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

April, 2020

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Mae'r ddogfen hon ar gael yn Gymraeg, ac mewn ieithoedd a fformatau eraill ar gais.
This document is available in Welsh, and in other languages and formats on request.

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 77 diffusion tubes and 5 continuous analysers. Particulate Matter is currently the only other observed pollutant and is monitored via 3 continuous analysers.

The network of 77 diffusion tubes consists of 74 that were in circulation in 2018, with the removal of 4 existing and the addition of 7 new diffusion tubes. The four that were removed demonstrated continuous compliance with the National Annual Objective for NO_2. The 7 new tubes have been located to assess local exposure along a village main road; these will also be used to assess likely pollution changes ahead of new development opportunities.

The levels of local air quality observed in 2019 illustrate varied trends in comparison to those in 2018. The majority of diffusion tubes exhibited a reduction in NO_2 levels, however, these reductions weren't as vast as those seen from 2017 to 2018.

Overall exceedances of the National Annual Objective for NO_2 has decreased from 13 to 11 diffusion tubes, including CCBC 19, located on White Street – part of the existing Caerphilly Town Centre AQMA. This means that the only existing exceedances are located solely within the Hafodyrynys AQMA; these consist of 11 diffusion tubes, as well as the annual NO_2 level recorded by the continuous analyser.

CCBC currently have two declared Air Quality Management Areas, 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 2020. The latest action has included working with Stagecoach and CCBC Passenger Transport Unit on the successful Ultra-Low Emission Bus (ULEB) bid to replace 16 diesel buses for electric alternatives.

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 have undertaken 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 their Final Plan to Welsh Government (WG) on the 30th June 2019. The Final Plan concluded that demolition of the houses on the south side of the A472 and realignment of the footway was the measure that would deliver compliance in the shortest possible time, with the project completion date being December 2021.

Actions to Improve Air Quality

Environmental Health have worked with Stagecoach to bid for 21 electric buses to operate within the Caerphilly Basin. The outcome of which has been the successful grant for 16 ULEB, approved in February 2019.

A pilot study of air quality monitoring and education at 7 schools has been completed. The study involved capturing NO_2 levels of playgrounds located near busy roads, as well as introducing air quality talks to pupils on causes of poor air quality and what actions they could take to help improve air quality.

Another education project was run alongside the pilot study which consisted of air quality presentations by members of the Pollution Control Team. The presentations were delivered to key stage two pupils in 25 schools across the Local Authority Area consisting of information and advice on air pollution and what responsibilities we all have to protect the environment.

Environmental Health delivered a “Clean Air Week” that coincided with National Clean Air Day – the UK’s annual air pollution awareness day. The event was run over four days at Caerphilly Castle based around a play delivered by Performance in Education called ‘Abbey Ayre and the Shed of Science’. This was an interactive performance which taught children about air pollution, specifically what causes poor air quality and actions we can all take to help improve air quality. Other partnerships were also in attendance such as Stagecoach, Tenovus, Head4Arts and other CCBC departments, to deliver information around public safety and wellbeing. The event was attended by 833 pupils over 19 schools, as well as the Welsh Minister for Environment and Rural Affairs, Lesley Griffiths.

CCBC are also currently implementing the recommendations of the Final Plan submitted to Welsh Government to demolish all properties on the southern side of the A472 at Woodside Terrace and realignment of the footway, as directed by the Minister, as well as undertaking further modelling and assessment work around the suitability of a Clean Air Zone at Hafodyrynys.

Local Priorities and Challenges

The main priority for addressing Local Air Quality in Caerphilly County Borough at this time is to implement the effective resolution for Hafodyrynys AQMA, namely demolition of the properties on the southern side of the A472 at Woodside Terrace and realignment of the footway and completion of the required modelling and assessment work around the suitability of a Clean Air Zone which was required as part of a second Air Quality Direction from WG.

Another priority will be to undertake a review of the existing Caerphilly Town centre Air Quality Action Plan.

We will also work with strategic planning on the review of the LDP to ensure that air quality policy features heavily in the new revision. This will then lay out the Council's expectations to developers and provide a steer of what is expected going forward.

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.

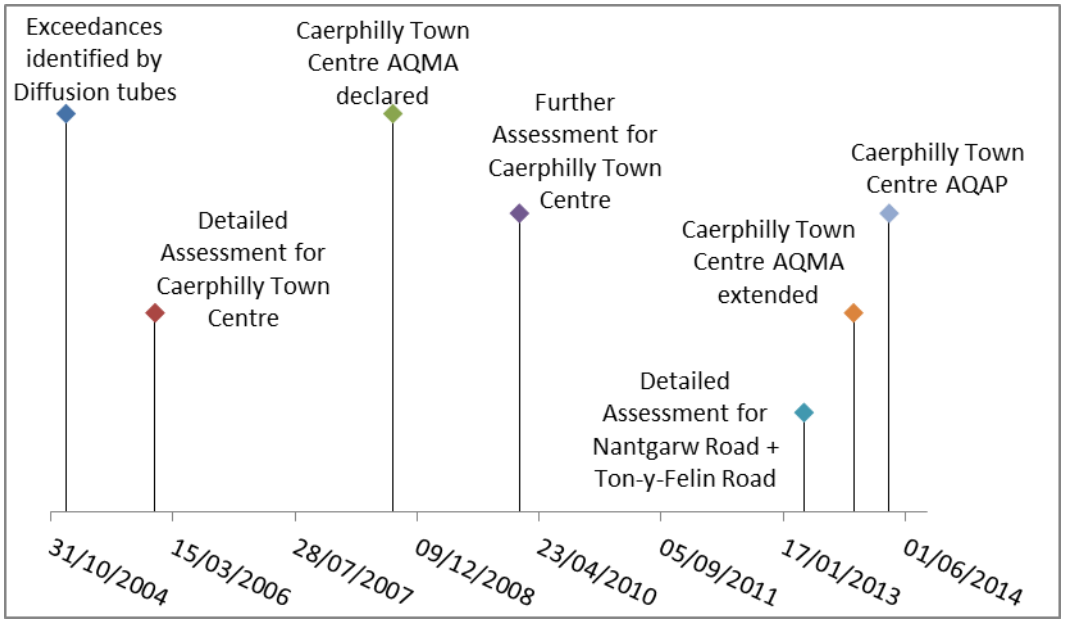
The modelling study undertaken as part of the Further Assessment, along with current monitoring and meteorological data for the area, confirmed that the current AQMA was sufficient to cover the exceedances of the National Annual Objective for NO_2, for White Street and Bartlett Street. However, the study 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.

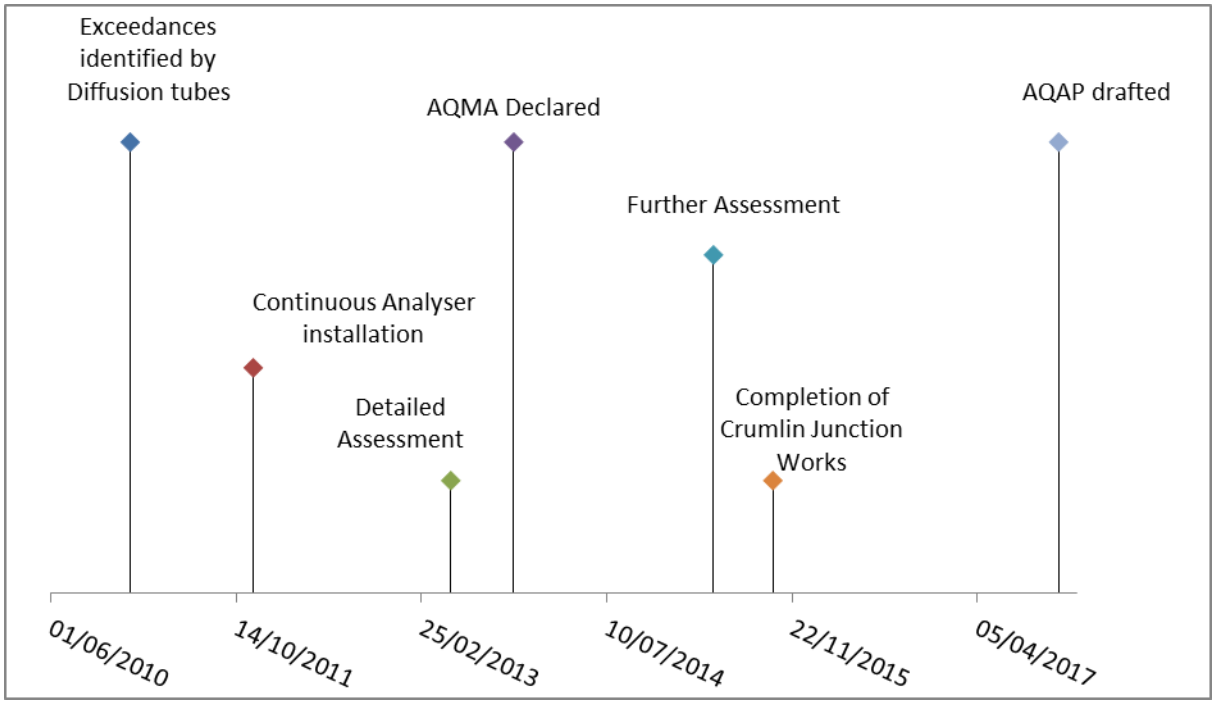
CCBC designated the Hafodyrynys Road AQMA in November 2013 (figure 1.2) and proceeded to a Further Assessment of Air Quality in 2014.

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



The Crumlin junction works were assessed for air quality prior to their implementation, the report concluded that the works would reduce pollution levels by around 10% in relation to the annual mean. The hourly means were also modelled and the report concluded that the exceedances of the hourly mean for nitrogen dioxide would be resolved.

The Council monitored for a period of 12 months following the Crumlin Junction works and the scheme had very little effect on air quality. Therefore the Council had to proceed with the production of any air quality action plan for the area.

Meetings were held with various partners including Public Health Wales and the local residents as well as a number of departments within the local authority and the work began on the formation of air quality action plan for the area.

In 2013, 2 diffusion tubes were placed in Cwmfelinfach and Wattsville respectively to investigate NO_2 levels along a main B-road that dissects valley villages to connect the A472 to the A467.

In July 2014, the monitoring network was increased to 7 diffusion tubes, with a further 5 added along Islwyn Road in Wattsville. The majority of the NO_2 levels recorded, fell comfortably below the National Annual Objective for NO_2, apart from CCBC 69 which recorded borderline levels in 2014 & 2015.

In an effort to further investigate these levels, an additional tube was added in August 2016 to measure the approximate drop-off in NO_2 from houses close to the road (CCBC 69) and those set back from the road (CCBC 78). This coincided with CCBC 69 exceeding the National Annual Objective for NO_2 in 2016.

In response, CCBC installed a continuous analyser in close proximity to CCBC 69 in May 2017, in an effort to better understand NO_2 levels. Diffusion tube data indicated that the exceedance was confined to a localised area and we needed to explore potential solutions before deciding whether to progress to a detailed assessment for the local area.

For 2017, the analyser, as well as CCBC 69, demonstrated compliance with the National Annual Objective for NO_2 so there was no immediate need to proceed to a Detailed Assessment, however we would continue to monitor NO_2 levels within the area and keep a close eye. .

In 2018, a further 6 diffusion tubes were added to the network, three along Islwyn Road in Wattsville to measure at those parts of the street that we felt did not have adequate coverage and three in Cwmfelinfach in locations around the industrial estate to measure levels of NO_2 away from the road but that may be attributable to industrial processes. The Council were also made aware of a waste recycling process that was proposed for the area which would utilize a thermal oxidizer as part of its odour abatement techniques so we were keen to get an understanding of current levels within the area.

Since 2016, all NO_2 levels recorded by these diffusion tubes and the continuous analyser have demonstrated reductions and continued compliance with the National Annual Objective for NO_2.

This report will assess all monitoring data and any respective action taken for 2019. 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 3. 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	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

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.

CCBC has taken forward a number of measures during 2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned, are set out in Table 4. More detail on these measures can be found in the Air Quality Action Plan relating to any designated AQMAs.

Key completed measures completed in 2019 are:

- Successful ULEB bid with Stagecoach to replace 16 buses with electric alternatives.
- Completion of pilot schools study of 7 CCBC schools, including those in close proximity to Hafodyrynys and Caerphilly AQMAs.
- Completion of a Feasibility Study and production of a final Air Quality Plan for Hafod-yr-ynys.
- Implementation of a scheme to demolish the properties on the south side of the A472 at Woodside Terrace with realignment of the southern footway.
- Participation in Clean Air Day through organisation and running of a four-day education event at Caerphilly Castle for 833 school pupils.

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

- Working with colleagues in Strategic Planning on the production of a newly revised Local Development Plan which has a clear message on air quality and sustainability. Pollution Control will also have an opportunity to assess the

candidate sites proposed and provide comments to our planning colleagues on their suitability.

- Continued work towards engaging with taxi operators in an effort to encourage changes of their existing fleet to cleaner alternatives.
- Delivery of the proposed demolition scheme along the southern side of the A472 at Woodside Terrace, Hafod-yr-ynys.
- Delivery of a project based during the week of Clean Air Day focussed around anti-idling of vehicles.

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 granted for 16 electric buses.	Bid granted.	Complete	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}. Modelling hasn't been carried out for 16 buses.

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
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. Small amount of changes of existing fleet to greener alternatives, including the CCBC Mayor's car.	Funding secured from Welsh Government for a Gwent regional fleet review process. Work undertaken for a fleet review officer to undertake a departmental review of CCBC fleet.	Ongoing	CCBC are assessing the viability of EV pool cars and fleet changes; the vehicles will be used in place of our own diesel/petrol vehicles, thus reducing work related 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 / Transport Strategy & 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 67 active school travel plans. CCBC Transport Strategy & Development Control also conditions certain planning applications to produce sustainable travel plans.	7 school plans being renewed, approved Sep-19 106 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. Schools also have access to a series of workshops throughout the year to encourage pupils to be more active to and from school.

