, roof mounted coolers, walkway between an adjacent building and the proposed building, exhaust gas offtake pipes and steam pipes from the gas engine building and carbon catalyst abatement system. An air quality analysis undertaken by Fichtner Consulting Engineers Ltd (available at <http://planning.wrexham.gov.uk/Planning/StreamDocPage/obj.pdf?DocNo=4445761&PageNo=1&content=obj.pdf>) concluded that there would be no material change in the air quality impact from the current operations on site, especially as these gas engines would replace the operation of the two gas turbines on site.

Also in **WCBC**, an outline planning application was submitted (P/2019/0546) for development including up to 450 dwellings, provision of a primary school, small district centre comprising retail, restaurant / public house, multi-functional green infrastructure, car parking.

In **CCBC**, Vibrock Environmental Consultants produced an Air Quality Assessment in support of planning application Ref 0/46338 at the Land Adjacent to the Former Civic Centre, Colwyn Bay. The development of 28 residential properties will be constructed on land formerly used as a car park and ground of the former office development. The report details an assessment of the potential impact of the development on local air quality during both the construction and the operation phases. It concluded that there would be a reduction in traffic movements from the site under the proposal and there would not be a significant impact on local air quality.

3.4 Other Sources

None identified.

The local authorities in North Wales confirm that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

The authorities in North Wales confirm 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. Policies and Strategies Affecting Airborne Pollution

4.1 Local / Regional Air Quality Strategy

There are no AQMAs declared in North Wales. Therefore, there are currently no active AQAPs. As air quality is considered to be good within all six local authority areas, there have been no local policies specifically related to air quality developed.

4.2 Air Quality Planning Policies

Air quality is considered in the wider context in the following local policies:

IACC and **GC** have adopted a joint Local Development Plan which provides the land use strategy for the next 15 years. The plan addresses the need to maintain good air quality in the area and ensure new development does not cause adverse impacts.

CCBC Local Development Plan 2007-2022 includes strategic policies (NTE/1) to ensure natural resources including air quality are protected (available at http://spp.conwy.gov.uk/upload/public/attachments/629/Conwy_Adopted_LDP_2007_2022_English_.pdf).

DCC Local Development Plan 2006-2021 was adopted in 2013 and includes a commitment to avoid reaching critical air quality levels. It acknowledges that assessments of the environmental impact of transport proposals will need to also include air pollution along with noise and ecological impacts.

FCC is currently preparing their Local Development Plan. However, in the interim their Unitary Development Plan for the 15-year period, from 2000 to 2015 remains adopted. The plan identifies sites where new housing, employment and other development can take place, as well as setting out policies to protect important countryside, habitats, resources and heritage. Specific to air quality, Policy STR1 addresses the need to minimise pollution to air, water and land when proposing new developments and STR7 highlights the need to safeguard the natural environment.

WCBC is currently preparing the Local Development Plan 2013 to 2028 which will replace the adopted Unitary Development Plan 1996 to 2011. The plan is a long-term land use and development strategy focused on achieving sustainable development. It will set out policies that will be used to decide planning applications and safeguard

areas of land requiring protection including strategies to ensure the environment is protected from adverse effects of pollution.

4.3 Local Transport Plans and Strategies

The North Wales Joint Local Transport Plan (LTP) (2015-2025) has been jointly produced by the six North Wales local authorities in response to the Welsh Government requirement for LTPs to be submitted by the end of January 2015. The plan preparation has been overseen by Taith as a Joint Committee of the local authorities for transport. The Plan is a statutory document for transport in the region.

A review of the Wales Transport Strategy Objectives, the Welsh Government targets for investment and the Regional Transport Plan priorities, together with the review of issues and opportunities led to the drafting of outcomes for the Local Transport Plan. The Local Transport Plan Outcomes that relate to bringing about air quality improvements includes:

- Connections to Key Destinations and Markets: Support for Economic Growth through an improvement in the efficiency, reliability, resilience, and connectivity of movement, including freight, within and between North Wales and other regions and countries (with a particular focus on accessibility to the Enterprise Zones and an improvement in the vitality and viability of towns and other key centres); and
- Benefits and Minimised Impacts on the Environment: the potential for transport improvements to positively affect the local and global natural and built environment will have been maximised and negative impacts minimised, including adaptation to the effects of climate change.

A set of higher-level interventions have been developed which together aim to deliver the vision and outcomes sought for the LTP:

- Transport network resilience improvements – Improvements to key county corridors to remove/ improve resilience problems;
- Integration with strategic public transport services – Schemes to improve access to rail stations including road access and bus services and interchange facilities, support for park and ride, walking and cycling routes and facilities;

- Improved links to Employment – Schemes to provide improved access to Enterprise Zones (EZs), ports, employment sites and town centres;
- Access to services – Range of integrated transport measures to improve access to education, health, community, shopping and other services by public transport, walking and cycling as well as community transport, taxi, car share sites; and
- Encouraging sustainable travel – Infrastructure improvements and promotional initiatives to increase levels of walking and cycling both for travel and for leisure as well as public transport. May include road and rail bridges/ crossings, cycle routes, footway/ footpath provision, safe routes to school, travel planning as well as road safety measures to assist vulnerable users.

