Caerphilly County Borough Council
2018 Air Quality Progress Report
In fulfillment of Part IV of the Environment Act 1995
Local Air Quality Management

October, 2018

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Executive Summary: Air Quality in Our Area

Air Quality in **Caerphilly County Borough**

Caerphilly County Borough Council (CCBC) currently monitors Local Air Quality via passive diffusion tubes and continuous analysers. Nitrogen Dioxide is the main pollutant and is monitored via an extensive network of 57 diffusion tubes and 5 continuous analysers. Particulate Matter is currently the only other observed pollutant and is monitored via 3 continuous analysers. Levels of local air quality observed in 2017, mostly reduced from levels experienced in 2016 with the number of exceedances of the National Air Quality Objectives reducing from 7 to 6 locations – five diffusion tubes and 1 continuous analyser.

CCBC currently have two declared Air Quality Management Areas (AQMAs), Caerphilly Town Centre and Hafodyrynys Road (https://airquality.gov.wales/laqm/air-quality-management-areas). Caerphilly Town Centre AQMA action plan is due to be renewed in 2019; the latest action has included working with Stagecoach and CCBC Transport to bid for an Ultra-Low Emission Bus (ULEB) grant to replace 21 diesel buses for electric alternatives. The decision of this bid is still outstanding with a verdict due at the end of October. Hafodyrynys Road AQMA action plan has been recently approved by Welsh Government (WG) and Cabinet, with a formal direction for the council being made by Welsh Ministers, to assess solutions for the AQMA. CCBC are required to undertake a feasibility study to assess measures which are likely to bring about compliance at Hafodyrynys AQMA with the EU Ambient Air Quality Directive in the shortest possible time. CCBC submitted an initial plan to WG in September with a Final Plan due by 30th June 2019. The Final Plan must detail what the preferred measures/basket of measures will be with a fully costed business case to deliver the measure(s).

Actions to Improve Air Quality

As stated previously, Environmental Health have worked with Stagecoach to bid for 21 electric buses to operate within the Caerphilly Basin, the outcome of which is still awaited and due by the end of October.

In 2015, works were carried out to the Crumlin Junction at the bottom of Hafodyrynys Road, in an effort to increase capacity and efficiency of the junction, and reduce queueing and subsequent idling of vehicles within Hafodyrynys AQMA. The works were modelled to reduce the NO_2 levels captured by the continuous analyser by 10% to roughly 60µg/m^3, as well as removing all exceedances of the National Hourly Objective. However, in 2016 levels remained the same as they did in 2015 and the exceedances of the National Hourly Objective increased from 108 to 126. The Annual Average NO_2 levels in 2017 increased by 1µg/m^3 to 70µg/m^3 and the number of Hourly exceedances have also risen to 132, from 126.

The conclusion of these works is that although they have improved capacity and efficiency at the junction to release idling vehicles travelling westbound on Hafodyrynys Road, it has introduced idling and congestion during Am peak for vehicles travelling eastbound, which has counteracted the positive effects. The effects of the eastbound queues will be considered as part of the feasibility study along with potential measures to negate the effects, EG. Signalising Swyffryd Junction, queue detection along the A472 carriageway and reconsideration of the signal timings of the Crumlin Junction.

Environmental Health have introduced a further five diffusion tubes in Cwmfelinfach and Wattsville to better understand NO_2 levels around Islwyn Road. Although there are no longer any exceedances in this location, the level is still close to the National Annual Objective and needs to be assessed further. Discussions have taken place with Traffic Management in an effort to understand the reasons for the pinch point in NO_2 emissions. Further traffic counts are required along this road to understand fully what is causing the elevated levels of NO_2. These will be undertaken over the coming months.

Local Priorities and Challenges

The main priority for addressing Local Air Quality in Caerphilly County Borough at this time is to identify and implement an effective resolution for Hafodyrynys AQMA. The measure(s) will either have to effectively reduce levels of NO_2 and bring them back into compliance with EU Ambient AQ Directive, or consideration may need to be given to removing the affected receptors.

Environmental Health increased the Hafodyrynys monitoring network by 10 diffusion tubes in November 2017; as only two months were captured in the calendar year, these results are not reported in this Progress Report. They will be used to better understand how NO_2 levels fluctuate along different points on Hafodyrynys Road and increase the effectiveness of the modelling of potential measures.

How to Get Involved

Information on our local air quality network can be accessed via https://airquality.gov.wales/. Should you wish to speak with an officer, contact Environmental Health on 01443 811328 or ehadmin@caerphilly.gov.uk.

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1. Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

The risk of an exceedance of the 2005 objective for annual mean NO_2 in central Caerphilly was first indicated by diffusion tube monitoring at White Street in 2004 and 2005. The exceedance area was investigated during the Detailed Assessment, which was carried out in 2006. The Detailed Assessment predicted that the National Annual Objective of 40µg/m^3 for NO_2, was being exceeded at relevant receptors in White Street between Van Road and Bartlett Street. It was further predicted that the National Hourly Objective for NO_2 in 2005 was not being exceeded at any relevant receptor in the study area.

The Detailed Assessment recommended that CCBC declare an AQMA in Caerphilly Town Centre.

The 2006 Updating and Screening Assessment (USA) identified exceedances of NO_2 in central Caerphilly. Subsequent progress reports in 2007 and 2008 corroborated this finding.

The 2007 Progress Report advised of another area of the County Borough that continued to remain close to the National Annual Objective for NO_2, namely Blackwood High Street. However, due to the construction of a bypass road and the redevelopment of the bus station, it was agreed by the Welsh Government (WG) that CCBC would be afforded a time period until the aforementioned works were completed, to assess the impact they had upon the levels of NO_2 within the High Street. Since the completion of the bypass there have been no exceedances of the National Annual or Hourly Objectives for NO_2 at Blackwood High Street.

In 2008, CCBC declared an AQMA for NO_2 encompassing a number of properties along Clifton Street, White Street and Bartlett Street in Caerphilly.

The 2009 USA concluded several areas within Caerphilly Town Centre were exceeding the National Annual Objective for NO_2; however, the majority of the locations were already contained within the AQMA and were the focus of a Further Assessment. Two areas outside of the AQMA, namely Ton-Y-Felin Road and Nantgarw Road were also included within the Further Assessment, as any proposed actions for the AQMA would have a 'knock on' effect on these areas due to the road network. In conclusion, CCBC was not required to proceed to a Detailed Assessment for any areas within the County Borough.

In 2010, AEA consultants were commissioned by CCBC to undertake a Further Assessment of the air quality in Caerphilly Town Centre AQMA and the surrounding road network.

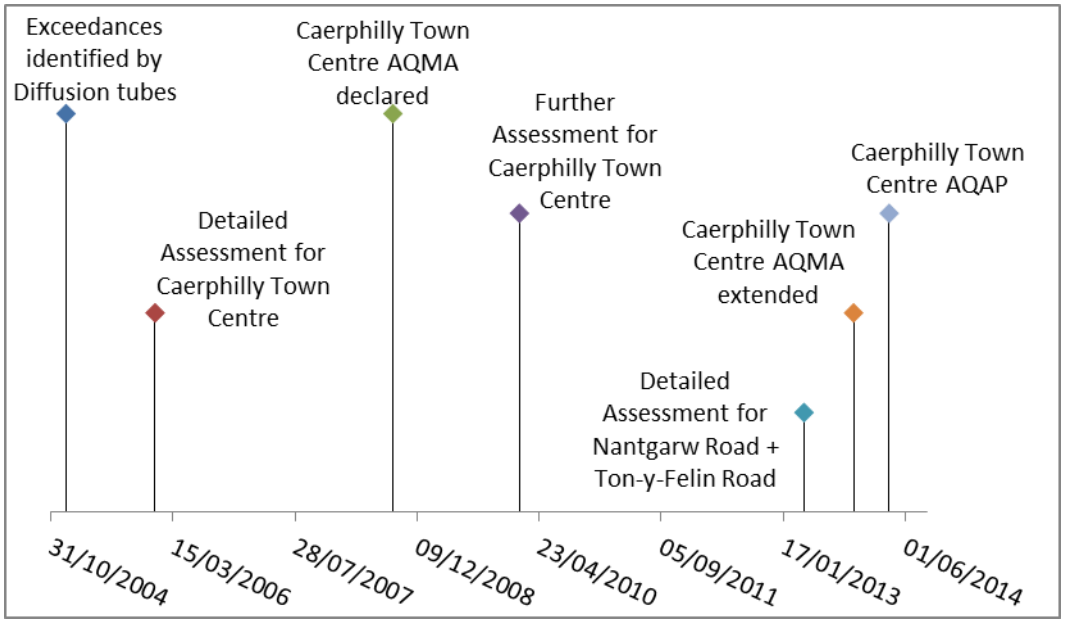
The modelling study undertaken as part of the Further Assessment, along with current monitoring and meteorological data for the area, confirmed that the current AQMA was sufficient to cover the exceedances of the National Annual Objective for NO_2, for White Street and Bartlett Street. However, the study also suggested that CCBC consider declaring a further AQMA (or extend the current AQMA) to encompass another small exceedance area identified to the north of the gyratory system, namely Ton-Y-Felin Road.

The modelling study for the Further Assessment used 2009 monitoring data. At the time, monitoring data relating to the Ton-y-Felin Road area of Caerphilly was not exceeding the National Annual Objective for NO_2. CCBC sought permission from WG to monitor in this area for a further year to confirm whether there was general improvement in this area or whether it was a 'one off' result. Monitoring data for 2010 confirmed that it was in fact a 'one off' result and that there was no requirement for CCBC to extend the existing AQMA within Caerphilly to encompass this area.

In addition to the exceedance at Ton-y-Felin Road, diffusion tube monitoring locations at Nantgarw Road Caerphilly, were also showing exceedances of the National Annual Objective for NO_2. The 2012 USA discussed how CCBC had deployed a new continuous monitoring station for the Nantgarw Road area, to inform the Detailed Assessment that was required. CCBC undertook a Detailed Assessment for the Nantgarw Road area using 6 months' of continuous data and the results of the modelling exercise were very close to the National Annual Objective for NO_2.

However the report concluded that there were no exceedances of the National Annual Objective for NO_2 at receptor locations along Nantgarw Road and there was no requirement for CCBC to extend the current Caerphilly Town Centre AQMA. The report was submitted to WG and the conclusions of the report were rejected. CCBC then rerun the air quality model for this area using 12 months of data rather than the previously used 6 months. This altered the conclusions of the report. The recommendations of the updated Detailed Assessment for Nantgarw Road, was to extend the Caerphilly Town Centre AQMA to include the affected areas along Nantgarw Road and Ton-y-Felin Road. CCBC extended the Caerphilly Town Centre AQMA in November 2013 to include the areas recommended within the Detailed Assessment.

Table 1 – Chart for Caerphilly Town Centre AQMA



As well as the Caerphilly area, the 2012 USA also discussed one other area that was exceeding the air quality objective for NO_2, namely Woodside Terrace, Hafodyrynys. CCBC commenced a Detailed Assessment for this area; the conclusions of which recommended that CCBC proceed to designating the area as an AQMA.

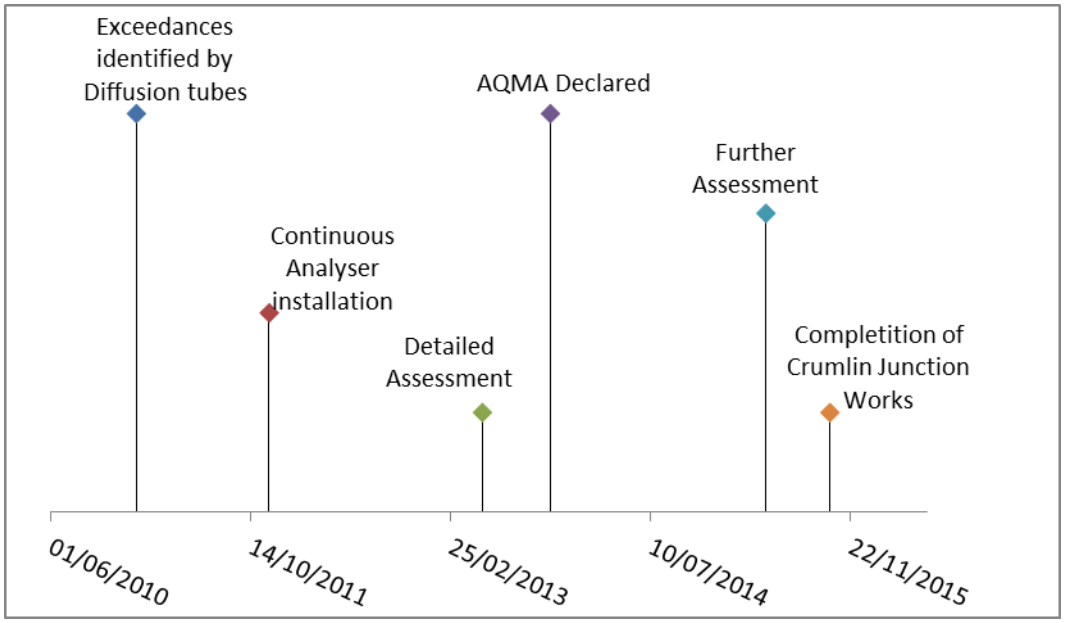
CCBC designated the Hafodyrynys Road AQMA in November 2013 (figure 1.2) and proceeded to a Further Assessment of Air Quality in 2014.

Further to this, in 2015 highway improvement works were undertaken at Crumlin Junction. The aim of the works was to improve the efficiency of the junction and minimise the congestion of traffic at Hafodyrynys Road by the introduction of the following:

- Installation of MOVA System.
- Additional right turn lane for North Bound (N/B) A467 vehicles turning East into A472
- Additional lane provided for A467 South Bound (S/B) vehicles passing straight on at traffic signals with A472.
- Extended left turn filter lane on the A472 for vehicles joining the A467 S/B.
- Additional right filter lane provided for vehicles leaving the A472 going N/B onto the A467.
- Additional merge lane provided on the A472 for vehicles heading East from N/B A467.
- Left turn filter lane extended on S/B A467 for vehicles joining into A472.

These works were completed in October 2015.

Table 2 – Chart for Hafodyrynys AQMA



This report will assess all monitoring data and any respective action taken for 2017. It will also discuss any other areas that are exceeding the National Air Quality Objectives.

1.2 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when air quality is close to or above an acceptable level of pollution (known as the air quality objective (Please see Appendix A)). 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 air quality objectives, 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.

A summary of AQMAs declared by CCBC can be found in Table . Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=393.

Table 3 – Declared Air Quality Management Areas

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	City / Town<Delete column if not relevant>	Description	Action Plan
Caerphilly Town Centre (MAP)	NO_2 annual mean PM_{10} 24-hour mean	Gradual reductions in NO_2 & PM_{10} levels from both continuous analysers and BAM over a five year period	Caerphilly	Residential properties along main route through Caerphilly Town Centre – White Street and Bartlett Street, which was extended to include Nantgarw Road and Ton-y-felin Road	Caerphilly Town Centre Air Quality Action Plan
Hafodyrynys Road (MAP)	NO_2 annual mean	No discernible difference in levels of NO_2 over a five year period	Crumlin	Residential properties surrounding the A472 – a main trunk road connecting Pontypool and the A467.	Hafod-yr-ynys Air Quality Action Plan

1.3 Implementation of Action Plans

CCBC has taken forward a number of measures during 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table . More detail on these measures can be found in the Air Quality Action Plan relating to any designated AQMAs.

Air Quality Action Plans are continuously reviewed and updated whenever deemed necessary, but no less frequently than once every five years. Such updates are completed in close consultation with local communities.