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
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 449 vehicles in total, 324 of which are Euro VI.	Two reports are due to be submitted to Cabinet requesting funding on reducing council grey fleet mileage and associated charging infrastructure.	Ongoing	The Council renews it fleet on a rolling programme, ensuring the oldest vehicles are usually replaced with cleaner alternatives.
5	Development of CCBC Electric Vehicle Strategy and Action Plan	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	Completed	Finalised and agreed by CCBC Cabinet, September-18	Completed	Strategy outlines 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	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.	6200 pupils participated in walk-to-school week/month.	Ongoing	This is aimed to reduce the emissions generated by pupil travel in the County Borough.
7	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 – Feb-18	Ongoing	Modal Shift
8	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	25 schools presented to	25 schools presented to	Ongoing	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
9	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	Pilot Study of 7 schools completed	Pilot Study completed.	Completed	Pilot Study has been completed. A decision will be made regarding the continuation of another round of schools, dependant on staff resource.

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
10	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 2018, which includes new and improved walking & cycling routes, new and improved facilities. Work undertaken to identify sites and secure funding for electric bike charge point infrastructure.	Ongoing	By increasing and publicising the availability of cycling facilities/routes, cleaner travel alternatives are encouraged, reducing overall vehicle emissions.
11	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	3561 pupils trained in total	256 pupils trained in 2019	Ongoing	Currently being delivered in schools on a rolling programme.

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
12	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 plan submitted to Welsh Government	Completed	Local Air Quality has a direct effect on bio-diversity. The interventions will be delivered through action planning.
13	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.
14	CCBC adoption of parking enforcement from Gwent Police	To reduce instances of illegal parking	CCBC Traffic Management / Civil Parking Enforcement	2018	April - 19	Number of Fixed Penalty notices served	Not quantifiable	Civil Parking enforcement adopted on April 19	11528 Penalty Charge Notices (PCNs) served in 2019	Ongoing	Congestion and subsequent emissions caused by illegally parked vehicles are reduced by restrictions that are now enforced.

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
15	The reduction from 30 mph along Pengam Road into the existing 20 mph zone in Ystrad Mynach Town Centre	To increase the 20mph zone in Ystrad Mynach Town Centre to facilitate active travel	CCBC Traffic Management / Transport	2018	2019	N/A	Not modelled	Scheme approved	Scheme Approved	Completed	Reducing the speed along Pengam road will likely reduce vehicle emissions, as well as introducing active travel routes in the town to facilitate cleaner travel.
16	Increase the provision of EV charging points in the Local Authority Area to encourage modal shift to EVs.	To gain funding for EV charging points for CCBC and residential use.	CCBC Policy / Transport / Traffic Management	2015	2018	Number of charging points available in the Local Authority Area	Not Quantifiable	EV Charging points installed at CCBC buildings and the local authority area.	23 Electric vehicle charge points installed across 13 sites in the local authority area.	Ongoing	By making more EV charging point available across the Local Authority Area, residents and CCBC workforce are able to use EV in place of diesel/petrol alternatives, thus reducing vehicle emissions.
17	Purchase of an electric pool bike for staff work commutes	To provide an electric bike for employee commutes, which is easier to ride the local topography	CCBC Policy / Transport	2018	2018	Number of staff trips	Not Quantifiable	Bike purchased and offered to staff for work commutes	CCBC promotion of National Bike Week, promoting cycling and the salary sacrifice schemes available	Completed	By providing a pool bike, staff can use it to commute to work, reducing vehicle emissions. An electric bike is better for the majority of staff due to topographic and fitness issues, and is likely to be used more.

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
18	To improve the private fleet of CCBC employees	To encourage and provide cleaner vehicle alternatives for CCBC staff in their private vehicle ownership	Policy	2018	2018	Number of users of salary sacrifice schemes	Not quantifiable	CCBC has a car sacrifice and a cycle to work scheme in place. CCBC employees are able to use their wages to purchase cars for private ownership and bicycles to travel to work	Work commenced on improving the existing car sacrifice and cycle-to-work schemes to provide more options for electric/hybrid cars and bicycles.	Ongoing	The aim is on reducing the emissions attributed to CCBC employees private vehicles.

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

2.1 Summary of Automatic Monitoring Undertaken in 2019

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.

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)	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Pollutants Monitored	Monitoring Technique
				X	Y						
BLW	Blackwood	Kerbside	No	317456	197109	1.8	1	0	1	PM_{10}	BAM
										NO_2	M200A Chemiluminescent analysers
CWS	Caerphilly White Street	Roadside	Caerphilly Town Centre	315682	186825	1.8	2	7	5	PM_{10}	BAM
										NO_2	M200A Chemiluminescent analysers
CNG	Caerphilly Nantgarw	Roadside	Caerphilly Town Centre	314744	186997	1.8	2	0	2	NO_2	M200A Chemiluminescent analysers

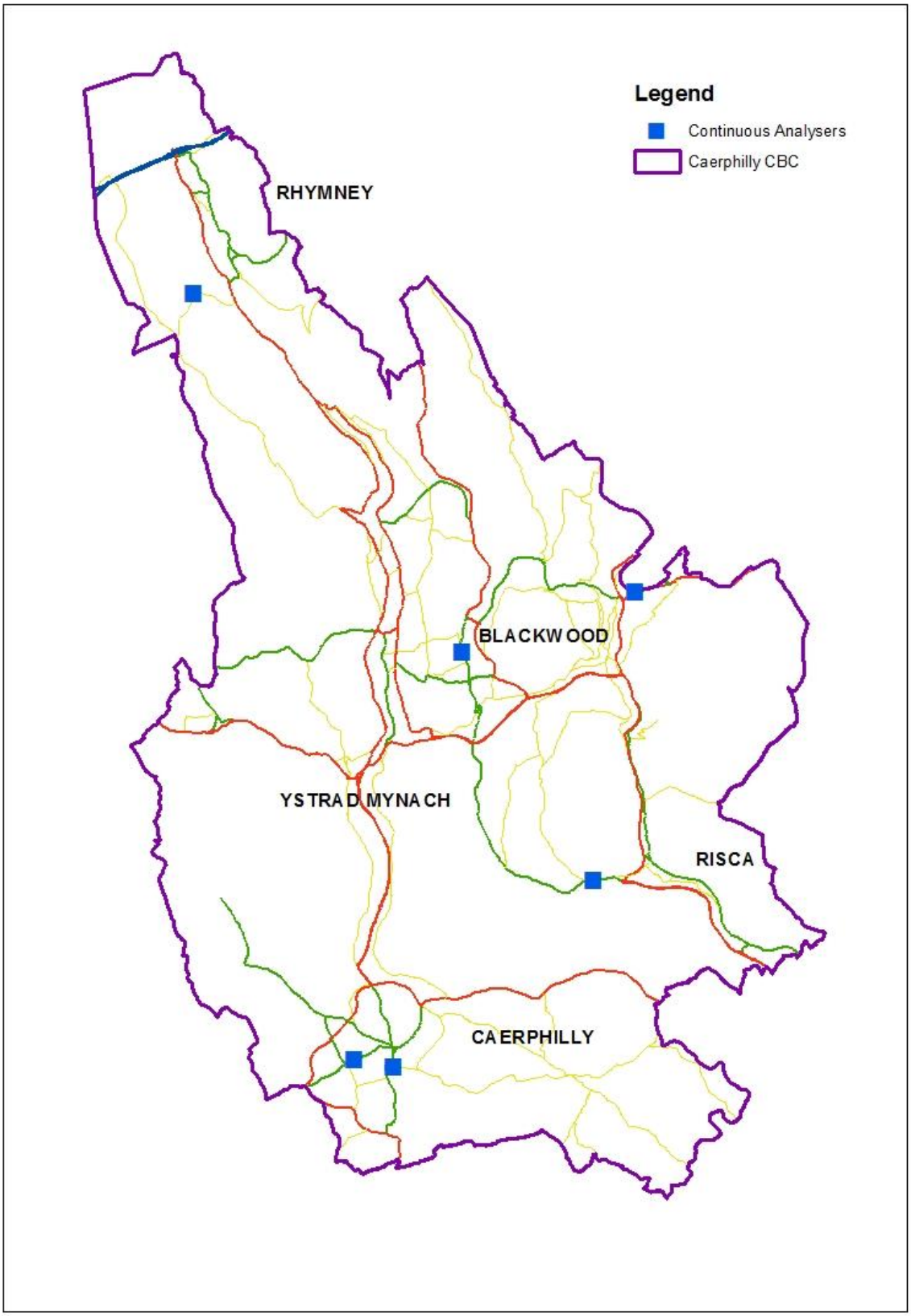
Site ID	Site Name	Site Type	Associated with (Named) AQMA?	OS Grid Reference		Inlet Height (m)	Distance from Kerb to Monitor (m)	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Pollutants Monitored	Monitoring Technique
				X	Y						
FCR	Fochriw	Roadside	No	310452	205422	1.8	2	0	2	PM_{10}	BAM
										$PM_{2.5}$	BAM
HAF	Hafodyrynys	Kerbside	Hafodyrynys AQMA	321727	198588	1.65	0.5	2.5	3	NO_2	M200A Chemiluminescent analysers
IRW	Islwyn Road Wattsville	Roadside	No	320663	191427	1.5	2	1	1	NO_2	T200 NOx Chemiluminescent analysers

Notes:

1) 0m indicates that the sited monitor represents exposure and as such **no distance calculation is required**

(2) N/A if not applicable.

Figure 1 – Map of Automatic Monitoring Sites



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

CCBC undertook automatic (continuous) monitoring at 6 sites during 2019. 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 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

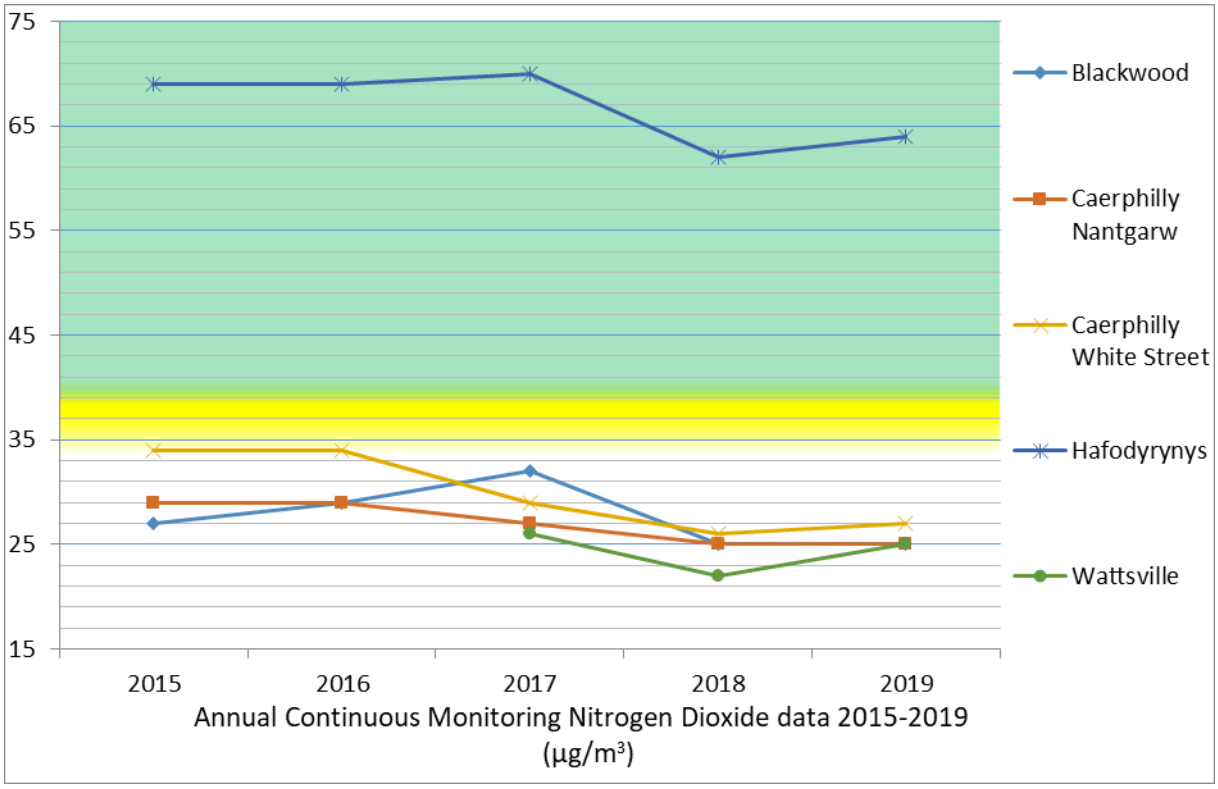
Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2019 (%)	NO_2 Annual Mean Concentration (µg/m^3)				
					2015	2016	2017	2018	2019
BLW	Kerbside	Automatic	96%	96%	27	29	32	25	25
CNG	Roadside	Automatic	99%	99%	29	29	27	25	25
CWS	Roadside	Automatic	96%	96%	34	34	29	26	27
HAF	Kerbside	Automatic	99%	99%	**69**	**69**	**70**	**62**	**64**
IRW	Roadside	Automatic	93%	93%	N/A	N/A	26	22	25

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, all sites have decreased by 2-7µg/m^3, however, there are some increases from 2018-2019.

Hafodyrynys has increased by 2µg/m^3 to 64µg/m^3. Caerphilly White Street has increased by 1 µg/m^3 to 27 µg/m^3, which is the first annual increase since 2012; however, the level still remains below the borderline levels of 39-36 µg/m^3 – denoted by the area coloured in yellow. Wattsville continuous analyser concentration has increased by 3µg/m^3 to 25µg/m^3. Blackwood High Street has remained the same level as 2018, 25µg/m^3. Although those increases are small, the levels will be monitored further and reported on in the 2021 APR.