4.4 Local Authorities Well-being Objectives

IACC and **GC** have published Wellbeing Plans (available at <https://www.llesiantgwyneddaron.org/eN/Asesiad-Llesiant/Asesiad-Llesiant/>) the report recognises that the population of Anglesey considers that the natural environment improves well-being and contributes towards quality of life. As a consequence, the Board recognised the importance of protecting the natural environment. While this does not make specific reference to Air Quality, there could be an implied reference and future plans will be required by law to report on progress made.

FCC has published its Wellbeing Plan 2017-2023 (available at <https://www.flintshire.gov.uk/en/PDFFiles/Policy-and-Performance/PSB/A-Well-being-Plan-for-Flintshire.pdf>). The plan recognises the importance of protecting and enhancing the Environment. It states that the Authority wants to ensure “air quality is the best it can be by working with partners to monitor and reduce harmful emissions”.

4.5 Climate Change Strategies

CCBC has progressively reduced its total carbon emissions from its overall activities including energy use in council buildings and fuel used in both the council fleet and employees’ vehicles used on district work. This has resulted in a 33% reduction in carbon emissions between 2011 and 2019 totalling 3,479 Tonnes of CO₂.

North Wales Authorities Collaborative Report

This reduction is summarised with the CCBC 2018/2019 Environmental Report (available at <https://www.conwy.gov.uk/en/Council/Strategies-Plans-and-Policies/Corporate-Plan/assets/documents/Environmental-Report-2018-19.pdf>).

5. Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

There was one exceedance of the NO₂ annual mean AQO recorded in 2019 at IACC's Site 46, however the site had only one month of valid data. The concentration at the nearest location of relevant exposure is estimated to be well below the AQO (see Appendix C).

PM₁₀, PM_{2.5} concentrations were below the AQO at every monitoring sites.

5.2 Conclusions relating to New Local Developments

There are no new or newly identified local developments which are expected to cause a significant adverse air quality impact on the surrounding area within North Wales.

5.3 Other Conclusions

No detailed assessments are required as a result of exceedances of pollutant concentrations and no AQMA need to be declared. Nonetheless, wider policy documents discussed in Section 4 address air quality issues to ensure concentrations remain below the AQOs.

5.4 Proposed Actions

The recommendations for the coming year are listed below:

- Proceed to the 2020 Updating and Screening Assessment;
- Maintain the air quality monitoring programmes in each local authority; and
- Ensure new monitoring sites are added as required.

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- Isle of Anglesey County Council (2018) Wylfa Newydd: Supplementary Planning Guidance May 2018. <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010007/EN010007-002957-Isle%20of%20Angelesey%20-%20Wylfa%20Newydd%20SPG%20May%202018.pdf>
- National Diffusion Tube Bias Adjustment Spreadsheet, Version Number 06/19. July 2019. <https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>
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- The Conwy Local Development Plan 2007-2022. http://spp.conwy.gov.uk/upload/public/attachments/629/Conwy_Adopted_LDP_2007_2022_English_.pdf
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- Welsh Government (2017) Local air quality Management in Wales
- Wood Environment and Infrastructure Solutions UK Ltd (Wood) (2018) North Wales Combined Authority 2018 Air Quality Progress Report.
<https://beta.conwy.gov.uk/en/Resident/Environmental-problems/assets-Air-Quality/documents/North-Wales-Combined-Authority-Air-Quality-Progress-Report-2018.pdf>
- Wood Environment and Infrastructure Solutions UK Ltd (Wood) (2019) North Wales Combined Authority 2019 Air Quality Progress Report.
<https://www.anglesey.gov.uk/documents/Docs-en/Environmental-health/Pollution/Air-Quality-Progress-Report-2019.pdf>
- Wrexham County Borough Council (2016) Annual Status Report
- Wrexham County Borough Council Unitary Development Plan 1996 to 2011.
https://www.wrexham.gov.uk/english/planning_portal/plan_policy/wxm_udp.htm