Key completed measures completed in 2017/18 are:

- Trial of electric pool car by CCBC in an effort to assess the potential to move towards a cleaner council fleet.
- Replacement of CCBC Mayor's car to a hybrid alternative.
- Hafodyrynys AQAP completed and agreed by WG and Cabinet. These actions have now commenced and will continue into 2019.
- Submission of ULEB bid with Stagecoach to replace 21 buses with electric alternatives.
- Production of CCBC Electric Vehicle Strategy.
- Commencement of pilot schools study of 6 CCBC schools, including those in close proximity to Hafodyrynys and Caerphilly AQMAs.

CCBC expects the following measures to be completed over the course of the next reporting year:

- The verdict of the multi-agency bid to Central Government funding for the replacement 21 buses in Caerphilly Basin to electric alternatives, is due at the end of October and will be reported on in 2019. A successful bid will reduce the air quality impact of NOx in the Caerphilly basin bus fleet by approximately 30%, which should lead to reductions in levels of NO_2 at Caerphilly Town Centre AQMA.
- The completion of Pollution Control's air quality monitoring pilot study of five schools across the County Borough; which is designed to raise awareness of poor air quality and its effects on health. The pilot will also look to raise awareness of the effects of the idling of vehicles around schools.
- The completion of Pwll-y-pant roadworks, which was designed to increase capacity and efficiency of the A468 / A469 road network to discourage the use of Caerphilly Town Centre.
- The creation of a Caerphilly CBC supplementary planning guidance (SPG) for air quality to enable consistency for how air quality is addressed through the planning system.
- Aspirations to work with private taxi operators to encourage the changing of existing fleet to cleaner alternatives.

Table 4 – Progress on Measures to Improve Air Quality

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
1	Reduce emissions from buses in Caerphilly Town Centre	Reducing vehicle emissions by working with commercial bus operators and seeking grants to assist with the purchase of 'green' buses (biodiesel / hybrid / alternative fuels)	CCBC Passenger Transport & Bus Operators	April-17	Bid for ULEB funding for 21 electric buses and associated infrastructure submitted to WG	Reduction in local air quality levels captured by diffusion tubes and continuous analysers within Caerphilly Basin	Unknown reductions on AQMA, however, bus fleet emissions modelled to be reduced by 36.9% for NO_x and 39.4% for PM_{10}.	Bid submitted on 16th July 2018	Bid submitted, awaiting verdict.	2019	By removing 21 buses and replacing them with a ULEB fleet, reductions in fleet emissions have been modelled as 36.9% for NO_x and 39.4% for PM_{10}.
2	Investigate the potential for the use of electric vehicles in the Council's fleet	Reducing vehicle emissions	Policy / Fleet Management	Sep-15	Mar-16	Outcome of Investigation	Not quantifiable	Electric vehicle trial completed and charging points installed at Penallta House. Assessments being made on viability of electric fleet.	Electric charge points installed at Council Buildings. Electric pool car trialled in June 2018. CCBC Mayor car changed to a hybrid alternative.	2019-2020	CCBC have plans to procure electric pool cars, pending the results of the trial; the vehicles will be used in place of our own diesel/petrol vehicles, thus reducing work emissions.

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
3	Encourage travel plans for businesses, schools and CCBC	Reducing the number of vehicles travelling on the roads	CCBC Planning / Highway Development Control / Transport Strategy Group	Ongoing	Ongoing	No. of schools holding travel plans. No. of travel plans agreed through development control process.	Not quantifiable	There are 66 active school travel plans, 17 of which are for the Caerphilly Basin area. There are a large number of employers who currently have travel plans e.g. DAS Group, GE Group, Co-op and Caerphilly Library. CCBC Highways Development Control also conditions certain planning applications to produce sustainable travel plans.	18 school plans being renewed, approved Feb-18 106 integrated network routes approved Feb-18 – including the creation or improvement of existing walking and cycling routes.	Ongoing	Active travel plans are encouraged to be developed by businesses and schools to facilitate cleaner travel alternatives and are required through the development control process.
4	Improve CCBC vehicle fleet - lead by example	Upgrade vehicles to EURO VI standard to reduce emissions	Passenger Transport / Fleet Management	2014	2015	No. of vehicles in Council fleet which are EURO VI standard.	Not quantifiable	The Council has 500 vehicles in total, 229 of which are Euro VI	Replacement of approximately 45 vehicles to Euro VI alternatives, as well as the replacement of CCBC Major's vehicle to hybrid alternative.	Ongoing	The Council renews it fleet on a rolling programme, ensuring the oldest vehicles are usually replaced with cleaner alternatives.

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
5	Development of CCBC Electric Vehicle Strategy	Leading by example with internal electric vehicle infrastructure and fleet use. Encourage private industry and development to invest in electric vehicle infrastructure and use.	CCBC, Policy	2017	2018	Number of electric vehicles owned by CCBC and the number of Electric charging points throughout the County Borough.	Not Quantifiable	Draft strategy report completed Mar-18	Finalised and agreed by CCBC Cabinet, September-18	Completed	Strategy will outline actions that look to increase modal shift to cleaner vehicle alternatives (electric/hybrid)

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
6	Preliminary design work , inform public and carry out enabling works to A468 / A469 Pwll-y-Pant Roundabout improvements to increase vehicle capacity of the roundabout to discourage through traffic in the town centre subsequently reducing congestion and improving air quality.	Reduce emissions due to congestion and queuing in Caerphilly Town Centre	CCBC Transport Strategy / CCBC Engineering Consultancy	2008	2012	N/A	Not quantifiable - air quality modelling would be undertaken if the scheme was to be progressed.	Design Works completed. Construction Works commenced	Works commenced on 9th October 2017 and are due to finish in December 2018.	Construction works to be completed in December 2018	Implementation of the project is currently underway.
7	Promote school walking buses	Reduce emissions by promoting walking	CCBC Transport Strategy	2005	2005	No. of schools participating in the scheme.	Not quantifiable	20 schools signed up to participate in the walking bus initiative. 4 schools are in the Caerphilly Basin area.	13,000 pupils participated across 20 schools	Ongoing	This is aimed to reduce the emissions generated by pupil travel in the County Borough.

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
8	Improve walking routes in Caerphilly Basin	Reduce emissions by promoting walking	CCBC Highway Operations Group / Transportation Engineering Group	2014/15	Jan - 2015	No. of schemes delivered	Not quantifiable	Will progress as part of the Active Travel Duties / Safe Routes in Communities (SRIC) initiative	33 new or improved walking routes in the Caerphilly basin	Ongoing	Modal Shift
9	Air Quality Awareness - working with partners to incorporate AQ in to Eco schools and Healthy Schools	Curriculum education to encourage alternative forms of transport to reduce emissions	Env Health / Policy / Healthy Schools	Oct-14	Ongoing	No. of schools visited	Not quantifiable	6 schools to date	6 schools visited	Ongoing	All schools will be visited on a rolling programme. As the visits now include 12 months AQ monitoring, we will aim to deliver to 6-10 schools per year to ensure sufficient resource
10	Air Quality awareness exercise in CCBC schools	Monitoring air quality levels around school playground, as well as encouraging pupil participation and education through Healthy Schools/Eco-school's curriculum	CCBC Environmental Health, Education, Healthy Schools & Eco-Schools	Nov-17	Jan-18	Number of Schools participating	Not Quantifiable	19 diffusion tubes currently deployed at 6 schools across the County Borough as a pilot study. Education pack developed by Welsh Government to be delivered as part of ECO Schools project.	Ongoing	Rolling programme	By educating the children around the County Borough, the hope is that they encourage and develop cleaner travel habits. Active monitoring is designed as an education tool, but also as indicative levels of emissions around school playgrounds.

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
11	Increase and publicise the availability of cycling facilities	Reduce emissions by promoting alternative forms of transport	CCBC Transport Strategy/ Road Safety/ Passenger Transport/ Sustainable Development	Ongoing	Ongoing	Difficult to quantify	Not quantifiable	Initiatives completed include the travel hub in Caerphilly Town Centre that promotes Personalised Travel Planning, passenger transport and the existing travel routes within the Caerphilly Basin and the County Borough.	Active Travel Plan with newly proposed routes published in 2017, which includes new and improved walking & cycling routes, new and improved facilities	Ongoing	By increasing and publicising the availability of cycling facilities/routes, cleaner travel alternatives are encouraged, reducing overall vehicle emissions.
12	Introduce cycling proficiency / National Standards in schools	Reduce emissions by promoting safe use of alternative forms of transport	CCBC Sustainable Development & Transport Strategy	2010	Ongoing	No. of pupils trained	Not quantifiable	2876 pupils trained in total	655 pupils trained	Ongoing	Currently being delivered in schools on a rolling programme.
13	Maintain and enhance biodiversity within the County Borough, in accordance with the Environmental (Wales) Act 2016	Developments of a plan of Caerphilly CBC's biodiversity duties.	CCBC Ecology, Policy	2016	2019	Number of interventions delivered	Not Quantifiable	CCBC Draft plan completed Mar-17	CCBC Draft plan completed Mar-17	2018/19	Local Air Quality has a direct effect on bio-diversity. The interventions will be delivered through action planning.

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
14	Quarterly Newsline article highlighting Caerphilly CBC air quality issues and resolutions	Education and connection of County Borough residents with air quality work.	CCBC Environmental Health / Communications	Nov - 17	Dec - 17	Number of articles published	Not quantifiable	Two articles advocating anti-idling of vehicles and the current schools air quality project	Ongoing	Ongoing	To provide education to the public on air quality news and information, as well as updating on the air quality work in the Environmental Health field.

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

2.1 Summary of Automatic Monitoring Undertaken in 2017

CCBC currently has six automatic monitoring sites in the County Borough. Five of the sites monitor real-time NO_2 levels at using Teledyne Chemiluminescent continuous analysers.

Two of these five air quality stations also monitor PM_{10} using the Met One Beta Attenuation Monitors (BAM) 1020, at Blackwood and Caerphilly White Street. This equipment meets the equivalence criteria for monitoring, provided the results are corrected for slope.

The sixth air quality station, located in Fochriw, is situated near an open cast mine exclusively monitoring $PM_{2.5}$ as well as PM_{10} using individual BAMs.

The latest addition of the six sites, is the continuous analyser on Islwyn Road, Wattsville, which was commissioned in May 2017. The analyser measures levels of NO_2 after diffusion tube data identified a need to further investigate the area.

Blackwood (BLW) Continuous Monitoring Site

Blackwood air quality enclosure is a Kerbside monitoring site, located as a "worst case" scenario for NO_2 and particulate matter emissions along Blackwood High Street. The enclosure was originally sited to assess the exceedances in NO_2 levels along the High Street.

Hafodyrynys (HAF) Continuous Monitoring Site

Hafodyrynys air quality enclosure is a Kerbside monitoring site measuring NO_2 emissions from traffic along Hafodyrynys Road. The enclosure was sited to assess the exceedances of NO_2 at Woodside Terrace.

Caerphilly White Street (CWS) Continuous Monitoring Site

Caerphilly White Street air quality enclosure is a Roadside monitoring site, located to assess NO_2 and particulate matter exceedances along White Street. The enclosure was sited to assess the exceedances of NO_2 and to inform the Detailed Assessment as to whether a formal AQMA needed to be declared.

Caerphilly Nantgarw (CNG) Continuous Monitoring Site

Caerphilly Nantgarw air quality enclosure is a Roadside monitoring site, located to assess NO_2 exceedances along Nantgarw Road. The enclosure was sited to assess whether Caerphilly AQMA required extending.

Fochriw (FCR) Continuous Monitoring Site

Fochriw air quality enclosure is a Roadside monitoring site, located to assess particulate matter within the area. The enclosure was sited after concerns were raised by residents about the air pollution from Ffos-y-Fran opencast mine.

Islwyn Road, Wattsville Continuous Monitoring Site

Islwyn Road, Wattsville air quality enclosure is a Roadside monitoring site, located to assess NO_2 exceedances along Islwyn Road. The enclosure was sited to assess the elevated level of NO_2 at a pinch point along Islwyn Road.

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

Table 5 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with (Named) AQMA?	OS Grid Reference		Inlet Height (m)	Distance from Kerb to Monitor (m) (2)	Distance from Kerb to Nearest Relevant Exposure (m) (1	Pollutants Monitored	Monitoring Technique
				X	Y					
BLW	Blackwood	Kerbside	No	317456	197109	1.8	1	1	PM_{10}	BAM
									NO_2	M200A Chemiluminescent analysers
CWS	Caerphilly White Street	Roadside	Caerphilly Town Centre	315682	186825	1.8	2	7	PM_{10}	BAM
									NO_2	M200A Chemiluminescent analysers
CNG	Caerphilly Nantgarw	Roadside	Caerphilly Town Centre	314744	186997	1.8	2	2	NO_2	M200A Chemiluminescent analysers

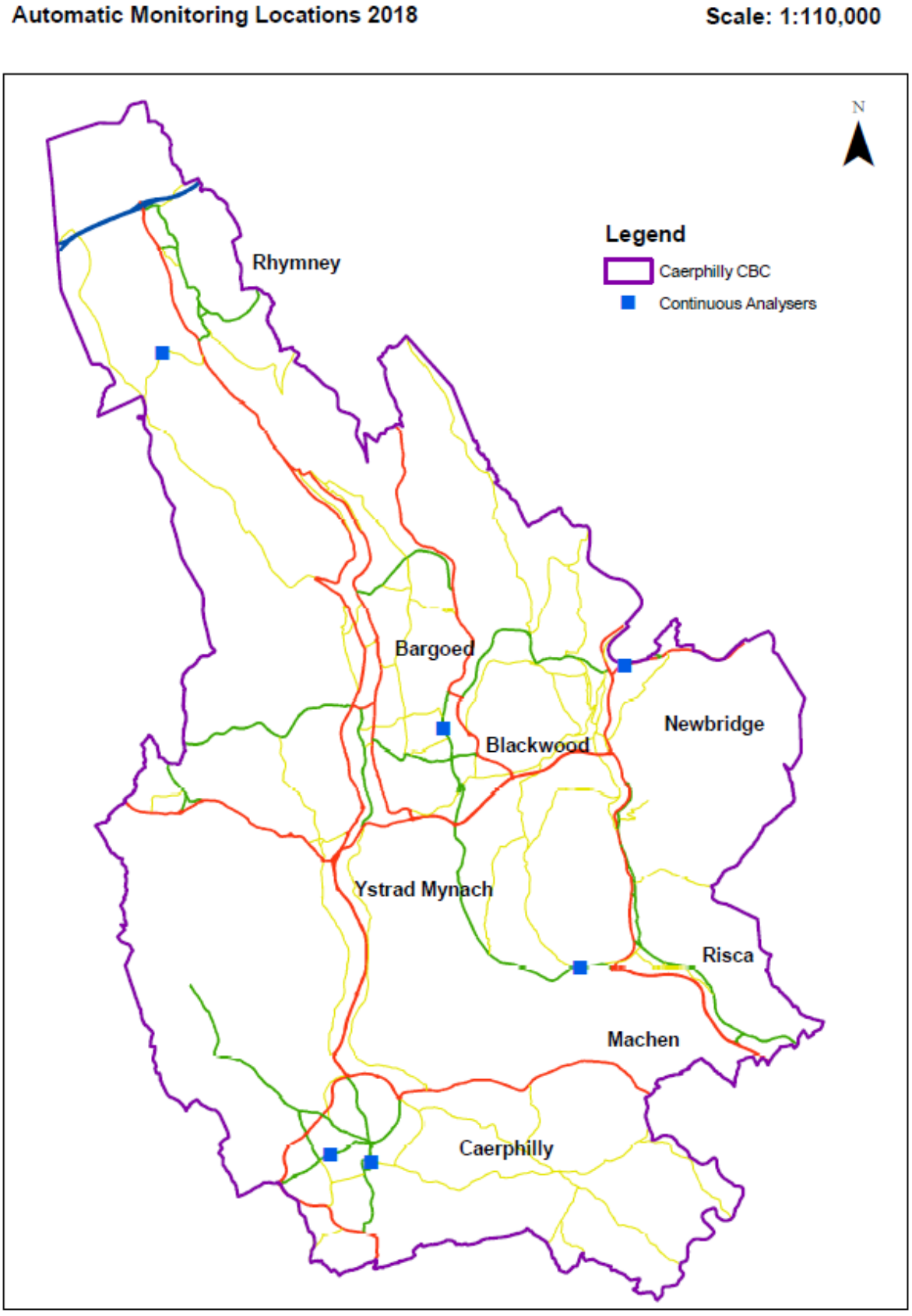
Site ID	Site Name	Site Type	Associated with (Named) AQMA?	OS Grid Reference		Inlet Height (m)	Distance from Kerb to Monitor (m) (2)	Distance from Kerb to Nearest Relevant Exposure (m) (1	Pollutants Monitored	Monitoring Technique
				X	Y					
FCR	Fochriw	Roadside	No	310452	205422	1.8	2	2	PM_{10}	BAM
									$PM_{2.5}$	BAM
HAF	Hafodyrynys	Kerbside	Hafodyrynys AQMA	321727	198588	1.65	0.5	3	NO_2	M200A Chemiluminescent analysers
IRW	Islwyn Road Wattsville	Roadside	No	320663	191427	1.5	2	1	NO_2	T200 NOx Chemiluminescent analysers

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



2.2 Comparison of 2017 Automatic Monitoring Results with Previous Years and the Air Quality Objectives

CCBC undertook automatic (continuous) monitoring at 6 sites during 2017. Table 6 presents the details and Tables 6-10 present the results of the sites. National monitoring results are also available at https://airquality.gov.wales/

Maps showing the location of the monitoring sites are provided in Figure 2.1. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix B. The Boundary Maps for the Air Quality Management Areas are included in Appendix C.