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 2019 (%) (2)	NO_2 1-Hour Means > 200µg/m^3				
					2015	2016	2017	2018	2019
BLW	Kerbside	Automatic	96%	96%	0	0	4	4	0
CNG	Roadside	Automatic	99%	99%	0	0	0	0	0
CWS	Roadside	Automatic	96%	96%	9	2	0	0	0
HAF	Kerbside	Automatic	99%	99%	**108**	**126**	**132**	**54**	**33**
IRW	Roadside	Automatic	93%	93%	N/A	N/A	0	0	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 a trend of reducing hourly NO_2 levels across the Local Authority Area. Hafodyrynys has exceeded the National Hourly objective for NO_2 33 times in 2019 – its lowest number of hourly exceedances since the site's inception in 2011. This is also a second consecutive reduction in exceedance levels and a 75% reduction since 2017. Blackwood continuous analyser has recorded zero hourly exceedances, a reduction from the 4 recorded in 2018.

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 2019 (%) (2)	PM_{10} Annual Mean Concentration (µg/m^3)				
				2015	2016	2017	2018	2019
BLW	Roadside	97%	97%	19	19	16	16	14
CWS	Roadside	97%	97%	19	19	18	17	17
FCR	Roadside	95%	95%	13	12	11	11	10

Notes:

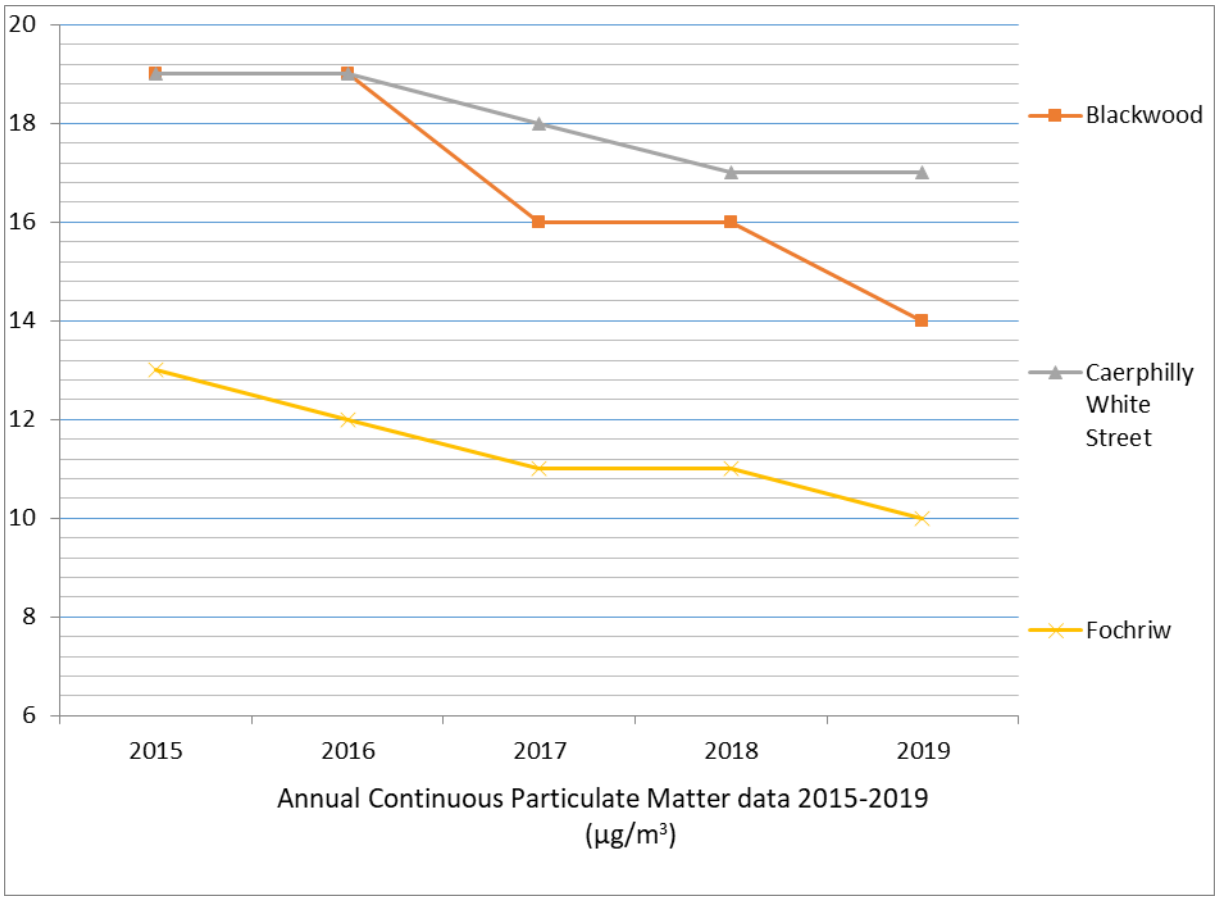
Exceedances of the PM_{10} annual mean objective of 40µg/m^3 are shown in **bold.**

(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 2015 to 2019.

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

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2015	2016	2017	2018	2019
BLW	Roadside	97%	97%	1	0	0	0	0
CWS	Roadside	97%	97%	1	1	2	0	1
FCR	Roadside	95%	95%	0	0	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.

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 2019 measured 7µg/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 2019 (%) (2)	$PM_{2.5}$ Annual Mean Concentration (µg/m^3)				
				2015	2016	2017	2018	2019
FCR	Roadside	97%	97%	11	8	6	7	7

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 2019

Since 2018, an additional seven diffusion tubes have been added to the network and four have been removed, bringing the overall total to 77 in circulation around the Local Authority Area.

All seven additional diffusion tubes have been located along a main road through a village town, to assess the existing air quality ahead of future development.

The four diffusion tubes that were removed from circulation have demonstrated continued compliance well below the National Annual Objective for NO_2.

Table 11 presents the details of the sites.

A map showing the location of the monitoring sites is provided in Figure 4. 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)	Distance from monitor to nearest relevant exposure (m) [1]	Distance from Kerb to Monitor (m)
				X	Y					
CCBC1	Blackwood Post Office	Kerbside	N	317497	196911	3	N	<1	0	<1
CCBC6	Ton-y-felin Road, Caerphilly	Roadside	Y	315709	187325	2	N	2.5	0	2.5
CCBC7	Cardiff Road, Caerphilly	Roadside	N	315552	186674	3	N	2	0	2
CCBC8	Blackwood High Street	Kerbside	N	317419	192211	2	N	2	0	1.5
CCBC17	Bedwas Road, Caerphilly	Roadside	N	315907	187320	3	N	3	0	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)	Distance from monitor to nearest relevant exposure (m) [1]	Distance from Kerb to Monitor (m)
				X	Y					
CCBC18	Pontygwindy Road, Caerphilly	Roadside	N	315670	187481	2	N	3	0	3
CCBC19	White Street, Caerphilly	Roadside	Y	315718	186723	2	N	2	0	2
CCBC20	Newport Road, Trethomas	Roadside	N	318179	188764	2	N	4	0	4
CCBC21	Maesycwmmer Shop	Roadside	N	315533	194725	2	N	12	0	12
CCBC22	Gellideg Heights, Maesycwmmer	Kerbside	N	316102	194790	2.5	N	3	2	<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)	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Monitor (m)
				X	Y					
CCBC27	Penrhiw Franc Farm	Urban background	N	319196	195196	2	N	25	24.5	<1
CCBC29	Maen Llwyd, Rudry	Urban background	N	319274	186558	2	N	<1	0	<1
CCBC30	AQE – Caerphilly *	Roadside	Y	315705	186839	2	Y	5	7	2
CCBC31	AQE – Caerphilly *	Roadside	Y	315705	186839	2	Y	5	7	2
CCBC32	AQE – Caerphilly *	Roadside	Y	315705	186839	2	Y	5	7	2
CCBC33	Lower left White street	Roadside	Y	315720	186761	2	N	2	0	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)	Distance from monitor to nearest relevant exposure (m) [1]	Distance from Kerb to Monitor (m)
				X	Y					
CCBC34	Corner of Windsor and White Street	Roadside	Y	315708	186808	2	N	7	0	7
CCBC35	Top Right of White Street	Roadside	Y	315714	186668	2.5	N	2	0	2
CCBC36	44/46 Bartlett Street	Roadside	Y	315738	186654	2	N	3	0	3
CCBC37	19 Station Terrace	Roadside	Y	315727	186617	2	N	2	0	2
CCBC38	32 Bartlett Street	Roadside	Y	315700	186660	2	N	3	0	3
CCBC39	18 Bartlett Street	Roadside	Y	315652	186663	2	N	3	0	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)	Distance from monitor to nearest relevant exposure (m) [1]	Distance from Kerb to Monitor (m)
				X	Y					
CCBC40	7 Bartlett Street	Roadside	Y	315621	186665	2.5	N	2	0	2
CCBC44	244 Nantgarw Road, Caerphilly	Roadside	N	314712	186999	2	N	2	0	2
CCBC45	38 Bedwas Road, Caerphilly	Roadside	N	315954	187377	3	N	3	0	3
CCBC46	8 Windsor Street	Roadside	Y	315669	186804	2	N	2	0	2
CCBC48	1 Woodside Shops, Hafodyrynys	Roadside	Y	321652	198557	2	N	2	0	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)	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Monitor (m)
				X	Y					
CCBC49	Pontygwindy Road, Caerphilly	Roadside	N	315470	188101	2	N	3	0	3
CCBC50	Past Woodside Terrace, Hafodyrynys	Kerbside	Y	321851	198619	2	N	47	47	<1
CCBC51	AQE – Blackwood *	Kerbside	N	317419	197103	2	Y	1	0	1
CCBC52	AQE – Blackwood *	Kerbside	N	317419	197103	2	Y	1	0	1
CCBC53	AQE- Blackwood *	Kerbside	N	317419	197103	2	Y	1	0	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)	Distance from monitor to nearest relevant exposure (m) [1]	Distance from Kerb to Monitor (m)
				X	Y					
CCBC54	Clive Street, Caerphilly	Roadside	N	315518	186646	2.5	N	2	0	2
CCBC55	6 Ton-y-Felin Road, Caerphilly	Roadside	Y	315742	187316	2	N	3	0	3
CCBC56	3 Nantgarw Road, Caerphilly	Roadside	Y	315579	187305	2	N	2	0	2
CCBC57	14 Mill Road, Caerphilly	Roadside	N	315629	187375	3	N	2	0	2
CCBC59	30 Ton-y-Felin Road, Caerphilly	Roadside	Y	315793	187305	2.5	N	3	0	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)	Distance from monitor to nearest relevant exposure (m) [1]	Distance from Kerb to Monitor (m)
				X	Y					
CCBC60	3 New Houses, Hafodyrynys	Roadside	Y	321681	198584	5	N	3.5	0	3.5
CCBC61	258 Nantgarw Road, Caerphilly	Roadside	N	314680	186988	2	N	1.5	0	1.5
CCBC67	84 Nantgarw Road, Caerphilly	Roadside	Y	315242	187223	2	N	2	0	2
CCBC68	Premier Stores, Cwmfelinfach	Roadside	N	318467	191788	2	N	1.5	0	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)	Distance from monitor to nearest relevant exposure (m) [1]	Distance from Kerb to Monitor (m)
				X	Y					
CCBC69	80 Islwyn Road, Wattsville	Roadside	N	320647	191427	2	N	1.5	0	1.5
CCBC70	153 Islwyn Road, Wattsville	Roadside	N	320499	191427	2	N	2	0	2
CCBC71	128 Islwyn Road, Wattsville	Roadside	N	320507	191405	2	N	2	0	2
CCBC72	109 Islwyn Road, Wattsville	Roadside	N	320629	191442	2	N	2	0	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)	Distance from monitor to nearest relevant exposure (m) [1]	Distance from Kerb to Monitor (m)
				X	Y					
CCBC73	21 Islwyn Road, Wattsville	Roadside	N	320886	191474	2	N	2	0	2
CCBC74	2 Islwyn Road, Wattsville	Roadside	N	320883	191451	2	N	2	0	2
CCBC78	86 Islwyn Road, Wattsville	Roadside	N	320634	191424	2	N	3	0	3
CCBC79	20 Woodside Terrace, Hafodyrynys	Roadside	Y	321812	198610	2	N	1.5	0	1.5
CCBC80	15 Commercial Street, Aberbargoed	Roadside	N	315430	200258	2	N	1.5	0	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)	Distance from monitor to nearest relevant exposure (m) [1]	Distance from Kerb to Monitor (m)
				X	Y					
CCBC81	29 Commercial Street, Aberbargoed	Roadside	N	315454	200227	2	N	1.5	0	1.5
CCBC82	60 Commercial Street, Aberbargoed	Roadside	N	315489	200116	2	N	1.5	0	1.5
CCBC83	10 Woodside Terrace, Hafodyrynys	Roadside	Y	321730	198583	2	N	2.5	0	2.5
CCBC84	La Loma, Hafodyrynys	Roadside	Y	321653	198583	5	N	3	0	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)	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Monitor (m)
				X	Y					
CCBC86	Telegraph pole outside 16 Woodside Terrace	Kerbside	Y	321780	198603	2	N	2	1.5	<1
CCBC87	16 Woodside Terrace, Hafodyrynys	Roadside	Y	321773	198560	2	N	2.5	0	2.5
CCBC88	13 Woodside Terrace, Hafodyrynys	Roadside	Y	321748	198591	2	N	3	0	3
CCBC89	AQE – Hafodyrynys 1 *	Kerbside	Y	321727	198588	2	Y	2.5	2	<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)	Distance from monitor to nearest relevant exposure (m) [1]	Distance from Kerb to Monitor (m)
				X	Y					
CCBC90	AQE – Hafodyrynys 2 *	Kerbside	Y	321727	198588	2	Y	2.5	2	<1
CCBC91	AQE – Hafodyrynys 3 *	Kerbside	Y	321727	198588	2	Y	2.5	2	<1
CCBC92	7 Woodside Terrace, Hafodyrynys	Roadside	Y	321397	198579	2	N	2.5	0	2.5
CCBC93	3 Woodside Terrace, Hafodyrynys	Roadside	Y	321667	198568	2	N	2	0	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)	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Monitor (m)
				X	Y					
CCBC94	Bus Stop outside 1 Woodside Terrace	Kerbside	Y	321645	198560	2	N	2.5	2	<1
CCBC95	1 Woodside Terrace, Hafodyrynys	Roadside	Y	321647	198558	2	N	2.5	0	2.5
CCBC96	4 Chapel View, Cwmfelinfach	Urban Industrial	N	318751	191476	2	N	40	0	40
CCBC97	3 Morrisville, Cwmfelinfach	Urban Industrial	N	319759	191243	2	N	12	0	12