Appendices

Appendix A: Monthly Diffusion Tube Monitoring Results

Appendix B: A Summary of Local Air Quality Management

Appendix C: Air Quality Monitoring Data QA/QC

Appendix A: Monthly Diffusion Tube Monitoring Results

Table A.1 – Full Monthly Diffusion Tube Results for 2019

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
IACC															
IACC-018	58.5	43.2	41.6	52.3	47.4	36.8	40.9	36.4	39.5	40.9	-	-	43.8	32.8	N/A
IACC-046	61.8	-	-	-	-	-	-	-	-	-	-	-	61.8	46.4	N/A
IACC-049	19.3	-	-	-	-	-	-	-	-	-	-	-	19.3	14.5	N/A
IACC-050	11.9	-	-	-	-	-	-	-	-	-	-	-	11.9	8.9	N/A
IACC-051	10.2	-	-	-	-	-	-	-	-	-	-	-	10.2	7.7	N/A
IACC-053	10.9	-	-	-	-	-	-	-	-	-	-	-	10.9	8.2	N/A
IACC-054	12.6	-	-	-	-	-	-	-	-	-	-	-	12.6	9.5	N/A
IACC-055	6.8	-	-	-	-	-	-	-	-	-	-	-	6.8	5.1	N/A
IACC-081	23.7	34.6	24.5	31.9	12.8	21.1	22.8	18.1	22.4	28.5	39.1	19.9	25.0	18.7	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
IACC-082	29.4	23.3	23.5	26.9	26.1	23	23.8	27.1	24.5	20.1	28	14.4	24.2	18.1	N/A
IACC-083	-	-	-	18.6	24.1	9.7	10.4	7.2	12.1	15.1	21.9	10.8	14.4	10.8	N/A
IACC-084	-	-	-	-	-	-	-	-	-	-	11.3	9.6	10.5	7.8	N/A
CCBC															
DT/CCBC001	23.9	24.3	23.9	31.3	21.0	22.0	16.7	15.1	-	-	-	-	22.3	17.4	N/A
DT/CCBC017	23.4	18.0	21.8	33.5	21.8	21.0	17.3	10.8	20.0	22.1	34.2	16.7	21.7	16.3	N/A
DT/CCBC018	25.6	22.3	21.9	22.2	23.9	22.8	22.9	21.1	23.9	22.2	24.9	21.0	22.9	17.2	N/A
DT/CCBC021	21.1	20.1	23.7	25.0	23.3	23.2	24.5	17.4	20.6	19.5	20.8	15.0	21.2	15.9	N/A
DT/CCBC022	24.3	19.4	24.4	22.9	19.3	19.6	19.0	19.3	21.5	25.9	29.1	21.7	22.2	16.7	N/A
DT/CCBC026	18.6	34.0	24.6	45.2	27.7	31.5	24.3	22.3	-	-	-	-	28.5	22.2	N/A
DT/CCBC033	17.6	13.9	14.5	25.2	15.1	15.9	11.4	8.0	15.4	19.0	28.7	13.0	16.5	12.4	N/A
DT/CCBC034	25.2	26.1	28.6	28.8	23.4	20.9	24.6	23.5	25.1	31.1	32.8	29.6	26.6	20.0	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
DT/CCBC035	20.8	24.0	18.1	30.7	20.6	23.0	17.3	13.8	21.7	24.0	27.2	15.9	21.4	16.1	N/A
DT/CCBC036	14.2	19.1	12.0	18.2	12.4	12.5	12.0	8.8	12.1	17.8	24.1	14.7	14.8	11.1	N/A
DT/CCBC040	19.4	-	17.9	22.3	15.7	17.7	14.4	11.5	19.4	23.7	31.5	14.5	18.9	14.2	N/A
DT/CCBC041	21.4	19.5	17.9	27.1	14.0	15.6	13.3	10.3	18.5	22.7	30.9	13.3	18.7	14.0	N/A
DT/CCBC042	18.3	26.0	21.2	26.5	15.6	16.7	15.3	17.0	18.4	24.9	28.7	23.8	21.0	15.8	N/A
DT/CCBC043	17.0	15.1	14.4	19.5	14.3	15.7	14.5	9.7	13.8	17.1	18.6	12.4	15.2	11.4	N/A
DT/CCBC044	18.5	25.8	26.5	36.5	30.1	27.8	27.1	19.5	22.6	22.8	24.1	15.1	24.7	18.5	N/A
DT/CCBC045	11.3	-	12.2	17.3	13.1	14.7	15.0	11.4	12.9	17.6	21.6	10.9	14.4	10.8	N/A
DT/CCBC046	26.9	-	26.5	32.6	25.8	28.2	27.3	25.9	27.0	-	36.7	26.7	28.4	21.3	N/A
DT/CCBC047	25.8	19.1	26.5	18.0	17.1	23.2	19.9	21.5	18.8	19.7	19.3	16.9	20.5	15.4	N/A
DT/CCBC048	-	-	-	-	-	-	23.5	21.3	19.7	24.4	26.6	18.4	22.3	18.9	N/A
DT/CCBC049	-	-	-	-	-	-	18.7	17.1	18.0	22.2	23.7	12.7	18.7	15.9	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
DCC															
DBK1	33.3	36.2	31.2	33.7	28.9	29.9	26.6	27.0	27.3	33.4	38.3	31.9	31.5	23.6	N/A
DBR2	35.6	35.7	31.7	33.9	27.2	25.2	24.5	28.4	26.8	32.6	38.4	34.8	31.2	23.4	N/A
DBR55	51.7	49.5	40.8	42.7	39.6	47.7	43.0	38.5	43.3	47.2	55.3	47.7	45.6	34.2	N/A
DBR57	20.2	16.3	13.1	13.8	9.3	11.1	8.5	9.0	11.3	12.9	22.3	17.9	13.8	10.4	N/A