2.2.1 Nitrogen Dioxide (NO_2) Automatic Monitoring results

Table 6 – Annual Mean NO_2 Monitoring Results

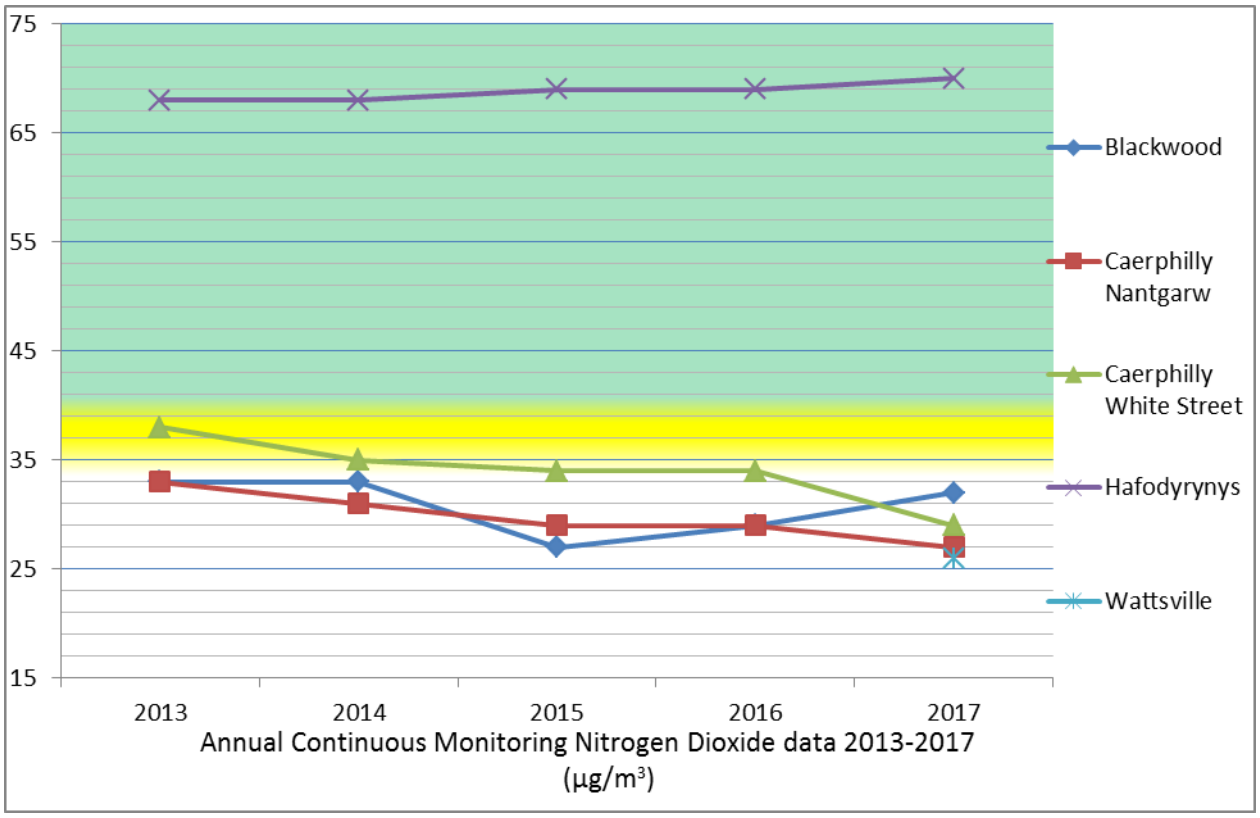
Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2017 (%)	NO_2 Annual Mean Concentration (µg/m^3)				
					2013	2014	2015	2016	2017
BLW	Kerbside	Automatic	99%	99%	33	33	27	29	32
CNG	Roadside	Automatic	98%	98%	33	31	29	29	27
CWS	Roadside	Automatic	96%	96%	38	35	34	34	29
HAF	Kerbside	Automatic	99%	99%	**68**	**68**	**69**	**69**	**70**
IRW	Roadside	Automatic	92%	62%	N/A	N/A	N/A	N/A	26

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

Figure 2 – Trends in Annual Mean NO_2 Concentrations from continuous analysers



As detailed above, Hafodyrynys continuous analyser is the only monitoring station that exceeds the National Annual Objective – denoted by the area coloured in green. Over a five year period, the majority of sites have decreased by 1-9 µg/m^3, except for Hafodyrynys which has exhibited a 2 µg/m^3 increase from 2013 to 2017. Caerphilly White Street has continued its reduction below the borderline levels of 39-36 µg/m^3 – denoted by the area coloured in yellow, to a five-year low of 29 µg/m^3. Blackwood has increased for the second consecutive year, but levels are compliant with the National Annual Objective. These will continue to be monitored further and reported on in the 2019 Progress Report; at present, levels are safely below national objectives but continued increases may indicate a need for further investigation at Blackwood High Street.

Table 7 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 1-Hour Means > 200µg/m^3				
					2013	2014	2015	2016	2017
BLW	Kerbside	Automatic	99%	99%	1	0	0	0	4
CNG	Roadside	Automatic	98%	98%	1	2	0	0	0
CWS	Roadside	Automatic	96%	96%	1	**23**	9	2	0
HAF	Kerbside	Automatic	99%	99%	**85**	**75**	**108**	**126**	**132**
IRW	Roadside	Automatic	92%	62%	N/A	N/A	N/A	N/A	0

Notes:

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 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%).

Over a five year period, the monitoring sites depict no real trend consistent across the County Borough. Hafodyrynys has exceeded the National Hourly objective for NO_2, 47 more times in 2017, than in 2013 – a 55% increase in hourly exceedances. Although the continuous analyser exceeded for the first time in 4 years, it's still within the 18 permitted exceedances annually.

2.2.2 Particulate Matter (PM_{10})

Particulate Matter is a term used to describe condensed phase (solid or liquid) particles suspended in the atmosphere. Their potential for causing health problems is directly linked to the size of the particles. The abbreviations PM_{10} and $PM_{2.5}$ relate to their diameter size in µm. PM_{10} is currently monitored in three locations in the County Borough – Caerphilly White Street, Blackwood High Street and Fochriw. The enclosure at Fochriw also monitors $PM_{2.5}$, due to the close proximity to an open cast mine.

Table 8 – Annual Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	PM_{10} Annual Mean Concentration (µg/m^3)				
				2013	2014	2015	2016	2017
BLW	Roadside	90%	90%	19	17	19	19	16
CNG	Roadside	N/A	N/A	21	18	N/A	N/A	N/A
CWS	Roadside	93%	93%	22	19	19	19	18
FCR	Roadside	96%	96%	15	13	13	12	11

Notes:

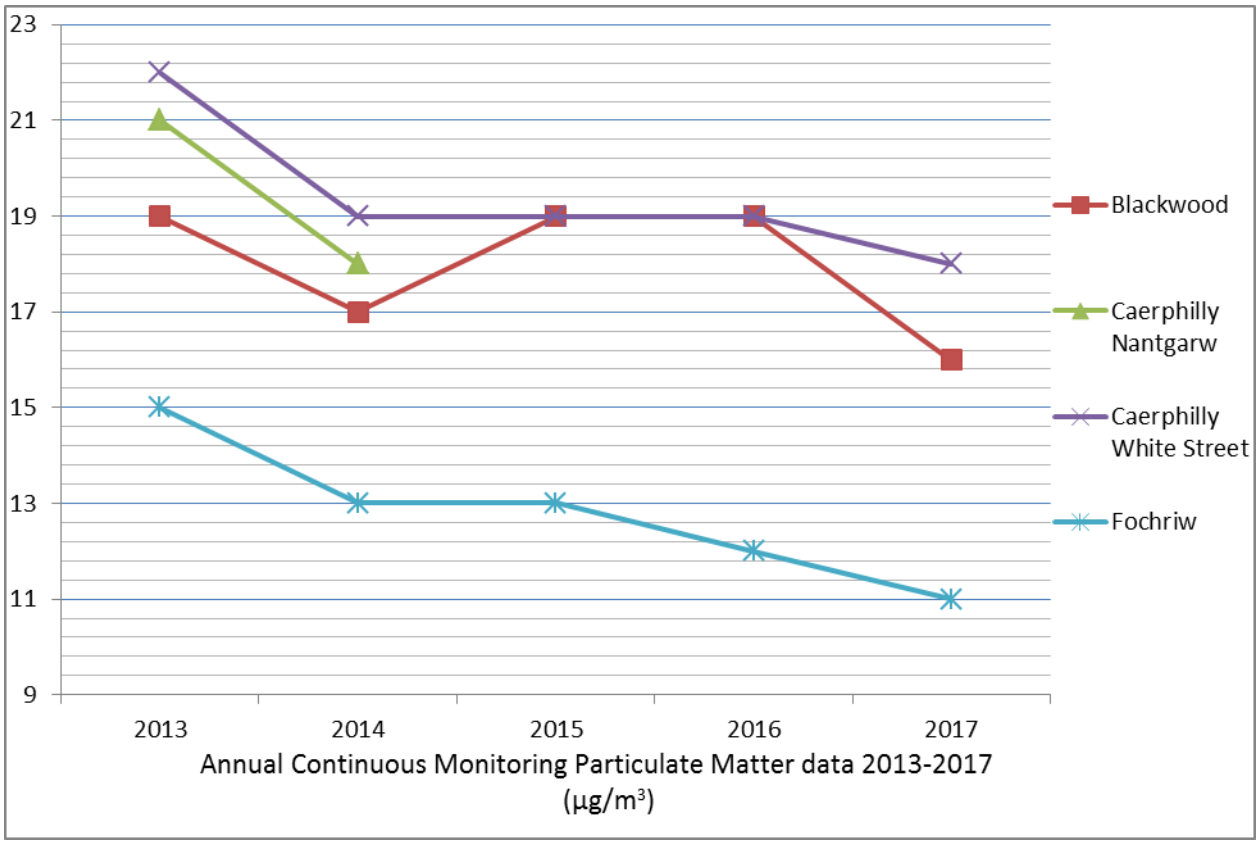
Exceedances of the PM_{10} annual mean objective of 40µg/m^3 are shown in **bold.**

(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%).

The chart above illustrates compliance Borough-wide for the National Annual Objective for PM_{10}. There is no requirement for further investigation at any of these sites.

Figure 3 – Trends in Annual Mean PM_{10} Concentrations



The chart above shows that all Particulate Matter Monitoring stations are compliant with the National Annual Objective for PM_{10} emissions. All sites depict the same trend of reductions in PM_{10} from 2013 to 2017.

Table 9 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3				
				2013	2014	2015	2016	2017
BLW	Roadside	90%	90%	3	1	1	0	0
CNG	Roadside	N/A	N/A	1	2	N/A	N/A	N/A
CWS	Roadside	93%	93%	1	3	1	1	2
FCR	Roadside	96%	96%	0	1	0	0	0

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 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%).

The table illustrates compliance with the National Daily objective for PM_{10} across all monitoring stations.

From the table it can be seen that PM_{10} monitoring at Caerphilly Nantgarw (CNG) ceased in 2014 due to an irreparable fault. The site had shown continuous compliance for some time prior to that time so the machine was not replaced.

2.2.3 Particulate Matter ($PM_{2.5}$)

CCBC monitors $PM_{2.5}$ along with PM_{10} at the Fochriw air quality monitoring station, which is situated near an open cast mine. This air quality station was installed during May 2012 due to health concerns raised by local residents. Although there is no legal requirement to monitor for $PM_{2.5}$, the annual mean for 2017 measured 6µg/m^3.

Table 10 – Annual Mean $PM_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	$PM_{2.5}$ Annual Mean Concentration (µg/m^3)				
				2013	2014	2015	2016	2017
FCR	Roadside	95	95	10	10	11	8	6

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%).

2.3 Summary of Non-Automatic Monitoring Undertaken in 2017

Since 2016, a total of 9 diffusion tubes were removed from circulation after it was deemed that levels had been well below the National Annual Objective for many years and monitoring at these sites was no longer required. For 2017, an additional 16 tubes were added to the network, bringing the overall total to 68 diffusion tubes in circulation around the County Borough.

Of the additional diffusion tubes, 11 were located towards the end of the year; as their data capture was below 34%, the results will be presented in the 2019 Progress Report. Out of the remaining five tubes, three were placed to assess the exposure of a new location (CCBC 80-82), with the other two (CCBC 83-84) being placed to enhance the assessment of an area already under consideration.

Table presents the details of the sites.

A map showing the location of the monitoring sites is provided in Figure. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix B.