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)	Distance from monitor to nearest relevant exposure (m) [1]	Distance from Kerb to Monitor (m)
				X	Y					
CCBC98	43 Islwyn Road, Wattsville	Roadside	N	320819	191465	2	N	2	0	2
CCBC99	22 Islwyn Road, Wattsville	Roadside	N	320835	191442	2	N	2	0	2
CCBC100	56 Islwyn Road, Wattsville	Roadside	N	320739	191432	2	N	2	0	2
CCBC101	Nine Mile Point Industrial Estate	Urban Industrial	N	319218	191389	2	N	456	457	<1
CCBC102	49 Coed-y-Brain Road	Roadside	N	314757	189767	2	N	1.5	0	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)	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Monitor (m)
				X	Y					
CCBC103	11/13 Coed-y-Brain Road	Roadside	N	314760	189869	2	N	2	0	2
CCBC104	53 De Winton Road	Roadside	N	314786	189981	2	N	3	0	3
CCBC105	Lampost outside 52 High Street	Roadside	N	314862	190368	2	N	3.5	2.5	1
CCBC106	16/17 Ffrwd Terrace	Roadside	N	314927	190504	2	N	2	0	2
CCBC107	19 Rees Terrace	Roadside	N	314956	190575	2	N	3.5	0	3.5
CCBC108	13 Glenview Terrace	Roadside	N	315035	190630	1.5	N	3.5	0	3.5

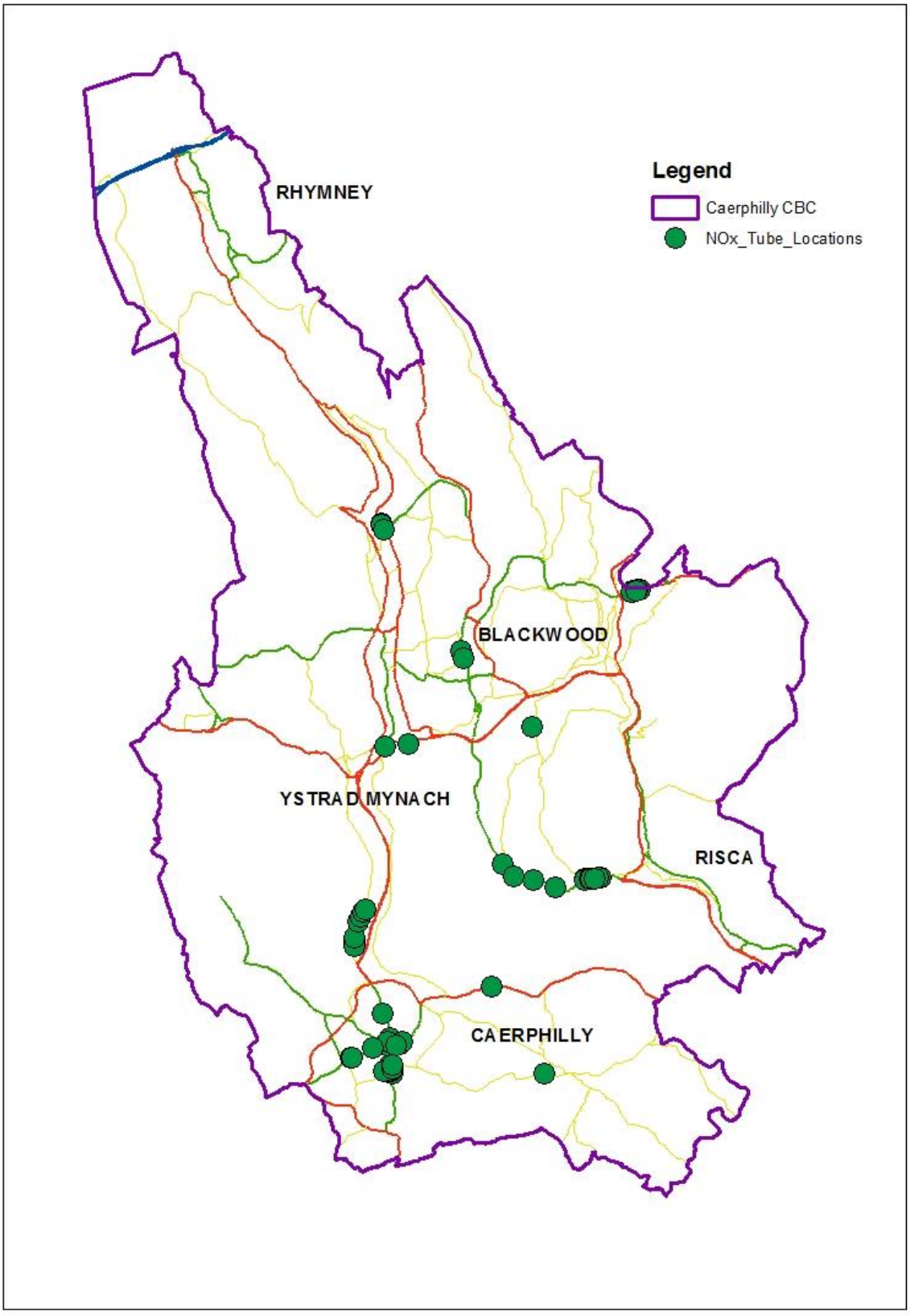
Notes:

(1) 0m indicates that the sited monitor represents exposure and as such **no distance calculation is required**.

(2) N/A if not applicable.

* denotes co-located diffusion tubes with automatic monitoring sites

Figure 4 – Map of Non-Automatic Monitoring Locations 2019



2.4 Comparison of 2019 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 2015-2019

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)				
					2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76	2018 Bias Adjustment Factor = 0.67	2019 Bias Adjustment Factor = 0.68
CCBC1	Kerbside	Diffusion Tube	100%	100%	31	30	30	26	26
CCBC6	Roadside	Diffusion Tube	100%	100%	32	37	33	27	28
CCBC7	Roadside	Diffusion Tube	92%	92%	18*	30	27	23	22
CCBC8	Kerbside	Diffusion Tube	92%	92%	29	30	27	22	26
CCBC17	Roadside	Diffusion Tube	100%	100%	26	25	26	23	23
CCBC18	Roadside	Diffusion Tube	100%	100%	24	27	24	22	21
CCBC19	Roadside	Diffusion Tube	100%	100%	**48**	**52**	**44**	**40**	38
CCBC20	Roadside	Diffusion Tube	100%	100%	24	27	25	25	23

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76	2018 Bias Adjustment Factor = 0.67	2019 Bias Adjustment Factor = 0.68
CCBC21	Roadside	Diffusion Tube	100%	100%	29	29	27	24	24
CCBC22	Kerbside	Diffusion Tube	100%	100%	27	30	29	25	24
CCBC27	Urban background	Diffusion Tube	83%	83%	12*	8	7	7	6
CCBC29	Urban background	Diffusion Tube	100%	100%	11	14	12	11	11
CCBC30	Roadside	Diffusion Tube	100%	100%	33	35	35	28	28
CCBC31	Roadside	Diffusion Tube	100%	100%	32	35	33	26	29
CCBC32	Roadside	Diffusion Tube	100%	100%	32	34	33	28	27
CCBC33	Roadside	Diffusion Tube	100%	100%	37	**42**	39	36	33
CCBC34	Roadside	Diffusion Tube	100%	100%	24	26	21	20	19
CCBC35	Roadside	Diffusion Tube	83%	83%	28	30	29	25	23

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76	2018 Bias Adjustment Factor = 0.67	2019 Bias Adjustment Factor = 0.68
CCBC36	Roadside	Diffusion Tube	100%	100%	21	23	23	17	17
CCBC37	Roadside	Diffusion Tube	92%	92%	21	22	21	17	17
CCBC38	Roadside	Diffusion Tube	100%	100%	**40**	37	38	32	30
CCBC39	Roadside	Diffusion Tube	100%	100%	29	31	30	25	25
CCBC40	Roadside	Diffusion Tube	92%	92%	25	28	25	22	21
CCBC44	Roadside	Diffusion Tube	100%	100%	37	37	37	33	29
CCBC45	Roadside	Diffusion Tube	100%	100%	26	27	24	20	20
CCBC46	Roadside	Diffusion Tube	100%	100%	17	19	17	16	15
CCBC48	Roadside	Diffusion Tube	100%	100%	**42**	**41**	**42**	36	35
CCBC49	Roadside	Diffusion Tube	100%	100%	19	26	24	23	24
CCBC50	Kerbside	Diffusion Tube	100%	100%	**47**	**48**	**49**	**45**	39

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76	2018 Bias Adjustment Factor = 0.67	2019 Bias Adjustment Factor = 0.68
CCBC51	Kerbside	Diffusion Tube	100%	100%	28	28	29	23	24
CCBC52	Kerbside	Diffusion Tube	100%	100%	28	28	27	24	24
CCBC53	Kerbside	Diffusion Tube	100%	100%	27	28	29	24	23
CCBC54	Roadside	Diffusion Tube	100%	100%	22	24	21	19	18
CCBC55	Roadside	Diffusion Tube	100%	100%	33	36	31	28	28
CCBC56	Roadside	Diffusion Tube	100%	100%	28	32	27	27	26
CCBC57	Roadside	Diffusion Tube	100%	100%	23	25	22	21	19
CCBC59	Roadside	Diffusion Tube	100%	100%	32	35	33	26	27
CCBC60	Roadside	Diffusion Tube	92%	92%	32	37	35	31	31
CCBC61	Roadside	Diffusion Tube	100%	100%	33	35	32	28	27
CCBC67	Roadside	Diffusion Tube	100%	100%	31	33	32	27	26

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76	2018 Bias Adjustment Factor = 0.67	2019 Bias Adjustment Factor = 0.68
CCBC68	Roadside	Diffusion Tube	100%	100%	27	28	25	24	23
CCBC69	Roadside	Diffusion Tube	83%	83%	38	**40**	38	32	29
CCBC70	Roadside	Diffusion Tube	83%	83%	20*	16	15	15	15
CCBC71	Roadside	Diffusion Tube	100%	100%	22	23	23	19	20
CCBC72	Roadside	Diffusion Tube	100%	100%	21	23	21	18	18
CCBC73	Roadside	Diffusion Tube	100%	100%	20	22	20	18	17
CCBC74	Roadside	Diffusion Tube	100%	100%	29*	27	27	23	22
CCBC78	Roadside	Diffusion Tube	100%	100%	N/A	26*	24	21	22
CCBC79	Roadside	Diffusion Tube	92%	92%	N/A	**53***	**59**	**53**	**51**
CCBC80	Roadside	Diffusion Tube	100%	100%	N/A	N/A	30	28	27
CCBC81	Roadside	Diffusion Tube	100%	100%	N/A	N/A	21	19	19

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76	2018 Bias Adjustment Factor = 0.67	2019 Bias Adjustment Factor = 0.68
CCBC82	Roadside	Diffusion Tube	83%	83%	N/A	N/A	33	25	27
CCBC83	Roadside	Diffusion Tube	92%	92%	N/A	N/A	**59**	**49**	**48**
CCBC84	Roadside	Diffusion Tube	100%	100%	N/A	N/A	39	35	33
CCBC86	Kerbside	Diffusion Tube	100%	100%	N/A	N/A	N/A	**58**	**61**
CCBC87	Roadside	Diffusion Tube	100%	100%	N/A	N/A	N/A	**55**	**56**
CCBC88	Roadside	Diffusion Tube	100%	100%	N/A	N/A	N/A	**45**	**47**
CCBC89	Kerbside	Diffusion Tube	100%	100%	N/A	N/A	N/A	**59**	**60**
CCBC90	Kerbside	Diffusion Tube	100%	100%	N/A	N/A	N/A	**61**	**62**
CCBC91	Kerbside	Diffusion Tube	92%	92%	N/A	N/A	N/A	**62**	**62**
CCBC92	Roadside	Diffusion Tube	100%	100%	N/A	N/A	N/A	**46**	**47**
CCBC93	Roadside	Diffusion Tube	100%	100%	N/A	N/A	N/A	**49**	**49**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76	2018 Bias Adjustment Factor = 0.67	2019 Bias Adjustment Factor = 0.68
CCBC94	Kerbside	Diffusion Tube	100%	100%	N/A	N/A	N/A	**51**	**50**
CCBC95	Roadside	Diffusion Tube	100%	100%	N/A	N/A	N/A	37	35
CCBC96	Urban Industrial	Diffusion Tube	92%	92%	N/A	N/A	N/A	7	8
CCBC97	Urban Industrial	Diffusion Tube	92%	92%	N/A	N/A	N/A	10	10
CCBC98	Roadside	Diffusion Tube	83%	83%	N/A	N/A	N/A	16	16
CCBC99	Roadside	Diffusion Tube	100%	100%	N/A	N/A	N/A	24	28
CCBC100	Roadside	Diffusion Tube	92%	92%	N/A	N/A	N/A	24	23
CCBC101	Roadside	Diffusion Tube	83%	83%	N/A	N/A	N/A	N/A	11
CCBC102	Roadside	Diffusion Tube	88%	58%	N/A	N/A	N/A	N/A	17
CCBC103	Roadside	Diffusion Tube	100%	67%	N/A	N/A	N/A	N/A	17

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2015 Bias Adjustment Factor = 0.81	2016 Bias Adjustment Factor = 0.775	2017 Bias Adjustment Factor = 0.76	2018 Bias Adjustment Factor = 0.67	2019 Bias Adjustment Factor = 0.68
CCBC104	Roadside	Diffusion Tube	100%	67%	N/A	N/A	N/A	N/A	14
CCBC105	Roadside	Diffusion Tube	100%	67%	N/A	N/A	N/A	N/A	14
CCBC106	Roadside	Diffusion Tube	100%	67%	N/A	N/A	N/A	N/A	13
CCBC107	Roadside	Diffusion Tube	100%	67%	N/A	N/A	N/A	N/A	12
CCBC108	Roadside	Diffusion Tube	100%	67%	N/A	N/A	N/A	N/A	11

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 2019.