DBR5	22.4	9.8	22.6	15.1	12.3	19.8	16.9	14.4	16.8	17.1	26.2	13.7	17.3	12.9	N/A
DBR48	10.2	26.7	37.1	30.2	31.0	29.0	23.9	21.6	29.4	34.1	44.0	31.5	29.1	21.8	N/A
DBR23	29.1	20.3	28.4	17.3	17.1	23.4	16.2	12.9	19.8	24.8	33.2	25.2	22.3	16.7	N/A
DBR8	22.5	15.9	15.2	13.4	14.0	12.8	13.3	11.4	14.2	16.0	22.6	17.0	15.7	11.8	N/A
DBR9	32.2	29.5	24.8	25.0	17.9	19.0	18.2	18.6	21.5	29.0	32.6	28.8	24.8	18.6	N/A
DBR10	22.9	18.4	16.9	23.1	13..5	14.8	12.4	12.7	14.9	21.2	26.5	18.3	18.4	13.8	N/A
DBR24	53.6	44.9	46.7	26.6	37.8	39.9	34.2	-	35.3	36.8	-	44.5	40.0	30.0	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
DBR56	25.7	22.8	18.7	16.5	16.2	15.3	15.4	15.4	17.6	20.1	25.8	20.7	19.2	14.4	N/A
DBR20	37.8	27.5	32.7	20.6	21.8	25.9	21.1	22.4	24.9	27.2	36.9	26.3	27.1	20.3	N/A
DBR43	50.9	39.4	47.9	23.1	32.2	34.3	29.9	32.6	36.2	42.5	45.8	42.9	38.1	28.6	N/A
DBR44	29.7	28.9	32.8	24.4	27.3	30.5	-	24.3	26.3	31.3	37.5	33.5	29.7	22.3	N/A
DBR45	38.8	29.8	25.2	24.9	21.2	24.6	21.8	22.8	25.9	31.5	38.5	35.5	28.4	21.3	N/A
DBR37	41.3	26.5	37.2	25.8	32.2	39.6	33.6	31.2	35.9	39.4	46.3	33.0	35.2	26.4	N/A
DBR38	27.4	16.4	18.6	13.8	14.6	17.0	15.0	17.5	19.3	21.4	23.7	20.5	18.8	14.1	N/A
DBR52	34.4	26.8	27.2	22.8	20.0	22.1	18.0	19.7	24.3	30.5	38.0	30.6	26.2	19.7	N/A
DBR53	45.0	32.1	40.8	27.0	29.1	31.7	29.5	27.3	33.2	37.5	44.4	39.5	34.8	26.1	N/A
DBR31	28.6	22.1	21.1	20.4	17.3	18.8	15.8	14.4	18.2	25.3	31.3	26.4	21.6	16.2	N/A
DBR32	31.9	21.7	27.7	18.1	19.1	18.9	18.0	16.1	19.8	23.9	32.0	22.1	22.4	16.8	N/A
DBR33	39.9	53.3	33.3	30.7	25.3	23.0	22.4	25.9	28.6	36.1	38.9	40.1	33.1	24.8	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
DBR34	24.2	19.7	17.4	19.3	15.1	13.6	12.2	12.2	16.5	22.1	29.6	23.0	18.7	14.1	N/A
DBR49	23.5	18.9	20.9	21.7	17.6	20.8	14.9	13.5	17.8	20.5	29.9	17.2	19.8	14.8	N/A
DBR58	24.2	21.2	22.4	12.9	18.5	19.0	15.6	15.8	15.5	19.5	27.6	20.3	19.4	14.5	N/A
FCC															
Site 1	26.9	33.2	-	36.4	28.4	25.4	20.7	18.2	25.5	33.8	-	28.6	27.7	20.8	N/A
Site 2	26.3	35.7	19.1	35.4	4.7	16.4	14.8	15.8	19.5	29.3	32.7	30.5	23.4	17.5	N/A
Site 3	32.0	53.0	20.9	49.5	27.2	25.3	26.2	28.8	26.3	33.9	41.4	38.0	33.5	25.2	N/A
Site 4	27.3	-	20.3	21.6	22.0	14.4	14.5	12.6	19.2	26.3	35.2	21.0	21.3	16.0	N/A
Site 5	22.7	22.4	13.1	23.1	18.5	17.3	13.8	11.6	17.7	22.5	30.6	19.0	19.4	14.5	N/A
Site 6	15.6	17.9	8.6	19.5	12.4	9.0	8.3	-	8.8	16.8	24.3	12.7	14.0	10.5	N/A
Site 7	24.8	23.4	16.7	24.8	15.7	13.7	13.9	11.9	16.6	22.4	29.1	23.0	19.7	14.8	N/A
Site 8	21.9	18.7	15.6	20.0	11.4	11.5	10.3	9.9	14.1	18.5	23.7	21.2	16.4	12.3	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
Site 9	-	16.0	16.2	20.2	13.8	12.7	11.0	11.5	16.0	20.3	29.2	-	16.7	12.5	N/A
Site 11	47.3	29.2	42.6	34.9	39.3	35.2	32.3	30.1	36.4	41.4	53.0	30.9	37.7	28.3	N/A
Site 12	45.9	54.9	41.2	46.2	39.7	35.4	36.7	36.3	38.5	46.2	53.8	49.1	43.7	32.7	N/A
Site 13	55.1	55.8	45.7	44.7	34.8	34.2	34.1	35.0	28.8	48.9	49.1	48.6	42.9	32.2	N/A
Site 14	25.1	-	-	20.7	15.9	14.9	12.4	10.4	15.7	21.5	31.5	17.6	18.6	13.9	N/A
Site 15	35.7	47.7	25.4	60.9	31.3	30.1	23.0	24.0	30.9	44.2	44.5	46.8	37.0	27.8	N/A
Site 16	39.7	37.3	35.0	34.0	29.3	26.4	23.9	24.7	27.0	33.3	44.3	34.6	32.5	24.3	N/A
Site 17	39.0	23.8	31.6	36.5	33.1	27.2	24.1	18.5	28.9	34.9	49.3	30.6	31.5	23.6	N/A
Site 18	26.7	-	18.0	-	11.5	13.9	11.5	9.7	13.9	23.5	34.8	18.0	18.2	13.6	N/A