Table 11 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with Named AMQA?	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				
CCBC1	Blackwood Post Office	Kerbside	N	317497	196911	3	N	3.5	<1
CCBC6	Ton-y-felin Road, Caerphilly	Roadside	Y	315709	187325	2	N	2.5	2.5
CCBC7	Cardiff Road, Caerphilly	Roadside	N	315552	186674	3	N	2	2
CCBC8	Blackwood High Street	Kerbside	N	317419	192211	2	N	2	1.5
CCBC17	Bedwas Road, Caerphilly	Roadside	N	315907	187320	3	N	3	3
CCBC18	Pontygwindy Road, Caerphilly	Roadside	N	315670	187481	2	N	3	3

Site ID	Site Name	Site Type	Associated with Named AMQA?	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				
CCBC19	White Street, Caerphilly	Roadside	Y	315718	186723	2	N	2	2
CCBC20	Newport Road, Trethomas	Roadside	N	318179	188764	2	N	4	4
CCBC21	Maesycwmmer Shop	Roadside	N	315533	194725	2	N	12	12
CCBC22	Gellideg Heights, Maesycwmmer	Kerbside	N	316102	194790	2.5	N	2.5	<1
CCBC27	Penrhiw Franc Farm	Urban background	N	319196	195196	2	N	25	<1
CCBC29	Maen Llwyd, Rudry	Urban background	N	319274	186558	2	N	<1	<1
CCBC30	AQE – Caerphilly *	Roadside	Y	315705	186839	2	Y	7	2

Site ID	Site Name	Site Type	Associated with Named AMQA?	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				
CCBC31	AQE – Caerphilly *	Roadside	Y	315705	186839	2	Y	7	2
CCBC32	AQE – Caerphilly *	Roadside	Y	315705	186839	2	Y	7	2
CCBC33	Lower left White street	Roadside	Y	315720	186761	2	N	2	2
CCBC34	Corner of Windsor and White Street	Roadside	Y	315708	186808	2	N	7	7
CCBC35	Top Right of White Street	Roadside	Y	315714	186668	2.5	N	2	2
CCBC36	44/46 Bartlett Street	Roadside	Y	315738	186654	2	N	3	3
CCBC37	19 Station Terrace	Roadside	Y	315727	186617	2	N	2	2

Site ID	Site Name	Site Type	Associated with Named AMQA?	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				
CCBC38	32 Bartlett Street	Roadside	Y	315700	186660	2	N	3	3
CCBC39	18 Bartlett Street	Roadside	Y	315652	186663	2	N	3	3
CCBC40	7 Bartlett Street	Roadside	Y	315621	186665	2.5	N	2	2
CCBC44	244 Nantgarw Road, Caerphilly	Roadside	N	314712	186999	2	N	2	2
CCBC45	38 Bedwas Road, Caerphilly	Roadside	N	315954	187377	3	N	3	3
CCBC46	8 Windsor Street	Roadside	Y	315669	186804	2	N	2	2

Site ID	Site Name	Site Type	Associated with Named AMQA?	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				
CCBC48	1 Woodside Shops, Hafodyrynys	Roadside	Y	321652	198557	2	N	2	2
CCBC49	Pontygwindy Road, Caerphilly	Roadside	N	315470	188101	2	N	3	3
CCBC50	Past Woodside Terrace, Hafodyrynys	Kerbside	Y	321851	198619	2	N	47	<1
CCBC51	AQE – Blackwood *	Kerbside	N	317419	197103	2	Y	1	1
CCBC52	AQE – Blackwood *	Kerbside	N	317419	197103	2	Y	1	1
CCBC53	AQE- Blackwood *	Kerbside	N	317419	197103	2	Y	1	1

Site ID	Site Name	Site Type	Associated with Named AMQA?	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				
CCBC54	Clive Street, Caerphilly	Roadside	N	315518	186646	2.5	N	2	2
CCBC55	6 Ton-y-Felin Road, Caerphilly	Roadside	Y	315742	187316	2	N	3	3
CCBC56	3 Nantgarw Road, Caerphilly	Roadside	Y	315579	187305	2	N	2	2
CCBC57	14 Mill Road, Caerphilly	Roadside	N	315629	187375	3	N	3	2
CCBC59	30 Ton-y-Felin Road, Caerphilly	Roadside	Y	315793	187305	2.5	N	3	3
CCBC60	3 New Houses, Hafodyrynys	Roadside	Y	321681	198584	5	N	3.5	3.5

Site ID	Site Name	Site Type	Associated with Named AMQA?	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				
CCBC61	258 Nantgarw Road, Caerphilly	Roadside	N	314680	186988	2	N	1.5	1.5
CCBC67	84 Nantgarw Road, Caerphilly	Roadside	Y	315242	187223	2	N	2	2
CCBC68	Premier Stores, Cwmfelinfach	Roadside	N	318467	191788	2	N	1.5	1.5
CCBC69	80 Islwyn Road, Wattsville	Roadside	N	320647	191427	2	N	1.5	1.5
CCBC70	153 Islwyn Road, Wattsville	Roadside	N	320499	191427	2	N	2	2

Site ID	Site Name	Site Type	Associated with Named AMQA?	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				
CCBC71	128 Islwyn Road, Wattsville	Roadside	N	320507	191405	2	N	2	2
CCBC72	109 Islwyn Road, Wattsville	Roadside	N	320629	191442	2	N	2	2
CCBC73	21 Islwyn Road, Wattsville	Roadside	N	320886	191474	2	N	2	2
CCBC74	2 Islwyn Road, Wattsville	Roadside	N	320883	191451	2	N	2	2
CCBC75	2 Rock Cottages, Aberbeeg	Roadside	N	320336	200952	2	N	3	2

Site ID	Site Name	Site Type	Associated with Named AMQA?	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				
CCBC76	3 Fern Cottages, Aberbeeg	Roadside	N	320249	200987	2	N	2	2
CCBC77	3 Bute Place, Aberbeeg	Kerbside	N	320450	200971	2	N	N/A	<1
CCBC78	86 Islwyn Road, Wattsville	Roadside	N	320634	191424	2	N	3	3
CCBC79	20 Woodside Terrace, Hafodyrynys	Roadside	Y	321812	198610	2	N	1.5	1.5
CCBC80	15 Commercial Street, Aberbargoed	Roadside	N	315430	200258	2	N	1.5	1.5

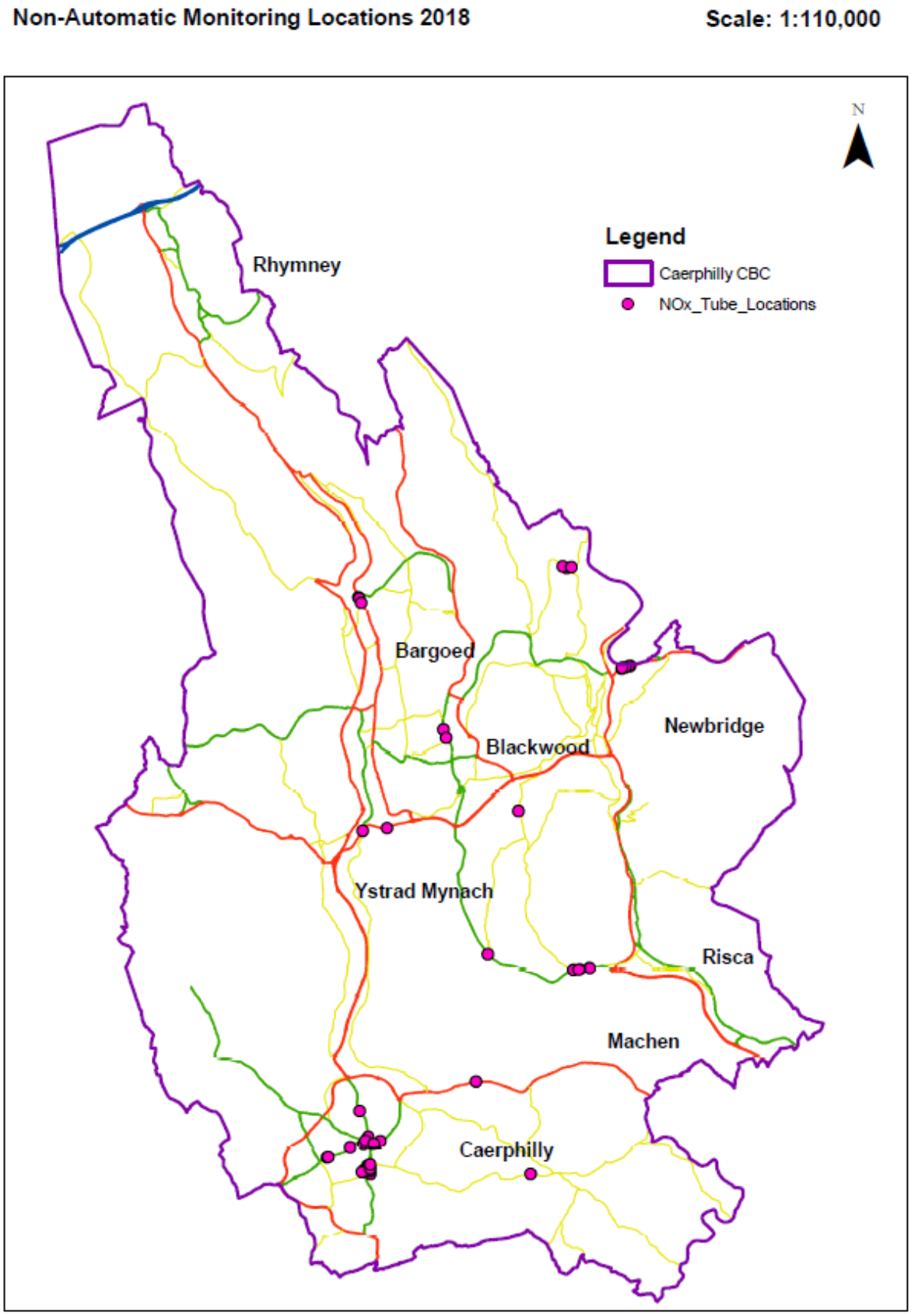
Site ID	Site Name	Site Type	Associated with Named AMQA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) (1)	Distance from Kerb to Monitor (m) (2)
				X	Y				
CCBC81	29 Commercial Street, Aberbargoed	Roadside	N	315454	200227	2	N	1.5	1.5
CCBC82	60 Commercial Street, Aberbargoed	Roadside	N	315489	200116	2	N	1.5	1.5
CCBC83	10 Woodside Terrace, Hafodyrynys	Roadside	Y	321730	198583	2	N	2	2
CCBC84	La Loma, Hafodyrynys	Roadside	Y	321653	198583	5	N	3	3

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 4 – Map of Non-Automatic Monitoring Locations 2018



2.4 Comparison of 2017 Non-Automatic Monitoring Results with Previous Years and the Air Quality Objectives

2.4.1 Nitrogen Dioxide (NO_2) Non-Automatic Monitoring results

Table 12 – Diffusion tube results 2013-2017

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2013 Bias Adjustment Factor = 0.86	2014 Bias Adjustment Factor = 0.86	2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76
CCBC1	Kerbside	Diffusion Tube	100%	100%	31	31	31	30	30
CCBC6	Roadside	Diffusion Tube	92%	92%	**40**	34	32	37	33
CCBC7	Roadside	Diffusion Tube	100%	100%	23*	36	18*	30	27
CCBC8	Kerbside	Diffusion Tube	92%	92%	32	36	29	30	27
CCBC17	Roadside	Diffusion Tube	92%	92%	30	30	26	25	26
CCBC18	Roadside	Diffusion Tube	100%	100%	28	25	24	27	24
CCBC19	Roadside	Diffusion Tube	100%	100%	**49**	**48**	**48**	**52**	**44**
CCBC20	Roadside	Diffusion Tube	100%	100%	28	27	24	27	25

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2017 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2013 Bias Adjustment Factor = 0.86	2014 Bias Adjustment Factor = 0.86	2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76
CCBC21	Roadside	Diffusion Tube	92%	92%	30	31	29	29	27
CCBC22	Kerbside	Diffusion Tube	92%	92%	32	30	27	30	29
CCBC27	Urban background	Diffusion Tube	83%	83%	9*	6	12*	8	7
CCBC29	Urban background	Diffusion Tube	100%	100%	14	14	11	14	12
CCBC30	Roadside	Diffusion Tube	100%	100%	39	37	33	35	35
CCBC31	Roadside	Diffusion Tube	100%	100%	**43**	36	32	35	33
CCBC32	Roadside	Diffusion Tube	100%	100%	**40**	37	32	34	33
CCBC33	Roadside	Diffusion Tube	100%	100%	**52**	**55**	37	**42**	39
CCBC34	Roadside	Diffusion Tube	100%	100%	30	27	24	26	21
CCBC35	Roadside	Diffusion Tube	75%	75%	25	29	28	30	29

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2017 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2013 Bias Adjustment Factor = 0.86	2014 Bias Adjustment Factor = 0.86	2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76
CCBC36	Roadside	Diffusion Tube	100%	100%	25	22	21	23	23
CCBC37	Roadside	Diffusion Tube	83%	83%	28*	22	21	22	21
CCBC38	Roadside	Diffusion Tube	100%	100%	**43**	**43**	**40**	37	38
CCBC39	Roadside	Diffusion Tube	92%	92%	33	34	29	31	30
CCBC40	Roadside	Diffusion Tube	92%	92%	29	27	25	28	25
CCBC44	Roadside	Diffusion Tube	100%	100%	**40**	35	37	37	37
CCBC45	Roadside	Diffusion Tube	100%	100%	30	28	26	27	24
CCBC46	Roadside	Diffusion Tube	100%	100%	22	20*	17	19	17
CCBC48	Roadside	Diffusion Tube	92%	92%	**48***	**46**	**42**	**41**	**42**
CCBC49	Roadside	Diffusion Tube	100%	100%	29	26	19	26	24
CCBC50	Kerbside	Diffusion Tube	100%	100%	**50**	**47**	**47**	**48**	**49**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2017 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2013 Bias Adjustment Factor = 0.86	2014 Bias Adjustment Factor = 0.86	2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76
CCBC51	Kerbside	Diffusion Tube	92%	92%	31	30	28	28	29
CCBC52	Kerbside	Diffusion Tube	100%	100%	31	31	28	28	27
CCBC53	Kerbside	Diffusion Tube	100%	100%	31	32	27	28	29
CCBC54	Roadside	Diffusion Tube	75%	75%	26	24	22	24	21
CCBC55	Roadside	Diffusion Tube	83%	83%	**40**	36	33	36	31
CCBC56	Roadside	Diffusion Tube	100%	100%	35	31	28	32	27
CCBC57	Roadside	Diffusion Tube	92%	92%	29	25	23	25	22
CCBC59	Roadside	Diffusion Tube	100%	100%	**50***	33*	32	35	33
CCBC60	Roadside	Diffusion Tube	100%	100%	**41**	39	32	37	35
CCBC61	Roadside	Diffusion Tube	100%	100%	39	34	33	35	32
CCBC67	Roadside	Diffusion Tube	100%	100%	34	34	31	33	32

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2017 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2013 Bias Adjustment Factor = 0.86	2014 Bias Adjustment Factor = 0.86	2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76
CCBC68	Roadside	Diffusion Tube	92%	92%	N/A	28	27	28	25
CCBC69	Roadside	Diffusion Tube	100%	100%	N/A	38	38	**40**	38
CCBC70	Roadside	Diffusion Tube	75%	75%	N/A	18*	20*	16	15
CCBC71	Roadside	Diffusion Tube	100%	100%	N/A	15*	22	23	23
CCBC72	Roadside	Diffusion Tube	83%	83%	N/A	20*	21	23	21
CCBC73	Roadside	Diffusion Tube	100%	100%	N/A	17*	20	22	20
CCBC74	Roadside	Diffusion Tube	100%	100%	N/A	25*	29*	27	27
CCBC75	Roadside	Diffusion Tube	100%	100%	N/A	N/A	N/A	24*	20
CCBC76	Roadside	Diffusion Tube	100%	100%	N/A	N/A	N/A	25*	24
CCBC77	Kerbside	Diffusion Tube	100%	100%	N/A	N/A	N/A	30*	27
CCBC78	Roadside	Diffusion Tube	92%	92%	N/A	N/A	N/A	26*	24

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2013 Bias Adjustment Factor = 0.86	2014 Bias Adjustment Factor = 0.86	2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76
CCBC79	Roadside	Diffusion Tube	100%	100%	N/A	N/A	N/A	**53***	**59**
CCBC80	Roadside	Diffusion Tube	92%	92%	N/A	N/A	N/A	N/A	30
CCBC81	Roadside	Diffusion Tube	100%	100%	N/A	N/A	N/A	N/A	21
CCBC82	Roadside	Diffusion Tube	100%	100%	N/A	N/A	N/A	N/A	33
CCBC83	Roadside	Diffusion Tube	100%	75%	N/A	N/A	N/A	N/A	**59**
CCBC84	Roadside	Diffusion Tube	100%	75%	N/A	N/A	N/A	N/A	39

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 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%).

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

Appendix D displays the monthly un-ratified diffusion tube data for 2017.