Table 13 – Diffusion tube distribution from 2018-2019

Places	Amount of Diffusion Tubes in distribution 2018 & 2019	Amount of tubes that increased in NO_2 levels from 2018 to 2019	Percentage increase of tubes from 2018 to 2019	Exceedances in National Annual Objective for NO_2
Caerphilly AQMA	20	4	20%	0
Caerphilly Other	9	1	11%	0
Hafodyrynys AQMA	16	6	38%	11
Blackwood	5	2	40%	0
Wattsville	13	4	31%	0
Others	6	1	17%	0

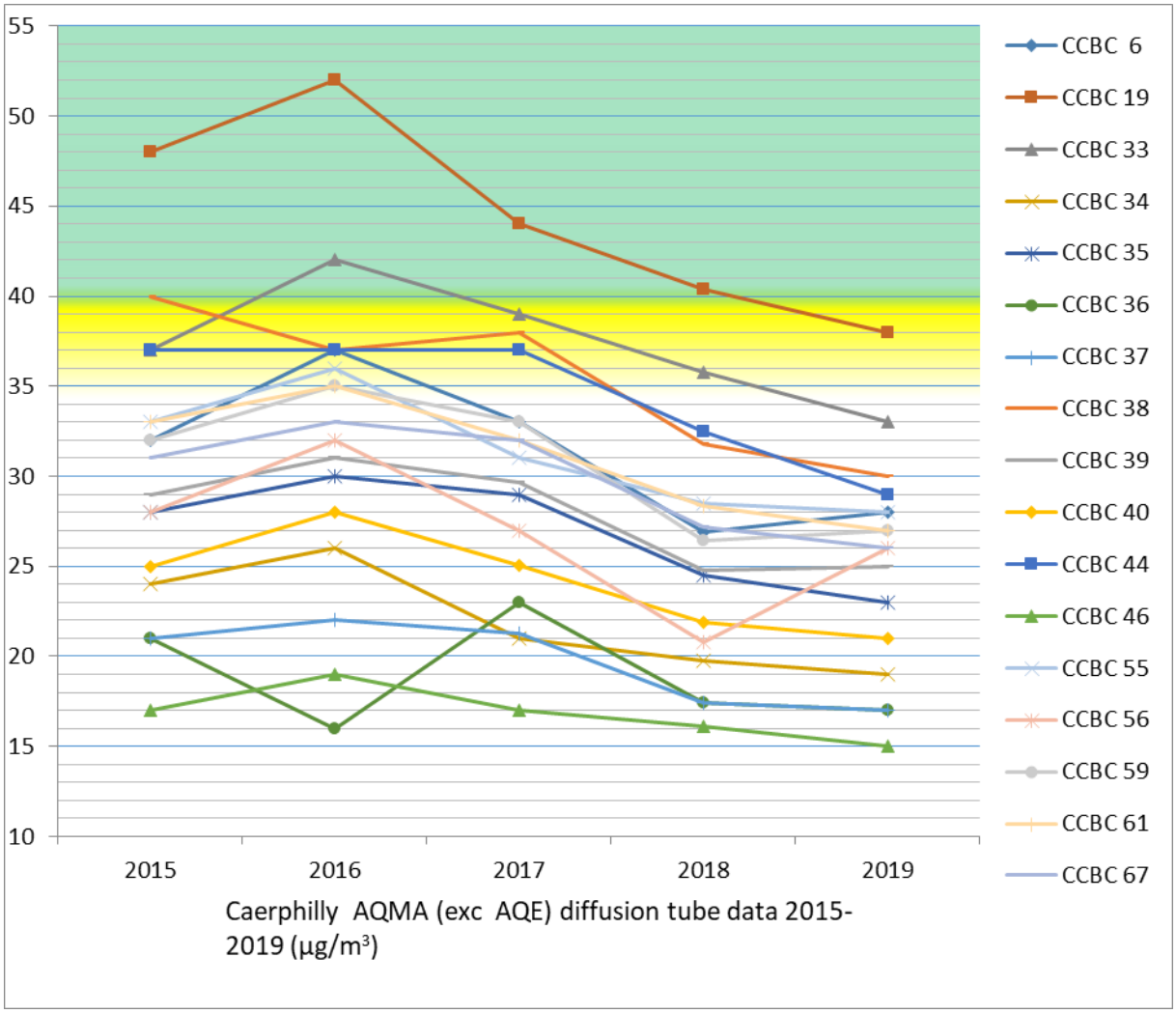
The purpose of this table is to show the overall % increase in NO_2 levels measured by diffusion tubes in circulation in 2018 and 2019.

As the table shows, 18 of the sixty nine (23%) diffusion tubes in circulation increased from 2018 to 2019 - a 21% increase from the previous year.
These diffusion tubes are located all over the Local Authority Area with the majority being increases of 1-3µg/m^3.

Out of the remaining diffusion tubes, 30 of the sixty nine (43%) exhibited reductions in annual NO_2 levels from 2018 to 2019. In contrast, the reduction in levels from 2017 to 2018 was 93%, illustrating that over a two year period, the majority of diffusion tube levels in the Local Authority Area continue to decrease. Possible reasons for these decreases can be from continued Local Air Quality Management interventions, a younger transport fleet and favourable meteorological conditions.

Caerphilly Town Centre AQMA Diffusion Tubes

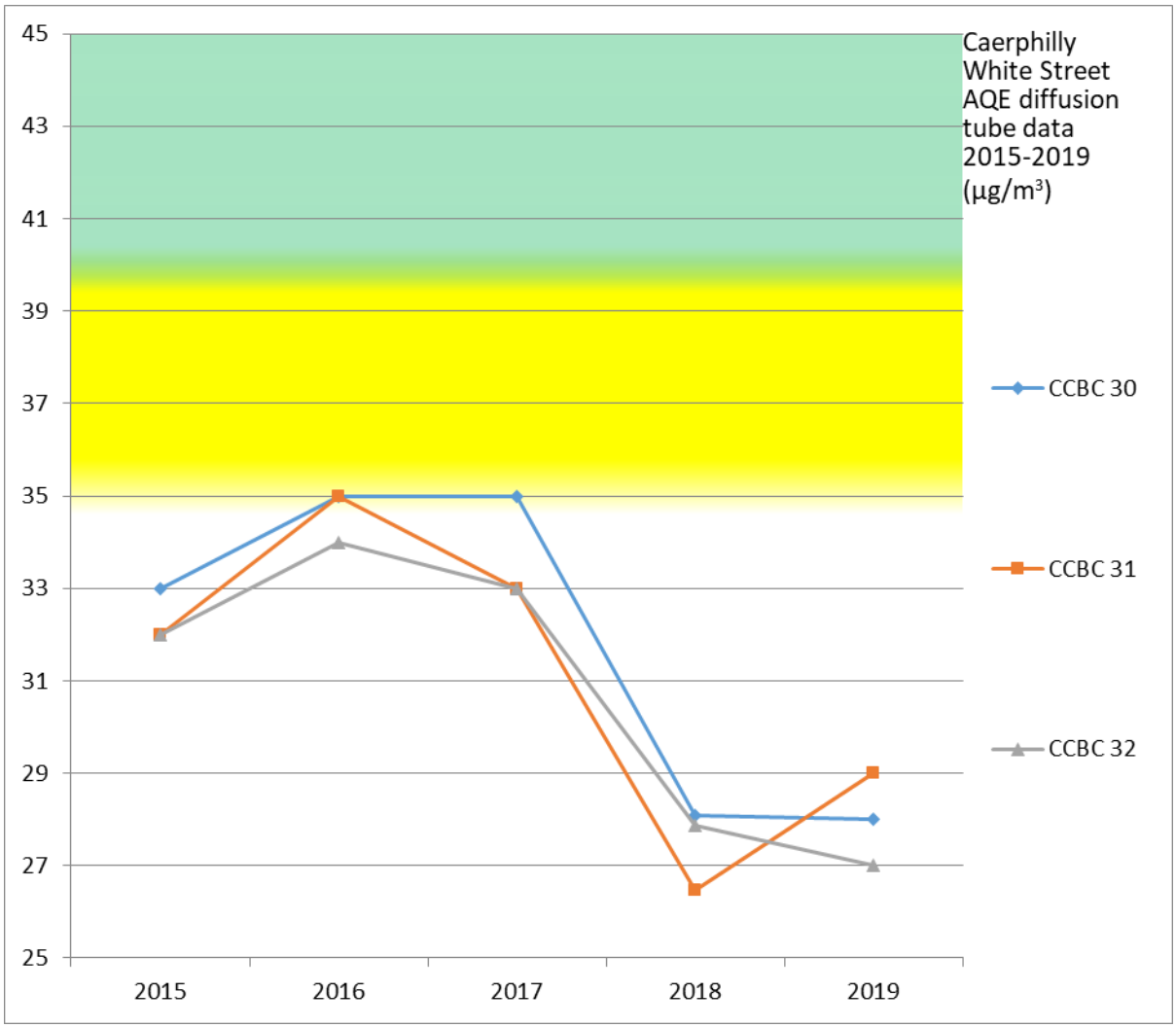
Figure 5 – Chart of Caerphilly Air Quality Management Area Diffusion Tube (excluding Co-located tubes) results 2015-2019



The chart above illustrates the trends in NO_2 levels over five years. Notably it highlights how many of the diffusion tube results have decreased from 2018 to 2019. CCBC 19 located on White Street within the AQMA has complied with the national annual objective for the first time since it's inception in 2004; this was the only exceedance in 2018 and has now decreased to a borderline level of 38 µg/m^3. 2019 is the first year that the monitoring network of diffusion tubes in Caerphilly Town Centre AQMA have demonstrated compliance with the National Annual Objective for NO_2.

CCBC 33 located on White Street previously displayed borderline NO_2 levels in 2018; these have now decreased to below borderline levels. This is a considerable reduction in annual levels for a diffusion tube that exceeded the national annual objective for NO_2 in 2016.

Figure 6 – Chart of Caerphilly Air Quality Enclosure Co-Located Diffusion Tube results 2015-2019



The chart above depicts the same trends as the other diffusion tubes in Caerphilly Town Centre AQMA; over five years there is a notable reduction in NO_2 levels. Annually, the diffusion tube results all vary slightly. The 2019 levels 27-29µg/m^3 mirror those recorded by the continuous analyser - 27µg/m^3.

Hafodyrynys AQMA Diffusion Tubes

Figure 7 – Chart of Hafodyrynys Air Quality Management Area Diffusion Tube results 2015-2019

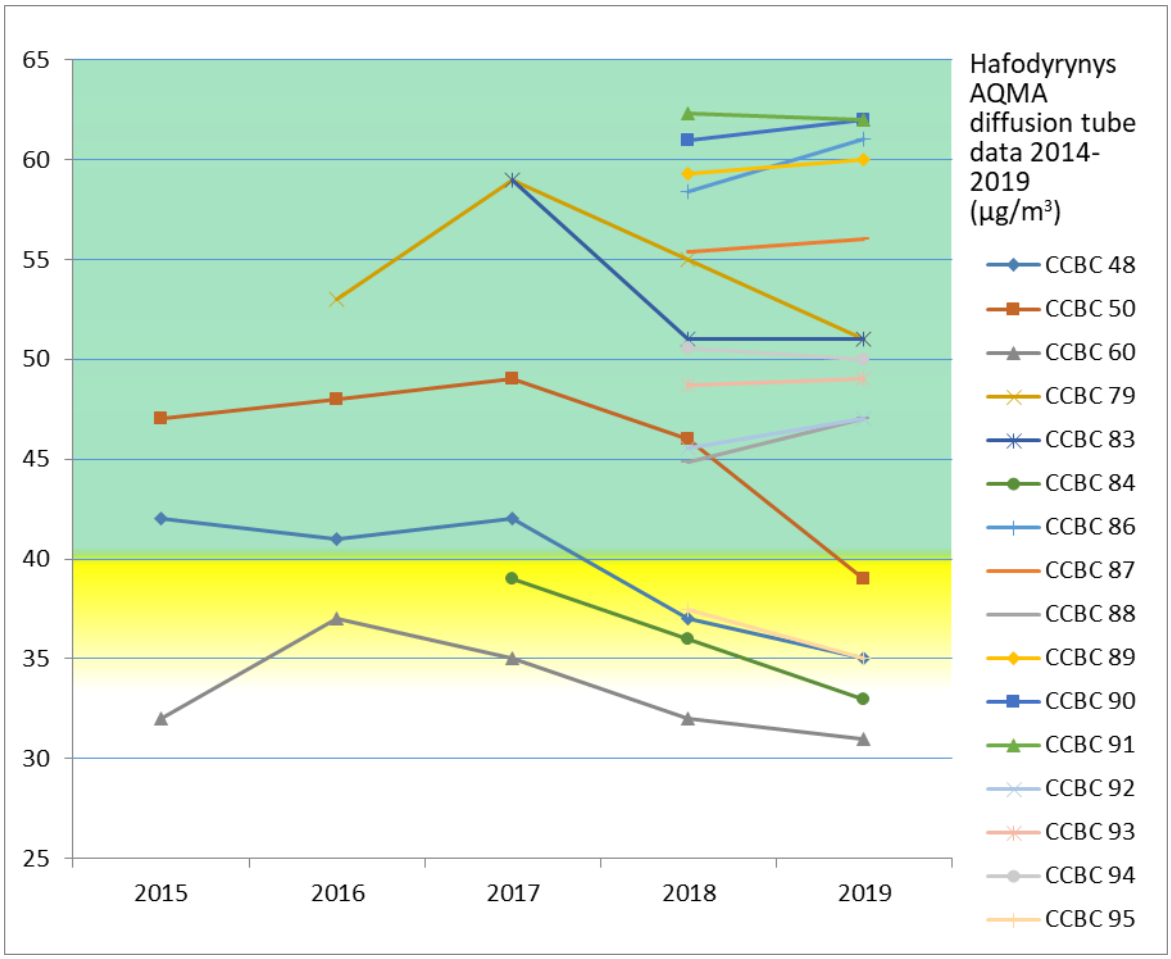


Table 13 – Table of Hafodyrynys Air Quality Management Area Diffusion Tube results 2015-2019