Site 19	30.9	27.8	20.7	32.4	21.7	18.9	18.6	15.5	24.7	31.5	40.2	-	25.7	19.3	N/A
Site 20	35.8	32.9	36.4	32.2	27.7	24.5	20.9	21.3	23.6	26.5	37.7	33.3	29.4	22.1	N/A
Site 21	32.2	34.1	19.3	33.0	20.1	19.3	16.8	16.3	20.1	29.9	39.6	-	25.5	19.1	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
Site 22	29.0	26.6	20.9	28.0	16.6	15.7	15.9	14.7	19.4	28.1	30.7	29.3	22.9	17.2	N/A
Site 23	42.6	36.0	36.2	40.2	27.1	25.8	27.6	27.5	-	-	-	28.2	32.4	24.3	N/A
Site 24	48.2	51.0	38.8	41.3	40.4	39.3	33.6	30.9	39.3	43.1	55.3	-	41.9	31.4	N/A
Site 25	31.2	22.7	20.5	25.9	15.8	15.8	15.0	14.1	18.6	24.1	38.1	23.8	22.1	16.6	N/A
Site 26	25.9	28.0	15.1	17.8	12.6	11.5	9.8	10.3	16.2	24.4	36.4	21.8	19.2	14.4	N/A
Site 27	-	-	20.5	33.3	18.8	16.8	16.5	16.3	16.8	26.1	35.8	27.2	22.8	17.1	N/A
Site 28	32.1	24.0	24.8	20.9	20.5	19.0	20.3	19.1	21.2	28.4	34.1	27.9	24.4	18.3	N/A
Site 29	27.8	32.5	16.1	24.5	15.5	14.7	13.5	12.8	18.6	26.7	36.4	26.0	22.1	16.6	N/A
Site 30	40.7	30.2	35.4	36.3	32.2	29.4	26.2	23.4	30.0	34.6	40.0	30.4	32.4	24.3	N/A
Site 31	31.1	33.1	22.2	37.5	23.1	20.5	16.9	18.5	23.6	29.6	35.8	33.2	27.1	20.3	N/A
Site 32	-	-	23.3	4.0	21.0	-	16.8	17.4	-	25.0	32.0	25.1	20.6	16.4	N/A
Site 33	35.6	40.4	26.1	38.9	-	24.4	25.1	24.5	26.1	35.7	40.7	40.9	32.6	24.4	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
Site 34	35.9	34.8	29.5	31.4	25.3	21.9	20.5	20.9	26.6	21.7	40.2	30.3	28.3	21.2	N/A
Site 35	30.7	26.2	23.4	24.3	21.0	19.2	15.0	15.7	17.7	25.9	34.3	27.4	23.4	17.6	N/A
Site 36	34.8	32.2	25.4	30.1	24.7	20.7	19.6	19.6	24.7	31.2	37.7	32.0	27.7	20.8	N/A
Site 37	-	31.4	-	-	-	-	21.2	21.8	27.7	39.4	45.8	35.3	31.8	24.8	N/A
Site 38	20.1	14.7	12.9	18.3	14.1	11.6	8.5	7.5	13.7	20.0	26.0	19.1	15.5	11.7	N/A
Site 39	28.2	24.3	19.4	23.9	23.1	-	17.2	15.1	21.1	19.5	31.3	-	22.3	16.7	N/A
Site 40	24.3	18.0	19.0	18.1	14.8	13.0	13.5	10.9	16.7	19.9	29.0	17.6	17.9	13.4	N/A
Site 41	-	-	9.1	17.3	11.8	9.6	8.4	5.7	10.3	13.1	20.8	-	11.8	8.8	N/A
Site 42	-	15.0	12.7	18.5	12.5	10.5	9.4	-	12.2	19.3	30.9	17.4	15.8	11.9	N/A
Site 43	-	16.4	12.2	17.1	12.8	11.3	10.5	7.7	15.3	19.1	27.5	-	15.0	11.2	N/A
Site 44	24.7	-	-	33.7	26.6	25.0	24.3	20.6	27.7	35.7	44.7	28.1	29.1	21.8	N/A
Site 45	-	-	-	15.4	8.1	-	-	6.2	7.7	15.2	24.3	15.3	13.2	10.0	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
Site 46	31.3	25.8	21.2	22.1	16.6	-	15.9	15.6	21.9	28.2	39.0	-	23.8	17.8	N/A
Site 47	45.4	34.7	43.7	38.6	33.3	36.2	36.5	30.0	36.0	39.2	48.8	26.6	37.4	28.1	N/A
Site 48	29.0	20.7	24.5	23.1	17.6	18.5	16.8	14.0	21.3	24.4	35.2	-	22.3	16.7	N/A
Site 49	25.8	27.3	20.7	27.9	14.6	16.2	13.3	15.2	16.9	24.3	29.0	33.8	22.1	16.6	N/A
Site 50	29.9	23.0	20.2	22.0	16.9	18.1	15.6	12.4	20.0	25.1	35.5	23.4	21.8	16.4	N/A
Site 51	52.3	52.0	37.2	47.2	36.8	38.6	33.5	34.6	37.1	45.3	53.1	45.3	42.8	32.1	N/A
Site 52	18.3	14.5	-	18.9	10.3	10.7	8.4	6.3	12.3	-	24.6	-	13.8	10.4	N/A
Site 53	37.9	32.7	27.1	28.9	19.4	24.4	22.7	21.3	25.7	32.8	30.9	34.9	28.2	21.2	N/A
Site 54	14.3	15.9	12.2	16.4	8.9	9.1	-	16.6	11.5	17.0	24.5	15.2	14.7	11.0	N/A
Site 55	20.4	15.1	12.3	14.6	8.3	6.7	8.0	6.6	10.2	14.8	23.8	15.4	13.0	9.8	N/A
Site 56	22.3	-	11.3	18.1	9.4	10.3	9.7	7.9	12.6	17.4	18.2	26.3	14.9	11.1	N/A
Site 57	59.2	50.2	48.5	49.5	35.7	44.5	41.3	38.8	47.5	54.4	59.8	45.3	47.9	35.9	30.9