Table 13 – Diffusion tube distribution from 2016-2017

Places	Amount of Diffusion Tubes	Amount of tubes that increased in NO_2 levels from 2016 to 2017	Percentage increase of tubes from 2016 to 2017	Exceedances in National Annual Objective for NO_2 - 2017
Caerphilly AQMA	20	2	10%	1
Caerphilly Other	9	1	11%	0
Hafodyrynys AQMA	4	3	75%	4
Blackwood	5	2	40%	0
Wattsville	8	0	0%	0
Others	6	0	0%	0

The purpose of this table is to show the overall % increase in NO_2 levels measured by diffusion tubes at various locations from 2016 to 2017.

As the table shows, the diffusion tubes in Hafodyrynys AQMA exhibit the same trends as the hourly and annual NO_2 levels captured by the continuous analyser – increasing from 2016 to 2017. Two of the three diffusion tubes that increased within the AQMA were by 1µg/m^3. The other tube - CCBC 79 increased by 6µg/m^3.

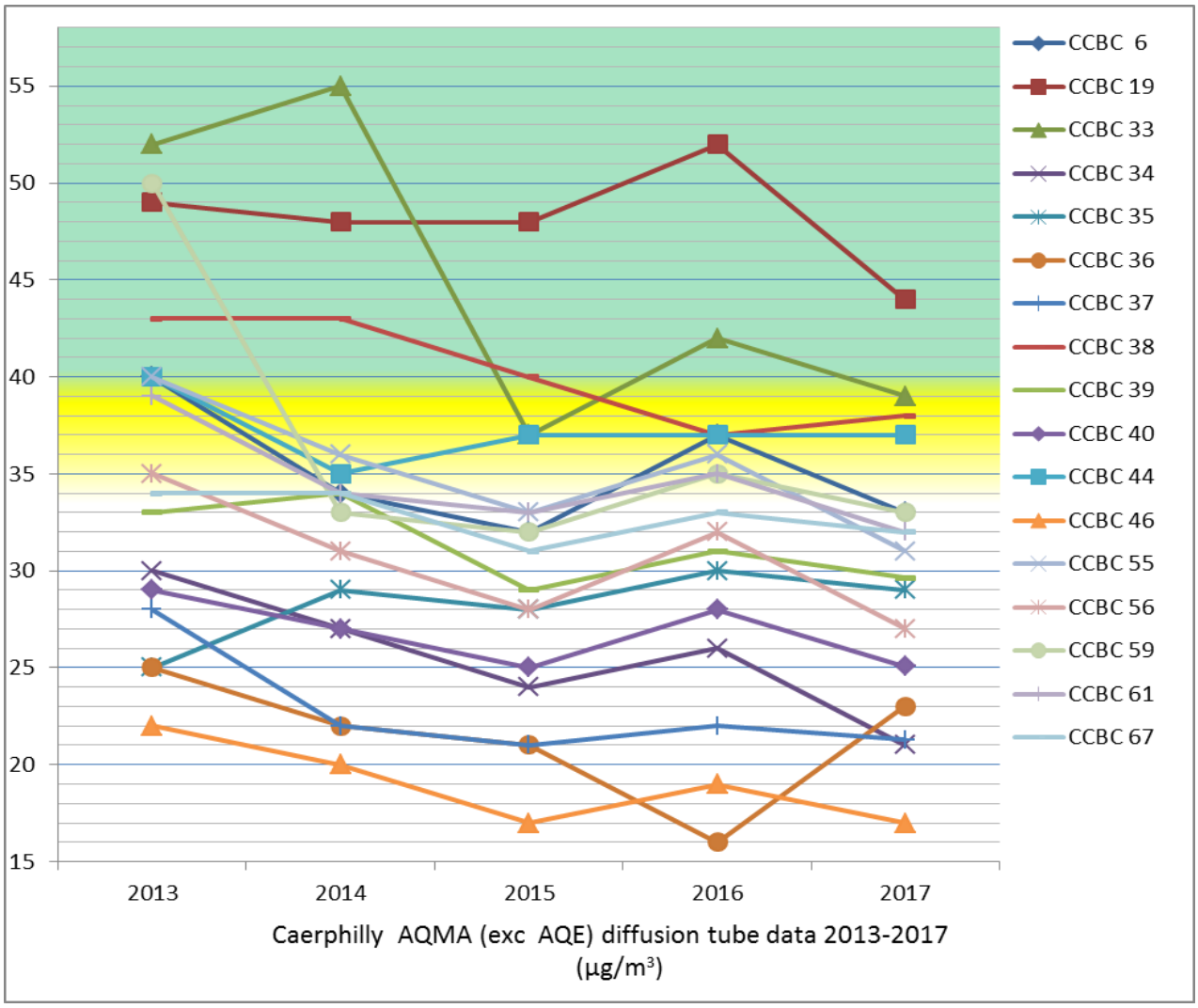
For 2016, the NO_2 level for CCBC 79 was annualised as there was only five months data capture. In 2017 CCBC 79 had 100% data capture and the large increase may be attributable to it being an actual representation of NO_2 exposure at that location, taking into account seasonal fluctuations.

Overall, from the 52 tubes that were already in distribution circa 2017, 8 (15%) exhibited higher NO_2 levels than in 2016; this can be compared to the 73% increase in NO_2 levels monitored by diffusion tubes in 2015-2016. In contrast, 75% of the diffusion tubes levels decreased in 2017, in comparison to the 17% of diffusion tubes that decreased from 2015-2016.

These levels display the disparity of trends over a two year monitoring period. There's no definitive reason for this disparity, however, we do know that meteorological conditions have an effect on air quality levels, as well as a younger transport fleet and continued Local Air Quality Management. It is reasonable to assume that these factors have had an effect on NO_2 levels.

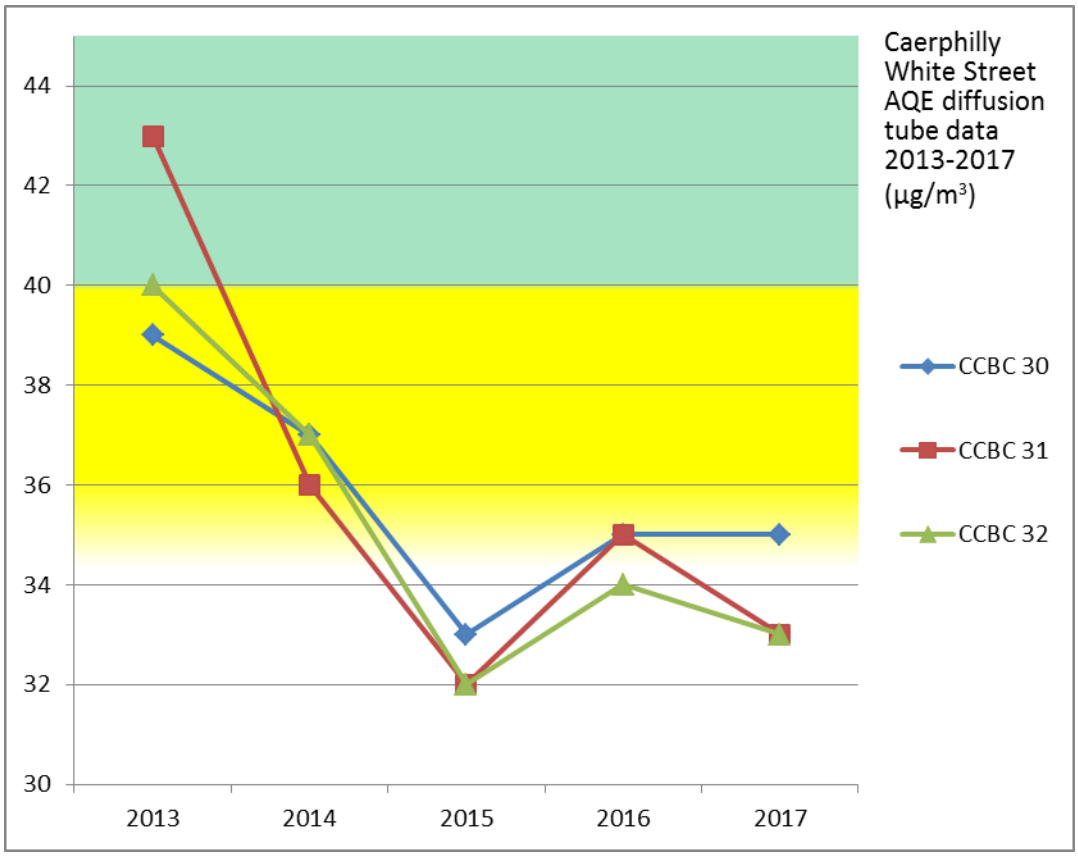
Caerphilly Town Centre AQMA Diffusion Tubes

Figure 5 – Chart of Caerphilly Air Quality Management Area Diffusion Tube (excluding Co-located tubes) results 2013-2017



The chart above illustrates the trends in NO_2 levels over five years. Notably it highlights how many of the tube results decreased from 2016 to 2017. CCBC 19 located on White Street and within the AQMA, exceeded the National Annual Objective for 2017. The remainder of the Caerphilly AQMA tubes are compliant with the air quality objective, including CCBC 33 that previously exceeded in 2016. CCBC 33, CCBC 38 and CCBC 44 located on White Street, Bartlett Street and Nantgarw Road were all borderline for NO_2 compliance.

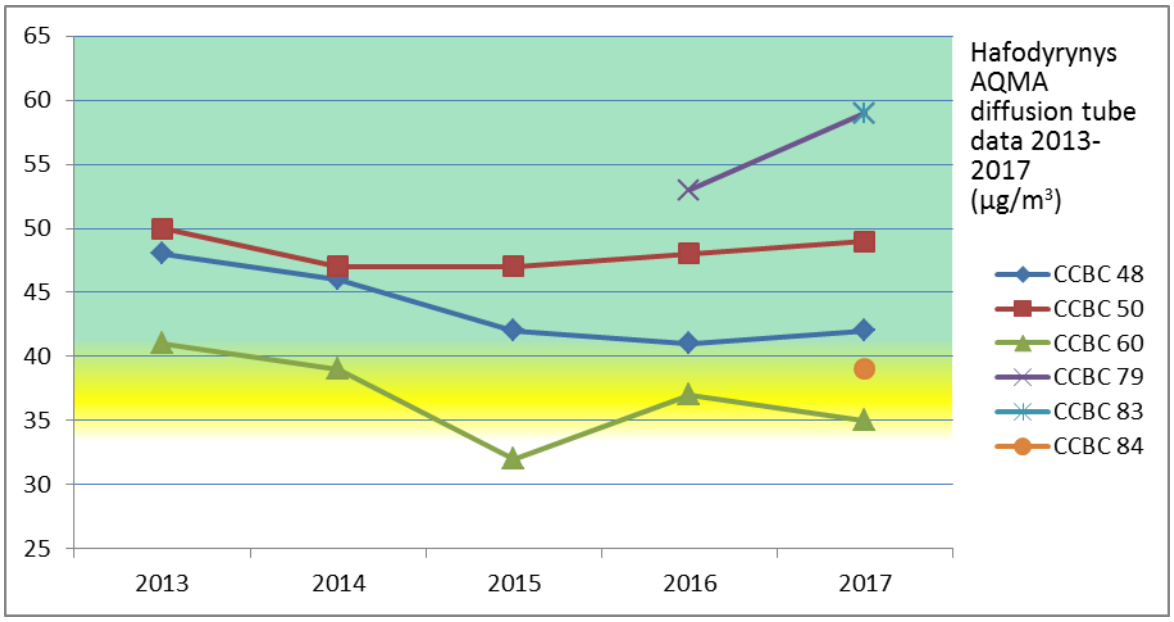
Figure 6 – Chart of Caerphilly Air Quality Enclosure Co-Located Diffusion Tube results 2013-2017



The chart above follows the same trends as the rest of Caerphilly AQMA; over five years there is a substantial reduction from exceedances in the National Annual Objective – ranging from 43-39µg/m^3 in 2013, to compliance. Similarly to the Continuous Analyser, the majority of tubes reduced from 2016-2017.

Hafodyrynys AQMA Diffusion Tubes

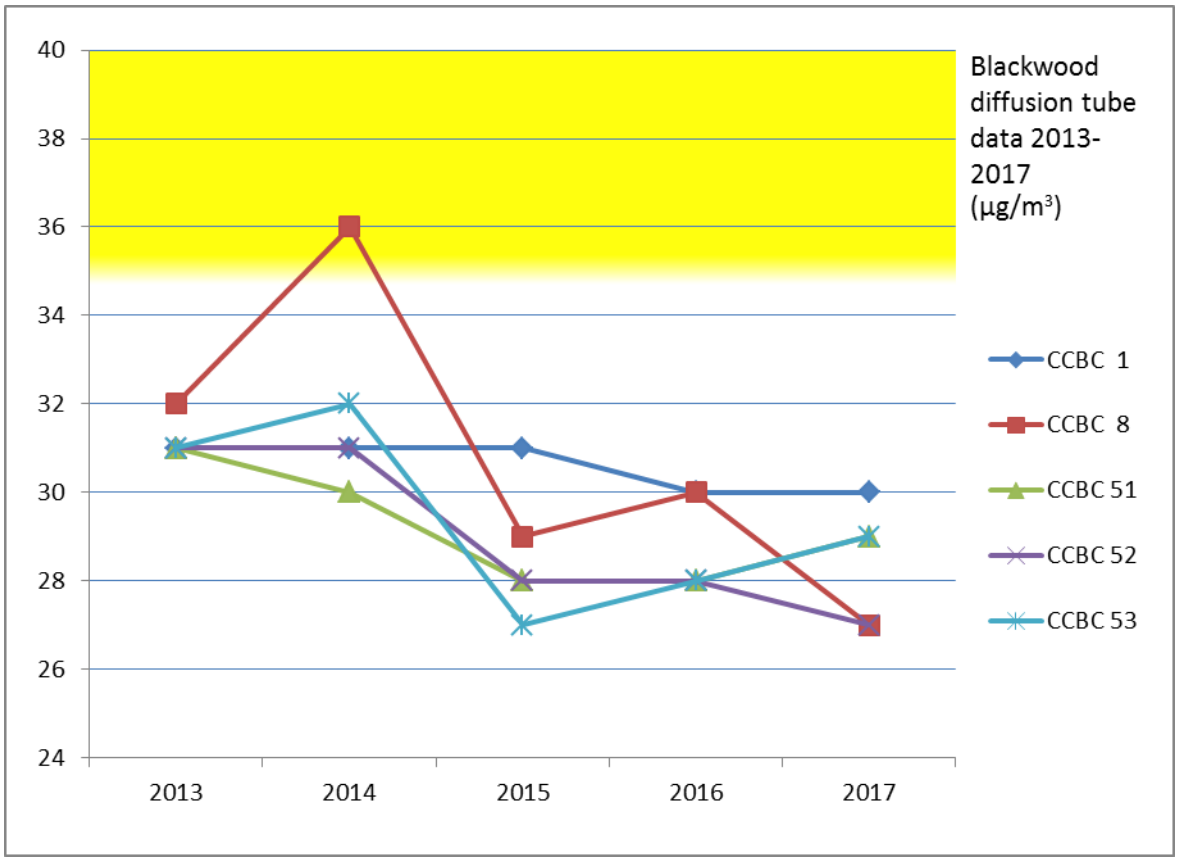
Figure 7 – Chart of Hafodyrynys Air Quality Management Area Diffusion Tube results 2013-2017



The chart above illustrates that there have been reductions in NO_2 levels over the five year period, although not as consistent as other diffusion tubes around the County Borough. CCBC 79 was introduced in 2016 on the façade of 20 Woodside Terrace to evaluate the dispersal of NO_2 around the location of CCBC 50, where the road opens up away from residential receptors. CCBC 79 continued to exceed in 2017 and even increased from 53µg/m^3 to 59µg/m^3. Although this follows the trend of the other nearby tubes – CCBC 49 & CCBC 50, the increase is much greater. The tube that hasn't exceeded the National Annual Objective for NO_2 since 2013, CCBC 60, has continued to comply alongside the newly introduced CCBC 84, which is located on the opposite side of Woodside Terrace around 5 meters above Hafodyrynys road. CCBC 84 has been placed for the same reasons as CCBC 60, to monitor the NO_2 levels at the residential receptors opposite the lower level properties at Woodside Terrace.