	2015	2016	2017	2018	2019
CCBC 48	42	41	42	37	35
CCBC 50	47	48	49	46	39
CCBC 60	32	37	35	32	31
CCBC 79	--	53	59	55	51
CCBC 83	--	--	59	51	51
CCBC 84	--	--	39	36	33
CCBC 86	--	--	--	58	61
CCBC 87	--	--	--	55	56
CCBC 88	--	--	--	45	47
CCBC 89	--	--	--	59	60
CCBC 90	--	--	--	61	62
CCBC 91	--	--	--	62	62
CCBC 92	--	--	--	46	47
CCBC 93	--	--	--	49	49
CCBC 94	--	--	--	51	50
CCBC 95	--	--	--	37	35

The chart and table above illustrate reductions in NO_2 levels for diffusion tubes in circulation over a five, four and three year period.

From 2018-2019, changes in annual mean NO_2 levels are varied; six diffusion tubes decrease, six increase and four remain the same. The majority of those that decreased (5/6) were those in circulation for over three years, including CCBC 50 that is now compliant with the National Annual Objective for NO_2 for the first time since its inception in 2009.

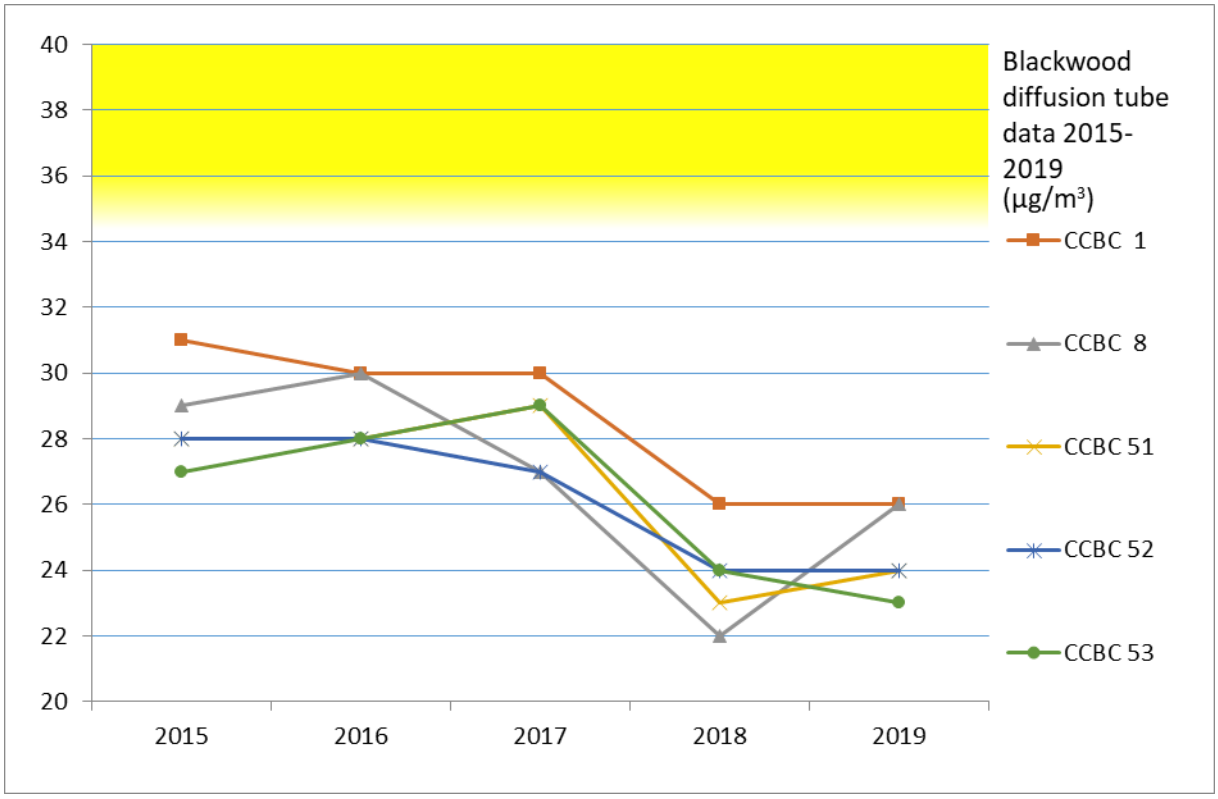
These diffusion tubes form part of the Hafodyrynys Road AQMA, which now exhibit the only exceedances of the National Annual Objective for NO_2 for continuous and non-continuous monitoring sites in the Local Authority Area.

Of the ten diffusion tubes added to this network in 2018, 9 continued to exceed the National annual Objective for NO_2, with six increases in levels from 2018 to 2019.

CCBC 89-91 that are co-located with the continuous analyser, varied slightly from 59-62 to 60-62 from 2018 to 2019; these results mirror those recorded by the continuous analyser, that increased from 62µg/m^3 to 64µg/m^3.

Blackwood Town Centre Diffusion Tubes

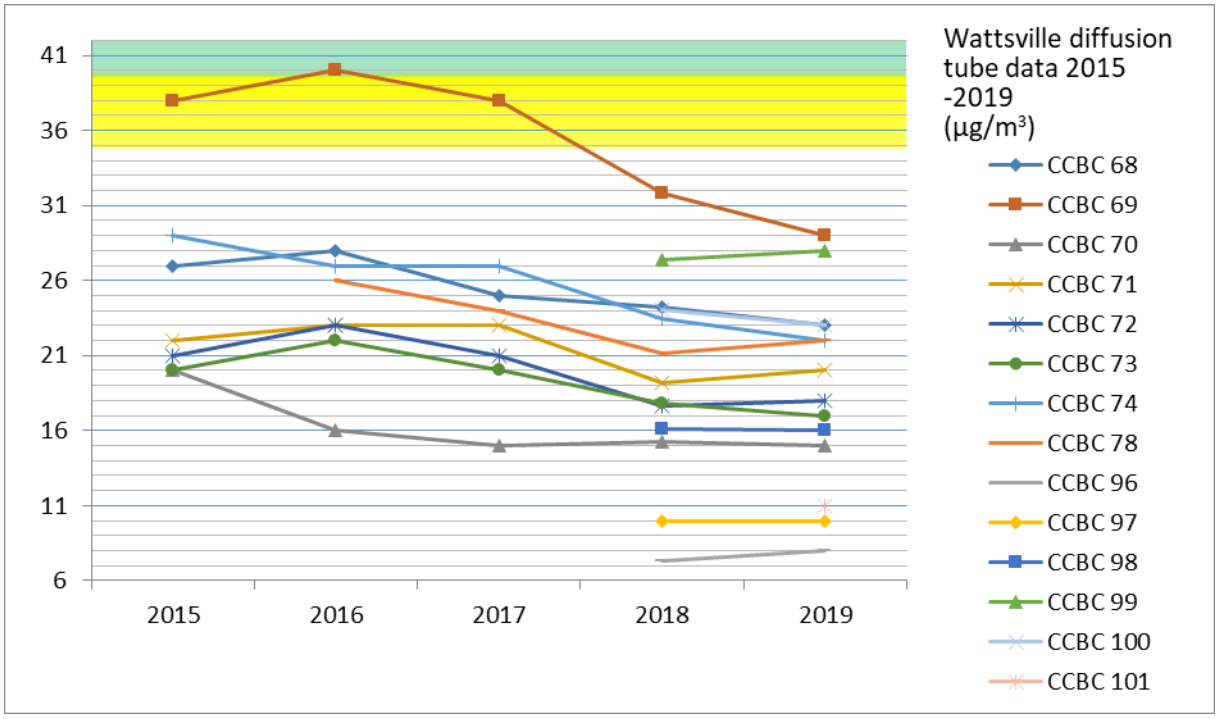
Figure 8 – Chart of Blackwood Town Centre Diffusion Tube results 2015-2019



The chart above shows a reduction in NO_2 levels over a five-year period; all diffusion tubes demonstrate compliance with the National Annual Objective for NO_2. CCBC51-53 are co-located with the continuous analyser, their levels remained the same for 2019 - 23-24µg/m^3, mirroring the continuous analyser - 25µg/m^3.

Wattsville Diffusion Tubes

Figure 9 – Chart of Wattsville Diffusion Tube results 2015-2019



The chart above illustrates reductions in annual mean NO_2 levels over a four and five year period.

From 2018 to 2019, the changes in NO_2 levels are varied. This distribution of diffusion tubes has maintained compliance with the National Annual Objective for NO_2, including those added in 2018. The 2019 levels for these diffusion tubes could be more representative of NO_2 exposure as the data capture has increased to around 100% from 75% in 2018.

2.4.2 Sulphur Dioxide (SO_2)

CCBC previously monitored for Sulphur Dioxide in 4 areas of the Local Authority Area. 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 2019

CCBC has examined the results from monitoring within the Local Authority Area.

Both Caerphilly Town Centre AQMA continuous analyser and diffusion tubes have recorded compliance with the National Annual Objective for NO_2 for the first time, since it's declaration and extension in 2008 and 2013 respectively. As this is the first year of compliance, further data will be reviewed as part of the 2021 APR to assess whether this area can demonstrate continued compliance that would warrant revocation of the AQMA.

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. The continuous analyser NO_2 levels have remained the same as 2018, allaying the concerns of consecutive increases from 2015-2017.

Hafodyrynys AQMA diffusion tubes and continuous analyser displayed exceedances of the National Annual and Hourly Objectives for NO_2, therefore the AQMA should remain. Overall diffusion tube exceedances have reduced from 12 in 2018 to 11 in 2019. The continuous analyser recorded an increase of 2 $\mu g/m^3$ to 64 $\mu g/m^3$.
Caerphilly CBC have been given an official direction by Welsh Government to assess and model appropriate remedial options that would result in compliance with the National Objectives for NO_2 in the shortest possible time. Demolition of all 23 houses on the southern side of the A472 at Woodside Terrace including realignment of the southern footway has been identified as the most appropriate option. Work on this scheme has already commenced including engagement with local residents and consideration of a compulsory purchase order for the properties, which when secured will be demolished to remove the receptors, open up the street canyon and help to aid the dispersal of the pollution. Modelled reductions in NO_2 estimate compliance with the National Objectives by 2022.

No breaches of the National Annual Objective for NO_2 were exhibited within the Wattsville monitoring network. The diffusion tube levels varied in 2019, but like the continuous analyser, were well clear of borderline and exceedance levels of the National Annual Objective for NO_2. CCBC 69 which previously exceeded in 2016, has now recorded levels of 29µg/m^3. The five diffusion tubes located in 2018 all demonstrated higher data capture in 2019, so these levels may be more representative of NO_2 exposure. The continuous analyser has exhibited an increase of 3µg/m^3 to 25µg/m^3. Although well below exceedance levels, this will be monitored and reported in the 2021 APR. CCBC hope to undertake 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.

Of the remaining twenty two diffusion tubes in circulation in 2019, none surpassed 30µg/m^3. The new diffusion tubes added in 2019, CCBC 102-108, were located in Llanbradach village to further assess local NO_2 exposure in anticipation of further development.

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 have no locations where diesel locomotives may regularly remain stationary for 15 minutes or more, with relevant exposure within 15m.
- 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 2019, there were no changes to the number of Environmental Permits authorised under The Environmental Permitting (England and Wales) Regulations 2016.

3.4 Planning Applications

In 2019, a development of approximately 200 dwellings and 6300 cubic square meters of industrial units was granted planning consent in Nelson. A scoping report was carried out to determine the likely effects on local air quality from the development; it concluded that the effects were negligible so there was no need to proceed to a formal Air Quality Impact Assessment.

A development has been granted reserved matters planning permission for 260 dwellings in Hendredenny, Caerphilly. The proposal was initially refused by CCBC planning committee in 2015 due to the impact on local highways; however, this was overturned by the Planning Inspector on appeal in 2017. On submission of the initial application, Environmental Health recommended an Air Quality Impact Assessment be carried out and submitted to investigate the impact of the development on local air quality and the Caerphilly Town Centre AQMA; on appeal, this recommendation wasn't carried forward by the Planning Inspector and as such Environmental Health could only request a scheme of air quality soft measures including electric vehicle charging points and wiring as well as links with active travel routes.