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
S1	52.0	38.9	35.5	37.0	25.4	29.1	26.7	25.7	32.6	41.1	40.6	38.8	35.3	26.5	N/A
S2	39.4	-	-	33.7	-	23.8	23.5	22.5	26.2	33.1	37.8	38.1	30.9	23.2	N/A
GC															
GCC 002	34.5	32.32	34.86	33.94	28.98	31.97	34.27	31.51	31.66	31.2	32.98	30.84	32.4	30.1	N/A
GCC 003	13.14	11.32	9.73	10.93	8.85	8.37	7.89	6.5	8.26	10.86	14.79	9.15	10.0	9.3	N/A
GCC 005	27.16	33.86	28.91	35.74	34.81	32.27	29.78	27.87	28.73	30.44	36.58	21.35	30.6	28.5	N/A
GCC 008	24.59	27.57	28.03	23.18	22.01	23.28	18.69	15.96	21.59	24.18	30.53	26.6	23.9	22.2	N/A
GCC 011	27.45	32.4	25.88	19.48	20.52	20.52	19.29	25.94	15.59	30.49	31.8	24.83	24.5	22.8	N/A
GCC 012	31.15	26.71	26.08	29.45	28.28	23.84	24.95	21.32	26.16	26.69	30.82	21.62	26.4	24.6	N/A
GCC 013	24.78	19.77	20.66	26.31	22.67	19.59	20.23	16.05	22.81	-	24.21	18.06	21.4	19.9	N/A
GCC 015	24.02	24.67	21.27	26.06	22.12	21.92	21.13	20.1	24.33	24.93	27.35	17.5	23.0	21.3	N/A
GCC 037	-	35.18	25.81	27.86	9.45	21.48	-	-	-	27.99	31.64	26.46	25.7	21.6	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
GCC 038	30.39	26.95	27.65	33.55	30.11	32.09	30.7	26.05	32.71	30.21	30.54	24.23	29.6	27.5	N/A
GCC 039	32.56	-	30.69	30.66	28.43	32.43	13.27	25.31	30.03	30.49	31.18	23.55	28.1	26.1	N/A
GCC 040	25.04	21.13	18.44	18.53	8.64	14.38	17.71	17.69	16.09	18.89	16.6	22.72	18.0	16.7	N/A
WCBC															
1	42.0	34.8	28.6	27.8	34.2	33.5	16.5	21.7	34.7	36.3	44.9	31.8	32.2	24.2	N/A
34	13.0	24.3	14.7	25.1	15.0	15.7	14.2	11.0	18.3	20.5	28.8	22.1	18.6	13.9	N/A
45	22.5	26.8	17.5	31.0	25.3	25.5	17.6	11.9	22.2	23.4	32.5	19.9	23.0	17.3	N/A
36	28.4	33.1	18.9	22.5	19.6	18.7	14.6	15.3	22.7	25.2	34.9	28.8	23.6	17.7	N/A
10	19.0	29.7	14.4	13.5	11.9	13.3	10.9	10.2	13.7	18.5	20.9	22.4	16.5	12.4	N/A
49	15.0	15.8	13.5	11.6	10.6	11.1	8.8	7.2	13.1	13.7	22.2	13.0	13.0	9.7	N/A
42	30.7	32.9	22.4	28.7	28.8	18.0	23.4	17.0	28.2	27.1	42.8	29.0	27.4	20.6	N/A
50	31.5	23.5	26.4	20.9	28.8	27.7	24.2	14.7	29.8	26.8	41.4	18.5	26.2	19.6	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
51	22.0	27.9	16.2	23.3	22.5	22.6	17.0	12.7	23.8	22.3	36.2	22.6	22.4	16.8	N/A
52	26.9	37.5	18.7	35.7	24.9	26.3	26.3	19.7	27.9	31.7	37.8	28.5	28.5	21.4	N/A
53	30.2	33.7	18.8	25.4	23.2	23.4	26.0	21.8	27.3	26.1	36.6	29.2	26.8	20.1	N/A
22	17.0	25.5	21.0	18.8	17.6	14.8	15.8	14.3	17.2	22.2	27.9	23.2	19.6	14.7	N/A
32	39.0	29.8	37.4	28.7	30.2	28.9	25.2	19.9	32.1	31.7	45.2	30.8	31.6	23.7	N/A
30	40.0	53.9	37.9	44.3	47.8	18.9	44.1	32.1	46.3	46.8	56.9	38.5	42.3	31.7	N/A
31	42.9	46.5	30.8	32.4	33.8	30.4	32.7	26.8	39.7	33.2	49.7	38.1	36.4	27.3	N/A
33	27.4	23.7	17.1	19.9	18.6	17.2	15.7	11.6	21.8	23.8	32.2	20.8	20.8	15.6	N/A
37	28.2	27.5	20.2	23.7	18.3	24.5	17.6	13.6	19.9	27.5	29.9	19.1	22.5	16.9	N/A
38	26.8	25.5	23.2	19.2	20.8	20.3	17.8	13.3	22.0	22.9	31.1	20.3	21.9	16.5	N/A
44	26.9	26.1	22.6	27.6	23.1	24.1	19.9	16.1	26.2	43.5	40.6	31.3	27.3	20.5	N/A
40	17.8	15.8	9.8	13.2	11.3	9.9	12.7	6.1	11.9	14.6	20.6	11.4	12.9	9.7	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
41	18.7	21.0	13.5	22.7	16.6	13.2	17.0	8.5	18.1	21.1	37.4	14.1	18.5	13.9	N/A
43	28.3	20.8	20.5	26.1	19.6	17.9	10.4	13.2	23.2	28.9	39.6	23.5	22.7	17.0	N/A
46	28.8	41.6	22.5	36.8	27.0	23.4	21.9	16.8	29.7	33.4	46.5	34.8	30.3	22.7	N/A
48	25.4	21.4	19.6	16.7	19.9	19.3	17.1	13.1	20.7	15.7	28.2	20.6	19.0	14.3	N/A
54	39.4	32.4	39.3	20.0	30.9	26.7	29.3	21.2	29.6	30.1	37.4	26.8	30.3	22.7	N/A
55	20.0	19.6	13.0	15.2	13.0	11.2	10.6	8.8	15.2	20.1	26.8	15.6	15.8	11.8	N/A
56	28.8	34.9	18.6	34.1	21.5	17.8	18.0	14.5	22.5	28.2	34.1	27.5	25.0	18.8	N/A
57	23.4	32.3	16.2	23.0	19.2	16.5	29.5	13.9	-	24.1	37.7	-	23.6	17.7	N/A
58	20.9	19.9	16.8	14.7	15.8	11.3	12.4	8.7	16.9	20.2	29.0	16.5	16.9	12.7	N/A
59	19.1	14.8	11.3	15.0	21.0	13.9	11.1	7.0	14.2	16.1	23.7	12.6	15.0	11.2	N/A
60	15.5	11.1	8.7	9.2	8.5	7.6	6.6	5.4	9.6	11.9	16.5	11.8	10.2	7.7	N/A