Blackwood Town Centre Diffusion Tubes

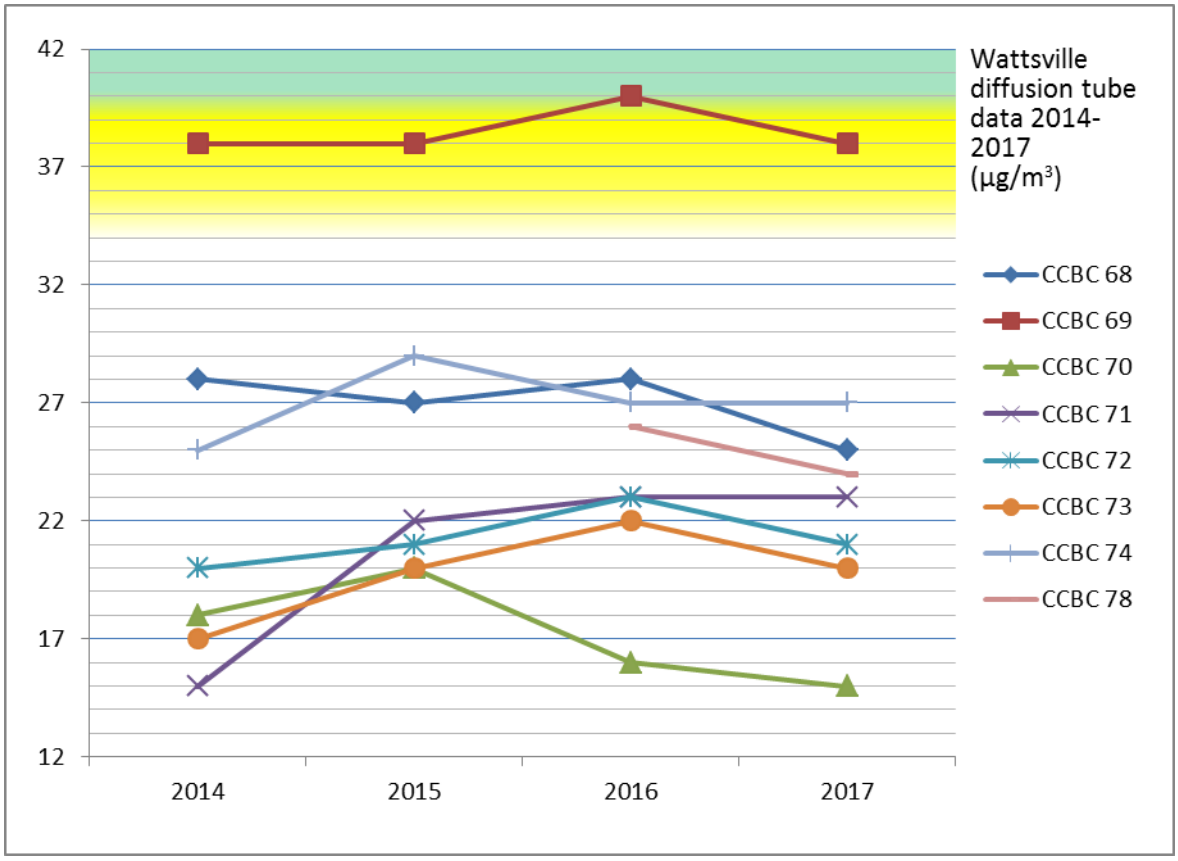
Figure 8 – Chart of Blackwood Town Centre Diffusion Tube results 2013-2017



The chart above shows a general reduction in all diffusion tubes from 2013 to 2017; mimicking the trends of the majority of diffusion tubes around the County Borough. Tubes CCBC 51-53 are co-located with the continuous analyser at Blackwood High Street; two exhibit increases in NO_2 levels, mimicking the increase captured by the continuous analyser. None of these diffusion tubes display exceedances of the National Annual Objective for NO_2.

Wattsville Diffusion Tubes

Figure 9 – Chart of Wattsville Diffusion Tube results 2013-2017



This chart demonstrates that over the four year monitoring period, NO_2 levels in Wattsville have not varied significantly. There is a mixed trend over this period and no increases have been exhibited from 2016 to 2017. CCBC 69 has reduced to compliance with the National Annual Objective for NO_2 and is the only borderline diffusion tube in this distribution.

In 2017, CCBC 78 maintained 100% data capture (annualised in 2016), when comparing this to CCBC 69, it is evident that there is a big difference in NO_2 exposure for properties set back from the road. NO_2 levels recorded at CCBC 69 were 38µg/m^3, compared to CCBC 78 which was 24µg/m^3, indicating a significant drop off of NO_2 levels at the façade of properties set back from the road.

2.4.2 Sulphur Dioxide (SO_2)

CCBC previously monitored for Sulphur Dioxide in 4 areas of the County Borough. The monitoring areas were situated in close proximity to large coal-fired boilers. The decline in industrial processes and the move to cleaner energy has meant that the use of large coal-fired boilers has now ceased. CCBC stopped actively monitoring for Sulphur Dioxide in 2009. All monitoring results collected between 1999 and 2009 were well below the air quality objective set for this pollutant.

2.4.3 Benzene

CCBC does not actively monitor for Benzene.

2.4.4 Other Pollutants Monitored

Other than those already reported, CCBC don't actively monitor any other pollutants.

2.5 Summary of Compliance with AQ Objectives as of 2017

CCBC has examined the results from monitoring within the County Borough.

Caerphilly AQMA diffusion tubes continue to record an exceedance of the National Annual Objective for NO_2, therefore the AQMA should remain.

Blackwood High Street diffusion tubes and continuous analyser display readings below the National Annual and Hourly Objectives for NO_2, therefore there is no need to proceed to a detailed assessment in this area. However, for the second consecutive year, continuous analyser NO_2 levels have increased; this is a 5 µg/m^3 increase over three years and is something that will need to be examined further should levels continue to rise. The continuous analyser has also recorded hourly exceedances for the first time in four years. Although the levels and exceedances are well below National Objectives, the increases need to be monitored closely and will be further reported in the 2019 Progress Report.

Hafodyrynys AQMA diffusion tubes and continuous analyser displayed exceedances of the National Annual and Hourly Objectives for NO_2, therefore the AQMA should remain. The Air Quality Action Plan has been approved by WG and CCBC's Cabinet. CCBC have been directed by Welsh Ministers to undertake a feasibility study at Hafodyrynys to bring about compliance with the EU Ambient Air Quality Directive. The study considers a list of measures that will bring about compliance in the shortest possible time. CCBC are currently working through the process and must submit a Final Plan to WG by 30th June 2019.

No breaches of the National Annual Objective for NO_2 were exhibited within the Wattsville monitoring network. As the diffusion tube levels have reduced, there are no longer any exceedances and the National Annual Average recorded at the continuous analyser was 26µg/m^3. The increased diffusion tube network will be closely monitored in 2018 to further identify any local hotspots of poor air quality. CCBC will also be undertaking traffic surveys in the area to ensure that all HGVs passing through Islwyn Road are only using it (as it is intended by traffic order) for access to Nine Mile Point Industrial Estate.

3. New Local Developments

3.1 Road Traffic Sources

3.1.1 Narrow Congested Streets with Residential Properties Close to the Kerb

CCBC has not identified any new narrow congested streets with residential properties close to the kerb since the last round of review and assessment.

CCBC confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.1.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

CCBC has not identified any new busy streets where people may spend 1 hour or more close to traffic since the last round of review and assessment.

CCBC confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.1.3 Roads with a High Flow of Buses and/or HGVs.

CCBC has considered roads with a high flow of HGVs and/or buses and no such locations have been identified.

CCBC confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.1.4 Junctions

CCBC confirms that no new busy junctions have been identified since the last round of review and assessment.

CCBC confirms that there are no new/newly identified busy junctions/busy roads.

3.1.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

There are no new roads constructed or proposed since the last round of review and assessment.

CCBC confirms that there are no new/proposed roads.

3.1.6 Roads with Significantly Changed Traffic Flows

CCBC has considered roads with a greater than 25% change in traffic flow and no new locations have been identified.

CCBC confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.1.7 Bus and Coach Stations

CCBC has two main bus stations in the County Borough, one in Blackwood Town Centre and one in Caerphilly Town Centre. Daily bus movements at these sites are in the order of 400 movements and 450 movements respectively. Technical guidance LAQM.TG (16) considers bus stations with less than 2,500 bus movements per day as not being significant. Therefore no further consideration of this section is required.

CCBC confirms that there are no relevant bus stations in the County Borough.

3.2 Other Transport Sources

- CCBC has no airports within the County Borough.
- CCBC locations where diesel locomotives may regularly remain stationary for 15 minutes or more, with relevant exposure within 15m were considered and no such locations were identified.
- None of the rail lines listed within table 7.2 of the Technical Guidance LAQM.TG (16) travel through the County Borough.
- CCBC has no coastline and therefore no significant shipping to consider.

3.3 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

In 2017, Environmental Health granted four new Environmental Permits under The Environmental Permitting (England and Wales) Regulations 2016. None of the installations required a formal air quality impact assessment and their respective emissions are controlled via permit conditions. The installations include a concrete batching plant, a petrol station and a biomass plant, that all have permit controls. The final installation is a solvent coating plant that has emission abatement in the form of a Regenerative Thermal Oxidiser that burns off VOCs, as well as the standard permit conditions.

In March 2017, planning permission was granted for the installation of diesel powered generators in Oakdale. During the consultation process, the impact of the generators on local air quality was assessed and deemed to have negligible effects.

3.4 Planning Applications

Since the last progress report, the Pandy Road development in Bedwas has been granted reserved matters planning consent, after the application was originally refused before being overturned by the Planning Inspectorate. The development is for approximately 300 houses; at the time of outline planning application, it was concluded via a traffic assessment that the development would not have adverse impact on the local transport routes, and thus did not meet the requirements for a formal air quality impact assessment.

Similarly to last year, there are a number of developments that have been granted in and around Caerphilly Town Centre, including 38 dwellings proposed at the site of the former Magistrates Court that have required a formal AQIA.

There were also large developments to the north of the County borough that were approved for planning permission; a development of 133 dwellings on the site of the former Oakdale Golf Club and a development of up to 190 dwellings at Hawtin Park in Pontllanfraith. Neither of these applications required an AQIA due to their location and because they didn't trigger the requirements for an AQIA under the EPUK-LAQM: Planning for Air Quality Guidance 2017.

In the absence of the recently renewed Planning Policy Wales and an Air Quality SPG note, the EPUK-LAQM document is used.

3.5 Other Sources

In 2017, Environmental Health received 139 service requests relating to bonfires, both commercial and domestic. A total of three abatement notices were served on domestic properties to abate the existence of smoke nuisance. No formal action was taken against commercial or industrial processes emitting smoke from a bonfire/plant. Pollution Control have seen a rise in the use of commercial wood burners as a means to reduce energy and waste costs; although these installations require written notice to Local Authorities, their existence has been highlighted mainly by smoke nuisance complaints.

On Saturday 4th November 2017, a firework display was held at Caerphilly Castle – which is located approximately 300m from Caerphilly Town Centre continuous analyser; there were no particular spikes in the data that are dissimilar to the dates around then, and there are also no exceedances of National Objectives.

4. Polices and Strategies Affecting Airborne Pollution

4.1 Local / Regional Air Quality Strategy

CCBC does not currently have an Air Quality Strategy document. LAQM reviews are undertaken on an annual basis in accordance with the National Air Quality Strategy and associated published guidance.

However, there are plans in place to develop a strategy in the near future and an update will be provided in the 2019 Progress Report.

4.2 Air Quality Planning Policies

Caerphilly Council does not have a specific air quality planning policy guidance note, but relies upon national planning policy and associated guidance.
CCBC will shortly be drafting a Supplementary Planning Guidance Note with regard to air quality and what information should be considered when a planning application is submitted.

The production of this guidance is being prepared as a reference document for Developers and their advisers, who may be involved in the assessment of air quality associated with developments. It will detail the type of information required by the Local Planning Authority (LPA) in order for them to assess an application for planning permission that may cause an impact on air quality.

The guidance will deal principally with the following;

- Those pollutants regulated under the Local Air Quality Management (LAQM) Regime.
- The impact of traffic emissions.
- The impact of emissions from biomass boilers/industrial emissions.
- The assessment and control of dust impacts during construction which contribute to airborne particulate emissions.

4.3 Local Transport Plans and Strategies

CCBC has a Local Transport Plan (South East Wales Valleys Local Transport Plan, January 2015), which aims to target investment, support economic growth, reduce economic inactivity, tackle poverty and encourage safer, healthier and sustainable travel. The report can be accessed through http://www.caerphilly.gov.uk/Services/Transport-and-parking/Local-Transport-Plan

There are a number of strategy policies within the Council's LDP which aim to bring about improvements in transport connections and infrastructure.

Strategy Policy 19 (SP19) in the LDP seeks to implement improvements to the existing transport infrastructure that;

- Address social exclusion by increasing accessibility to employment, services and facilities throughout the County Borough
- Assist in regenerating the Heads of the Valley Regeneration Area through creating and improving transport links to the settlements in the Northern and Southern Connections Corridors, and / or
- Reinforce the role and function of settlements, and/or
- Reduce the level of traffic movements and / or congestion, within any identified air quality management area, and/or
- Promote the most efficient use of the transport network.

There are a number of identified infrastructure improvement schemes under the various strategy policies. A few examples for the Caerphilly area are listed below, however all schemes are dependent upon funding availability.

TR6.2 Trecenydd Roundabout

Trecenydd Roundabout is located along the Caerphilly Northern Bypass and provides an important link for communities located within the Aber Valley. The roundabout was unable to cope efficiently with traffic volumes travelling along the A468 / A469 between Caerphilly and Cardiff, which resulted in congestion and particular problems for traffic from the Aber Valley accessing the A468. This not only caused localised problems but put pressure on Pwllypant Roundabout and other rural roads during peak hours as traffic was displaced to alternative routes. The scheme was undertaken in 2013 and included the redesign of the roundabout to provide better access to the A468 / A469 particularly for commuters from the Aber Valley.

TR6.3 Pwllypant Roundabout

The A468 / A469 Caerphilly Northern Bypass is the main artery linking Caerphilly and settlements in the north of the County Borough to the trunk road network (A470, M4) and Cardiff. The A468 / A469 Caerphilly Northern Bypass is already heavily overloaded at peak periods and all junctions are at, or in excess of, capacity at peak times. Improvements to this key six-arm junction at Pwllypant, which connects the A468 and A469 and forms part of the strategic network of roads in South East Wales, are required to improve efficiency of the network and reduce congestion, which is evident for periods throughout the day. These works commenced on 9th October 2017 and are currently ongoing.

TR6.4 Crumlin Junction

The implementation of the Crumlin junction works commenced 5 January 2015 and concluded in October 2015. The aim of the works was to minimise the congestion of traffic at the base of Hafodyrynys Hill by the introduction of the following:

- Installation of MOVA System.
- Additional right turn lane for North Bound (N/B) A467 vehicles turning East into A472
- Additional lane provided for A467 South Bound (S/B) vehicles passing straight on at traffic signals with A472.
- Extended left turn filter lane on the A472 for vehicles joining the A467 S/B.
- Additional right filter lane provided for vehicles leaving the A472 going N/B onto the A467.
- Additional merge lane provided on the A472 for vehicles heading East from N/B A467.
- Left turn filter lane extended on S/B A467 for vehicles joining into A472.