Similarly to last year, there are a number of developments that have been granted in and around the Local Authority Area, including 30 affordable homes at Wingfield Crescent in Llanbradach and a residential development of 55 dwellings in Aberbargoed. These applications didn't require an AQIA due to their location and because they didn't meet the criteria 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 2019, Environmental Health received 204 service requests relating to smoke, both commercial and domestic – a 24 complaint increase from 2018. The increase may be attributed to prevalence in domestic fuel burners, the regulation of which is something that Welsh Government have considered as part of the Clean Air Plan for Wales. No formal action was taken against any domestic, commercial or industrial processes emitting smoke. 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.

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 due course.

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.

We will look to work with strategic planning on the review of the LDP to ensure that air quality policy features heavily in the new revision. This will then lay out the Council's expectations to developers and provide a steer of what is expected going forward.

There is also a possibility to draft a supplementary planning guidance (SPG) document to provide further advice and guidance to developers to support the AQ policy steer within development control.

The production of this guidance would be 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.

TR6.3 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 have now concluded.

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 presented in section 2.4 all diffusion tubes in the Caerphilly Town Centre AQMA displayed compliance with the National Annual Objective for NO_2 for the first time. CCBC 19, located on White Street, has decreased 10µg/m^3 in five years to a record low of 38µg/m^3. CCBC 19 is now the only tube displaying borderline levels within this distribution of diffusion tubes. Comparing levels in 2019 against those in 2018, shows a variation of increases and decreases, with the majority (11 out of 20) decreasing in annual means.

The readings from the continuous analysers stationed at White Street and Nantgarw Road mirror those of the diffusion tubes, exhibiting low levels with White Street remaining the same - 25µg/m^3 and Nantgarw Road increasing by 1µg/m^3 - 26µg/m^3. They both continue without exceedances of the National Hourly Objective in 2019.

The PM_{10} level recorded at Caerphilly White Street for 2019 remained the same as 2018 - 17µg/m^3. The exceedances of the national daily mean increased from 0 in 2018 to 1 in 2019. .

To conclude, the review of the 2019 data set concluded compliance with the National NO_2 Objectives for the first time. Continued compliance with the National NO_2 Objectives for Caerphilly Air Quality Management Area must be demonstrated before a decision can be made on revocation. Both continuous and non-continuous data will be reviewed and progress will be made to renew the current action plan and implement any actions.

Blackwood Town Centre

Out of the five diffusion tubes in Blackwood Town Centre, two exhibited increases in NO_2 levels, one exhibited a decrease and two remained the same. All continued to display levels well below the National Annual Objective for NO_2. The continuous analyser has continued to display it's lowest ever level of 25 µg/m^3 and has not displayed any exceedances of the National Hourly Objective for the first time since 2016.

The PM_{10} levels decreased by 2µg/m^3 in 2019 to 14µg/m^3 – it's lowest ever level since the site's inception in 2009. There were no exceedances of the Daily Mean for PM_{10} for 2019.

To conclude, the review of the 2019 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 2019, Hafodyrynys AQMA was the location for all the exceedances of the National Annual Objective for NO_2 in the Local Authority Area. Out of the 16 diffusion tubes in circulation,11 exhibited exceedances a reduction of 1 exceedance from 2018. In 2019, of the 16 diffusion tubes, 6 increased in NO_2 levels, 3 decreased and the remaining 7 exhibited the same NO_2 levels from 2018. The most notable diffusion tube in 2019, was CCBC 50 located at the top of the hill of Woodside Terrace, which complied with the National Annual Objective for NO_2 for the first time since it's inception in 2009; this now sits at a borderline level of 39µg/m^3. CCBC 84 which has previously exhibited borderline levels, recorded 33µg/m^3 in 2019.

The continuous analyser has increased by 2 µg/m^3 to 64 µg/m^3 in 2019, which exceeds the National Annual Objective for NO_2. However, the number of exceedances of the National Hourly Objective for NO_2 has continued to reduce from 54 to 33; although these exceedances are greater than the 18 permitted annually, 33 exceedances represent a reduction of 99 since 2017.

To conclude, the review of the 2019 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 both the Hafodyrynys Final Plan and the preferred measure of demolition and realignment of the footway on the southern side of the A472 should continue to be progressed.

Fochriw

In 2019, PM_{10} levels reduced from 11 µg/m^3 in 2018, to 10 µg/m^3, with an overall decrease of 3 µg/m^3 overall from 2015. $PM_{2.5}$ levels remained the same as 2018 - 7 µg/m^3.

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

Wattsville

Of the 13 diffusion tubes in distribution from 2018 to 2019, 4 increased in levels of NO_2, 5 decreased and 4 remained the same. All levels recorded were well below the National Annual Objective for NO_2, including CCBC 69 which previously exceeded the objective in 2016, to a level of 29µg/m^3 in 2019.

The continuous analyser has exhibited an increase of 3µg/m^3 to 25µg/m^3, but sits well below the National Annual Objective for NO_2.

To conclude, the review of the 2019 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.

Other monitored locations

In addition to the diffusion tubes stated above, there are twenty two others located in areas around the Local Authority Area; these include seven new diffusion tubes (CCBC 102-108) added in Llanbradach in 2019, to assess local NO_2 exposure in anticipation of further development.
Of the fifteen in circulation from 2018 to 2019, only two increased in NO_2 levels with none exhibiting levels over 27µg/m^3.

To conclude, the review of the 2019 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

The outline planning application for 350 dwellings at Virginia Park around 0.5km from Caerphilly Town Centre AQMA previously reported in the 2018 APR, has now been granted planning consent. The AQIA concluded that the impact of the operational phase on the local air quality and the AQMA, would be negligible.

Another large housing development in the Caerphilly Basin has also been granted planning consent; 260 dwellings in Hendredenny have been approved on appeal after an initial refusal by CCBC Local Planning Authority.

The outline planning application for 618 dwellings around 1km from the Caerphilly Town Centre AQMA that was previously reported in the 2018 APR, has been refused as it contravened CCBC Local Planning Policies. Although the AQIA indicated negligible impacts on Local air quality and the AQMA, this development in addition to the 610 dwellings mentioned above had the potential to add 1228 new vehicles to the Caerphilly Basin road network.

There are no other planning developments currently under consideration that warrant inclusion in this APR.

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.
- To implement and conclude the preferred option at Hafodyrynys AQMA namely to demolish the properties on the south side of the A472 at Woodside Terrace with realignment of the southern footway.
- 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.
- Assess the roadside emissions in Llanbradach, in anticipation of further development.
- Continue to work with local taxi operators to examine the possibilities of cleaner travel provisions.
- Review the Caerphilly Town Centre AQAP

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

- Detailed Assessment ,of Air Quality, Hafod-yr-ynys, Caerphilly, Caerphilly County Borough Council, Ricardo-AEA/R/ED57888 Issue 3

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

- Hafod-yr-ynys Air Quality Action Plan, November 2017, Caerphilly County Borough Council,

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

- LAQM.TG (1) Part IV of the Environment Act 1995. Local Air Quality Management Technical Guidance 2016.

- 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 microgrammes per cubic metre µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

Table 15 – 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
	40µg/m^3	Annual mean	31.12.2010
Sulphur dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	16.25µg/m^3	Running annual mean	31.12.2003
	5µg/m^3	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 2018 was 0.67 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 Socotec Didcot for their diffusion tube analysis, with 29 overall in the UK; the suggested bias adjustment factor from these studies was 0.76.

The local bias adjustment factor has been used to not only provide consistency – as it has been used in previous years, but also as there are similarities with the annual averages of the co-located diffusion tubes and their respective continuous analysers. E.G – Diffusion tubes for Caerphilly White Street recorded 26-28 µg/m^3 in comparison with the continuous analyser 26 µg/m^3. Diffusion tubes for Blackwood High Street recorded 23-24 µg/m^3 in comparison with the continuous analyser 25 µg/m^3.

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 Socotec Ltd. Socotec 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

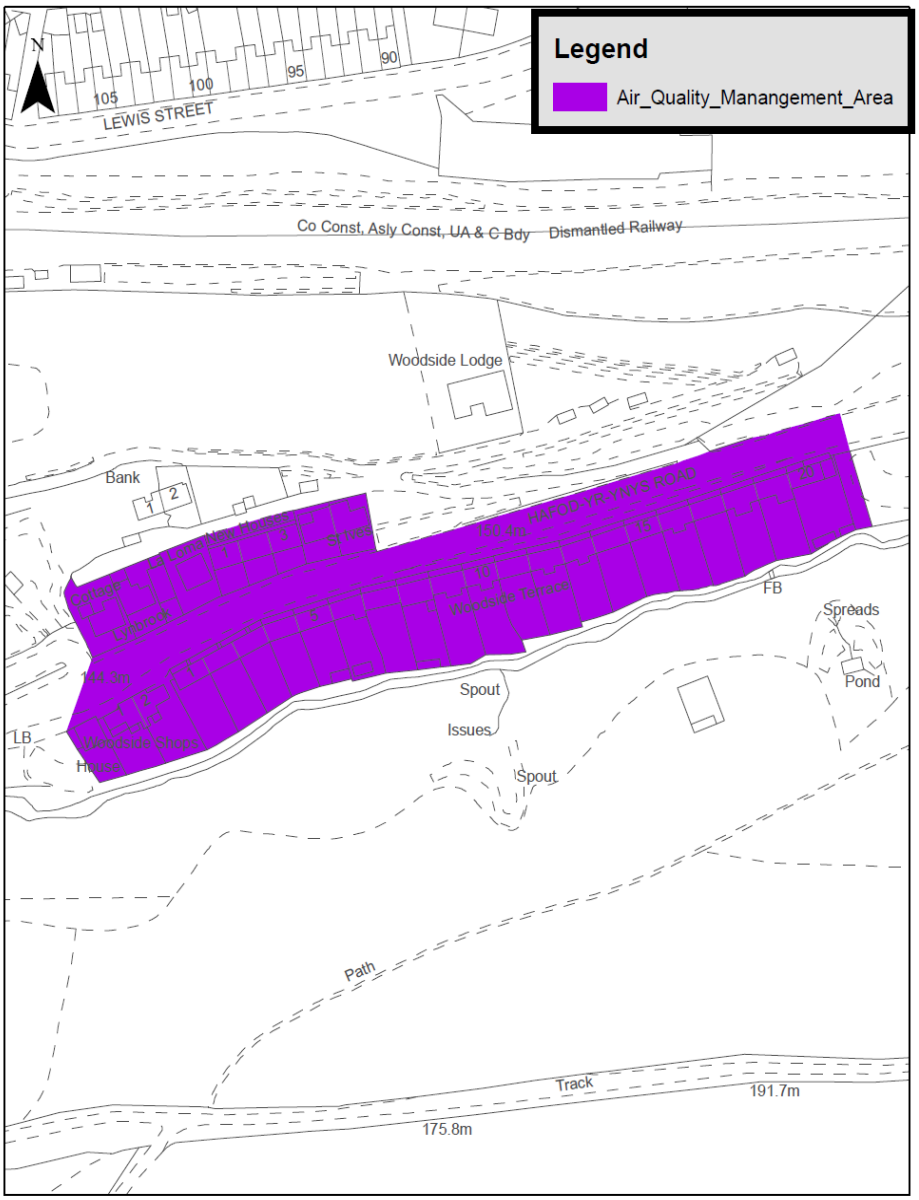
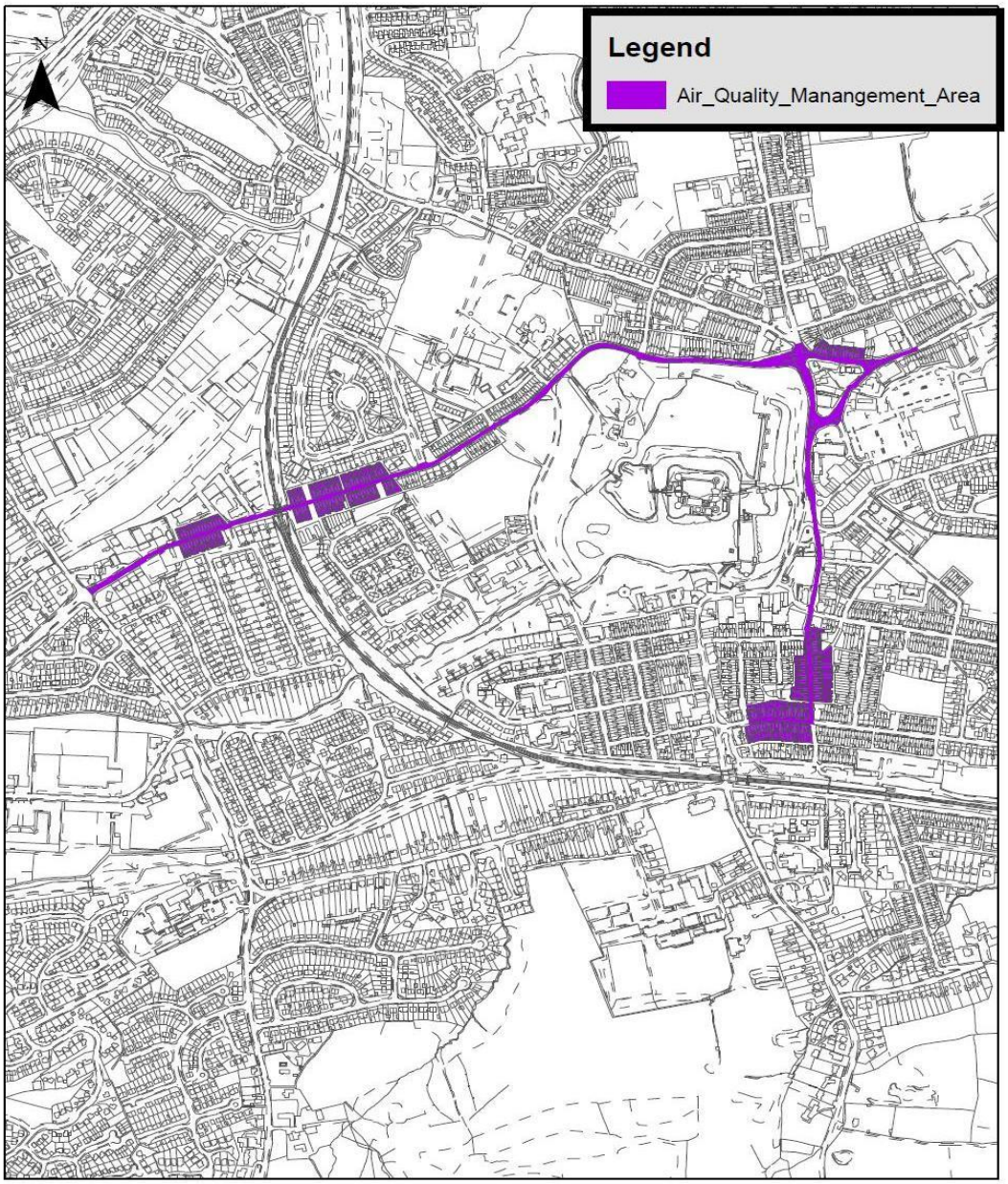


Figure 11 – Map of Caerphilly Town Centre AQMA



Appendix D: Monthly Diffusion Tube Monitoring Results

Table 16 – Full Monthly Diffusion Tube Results for 2019

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
CCBC1	46	47	43	34	31	30	31	30	30	38	47	46	38	26	26
CCBC6	47	45	37	49	36	38	33	29	34	45	57	46	41	28	28
CCBC7	32	45	23	29	29	26	26	28	29	36	48	/	32	22	22
CCBC8	46	40	33	42	32	33	/	29	32	41	47	44	38	26	26
CCBC17	39	40	32	33	28	31	24	27	28	35	42	40	33	23	23
CCBC18	33	36	27	34	26	26	22	23	27	35	46	35	31	21	21
CCBC19	55	64	49	72	49	49	44	38	53	60	86	62	57	38	38
CCBC20	44	38	34	31	32	30	30	29	29	33	43	39	34	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)
CCBC21	44	38	35	31	33	30	29	31	33	40	47	41	36	24	24
CCBC22	47	33	33	38	32	33	28	26	29	41	47	36	35	24	24
CCBC27	9	11	9	9	8	8	7	9	7	/	17	/	9	6	6
CCBC29	16	20	14	16	12	13	12	13	12	16	23	19	16	11	11
CCBC30	56	46	32	36	36	35	33	33	32	47	57	46	41	28	28
CCBC31	57	46	39	36	46	33	33	31	34	45	59	46	42	29	29
CCBC32	48	51	37	36	37	32	30	31	34	45	57	45	40	27	27
CCBC33	54	54	37	62	45	42	40	33	40	55	74	52	49	33	33
CCBC34	33	36	22	31	27	22	21	19	23	32	41	33	28	19	19
CCBC35	/	/	34	29	31	28	31	31	32	37	44	41	34	23	23
CCBC36	32	33	28	18	21	20	21	23	21	27	33	29	26	17	17

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	/	31	24	19	21	21	21	23	22	30	39	32	26	17	17
CCBC38	55	57	41	29	39	41	43	46	42	45	50	50	45	30	30
CCBC39	38	45	34	38	32	32	31	34	34	37	49	40	37	25	25
CCBC40	34	/	22	43	25	26	25	24	27	36	46	37	31	21	21
CCBC44	44	48	43	42	61	36	32	31	34	42	55	43	43	29	29
CCBC45	32	34	30	31	24	25	21	22	25	32	37	34	29	20	20
CCBC46	28	30	17	29	17	17	15	17	18	25	34	26	23	15	15
CCBC48	55	51	50	49	53	52	46	45	49	53	68	57	52	35	35
CCBC49	44	46	32	42	29	27	27	24	26	32	47	40	35	24	24
CCBC50	29	69	44	69	61	64	50	61	41	62	76	73	58	39	39
CCBC51	46	45	35	28	31	26	29	33	31	37	44	41	36	24	24

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	42	47	34	29	31	29	27	32	31	38	45	45	36	24	24
CCBC53	44	43	34	24	27	28	29	32	32	37	44	41	35	23	23
CCBC54	31	29	23	31	22	16	21	20	24	30	40	32	27	18	18
CCBC55	47	45	39	46	38	36	32	32	35	44	58	46	42	28	28
CCBC56	45	38	34	40	35	31	29	26	30	36	81	38	39	26	26
CCBC57	29	28	25	44	25	23	22	20	25	29	44	30	29	19	19
CCBC59	54	46	41	41	34	33	31	32	34	41	52	44	40	27	27
CCBC60	48	47	44	54	46	46	37	42	43	/	55	44	46	31	31
CCBC61	48	44	40	42	35	35	30	28	34	42	55	39	39	27	27
CCBC67	49	42	41	35	36	31	32	33	33	41	42	41	38	26	26
CCBC68	44	35	35	34	31	32	26	26	27	37	50	32	34	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)
CCBC69	/	51	46	42	42	41	40	38	38	47	/	46	43	29	29
CCBC70	27	/	/	26	17	18	14	12	17	23	35	26	22	15	15
CCBC71	36	33	26	29	27	25	23	21	23	30	40	34	29	20	20
CCBC72	32	32	25	28	22	23	20	21	23	28	39	27	27	18	18
CCBC73	32	31	21	29	22	22	18	19	22	28	35	25	25	17	17
CCBC74	43	45	38	28	25	28	25	28	21	35	41	34	33	22	22
CCBC78	45	36	28	30	31	29	27	26	27	41	42	34	33	22	22
CCBC79	81	81	45	83	79	77	69	69	/	78	84	79	75	**51**	**51**
CCBC80	53	44	23	50	35	35	31	26	34	45	65	37	40	27	27
CCBC81	34	29	24	35	25	26	21	18	24	30	45	26	28	19	19
CCBC82	41	50	40	/	35	34	/	35	36	43	47	37	40	27	27

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)
CCBC83	69	84	65	/	57	72	66	61	67	74	88	79	71	**48**	**48**
CCBC84	56	48	39	57	52	48	45	41	43	47	58	44	48	33	33
CCBC86	101	90	82	98	86	86	82	82	84	92	108	91	90	**61**	**61**
CCBC87	100	77	78	85	77	77	71	66	75	83	94	115	83	**56**	**56**
CCBC88	81	77	69	74	67	68	62	63	61	58	87	68	70	**47**	**47**
CCBC89	113	94	69	84	87	87	80	83	79	94	110	75	88	**60**	**60**
CCBC90	75	103	87	98	92	95	88	83	84	98	119	80	92	**62**	**62**
CCBC91	86	99	79	85	88	92	89	79	88	/	117	98	91	**62**	**62**
CCBC92	79	69	71	74	69	64	62	60	62	69	80	65	69	**47**	**47**
CCBC93	84	74	68	82	69	71	65	58	63	72	88	66	72	**49**	**49**
CCBC94	96	70	71	75	68	71	61	62	68	74	94	71	73	**50**	**50**

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)
CCBC95	43	56	44	56	50	52	47	41	46	49	73	55	51	35	35
CCBC96	19	14	11	14	9	9	8	7	9	12	17	/	12	8	8
CCBC97	17	16	12	16	14	12	11	/	12	15	22	13	15	10	10
CCBC98	33	31	21	24	20	20	17	18	21	/	/	29	23	16	16
CCBC99	54	47	38	39	37	38	33	32	35	42	55	42	41	28	28
CCBC100	40	40		36	32	32	27	28	30	36	45	35	35	23	23
CCBC101	/	20	/	12	15	15	12	13	14	18	28	18	17	11	11
CCBC102	/	/	/	/	/	25	24	23	26	32	38	35	25	17*	17*
CCBC103	/	/	/	/	28	27	26	28	29	35	43	39	26	17*	17*
CCBC104	/	/	/	/	23	23	21	20	23	30	38	33	21	14*	14*
CCBC105	/	/	/	/	21	21	20	22	23	27	39	36	21	14*	14*

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)
CCBC106	/	/	/	/	24	19	19	18	22	25	33	29	19	13*	13*
CCBC107	/	/	/	/	20	19	17	16	21	25	33	27	18	12*	12*
CCBC108	/	/	/	/	18	17	16	16	19	24	29	26	17	11*	11*

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.**

* 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%

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

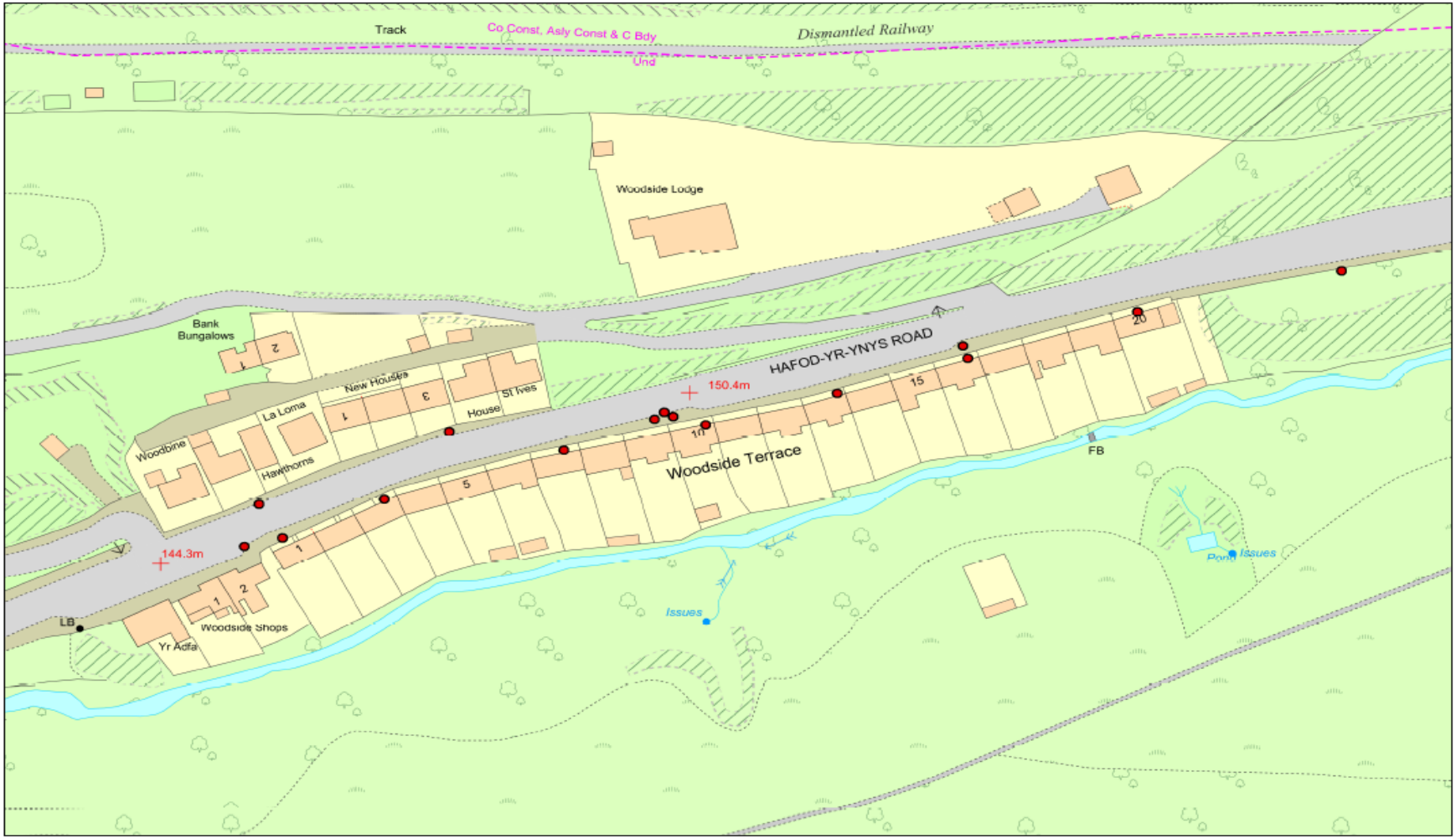
(2) Distance corrected to nearest relevant public exposure.

There are a number of diffusion tubes that are considered to not be individually relevant to public exposure, but in accordance with LAQMTG16 not all require distance correction. The only diffusion tubes that are above or within 10% of the National Annual Objective for NO_2 and aren't located relevant to public exposure are CCBC 50, CCBC 86, CCBC 89-91 and CCBC 94. However, as there are already diffusion tubes in the locations for relevant exposure, there's no requirement to distance correct. CCBC 50 is located beyond the houses at the top of Hafodyrynys Road with CCBC 79 located at its nearest receptor – 20 Woodside Terrace. CCBC 86 is located on a telegraph pole outside 16 Woodside Terrace, and CCBC 87 is located on the façade of the property. CCBC 89-91 is co-located on the Hafodyrynys Road AQMA continuous analyser with it's nearest relevant exposure located with CCBC 83 at 10 Woodside Terrace. CCBC 94 is located on the bus stop outside 1 Woodside Terrace, with CCBC 95 located on the façade of the property.

The reason for the location of these diffusion tubes is to measure the drop off in NO_2 levels from the road to the façade of the properties along Woodside Terrace, which hence negates the need for distance correction.

The location of the diffusion tubes are illustrated in Figure 12 on the next page.

Figure 12 – Map of Hafodyrynys Diffusion Tube Network



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