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

- (1) See Appendix C for details on bias adjustment and annualisation.
- (2) Distance corrected to nearest relevant public exposure.

Appendix B: A Summary of Local Air Quality Management

Purpose of an Annual Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995 and associated government guidance. 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 being achieved. Where exceedances occur, or are likely to occur, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) within 18 months of declaration setting out the measures it intends to put in place in pursuit of the objectives. Action plans should then be reviewed and updated where necessary at least every 5 years.

For Local Authorities in Wales, an Annual Progress Report replaces all other formal reporting requirements and have a very clear purpose of updating the general public on air quality, including what ongoing actions are being taken locally to improve it if necessary.

Air Quality Objectives

The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138), Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298), and are shown in Table B.1.

The table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

Table B.1 – Air Quality Objectives Included in Regulations for the Purpose of LAQM in Wales

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen Dioxide (NO ₂)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM ₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40µg/m ³	Annual mean	31.12.2004
Particulate Matter (PM _{2.5})	25 µg/m ³ (EU limit) (10µg/m ³ WHO guideline)	Annual mean	-
Sulphur dioxide (SO ₂)	350µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	16.25µg/m ³	Running annual mean	31.12.2003
	5.0µg/m ³	Annual mean	31.12.2011
1,3 Butadiene	2.25µg/m ³	Running annual mean	31.12.2003
Carbon Monoxide	10.0mg/m ³	Running 8-Hour mean	31.12.2003
Lead	0.25µg/m ³	Annual Mean	31.12.2008

Appendix C: Air Quality Monitoring Data QA/QC

Diffusion Tube Bias Adjustment Factors

Diffusion tubes adjustment factors were obtained from the national bias adjustment calculator v03/20. Tubes were analysed by Gradko and Socotec Didcot as detailed in the table below.