The schemes below are yet to be implemented:

TR6.4 Bedwas Bridge Roundabout

Bedwas Bridge Roundabout is a key junction on the northern route around Caerphilly town centre. It links the communities of Bedwas and Trethomas to the northern bypass and contributes to efficient distribution of traffic within the Caerphilly Basin. The junction also provides access to the park and ride facility at Caerphilly Station via the Lansbury Park ring road. The roundabout currently operates efficiently for much of the day, however congestion is evident during peak hours and further development in the Caerphilly Basin will put increased pressure on this key junction. A major constraint in improving operation of the roundabout is Bedwas Bridge and therefore improvements will require the provision of a second crossing. Highway improvements to A468 Bedwas Bridge will require a Flood Consequences Assessment to be submitted as part of any future planning application.

TR6.5 Piccadilly Gyratory

Piccadilly Gyratory is a key junction in managing and distributing traffic travelling within and through Caerphilly town centre. Traffic growth in the town centre has resulted in additional capacity being required at the junction. The scheme will upgrade and improve the existing traffic signals, improving network efficiency and providing additional capacity at the junction to relieve congestion and related environmental problems in the town centre.

TR6.6 Penrhos to Pwllypant

The current A468 / A469 varies in standard between dual carriageway and single carriageway. The single-carriageway section between Pwllypant and Penrhos has traffic levels far exceeding design capacity, which results in problems of congestion and queuing vehicles along the route during peak periods. This leads to traffic diverting through Caerphilly town centre, which increases traffic congestion / environmental problems and reduces the attractiveness of the town centre. The scheme will upgrade the existing A468/A469 single-carriageway road between Pwllypant and Penrhos roundabouts to dual carriageway standard, which will link into the existing duelled sections leading northwards from Pwllypant (along the A469) and westwards from Penrhos to the A470 (along the A468). The scheme aims to provide a high quality route along the length of the A468 / A469, to maximise the efficiency of the strategic highway network, reduce congestion/pollution, remove through traffic from Caerphilly town centre and improve access to the north of the County Borough to encourage economic regeneration.

TR6.7 Pwllypant to Bedwas

The section of the A468 between Pwllypant and Bedwas Bridge is important in managing traffic and congestion in Caerphilly town centre. The road completes the northern route around the town and currently operates efficiently for much of the day. However congestion is evident during the peak hours when commuter traffic is at its highest and further development in Caerphilly Basin will put increased pressure on the route. Network efficiency improvements will be required to maintain its attraction as a route for through traffic and prevent traffic diverting through the town centre.

4.4 Active Travel Plans and Strategies

4.4.1 Local Authorities Well-being Objectives

CCBC have outlined five Well-being objectives for 2017/18 in accordance with The Well-being of Future Generations (Wales) Act 2015. Objective four relates to CCBC's "Carbon Management", to take steps to reduce the Council's carbon footprint and inform and assist others within the borough to do the same.

CCBC currently have an annual carbon emission in excess of 26,000 tonnes and the objective to reduce emissions is a long-term action in accordance with Sustainable Development Principles and WG's own objective (number six) – To Support the transition to a low carbon and climate resilient society.

The actions to put into effect the objective include raising awareness and understanding of carbon management, greater control of own facilities (property energy consumption + technology use etc.) and a feasibility study and piloting of electric/hybrid vehicle fleet.

4.5 Green Infrastructure Plans and Strategies

4.5.1 Climate Change Strategies

The Climate Change Strategy for CCBC was produced by the Living Environment Partnership, one of the four partnerships of the Community Strategy. This group was predominantly made up of environmental organisations but on climate change issues it linked to a number of partners including Anuran Bevan Local Health Board, Caerphilly Community Safety Partnership, Health Challenge Caerphilly, National Farmers Union, Sus trans, CADW, Groundwork Caerphilly and Welsh Government, to name but a few.

The aims of the Strategy are:-

To bring together organisations from all sectors and coordinate a joined up response to the challenge of climate change, using the expertise and experience of partners and sharing good practice.

To establish baseline information about the contribution that CCBC makes to global climate change, in terms of greenhouse gas emissions from all sectors:

- ✓ To promote ownership of the responsibility for greenhouse gas mitigation within the County Borough, amongst all sectors.
- ✓ To encourage and facilitate greenhouse gas mitigation through providing advice and guidance to all sectors.
- ✓ To anticipate the possible effects that global climate change may have on Caerphilly County Borough and to begin planning the adaptation measures required to minimise the potentially harmful consequences of climate change on our residents and the local environment.
- ✓ To fully appreciate both the potential risks but also the potentially beneficial effects of climate change and to identify a range of opportunities that could arise from the environmental changes presented.

The Community Strategy has since been replaced by the Caerphilly Public Services Board Well-being Plan, with environmental issues within the Well-being Plan sit predominately within Action Area 5 Protect and enhances the Local Natural Environment. Work on this is reported to the Caerphilly Public Services Board.

Within CCBC, strategies and actions have been put in place for us to play our part in combating climate change. This includes:

Carbon Reduction Strategy

CCBC, working with the Carbon Trust, developed a long-term carbon reduction strategy in 2009. The ambitious but achievable target of a 45% reduction in $C0_2$ emissions by 2019 was agreed. It is anticipated that this target will be met by a mixture of:

- ✓ good housekeeping (10%)
- ✓ invest to save energy efficiency projects (20%)
- ✓ good design and asset management (10%)
- ✓ renewable energy (5%)

Housing

Housing accounts for 27% of the UK's carbon emissions. The rising cost of energy has resulted in an increase in Caerphilly residents being driven in to fuel poverty. Work is ongoing with Housing Services, housing associations and residents to address energy issues.

CCBC's Housing Services have an ongoing programme involving improving the energy efficiency of homes, including innovative measures such as external wall insulation and renewable technologies such as solar panels and heat pumps. They also have a programme replacing old boilers with new condensing boilers.

CCBC Adaptation Plan

CCBC is preparing a Climate Adaptation Plan for the County Borough, and has been engaging with all Council Service areas. This is following the methodology set out in the guidance accompanying the Climate Change Act 2008. A Local Climate Impact Profile (LCLIP) has been completed and approved by CCBC's Corporate Management Team in July 2015. The LCLIP identified 128 impacts, of which 32 were rated as high priority.

5. Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

Caerphilly Town Centre AQMA

As stated in Table 2.5, only two diffusion tubes within Caerphilly Town Centre Air Quality Management Area displayed increased levels of NO_2 from 2016 to 2017, with a reduction from two to one exceedance of the National Annual Objective for NO_2. The exceeding diffusion tube is located on White Street and although it has continued to exceed the National Annual Objective since its inception in 2004, the 2017 reading of 44µg/m^3 is its lowest level since 2009. The diffusion tube that previously exceeded in 2016, located at the bottom of White Street, has now reduced to compliance, albeit still at a borderline level – 39µg/m^3

In harmony with the diffusion tubes, both Caerphilly White Street and Nantgarw Road continuous analyser NO_2 levels decreased from 2016 to 2017, from 34µg/m^3 to 29µg/m^3 and 29µg/m^3 to 27µg/m^3 respectively. The decrease in the Caerphilly White Street continuous analyser NO_2 levels was also mirrored by the co-located diffusion tubes.

In 2017, both Caerphilly White Street and Nantgarw Road continuous analysers recorded 0 exceedances of the National Hourly Objective for NO_2 of over 200µg/m^3; this is the first year since its commencement that Caerphilly White Street continuous analyser has not recorded any exceedances.

The PM_{10} levels recorded at Caerphilly White Street for 2017 was 18µg/m^3, a 1µg/m^3 decrease from 2016, with an overall decrease of 4µg/m^3 from 2013 to 2017. The exceedances of the national daily mean increased from 1 in 2016 to 2 in 2017. PM_{10} monitoring ceased at Caerphilly Nantgarw in 2014. The National Air Quality Objective permits 35 daily exceedances a year.

To conclude, the review of the 2017 data set concluded exceedances of the National NO_2 Objectives and as such the Caerphilly Air Quality Management Area must remain in place and progress should be made with the current action plan. Should the AQMA be revoked in the future, continued and consistent compliance would need to be recorded at residential receptors.

Blackwood Town Centre

The five diffusion tubes located in Blackwood Town Centre did not display any substantial changes in NO_2 levels from 2016 to 2017. All three of the co-located diffusion tubes recorded levels of 27µg/m^3-29µg/m^3, compared to the continuous analyser levels of 32µg/m^3. From 2013 to 2017, both diffusion tube and continuous analyser levels have decreased by 1-4µg/m^3. However, for the first time since 2013, hourly exceedances of the National Hourly Objective for NO_2 were recorded. The National Air Quality Objective permits 18 hourly exceedances a year, with the continuous analyser only registering 4.

The PM_{10} levels decreased from 19µg/m^3 in 2016 to 16µg/m^3 in 2017, with an overall decrease of 3µg/m^3 from 2013 to 2017. There were no exceedances of the Daily Mean for PM_{10} for 2017.

To conclude, the review of the 2017 data-set demonstrates compliance with the National air quality objectives, therefore there is no requirement for CCBC to proceed to a Detailed Assessment for Blackwood High Street for PM_{10} or NO_2.

Hafodyrynys AQMA

In 2017, CCBC 83 and CCBC 84 were introduced to further assess residential exposure to NO_2. CCBC 83 was placed at 10 Woodside Terrace to measure the drop off in levels from the kerb-side continuous analyser, exhibiting levels of 59µg/m^3 for 2017. CCBC 84 was placed at La Loma, across from Woodside Terrace houses to assess residential exposure at the houses opposite which are at a higher level from Hafodyrynys Road, exhibiting levels of 39µg/m^3 for 2017.

From 2016 to 2017 – CCBC 48 and CCBC 50 both increased by 1µg/m^3 to 42µg/m^3 and 49µg/m^3 respectively, CCBC 60 decreased by 2µg/m^3 to 35µg/m^3 and the newly introduced diffusion tube from 2016, CCBC 79, increased by 6µg/m^3 to 59µg/m^3. Four out of the six diffusion tubes in the 2017 Hafodyrynys AQMA distribution, exceeded the National Annual Objective for NO_2.

The continuous analyser recorded an annual average of 70µg/m^3, a 1µg/m^3 increase from 2016. Following completion of the Crumlin Junction Works, NO_2 levels were modelled to be reduced by 10% to roughly 60µg/m^3, from 2016. For a second consecutive year, the levels have not reduced by the modelled amount, and have actually increased from 2016 to 2017. The junction works were also modelled to remove all exceedances of the National Hourly Objective; however, there were still 132 exceedances of the hourly objective for NO_2 recorded in 2017, an increase of 6 exceedances from 2016.

To conclude, the review of the 2017 data-set currently demonstrates non-compliance with the National Air Quality Objectives for NO_2; therefore the Air Quality Management Area must remain and the actions contained within the Hafodyrynys Action Plan should be implemented.

Fochriw

In 2017, PM_{10} levels decreased from 12µg/m^3 in 2016, to 11µg/m^3, with a decrease of 4µg/m^3 overall from 2013 to 2017. $PM_{2.5}$ levels also decreased from 8µg/m^3 in 2016, to 6µg/m^3 in 2017, with an overall decrease of 4µg/m^3 from 2013 to 2017.

Both PM_{10} and $PM_{2.5}$ levels are very low and do not require any further action.

Wattsville

Of the eight diffusion tubes in distribution from 2016 to 2017, six decreased in levels of NO_2 with the other two remaining the same. All reductions were between 1-3µg/m^3, most notably CCBC 69 which reduced by 2µg/m^3 to 38µg/m^3, which is now compliant with the National Annual Objective for NO_2.

2017 was the first year that the continuous analyser was in place; it recorded levels of 26µg/m^3 with no exceedances of the National Hourly Objective for NO_2. As the continuous analyser was commissioned in May 2017, the data capture rate was 62%.

To conclude, the review of the 2017 data-set demonstrates compliance with the National air quality objectives, therefore there is no requirement for CCBC to proceed to a Detailed Assessment for Wattsville for NO_2. However, as an exceedance was recorded in 2016, an extended monitoring network has been introduced to further investigate the previously reported "pinch-point" along Islwyn Road and these results will be reported in the 2019 Progress Report. In addition, CCBC will be undertaking traffic surveys along this stretch of road to ensure that the HGV restriction (except for access) is being adhered to.

Other monitored locations

Other than the diffusion tubes stated above, there are nine others located in areas around the County Borough; three of these were located in 2017 along Commercial Street, Aberbargoed after concerns were raised by local residents about local air quality. The results of the three diffusion tubes ranged from 21-33µg/m^3. Of the remaining six diffusion tubes, all measured reductions in NO_2 levels ranging from 1-4µg/m^3.

To conclude, the review of the 2017 data-set demonstrates compliance with the National air quality objectives, therefore there is no requirement for CCBC to proceed to a Detailed Assessment in any of the areas monitored within the County Borough.

5.2 Conclusions relating to New Local Developments

An outline application is currently under consideration for the development of approximately 618 dwellings on a 48 hectare site around 1km from Caerphilly AQMA. In 2015, a pre-application was submitted for this site and Environmental Health recommended an Air Quality Impact Assessment be submitted to determine the impact of the development on local air quality, including the AQMA itself. This AQIA is currently under consideration by AEA consultants as part of the outline application.

In addition is an outline application for approximately 350 dwellings on a 17 hectare site around 0.5km from Caerphilly AQMA is also before the Local Planning Authority for determination. An AQIA has been requested for this development and is currently under consideration. These two developments have the capacity to cumulatively add around 950 new dwellings and approximately 1900 new vehicles to the Caerphilly basin. The conclusions of these planning applications will be reported on in the 2019 Progress Report.

5.3 Proposed Actions

- Continue the actions for Caerphilly Town Centre and Hafodyrynys Air Quality Management Areas, as outlined within their Action Plans.
- Continue to review and assess the County Borough for air quality and identify any area of concern.
- Continue enhanced monitoring network at Hafodyrynys to enable effective modelling of mitigation strategies.
- Continue to work with developers of new development sites to encourage active travel solutions and also secure air quality mitigation on any new sites proposed.
- Work with schools to raise awareness and educate on poor air quality and its effects on health; including an increased monitoring network around school playgrounds.
- Continue to closely monitor Islwyn Road, Wattsville and Blackwood High Street.

References

- Caerphilly Town Centre Air Quality Action Plan, March 2014, Caerphilly County Borough Council, Ricardo-AEA, ED46519/Issue 1

- Detailed Assessment, May 2013, Caerphilly County Borough Council, Ricardo-AEA, ED57888/Issue 3

- Detailed Assessment, April 2013, Caerphilly County Borough Council, Ricardo-AEA, ED570767001/Issue 5

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- Further Assessment of Air Quality - Caerphilly. Caerphilly County Borough Council. AEA Technology AEAT/ENV/R/2813, ED45587106, Issue 4, February 2010.

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- Land-Use Planning & Development Control: Planning for all Air Quality (2017) EPUK and IAQM, January 2017, Vol 2.

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- Local Development Plan up to 2021,(Adopted November 2010), Caerphilly County Borough Council

- Progress Report 2017, Caerphilly County Borough Council, Ricardo Energy & Environment

- Review and Assessment LAQM Support Website, DEFRA (2014), http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html, Accessed in August 2017

- Updating and Screening Assessment 2012, Caerphilly County Borough Council.

Appendices

Appendix A: A Summary of Local Air Quality Management

Appendix B: Air Quality Monitoring Data QA/QC

Appendix C: AQMA Boundary Maps

Appendix D: Monthly Diffusion Tube Monitoring Results

Appendix A: 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 has 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 .

The table shows the objectives in units of micrograms per cubic metre µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

Table 14 – 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 7 times a year	24-hour mean	31.12.2010
	18µg/m^3	Annual mean	31.12.2010
Particulate Matter ($PM_{2.5}$)	10µg/m^3	Annual mean	31.12.2020
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	3.25µg/m^3	Running annual mean	31.12.2010
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 B: Air Quality Monitoring Data QA/QC

Diffusion Tube Bias Adjustment Factors

The bias adjustment value for 2017 was 0.76 and was calculated using the average of the co-located diffusion tube results of Caerphilly White Street and Blackwood High Street. The LAQM website was accessed at the time of writing this report to check how the locally derived bias adjustment factor compared to the national figures. There are a number of local authorities in Wales that use ESG Didcot for their diffusion tube analysis and with 29 overall in the UK; the suggested bias adjustment factor from these studies was 0.77. This shows the similarity of the analytical precision nationwide, but the local bias adjustment value has been used as it's more applicable to the County Borough.

CCBC have shared their co-location data with the National Physics Laboratory and the information is available at https://laqm.defra.gov.uk/assets/databasediffusiontubebiasfactorsv0618final.xlsx.

PM Monitoring Adjustment

CCBC are not required to make adjustments to the Particulate Matter results.

Short-Term to Long-Term Data Adjustment

CCBC have a data management contract with air quality consultants with respect to our continuous data, who make any necessary adjustments to data on our behalf. All data reported has been fully ratified.

Quality Assurance/Quality Control

QA/QC of Automatic Monitoring

The Environmental Health, Pollution Control officers undertake routine calibration checks of the chemiluminescent continuous analysers fortnightly. The validation and ratification of the data is undertaken by Ricardo on behalf of CCBC. The analysers at Blackwood High Street and White Street Caerphilly form part of the Welsh Air Quality contract for QA/QC, so as well as regular service and maintenance checks, further audits are undertaken by Ricardo as part of the contract. In addition, the air quality station at Hafodyrynys forms part of the AURN (Automatic Urban and Rural Network) which is run by DEFRA and is also subject to additional regular audit checks by independent consultants.

QA/QC of Diffusion Tube Monitoring

The Nitrogen Dioxide diffusion tubes are currently supplied and analysed by Environmental Scientifics Group (ESG) Ltd. ESG performed to the following proficiency levels during the AIR-PT testing scheme:

- January-February – 100%
- April-May – 100%
- July-August – 100%
- September-October – 100%

The testing scheme is in place to evaluate the performance of the laboratory and the diffusion tubes in distribution. The percentage displays a “snap-shot” of the analytical quality; if five rolling rounds average significantly lower than 95%, it indicates issues with bias. This performance should be married up with other variables such as the skills of the laboratory, their measurement standards, their customer care etc.

Appendix C: AQMA Boundary Maps

Figure 10 – Map of Hafodyrynys Road AQMA

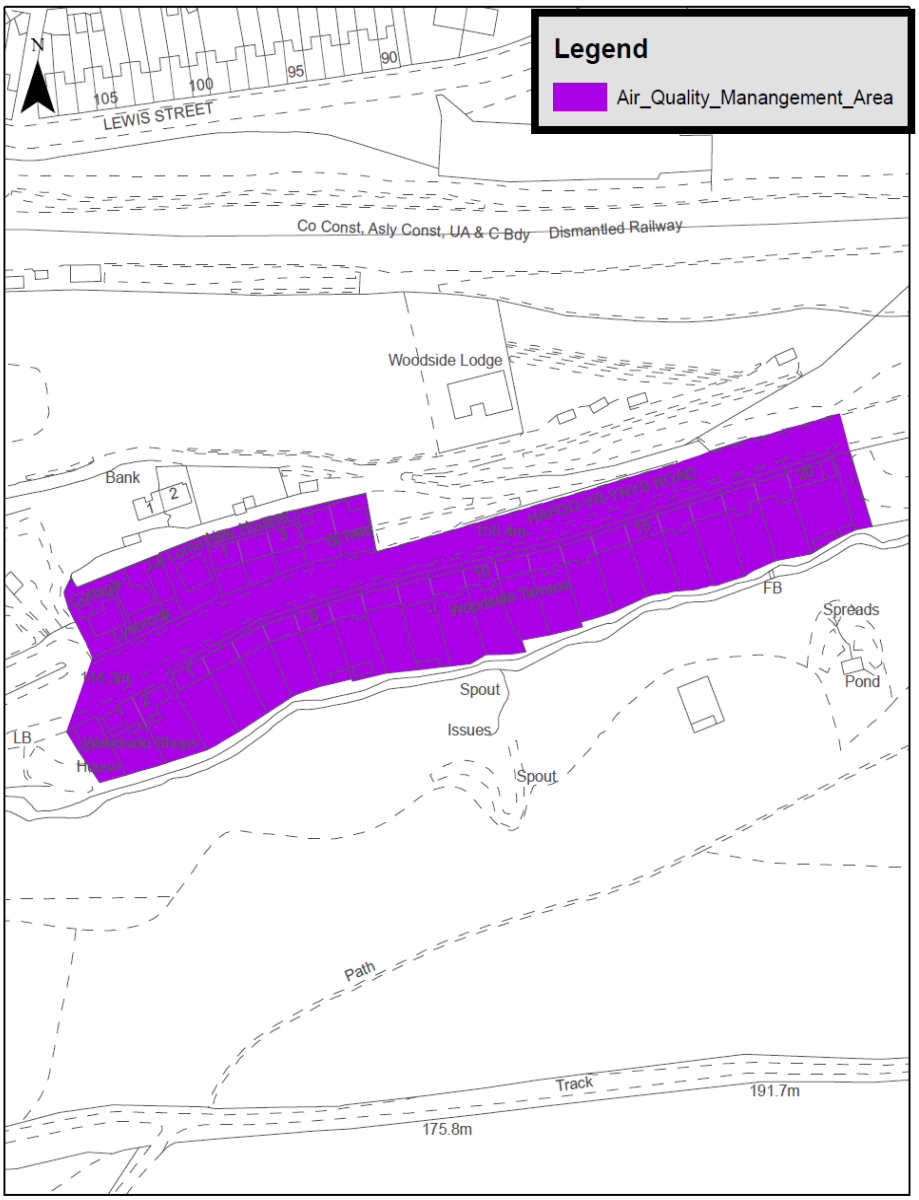
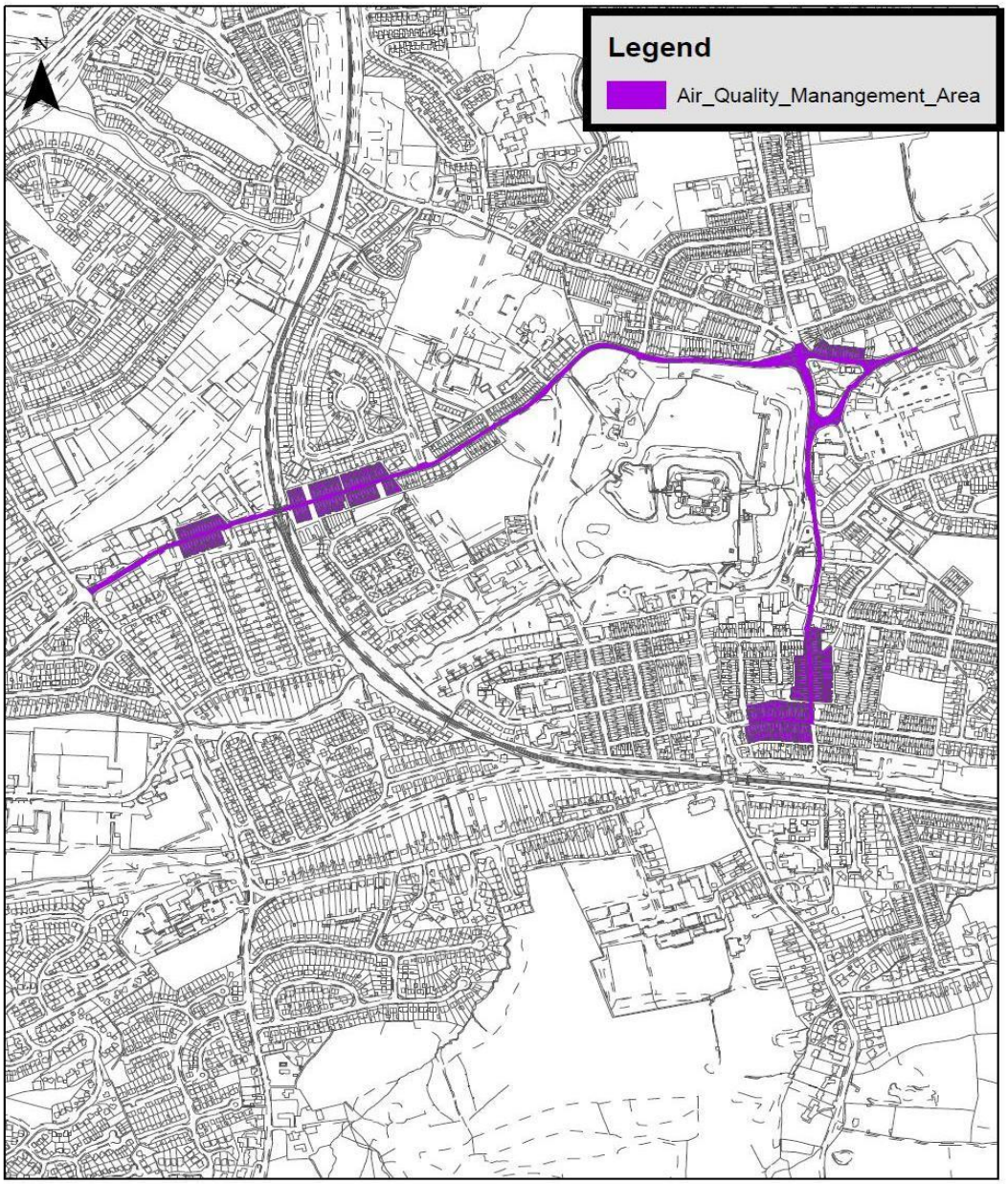


Figure 11 – Map of Caerphilly Town Centre AQMA



Appendix D: Monthly Diffusion Tube Monitoring Results

Table 15 – Full Monthly Diffusion Tube Results for 2017

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 (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
CCBC1	54	46	45	43	34	30	27	31	37	35	57	44	40	30	30
CCBC6	60	49	40	46	44	33	/	30	40	41	54	43	44	33	33
CCBC7	51	31	34	36	30	29	27	28	32	36	49	35	35	27	27
CCBC8	/	40	42	37	38	27	30	27	36	38	/	41	36	27	27
CCBC17	43	43	38	32	33	29	27	26	32	37	/	37	34	26	26
CCBC18	36	33	36	34	32	23	22	23	28	33	44	33	31	24	24
CCBC19	69	66	63	61	63	49	47	41	56	52	77	48	58	**44**	**44**
CCBC20	46	36	38	40	27	25	27	29	35	20	38	33	33	25	25

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 (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
CCBC21	43	43	/	36	35	31	23	30	36	35	50	36	36	27	27
CCBC22	53	40	37	37	33	/	27	25	36	30	56	41	38	39	39
CCBC27	18	/	12	9	7	6	6	8	9	11	/	11	9	7	7
CCBC29	25	12	20	16	16	14	12	11	15	14	21	13	16	12	12
CCBC30	66	44	44	57	32	31	33	36	47	44	69	47	46	35	35
CCBC31	53	46	44	50	36	30	33	33	47	36	67	51	44	33	33
CCBC32	61	37	40	52	37	29	31	33	42	46	69	48	44	33	33
CCBC33	72	53	52	55	58	38	39	37	49	49	66	47	51	39	39
CCBC34	43	33	28	32	26	19	20	20	25	23	38	25	28	21	21
CCBC35	49	40	41	/	30	34	28	31	38	/	53	/	38	29	29
CCBC36	49	32	33	28	20	22	21	23	26	27	40	35	30	23	23

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 (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
CCBC37	37	32	33	/	/	20	16	20	25	28	41	29	28	21	21
CCBC38	56	52	55	52	40	46	43	40	50	54	65	42	50	38	38
CCBC39	50	43	43	37	35	35	32	33	37	/	51	28	39	30	30
CCBC40	46	35	40	32	30	25	25	23	27	/	43	34	33	25	25
CCBC44	62	53	50	51	40	36	37	36	43	48	72	55	49	37	37
CCBC45	42	53	50	51	40	36	37	36	43	48	72	55	49	37	37
CCBC46	37	32	33	/	/	20	16	20	25	28	41	29	28	21	21
CCBC48	72	58	51	58	/	40	44	45	51	47	75	60	55	42	42
CCBC49	49	38	38	33	30	14	22	21	28	29	44	35	32	24	24
CCBC50	82	74	70	57	63	50	54	54	60	63	82	71	65	**49**	**49**
CCBC51	47	42	40	40	/	32	30	28	36	36	48	42	38	29	29

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 (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
CCBC52	37	40	30	37	33	31	29	31	34	39	49	43	36	27	27
CCBC53	47	42	41	42	30	31	29	29	37	39	48	44	38	29	29
CCBC54	41	34	27	25	25	22	22	21	25	/	/	/	27	21	21
CCBC55	56	46	48	48	/	30	30	34	41	40	/	40	41	31	31
CCBC56	45	42	25	42	35	26	27	28	34	38	56	33	36	27	27
CCBC57	46	34	33	26	28	20	21	19	22	30	42	/	29	22	22
CCBC59	57	37	45	45	36	31	30	32	41	45	63	49	43	33	33
CCBC60	27	43	54	49	43	41	40	39	38	42	58	51	46	35	35
CCBC61	57	43	41	43	40	31	32	30	37	44	60	48	42	32	32
CCBC67	46	45	44	46	33	31	36	34	37	47	61	47	42	32	32
CCBC68	47	28	38	34	28	27	23	26	32	30	47	/	33	25	25

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 (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
CCBC69	65	49	51	52	44	37	40	40	47	46	68	57	50	38	38
CCBC70	35	/	25	20	20	14	14	12	/	20	23	/	20	15	15
CCBC71	42	35	30	27	27	24	23	20	28	29	37	33	30	23	23
CCBC72	40	30	31	28	/	21	/	18	24	26	36	29	28	21	21
CCBC73	39	32	28	26	24	20	19	18	21	25	33	27	26	20	20
CCBC74	47	40	37	35	28	29	28	27	28	37	48	42	36	27	27
CCBC75	33	30	29	27	24	22	22	21	24	24	36	20	26	20	20
CCBC76	43	34	27	35	25	26	24	29	33	31	46	32	32	24	24
CCBC77	44	44	37	33	26	27	27	28	35	34	49	36	35	27	27
CCBC78	44	38	40	34	28	27	/	26	28	33	45	30	31	24	24
CCBC79	90	85	79	83	73	73	68	69	67	79	99	70	78	**59**	**59**

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 (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
CCBC80	60	/	42	45	37	27	31	27	36	38	57	44	40	30	30
CCBC81	43	31	30	29	25	18	21	18	22	24	37	28	27	21	21
CCBC82	50	47	46	43	31	35	34	36	42	41	59	49	43	33	33
CCBC83	/	/	/	84	67	66	63	69	77	78	101	91	77	**59**	**59**
CCBC84	/	/	/	56	50	42	47	46	50	50	65	55	51	39	39

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix B for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

The only diffusion tube that is required to be Distance Corrected in accordance with LAQM TG16 is CCBC50 which is situated beyond the houses at the top of Hafodyrynys Road. In August 2016, CCBC79 was located at 20 Woodside Terrace, the nearest receptor to CCBC50, to negate the need for distance calculation. CCBC50 will continue to be used as a marker tube for NO_2 levels at a point along Hafodyrynys Road where there is greater dispersion, away from the houses.

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'
AQE	Air Quality Enclosure – The name given to the enclosure that houses the continuous analyser
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)
CCBC	Caerphilly County Borough Council
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
WG	Welsh Government