Local authority	Laboratory	Method	2020 Bias adjustment factor	Number of studies
GC	Gradko	20% TEA in water	0.93	27
IACC CCBC DCC FCC WCBC	Socotec Didcot	50% TEA in acetone	0.75	24

PM Monitoring Adjustment

The particulate monitoring undertaken in WCBC was via use of daily gravimetric Partisols. These meet the European equivalence testing and therefore are not subject to any correction.

The Osiris instruments run by IACC have not been adjusted. The IACC have previously demonstrated that an adjustment factor of 1.3 would lead to a significant overestimation of the impact of coarse dust (e.g. quarry dust). Therefore, it was deemed inappropriate to adjust the data gathered using the Osiris monitors as these instruments are normally monitoring for the coarse fractions e.g. quarry dust.

Short-Term to Long-Term Data Adjustment

Data capture at all sites which recorded less than 75% data capture during 2019 has been annualised according to the method set out in Boxes 7.9 and 7.10 of LAQM.TG16.

NO₂ diffusion tubes concentrations were annualised using automatic monitoring data from three stations with a data capture above 85%. 2019 automatic monitoring data

was obtained from <https://airquality.gov.wales/>. The details of the annualisation have been provided in Table C.1.

PM₁₀ and PM_{2.5} concentrations at IACC's CM3 were annualised using data from the three other automatic monitors. Data was obtained from IACC.

Table C.1 – NO₂ Short-Term to Long-Term Monitoring Data Adjustment Ratios

Authority	Monitor ID	Cwmbran (Urban background)	Narberth (Rural)	Swansea Cwm Level Park (Urban background)	Average Ratio
CCBC	DT/CCBC001	1.08	0.99	1.05	1.04
	DT/CCBC026				
	DT/CCBC048	1.06	1.17	1.16	1.13
	DT/CCBC049				
FCC	Site 32	1.09	1.00	1.10	1.06
	Site 37	0.94	1.15	1.03	1.04
	Site 45	1.06	0.95	1.05	1.02
GC	GCC 037/C6	0.94	0.88	0.90	0.90

Table C.2 – PM Short-Term to Long-Term Monitoring Data Adjustment Ratios

Authority	Monitor ID	CM1	CM2	CM4	Average Ratio
PM₁₀					
IACC	CM3	0.90	0.91	0.85	0.89
PM_{2.5}					
IACC	CM3	0.76	0.86	0.78	0.80

QA/QC of Automatic Monitoring

The Victoria Road AURN automatic monitoring station in WCBC is part of the Automatic Urban and Rural Network (AURN). The data ratification and station audit are carried out by Ricardo-AEA under contract with Defra and the Devolved Administrations.

The four PM₁₀ automatic monitoring stations in IACC are run by the local authority. Routine filter changes and air flow checks (600ml/min) on the Turnkey Osiris instruments are carried out normally on a quarterly basis. This is in addition to an annual service and calibration undertaken by Turnkey Instruments under the terms of the service contract.

In 2017 The GSM modems have been replaced with Webservers which continuously upload the data into the AirQWeb website. The software immediately notifies the local authority by email of any issues with the monitors.

This enables the performance of the instrument to be monitored and enables problems to be rectified quickly and with minimum loss of data. Data is normally analysed as 15-minute averages and is exported hourly from AirQWeb into the Welsh Air Quality Website. A visual data ratification process is employed, to safeguard against erroneous peaks etc., before any results are reported. Utilizing a spare Osiris monitor, while normal monitors are away for calibration, has significantly improved data capture.

QA/QC of Diffusion Tube Monitoring

ESG Didcot and Gradko are both UKAS accredited laboratories who participates in the new AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO₂ tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance.

ESG Didcot and Gradko both scored 75% or above on all results for 2019. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

Results are available at <https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>.

Fall-off with Distance Correction of Sites Exceeding and within 10% of the NO₂ Annual Mean Objective

Concentration at IACC's Site 46 was above the NO₂ annual mean AQO. Consequently, it was used to estimate the concentration at the nearest location of

relevant exposure using the NO₂ fall-off with distance calculator (Version 4.2).

Calculations parameters and results are represented in the figure below.

It should be noted that the closest receptors are situated more than 20m further from the kerb than the monitor and so results need to be treated with caution.

		Enter data into the pink cells	
Step 1	How far from the KERB was your measurement made (in metres)?	3	metres
Step 2	How far from the KERB is your receptor (in metres)?	33	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	5.9	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	46.4	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	21.3	µg/m ³
Warning: your receptor is more than 20m further from the kerb than your monitor, treat result with caution			

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide