Monmouthshire County Council

2022 Air Quality Progress Report

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: September 2022

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Executive Summary: Air Quality in Our Area

Air Quality in Monmouthshire

This 2022 Annual Progress Report (APR) presents the results of the air quality monitoring undertaken by Monmouthshire County Council in 2021. Previous reports (2011 to 2021) are available on the Councils website - http://www.monmouthshire.gov.uk/air-quality.

Generally, air quality in Monmouthshire is good, however there are some hotspots of poor air quality close to busy or congested roads. As such these roads are monitored closely for nitrogen dioxide, which is one of the main pollutants from vehicle emissions.

In 2021 this monitoring was undertaken at a total of 49 locations: -

- 47 nitrogen dioxide diffusion tubes were located at 45 roadside locations (one location was a triplicate co-location study with the air quality monitoring station) in Chepstow, Pwllmeyric, Usk, Woodside, Monmouth and Abergavenny.
- 1 roadside Air Quality Monitoring Station (AQMS) that house three automatic analysers to monitor nitrogen dioxide, and particulate matter (both PM_{10} and $PM_{2.5}$) (on the pavement of the A48 in Chepstow).
- 24 ambient air quality sensors that monitor nitrogen dioxide, nitric oxides, carbon monoxide and ozone located at four schools. Chepstow Comprehensive and Usk Primary School were installed in 2019, and an additional 2 sensors were installed late in 2020 at Monmouth Comprehensive and St Mary's Primary.

Previously monitored locations that were discontinued when it became clear that the relevant air quality objective levels were not in danger of being exceeded include - Raglan, Caldicot, Undy and Magor.

There are two roads in Monmouthshire that have been declared Air Quality Management Areas (AQMA) due to having exceeded the nitrogen dioxide annual mean objective level in the past: -

- Bridge Street in Usk – declared 2005
- Hardwick Hill (A48) in Chepstow – declared 2007.

Both AQMAs have Action Plans and Steering Groups set up to identify options for improving air quality, the Action Plans are available from the following websites:

http://www.monmouthshire.gov.uk/air-quality

https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=403

In 2020, due to the implications of the COVID pandemic and lockdowns, air quality in Monmouthshire improved compared to 2019 at all locations. 2020 concentrations were the lowest to date. In 2021 concentrations increased slightly as COVID-19 restrictions were lifted, however they remained lower than every other previous year other than 2020.

In both 2020 and 2021 there were no exceedances of the nitrogen dioxide annual objective level (as measure by nitrogen dioxide diffusion tubes, the automatic analyser and the air quality sensors), no exceedances of the nitrogen dioxide hourly objective level, no exceedances of the PM10 annual and 24-hour objective level (all measured by the automatic analyser).

Whilst there are no $PM_{2.5}$ objectives included in regulations for the purpose of LAQM in Wales, we make consideration as to whether monitored $PM_{2.5}$ annual mean concentrations exceed either the 25µg/m^3 EU Limit Value or the 10µg/m^3 WHO Guideline. In 2021 neither the EU nor WHO value were exceeded (as measured by the automatic analyser).

Actions to Improve Air Quality

Actions to improve air quality include regular meetings of the steering groups set up to progress the action plan measures of the two Air Quality Management Areas. In addition, the council began an anti-idling campaign – primarily targeting schools but will be rolled out to other locations. Schools were invited to design anti-idling posters in 2020 and winners were made up into signage to use around the county. The pandemic slowed this campaign, but the signage has now been produced and they are being installed in 2022.

Local Priorities and Challenges

Priorities for the local authority in 2022 to improve air quality is to work with partners, including Welsh Government to progress the Chepstow Transport Study, progress the Usk Town Strategic Master Plan, and progress the anti-idling campaign.

How to Get Involved

Further information on air quality can be found at http://www.monmouthshire.gov.uk/air-quality

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1 Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

The conclusions of previous local action in relation to air quality is summarised below in chronological order. Each report can be found on Monmouthshire County Councils website.

Report Name	Date	Outcome
Updating and Screening Assessment (Round 2)	**June 2003**	**Detailed Assessment required for nitrogen dioxide at four roadside locations. Two in Monmouth, and one each in Usk and Chepstow**
Interim Detailed Assessment (9 months monitoring)	November 2004	AQMA required for Bridge Street in Usk. Chepstow and Monmouth monitoring results were marginal and AQMA's not declared
Detailed Assessment (12 months monitoring)	February 2005	AQMA for Usk confirmed. Chepstow and Monmouth did not require an AQMA
Progress Report	May 2005	Confirmed nitrogen dioxide exceedance in Usk. Elsewhere levels were below the objective levels for all pollutants although Hardwick Hill in Chepstow was close
AQMA declared for Bridge Street, Usk	November 2005	The location is shown in Figure 1.1.
Updating and Screening Assessment (Round 3)	March 2006	Exceedances of Nitrogen Dioxide level on Hardwick Hill, Chepstow. Decided to progress straight to declaration of an AQMA
AQMA declared for Hardwick Hill, Chepstow	April 2007	The location is shown in Figure 1.2
Further Assessment for Usk AQMA	April 2007	Confirmed the AQMA should be retained with no changes to the boundary
Further Assessment for Chepstow AQMA	May 2008	One exceedance of ten monitoring locations representing 8 residential properties. Rather than cycle between increasing and

		decreasing boundaries it was decided to keep the original AQMA boundary
Progress Report	November 2008	NO2 exceedances limited to the two AQMA's.
Updating and Screening Assessment (Round 4)	May 2009	Little changed in source emissions since 2006. A detailed Assessment was not necessary. Additional monitoring undertaken in Magor/Undy along the proposed route of the M4 relief road for 12 months to give a baseline
Usk Air Quality Action Plan	September 2009	Agreed by Welsh Assembly Government in November 2009. 14 proposed measures to improve air quality
Chepstow Action Plan Stakeholder Workshop Report	November 2009	Outcomes of two stakeholder workshops with residents
Progress Report	May 2010	Only the two AQMA's exceeded nitrogen dioxide objective levels. No Detailed Assessment required.
Hardwick Hill, Chepstow Origin & Destination Study	August 2010	Undertaken to support the Action Plan process
Progress Report	June 2011	Nitrogen dioxide is still the only pollutant that exceeds the objective level, and these exceedances are contained in the two declared AQMAs in Usk and Chepstow. It concluded that a Detailed Assessment for air quality within Monmouthshire was not necessary for any pollutant
Chepstow Air Quality Action Plan	August 2011	Accepted by the Welsh Government in September 2011 with 29 proposed measures for improving air quality
Updating and Screening Assessment (Round 5)	April 2012	Air quality within Monmouthshire continues to meet the relevant air quality objectives outside of the declared AQMAs however levels at Merthyr Road Abergavenny were close to the objective level. Within the AQMAs there are still exceedances of the nitrogen dioxide objective at Hardwick Hill, Chepstow and Bridge Street, Usk. A Detailed Assessment was not required; however, it was decided to increase monitoring on Merthyr Road from one to three locations. These were installed mid-2012.

		Further details below
Progress Report	April 2013	Nitrogen dioxide was still the only pollutant that exceeded the objective level. The two Air Quality Management Areas still exceeded. Nitrogen Dioxide levels across the County increased sharply in 2012, which lead to Wyebridge Street in Monmouth being close to the objective level, and Merthyr Road in Abergavenny slightly exceeding the objective level. A Detailed Assessment was not undertaken, as it was decided that the results of the 2013 monitoring would be required to ensure 2012 was not an unusually high year. To support this and in preparation for a potential Detailed Assessment for Merthyr Road, an additional three diffusion tubes were to be installed on Merthyr Road (to increase monitoring from one in 2011, to three in 2012, and six in 2013.
Progress Report	April 2014	Nitrogen dioxide was still the only pollutant that exceeded the objective level. The two Air Quality Management Areas still exceeded. Nitrogen dioxide levels were lower in 2013 than 2012 at all but one location and no location outside the two AQMA's exceeded the objective level. It was decided that a further 13 diffusion tubes were to be installed in Monmouth at the end of 2013 in preparation for the 2014 monitoring year. These were installed to support a more detailed assessment of nitrogen dioxide levels in the town centre and along the A40.
Monmouth Six Month Detailed Assessment	September 2014	The report provided a summary of monitoring data for the period January–July 2014 and indicated that the annual mean objective was likely to be met at all sites. However, an assessment of two Air Quality Models undertaken for developments under the planning process identified possible exceedances elsewhere in the town. It was decided to install further diffusion tubes at these locations in January 2015, and to liaise with Natural Resources Wales to install an automatic monitoring station for NO2 and PM10, PM2.5 on the pavement of Wyebridge Street.
Updating and Screening Assessment (Round 6)	April 2015	The two AQMA's continued to experience exceedances of the nitrogen dioxide annual mean at two locations in each town. Concentrations in 2014 were fairly similar to those recorded in 2013

		(which had seen a decrease from 2012). There were no exceedances outside the AQMA's The full year's monitoring for Monmouth had confirmed the findings of the September 2014 six-month Detailed Assessment. The USA confirmed that further diffusion tube monitoring was being undertaken in 2015 in Monmouth, and that the NRW's MMF had also been installed in December 2014. There were no exceedances of nitrogen dioxide in Abergavenny, although two locations were close enough to warrant continued monitoring.
Progress Report 2016	April 2016	Nitrogen dioxide, PM10 and PM2.5 concentrations decreased at all locations (diffusion tube and automatic analysers). One location exceeded the nitrogen dioxide annual mean in the Chepstow AQMA, there were no other exceedances (including the Usk AQMA). This was the first year Usk did not have a location exceeding the objective level. NRW's MMF monitoring in Monmouth was also summarised. It did not identify exceedance at a relevant receptor.
Progress Report 2017	September 2017	This PR confirms that air quality within the Chepstow Air Quality Management Area (AQMA) continues to exceed the nitrogen dioxide annual mean objective level at one location, however for the second year all six monitoring locations the Usk AQMA were below the nitrogen dioxide annual mean objective level. There were no recorded exceedances in Monmouth or Abergavenny.
Annual Progress Report 2018	September 2018	Air Quality within the Chepstow AQMA continues to exceed the nitrogen dioxide annual mean objective level at one location. Third year with no exceedance in Usk AQMA. No exceedances elsewhere. Concentrations broadly similar to 2016. Additional monitoring undertaken in Woodside south of Usk AQMA.
Annual Progress Report 2019	September 2019	Air Quality within the Chepstow AQMA continues to exceed the nitrogen dioxide annual mean objective level at one location. Fourth year with no exceedance in Usk AQMA, and first year with concentrations under 36µg/m^3 (10% of objective level). No exceedances elsewhere. Generally, concentrations in all towns were the lowest ever recorded.

Annual Progress Report 2020	September 2020	Air Quality within the Chepstow AQMA continued to exceed the nitrogen dioxide annual mean objective level at one location. Fifth year with no exceedance in Usk AQMA, and second year with concentrations under 36µg/m^3 (10% of objective level). No exceedances elsewhere, and no PM10 or PM2.5 exceedances. Generally, concentrations in all towns were similar to the previous year but slightly higher.
Annual Progress Report 2021	August 2021	Report for the COVID pandemic identified no exceedances of any air quality objective level and all concentrations the lowest to date by a significant degree. The sixth year with no exceedances in Usk and third below 36µg/m^3. The only year to date with no exceedances in Chepstow AQMA

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 Monmouthshire County Council can be found in Table 1.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at http://www.monmouthshire.gov.uk/air-quality and https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=403

Table 1.1 – Declared Air Quality Management Areas

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Description	Action Plan
Bridge Street Usk	NO_2 annual mean	There have been improvements in air quality in the AQMA over the last 7 years. There have been no exceedances for 7 years, and under 10% of the Objective level for 4 years	An area encompassing Bridge Street, from its junction with Newmarket Street up to and including the area around the junction with Castle Parade and Porthycarne Street	http://www.monmouthshire.gov.uk/app/uploads/2013/08/Usk-Action-Plan-Final-September-2009.pdf
Hardwick Hill, Chepstow	NO_2 annual mean	There have been improvements in air quality in the AQMA over the since 2017. One location continued to exceed prior to 2020, but did not exceed in 2020 or 2021	An area encompassing properties either side of the A48, between the roundabout with the A466 to the west and extending east just beyond the junction with the B4293 at Hardwick Terrace	http://www.monmouthshire.gov.uk/app/uploads/2013/06/Chepstow-AQAP-Final-31-August-2011.pdf

AMQA boundary maps within Monmouthshire can be viewed at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=403 and are included in Appendix D.

1.3 Implementation of Action Plans

Monmouthshire County Council has taken forward several measures during 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 1.2. More detail on these measures can be found in the Air Quality Action Plan relating to each designated AQMA.

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 by way of regular steering group meetings.

Key completed measures are:

- Implementation of a 20 mile an hour zone through the Usk Air Quality Management Area, enforcement of double yellow line parking, lorry watch scheme to help enforce the Road Traffic Order, as well as improved signage.
- Starting a new Strategic Vision for Usk and Llanbadoc that is scoping options for various town improvements, including traffic and air quality issues.
- Completion of a WelTAG (Welsh Transport Appraisal Guidance) stage 2 assessment for air quality-based improvements in Chepstow.
- Completion of WelTAG stage 1 study for improvements to High Beech Roundabout in Chepstow

Monmouthshire County Council expects the following measures to be completed over the course of the next reporting year:

- Roll out of anti-idling campaign at schools with installation of pupil designed signage
- WelTAG study Stage 2 for High Beech Roundabout (Chepstow)
- Next stage of WelTAG study to be determined.
- Progress Usk and Llanbadoc Strategic Masterplan
- Progress of the 4 Active Travel Schemes that secured WG funding

Table 1.2 – Progress on Measures to Improve Air Quality

Usk Action plan (The Action Plan was reviewed in 2022 and the 2023 report will show the new Action Plan)

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
6.	Management of on and off-street parking consideration of delivery time strategy	MCC	**Complete**	n/a	Police in Usk have increased enforcement of on street parking. M.C.C improved car park signage Chamber of Commerce re-established and members of Steering Group. Chamber of Commerce actively engaging with businesses (letters and emails and meetings) to promote non-roadside deliveries and/or off-peak deliveries	M.C.C. have taken over enforcement of double yellow line parking, in bid to increase enforcement.	Complete, however ongoing work required to continually engage with police, Civil Enforcement Officers and chamber of commerce	Reducing on street parking has improved congestion at peak times.
5.	HGV Restriction along Bridge Street – to be informed by surveys and subsequent report	MCC	**Complete**	HGV numbers	There is an RTO in place, but difficult for police to enforce due to its length and proximity to the Caerleon RTO. As such enforcement is minimum and two Caerleon businesses have		Current RTO: - Signage in place Lorry Watch – ongoing	Emissions reductions if HGVs are taken off the route through Usk. Likely to be the most beneficial measure in

					been allowed to breach the RTO without penalty. In addition, there are local businesses who use HGV's that are exempt. As such the RTO has not been successful in the past. MCC has spent a great deal of time working with the police and local businesses and town council to replace the RTO with a more effective one. First a shortened RTO was proposed, but opposed by local businesses, secondly a time ban (e.g., no HGVs at all in peak traffic times) but was again opposed. It has now been decided to no longer pursue the implementation of new RTO's however the current one is still in place. Work has been undertaken, however, to try to make the exiting RTO more effective - Signage improved (sat nav signs and CCTV signs), and a Lorry Watch Scheme was implemented and run by a consultancy but has now been taken over by Trading Standards. HGVs in breach of the RTO are recorded by local volunteers to TS, who send warning letters, and if necessary, fines to the company.	All HGV's reported are contacted by MCC officers. This has resulted in a reduction in the number of HGV's using the town as a short cut. Typically, once contacted the companies do not offend again.	terms of reducing emissions and concentrations.
3.	Encourage walking as a mode of transport	MCC	On going	n/a	MCC undertaken Active Travel Act duties including identification of walking routes in Usk and improvements to routes.	On going	Unlikely to be significant emissions reductions.
8.	Increase the number of public transport services	MCC	Ongoing	Numbers of public transport services	Bus companies report loss of money from routes and require additional MCC	Ongoing	Unlikely to be significant emissions reductions.

	to and from Usk. include community transport				funding. Currently MCC priority is to return bus services to previous levels			
9.	Contain indirect emissions from future development and from changes of land use that would generate traffic	MCC	Ongoing	Numbers of air quality assessments requested	Proactive engagement with Planning authority that may have air quality implications		Ongoing	Could be significant depending on numbers of planning applications.
15	Travel Awareness Campaigns	MCC	Ongoing but not specifically targeting Usk now	n/a	None in Usk	n/a	Ongoing	Sustained travel awareness campaigns coupled with improvements to alternatives could reduce car use and therefore reduce emissions.
New	Work with school and others to produce a community and school traffic plan	MCC in partnership	Ongoing	Numbers of Travel Plans in place	A member of the Steering Group is a Governor at Usk School and is proactively engaging with the school to encourage improve parking arrangements and to encourage walking on behalf of the Group.	Air Quality monitoring undertaken at School, coupled with potential education opportunities using the monitoring data. Educating the children should help inform parents of emissions from school drop-offs and encourage alternative.	On-going – Continuous monitoring installed at school in summer 2018, and school taking part in Eco School diffusion tube monitoring education package. Monitoring data from the sensor will be available to the school for teaching purposes via a website. Anti-Idling group set up within MCC with intentions of promoting anti idling campaigns starting in 2020 and focused on School pick up and drop off times	Could potentially provide reductions in emissions at locations close to schools, or at congestion hotspots.

1.	Encourage more cycling: implement hierarchy of urban and inter-urban cycle routes	MCC	On-going	Numbers of cyclists	MCC working on Active Travel Act that will include Usk cycle and walking routes	MCC working through the stages of the Active Travel Act. Specific work to create new walking and cycling connections to Coleg Gwent and MCC County Hall, and then South towards Pontypool. – Planning applications made	On-going	Potential reductions in emissions if modal shift from car to cycling.
2.	Support and promote facilities for cyclists at school and in town centres	MCC	On-going	Numbers of cyclists	Provision of cycle racks on Bridge Street	Part of Active Travel Act work	On-going	Potential reductions in emissions if modal shift from car to cycling.
13.	Car club scheme	MCC	n/a	n/a	n/a	Not being progressed – unlikely to be effective	n/a	n/a
New	Develop kerbside recycling collections to reduce traffic to civic amenity site	MCC	**Complete**	n/a	Complete	n/a	n/a	Unlikely to have a major impact on emissions. Included in original Action Plan to reduce number of household trips to Municipal Refuse Site.
14.	Flexible home working, work times etc.	MCC	Ongoing	Number of work-related trips in private single occupancy cars.	Promoted within MCC.	Much greater levels of homeworking within MCC	Ongoing	Due to COVID 19 pandemic from early 2020 - home working is much more prevalent and acceptable for

								employers. The benefits to the environment have been seen. – especially March – June 2020. MCC has stated that they will encourage more home working and remote meetings
7.	Implement new 20mph speed limits/ zones on Bridge Street	MCC	**Complete**	n/a	This has now been put in place by MCC in 2018 Modelling undertaken for 20mph – however it showed increased emissions, as it created additional queuing. Therefore, implemented without road obstacles that could increase congestion.	A Share Space Concept was considered by MCC and a consultant. This work has now been rolled into the Strategic Vision Plan for Usk	Completed On-going – early stages of viability work	Traffic studies have shown that vehicles in Usk do not tend to exceed 20mph in the day. However, it is possible that less accelerating and braking up to and down from 30mph might reduce emissions, and a 20mph zone might discourage certain vehicles, who could take a faster road. 2018 was the first full year of 20mph, and emissions in Usk were recorded at an all-time low (however this occurred Countywide), this continued into 2019 with only a slight increase in emissions. In addition, it is possible that this will be the first step in making Usk town centre a more pedestrian orientated

								place, rather than a vehicle through route. Options are being investigated to create a Shared Space.
New	Investigation of altering traffic flows through the town	MCC	**Complete**	n/a	Considered again in 2014 and modelled for several options. Each option, however, increased congestion and emissions.		Will not be progressed as a standalone option, however, will be considered again alongside other measures as party of the Usk Strategic Masterplan	Increased emissions

Chepstow Action Plan

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
1.	Chepstow integrated Transport Strategy	MCC	n/a	n/a	No progress	No progress	n/a	n/a
2.	Limit HGV weight or emissions	Welsh Government	n/a	n/a	No progress as A48 still a trunk road and considered not appropriate	Considered in 2013 public consultation. Considered again in 2018 WelTAG study. Not considered feasible	n/a	n/a
3.	Amend MOVA at Tesco (Upper Street) traffic lights	Welsh Government	n/a	n/a	Completed	Completed	April 2012	Anecdotal evidence suggests less congestion on Hardwick Hill

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
4.	Encourage car sharing	MCC	Ongoing	None	There are several informal cars sharing locations people use. MCC is looking in =to ways to formalise them	Transition Chepstow have taken lead in identifying places for car sharing carparks and using an app to advertise them. One such location is Chepstow Racecourse. MCC currently looking into finding a gate for the carpark so the Racecourse will allow the use of its Car park for this purpose	Ongoing	Depending on the uptake – and provided the car sharing removes vehicles from the AQMA.
5.	Monitor developments in adjoining areas	MCC	Ongoing	Number of air quality assessment asked for	Good working relationship with planners. Also liaise with Forest of Dean regularly	Good working relationship with planners. Also liaise with Forest of Dean regularly	Ongoing	Could be potential emissions reductions in the long term (or at least reductions on increases).
6.	Improve Council integration on planning issues	MCC	Ongoing	Consultation between departments	Good working relationship with planners.	Good working relationship with planners.	Ongoing	Could be potential emissions reductions in the long term (or at least reductions on increases).

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
7.	Education of HGV operators	MCC	Ongoing	n/a	None specifically for Chepstow	None specifically for Chepstow	Ongoing	Could be potential emissions reductions with eco driving techniques.
8.	Improve cross boundary working	MCC	Ongoing	n/a	MCC Env Health sits on Forest of Dean AQ Steering Committee	Good integration with Forest of Dean	Ongoing	Could be potential emissions reductions in the long term (or at least reductions on increases).
9.	Include LDP Policy covering air quality	MCC	Complete	n/a	Policy in the LDP.	New LDP currently in progress and Air Quality will be a factor.	Ongoing	In the long term could be significant if affects major developments. However, there is a lot of pressure on MCC to increase housing especially in the south of the County. There are contradictory pressures from Government of increasing housing and reducing vehicle emissions
10.	Redesign High Beech Roundabout	Welsh Government in partnership with MCC	n/a	Completion of roundabout improvements	Discussions in relation to new development. Contributions being secured through planning process. This will be implemented as a phased program of works including	Considered again in 2018 WelTAG study but not recommended for progress. WG undertaken Stage 1 WelTAG study in 2020.	Several years after Station Road improvements to allow monitoring and improvements in car engines.	Localised improvements round the Roundabout. Potential improvements on the A48 assuming reduced queuing times.

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
					Station Road junction improvement and Bulwark junction improvement	Stage 2 expected to be completed by April 2022	Stage 2 due by April 2022	
11.	Target schools Traffic	MCC in partnership	Ongoing	Number of Travel Plans in place	Walking buses being organised by Transition Chepstow	Env Health installed air quality sensor at Chepstow Comp in Summer 2018. Hopeful the data will be used by the school as well to educate pupils, and have an impact on parent's school runs	Sensor installed. Monitoring in progress Work with school over next 12 months to try to include the data in education	Could potentially provide reductions in emissions at locations close to schools, or at congestion hotspots.
12.	Promote Sustainable transport as part of new developments	MCC	Ongoing	n/a	General improvements as part of planning process	General improvements as part of planning process	Ongoing	Could be potential emissions reductions in the long term (or at least reductions on increases).
13.	Promote town centre developments	MCC	n/a	n/a	1 town centre development with planning permission, and 1 in the LDP	1 town centre development with planning permission still under construction, and 1 in the LDP	n/a	n/a
14.	Rail Park and Ride	MCC	n/a	n/a	On-going – Funding applied for & P&R	Racecourse require a gate/barrier before allowing it to	n/a	Park and Ride on racecourse likely to cause some

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
					from racecourse complete. Improvements made to the carpark to enable additional parking and room for buses	be used. MCC looking into finding. Considered in 2018 WelTAG Stage 1 and recommended for further consideration at stage 2		emissions reductions on Hardwick Hill.
15.	Support the climate change and sustainable energy strategy	MCC	n/a	n/a	General support, particularly for transport measures	No specific progress	Ongoing	Unlikely to be significant.
16.	Travel Plans	MCC	Ongoing	Numbers of Travel Plans in place	No specific progress in Chepstow other than Active Travel work	n/a	Ongoing	Unlikely to be significant unless resources put into Travel Planning.
17.	Bypass	Welsh Government	n/a	n/a	Not being progressed at present however considered in 2018 WelTAG stage 1 assessment, and recommended for further appraisal at Stage 2	Four potential routes were considered in the 2018 WelTAG Stage 1 study. One route was recommended for further consideration at Stage 2.	Unknown at present	Likely to take a substantial amount of traffic off the A48 through Chepstow
18.	Improve bus services	MCC	Ongoing	Bus patronage	C5 service used to serve Chepstow Rail	Improved public transport integration	Ongoing	Some improvements if modal shift from car to bus and train.

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
					Station has been re-timed, enabling greater integration with Gloucester and Newport bound rail services.	was considered in 2018 WelTAG stage 1 assessment and recommended for further consideration at stage 2		
19.	Improve public transport integration	MCC	Ongoing	Bus and train patronage	As above	As above	Ongoing	Some emissions improvements if modal shift from car to bus and train
20.	Origin and Destination survey	MCC	2011	Survey undertaken	Complete	Completed in 2011	Completed	Identified a significant number of HGV's were using A48 as a through route to avoid paying the Severn Bridge Toll
21.	Provide information for residents	MCC	Ongoing	n/a	Information provided on MCC website, and at meetings	MCC website updated. Steering group meetings	Ongoing	n/a
22.	Target HGVs using unsuitable satnav routes	MCC	Not progressed	n/a	Included in 2013 public consultation however Welsh Government considered it in Detail Design stage in 2015/16 and will not progress at this time	No specific progress	n/a	n/a

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
23.	Improve rail services to the town	Network Rail/ MCC	Ongoing	Numbers of train passengers	From May 24, 2011, 14 more Cross Country trains a day will stop at Chepstow to gauge customer demand for a more frequent service.	Improved public transport integration was considered in 2018 WelTAG stage 1 assessment and recommended for further consideration at stage 2	Ongoing	Potential emissions reductions if modal shift from car to train
24.	Upgrade the railway station	Network Rail/ MCC	Not progressed	n/a	Improved parking and bus drop of space	None	n/a	n/a
25.	Improve cycling facilities	MCC	On-going	Uptake of cycle routes	Walking/cycle routes identified in Active Travel plan	Several routes identified for improvement. A-B connecting Communities actively working on improving the Wye Wander Route	n/a	Greater uptake of cycle routes should help reduce local traffic in and around Chepstow
26.	Bus Park and Ride/ Share	MCC	On-going	Numbers of people using P&R	P&R set up from Chepstow Racecourse	Considered in 2018 WelTAG Stage 1 and recommended for further consideration at stage 2	n/a	Park and Ride on racecourse likely to cause some emissions reductions on Hardwick Hill

Action Plan Measure No.	Measure	Lead authority	Implementation Phase	Indicator	Progress to date	Progress in the last 12 months	Estimated Completion Date	Comments relating to emissions reductions
27.	Distribution hub	MCC	Not progressed	n/a	Considered unsuitable for Chepstow	Not progressed	n/a	n/a
28.	Lobby for change in toll system at Severn Bridge	MCC/ Welsh Government	On-going	n/a	Toll removal occurred in 2019	WG to undertake a before and after traffic study to determine how the toll removal has impacted	December 2018 With traffic study undertaken in 2018 (before) and same time of year in 2019 (after	The Origin and Destination study identified a significant number of HGV's using Hardwick Hill to avoid Tolls; hence Toll removal was included in the Action Plan. However, it now appears that Toll removal will remove a barrier for car use and could increase traffic. Chepstow is being marketed as a cheaper housing market for Bristol Commuters.
29.	Promote Rail Freight	MCC/ Network Rail	Not progressed	n/a	No specific progress in Chepstow	No specific progress in Chepstow	n/a	n/a

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

2.1 Summary of Monitoring Undertaken in 2020

2.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how results compare with the objectives.

Monmouthshire County Council undertook automatic (continuous) monitoring of three pollutants at one site during 2021.

Table 2.1 presents the details of this site. National monitoring results are available on the Welsh Air Quality Forum (WAQF) and DEFRA websites http://www.welshairquality.co.uk http://uk-air.defra.gov.uk/

The automatic analysers are in Chepstow at the Air Quality Monitoring Station (AQMS) located on the A48 on the pavement of Hardwick Hill, which is within the Chepstow Air Quality Management Area and at a roadside location. The AQMS is situated in a location that is the closest it can technically be (based on its size and available space and power) to the location of the highest recorded concentrations in the county.

Maps showing the location of the monitoring sites are provided in Figure 2.1

The Chepstow AQMS became part of the UK's Automatic Urban and Rural Network (AURN) in January 2008. In February 2010 the PM10 monitor was upgraded to a TEOM-FDMS (Filter Dynamics Measurement System) analyser and a TEOM-FDMS PM2.5 analyser was introduced. TEOM-FDMS monitors are accepted as giving results equivalent to the European Gravimetric Standard Method. The analysers were Thermo Scientific rp Series. There were two 8500 FDMS units, two 1400A TEOM Sensor Units and two 1400A TEOM Control Units.

In 2018 the AURN began replacing the TEOM-FDMS analysers in the network with BAM (Beta Attenuation Monitors) analysers. The analysers in the Chepstow AQMS were replaced in August 2018, Therefore PM10 and PM2.5 data reported for January to July 2018 is TEOM-FDMS data and August 2018 onwards is BAM data.

The original nitrogen dioxide analyser (Monitor Labs 9841B chemiluminescence analyser) and Odessa data logger were replaced in January 2012 to the latest compliant Monitor Europe 20xx series continuous gaseous analyser (ML 2041 NOx Chemiluminescence Analyser).

On 7th November 2019, the ML2041 NOx Analyser was then replaced with an API T200 NOx gas analyser.

In 2021, Air Monitors serviced the NOx analyser and Enviro Technology serviced the PM10 and PM2.5 analysers, and all three were audited by Ricardo-AEA. Services and audits are undertaken twice a year. Monmouthshire County Council undertakes routine LSO (Local Site Operator) duties at the station including regular calibration checks, filter changes, PM-head cleaning, BAM tape changes and calibration gas changes.

Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

2.1.2 Non-Automating Monitoring Sites

Diffusion Tubes

Monmouthshire County Council undertook non- automatic (passive) monitoring of NO_2 at 44 sites during 2021. Table 2.2 presents the details of the sites. In addition to the discrete 44 diffusion tube sites, three tubes are also co-located with the Chepstow AQMS – (next to the NO_2 analyser's inlet) as part of a local and national bias adjustment study. With this information all the diffusion tubes can be adjusted to reflect atmospheric concentrations more accurately.

Maps showing the location of the monitoring sites are provided in Figure 2.2.

Since May 2010, Monmouthshire County Council has used diffusion tubes prepared and analysed by Gradko International Limited using 20% TEA in Water. The tubes are changed every month (either 28 or 35 days) and sent to Gradko for analysis.

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

Air Quality Sensors

In summer 2018 two air quality sensors were installed at two schools, and in 2020 and then 2021 a further two were installed at two additional schools.

The sensors are the Air Quality Transmitter AQT410 manufactured by Vaisala. They continuously monitor nitrogen dioxide, nitric oxide, ozone, carbon monoxide, air temperature, humidity, and air pressure.

The schools are: -

- Usk R.C Primary School, which is just outside the eastern boundary of the Chepstow AQMA installed in August 2018. The sensor is installed on the north side of the school building and monitors the classrooms and playground closest to the A472 (Monmouth Road, that become Bridge Street).
- Chepstow Comprehensive School, North of the Chepstow AQMA, and off Welsh Street was installed August 2018. The sensor is installed on the south side of the school building at the bus and car drop off point, and monitors exposure at the classrooms and school entrance, where pupils tend to congregate at drop off and pick up times.
- Monmouth Comprehensive, which is situated north of the A40 and south of Dixton Road (B4249), was installed June 2020. The sensor is installed on the north side of the school building and monitors classrooms closest to Dixton Road, which is also used as a drop off point.
- St Mary's R.C. Primary School, which is situated in Bulwalk, Chepstow, south of the Chepstow AQMA. It is the closest school to the AQMA and was originally installed in June 2020, but due to sensor errors, and then communication issues it had to be returned to the manufacturer twice. It finally came online, with stable readings in May 2021. The sensor is installed on the east side of the school building and monitors classrooms, and teacher's lounge and play area closest to Bulwark Road

Table 2.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	In AQMA	OS Grid Reference		Pollutants Monitored	Monitoring Technique	Inlet Height (m)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
				X	Y					
AQMS	A48 Hardwick Hill, Chepstow	Roadside	Chepstow A48/Hardwick Hill AQMA	353125	193472	PM_{10} $PM_{2.5}$	Beta Attenuation Monitoring (BAM)	2.5	7.5m	3
						NO_x NO_2	Chemiluminescence			

Figure 2.1 – Map of Automatic Monitoring Site (AQMS) https://airquality.gov.wales/

Table 2.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)[1]	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser	Height (m)
CH1	38 Larkfield Park Chepstow	Roadside	352800	193274	NO2	Chepstow	0.2	10.0	No	1.6
CH2a	Lamppost No. WH70, Newport Road, Chepstow	Kerbside	352821	193307	NO2	Chepstow	3.7	1.8	No	2.5
CH3	36 Wayside - Hardwick Hill Chepstow	Roadside	352970	193452	NO2	Chepstow	0.2	12.0	No	1.7
CH4	2 Hardwick Hill - Chepstow	Roadside	353009	193444	NO2	Chepstow	0.6	4.0	No	3.1
CH5	1 Ashfield House - Mount Pleasant	Roadside	353141	193451	NO2	Chepstow	0.2	14.0	No	1.6
CH6	Hill House -Mount Pleasant Chepstow	Roadside	353166	193586	NO2	Chepstow	0.2	6.0	No	2.3
CH7	2 Hardwick Terrace - Chepstow	Roadside	353164	193663	NO2	Chepstow	0.2	1.5	No	2.6
CH8	Moor Street Lamppost- Chepstow	Roadside	353219	193730	NO2	Chepstow	0.5	1.7	No	2.8
CH9	Restway Wall - Garden City Way	Roadside	353306	193681	NO2	No	0.2	11.0	No	1.9
AQ1, AQ2, AQ3	AQMS - Hardwick Hill Chepstow 3	Roadside	353125	193472	NO2	Chepstow	20.0	4.0	Yes	2.9
PWLL1	Lamppost NY237 - 1 The Chestnuts, Pwllmeyric	Kerbside	351983	192594	NO2	No	16.0	1.2	No	2.4
PWLL2	Lamppost NY241 - The Cedars, Pwllmeyric	Kerbside	351873	192489	NO2	No	1.9	1.9	No	2.4
PWLL3	Lamppost NY246 - Hill House, Pwllmeyric	Kerbside	351724	192370	NO2	No	6.2	1.4	No	2.4
PWLL4	2 White Cottage, Pwllmeyric	Roadside	351666	192300	NO2	No	0.1	2.2	No	2.4
MM1	School House - Wyebridge St Monmouth	Roadside	351072	212821	NO2	No	0.2	3.4	No	2.7
MM2	Flat 1 - Granville St Monmouth	Roadside	351139	212894	NO2	No	0.2	25.0	No	2.7
MM3	Lamppost ME 145 - 21 St James Sq. Monmouth	Roadside	351085	212930	NO2	No	2.4	0.5	No	2.3
MM4	12A Monnow Street on St Johns Street, Monmouth	Roadside	350718	212794	NO2	No	0.2	0.7	No	2.3
MM7	Arka, Old Dixton Road, Monmouth	Roadside	351197	212980	NO2	No	0.1	23.0	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)[1]	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser	Height (m)
MM9	1, The Shrubbery, Old Dixton Road, Monmouth	Roadside	351467	213280	NO2	No	0.2	16.0	No	2.3
MM11	Fence of Boys School Playground	Roadside	351024	212652	NO2	No	0.5	4.8	No	3.0
MM13	Pike House, New Dixton Road, Monmouth	Roadside	351884	213660	NO2	No	0.2	6.5	No	1.6
MM15	6 Monnow Street/Fancy Fred's, Monmouth	Roadside	350729	212811	NO2	No	0.2	1.5	No	2.3
MM16	Lamppost ME380 Adj 20A Monnow Street, Monmouth	Roadside	350695	212775	NO2	No	1.4	2.1	No	2.3
MM17	4 Agincourt Square - The Punch House	Roadside	350779	212868	NO2	No	0.5	1.7	No	2.5
MM18	Monmouth School D&T Block	Roadside	351091	212791	NO2	No	0.2	13.0	No	2.1
MM19	Lamp post, 7 Ty Mawr, Monk Street, Monmouth	Roadside	350953	213098	NO2	No	1.5	1.8	No	2.5
MM21	Lamp post ME399,14 Victoria Place, Priory Street, Monmouth	Roadside	350910	213071	NO2	No	0.3	1.5	No	2.5
AB1	Lamppost MC178- Merthyr Rd, Abergavenny	Roadside	329170	213867	NO2	No	0.4	0.9	No	2.4
AB2	Back Clinic, 2a Bridge Cottages, Merthyr Rd Aber	Roadside	329202	213822	NO2	No	0.2	1.7	No	2.5
AB3	112 Merthyr Road, Abergavenny	Roadside	329324	214080	NO2	No	0.3	1.8	No	2.5
AB4	L/P Adj. 5 Coopers Way, Merthyr Rd, Abergavenny	Roadside	329275	213686	NO2	No	2.4	1.6	No	2.4
AB5	1 Usk View, Merthyr Rd, Abergavenny	Roadside	329212	214075	NO2	No	0.1	5.0	No	1.9
AB7	Lamp post WB259 - 14 Pen-y-fal Road, Abergavenny, NP7 5UB	Roadside	329848	214556	NO2	No	6.1	1.6	No	2.3
AB8	4 Northgate, Abergavenny, NP7 5TT	Roadside	329837	214547	NO2	No	0.3	3.5	No	1.8
AB9	8 Brecon Road, Abergavenny, NP7 5UG	Roadside	329523	214512	NO2	No	0.3	2.5	No	1.8
USK1	14A Castle Parade - Usk	Roadside	337860	201039	NO2	No	0.2	1.6	No	2.3
USK2	Castle Court - Usk	Roadside	337710	200936	NO2	Usk	0.2	1.4	No	2.5
USK3	White Hart - 5 Bridge St Usk	Roadside	337663	200906	NO2	Usk	0.2	1.3	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)[1]	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser	Height (m)
USK4	35 Bridge St - Usk	Roadside	337596	200849	NO2	Usk	0.2	1.3	No	2.5
USK5	16 Bridge St -Lamp Post MA 556 - Usk	Roadside	337562	200824	NO2	Usk	0.5	1.2	No	2.4
USK6	4 Usk Bridge Mews - Usk	Roadside	337473	200755	NO2	Usk	0.2	4.9	No	2.6
WS1	13 Woodside, Usk	Roadside	337363	200707	NO2	No	0.2	1.0	No	2.5
WS2	19 Woodside, Usk	Roadside	337356	200736	NO2	No	0.2	2.7	No	1.8
WS3	22 Woodside, Usk	Roadside	337364	200749	NO2	No	0.0	1.5	No	2.5

Notes:

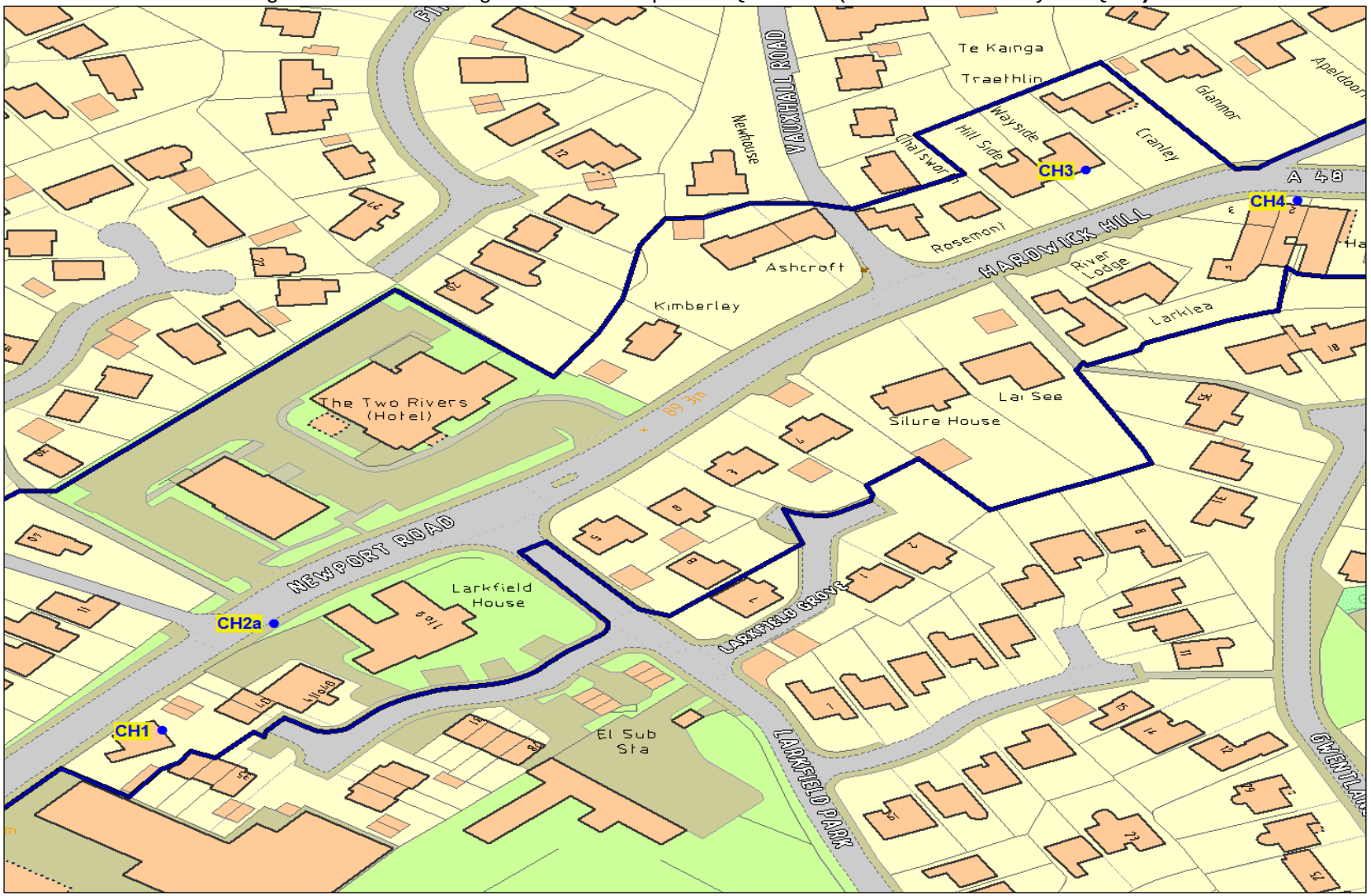
(1) 0m indicates that the sited monitor represents exposure and as such no distance calculation is required.

Table 2.3 – Details of Air Quality Sensor Monitoring Sites

Site ID	Site Name	Site Type	In AQMA	Latitude/Longitude		Pollutants Monitored	Monitoring Technique
AQTCC	AQT410 Chepstow Comprehensive School	School	No	51.6467362	-2.6844269	NO_2 NO CO O_3	electrochemical sensors
AQTUP	AQT410 Usk Primary School	School	No	51.7052697	-2.8982932		
AQTMC	AQT410 Monmouth Comprehensive School	School	No	51.8150024	-2.7089667		
AQTSMP	AQT410 St Mary's Primary School	School	No	51.6355370	-2.6783532		

Figure 2.2 – Maps of Non-Automatic Monitoring Sites

Nitrogen Dioxide Monitoring Locations - Chepstow AQMA west (blue line is boundary of AQMA)

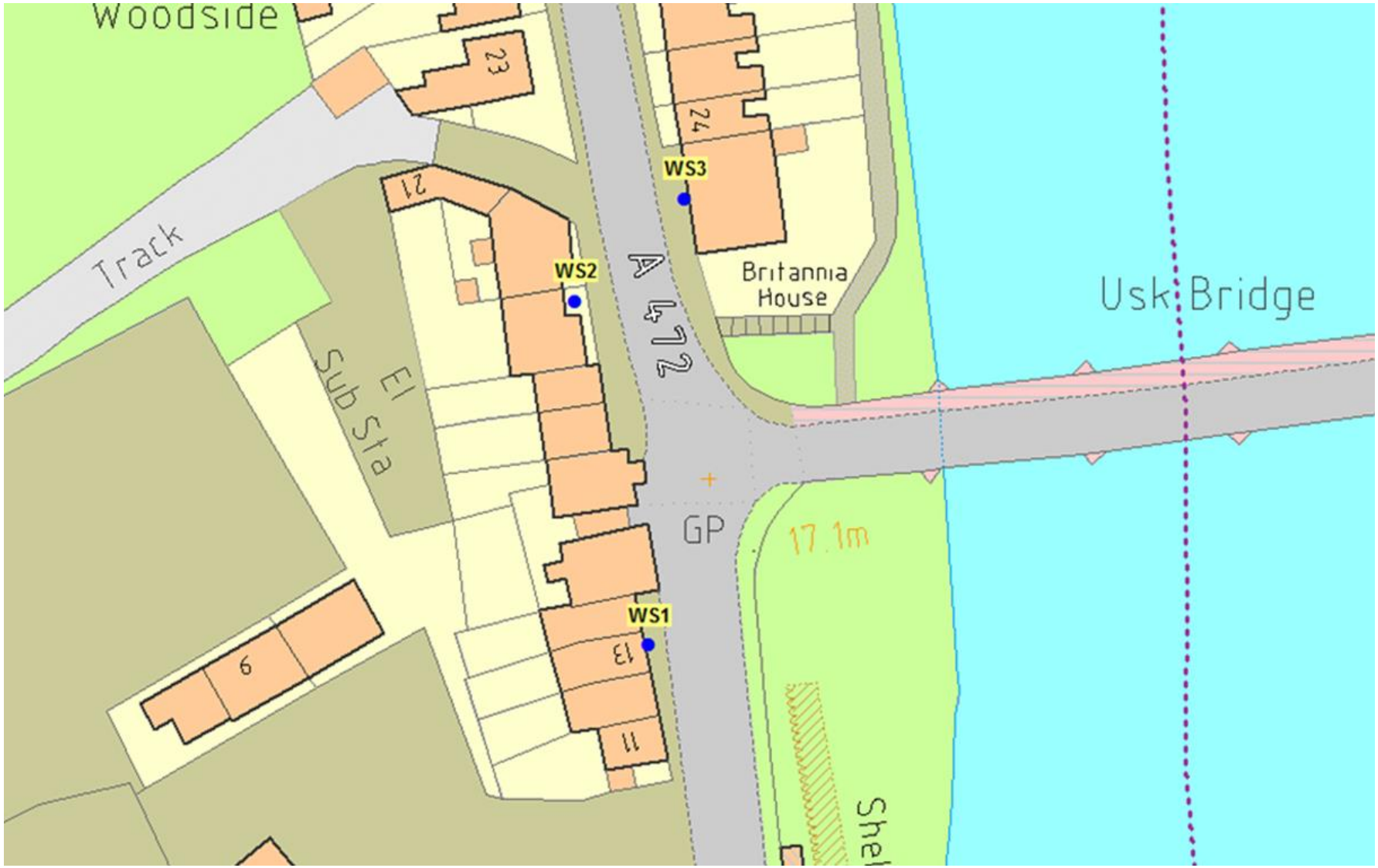


Nitrogen Dioxide & AQMS Monitoring Locations - Chepstow AQMA east (blue line is boundary of AQMA)

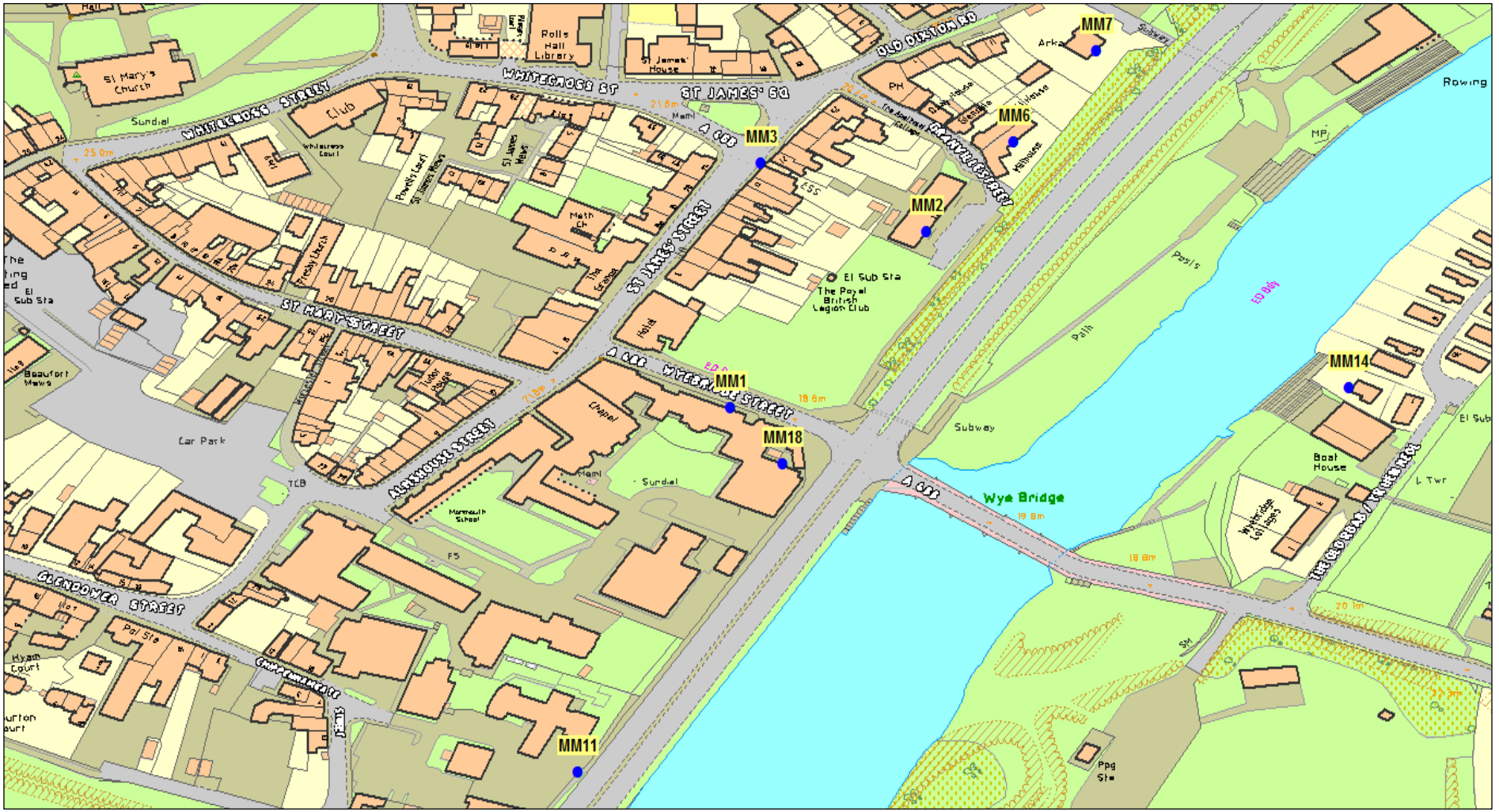
Nitrogen Dioxide Monitoring Locations – Pwllmeyric

Nitrogen Dioxide Monitoring Locations - Usk AQMA (blue line is boundary of AQMA)

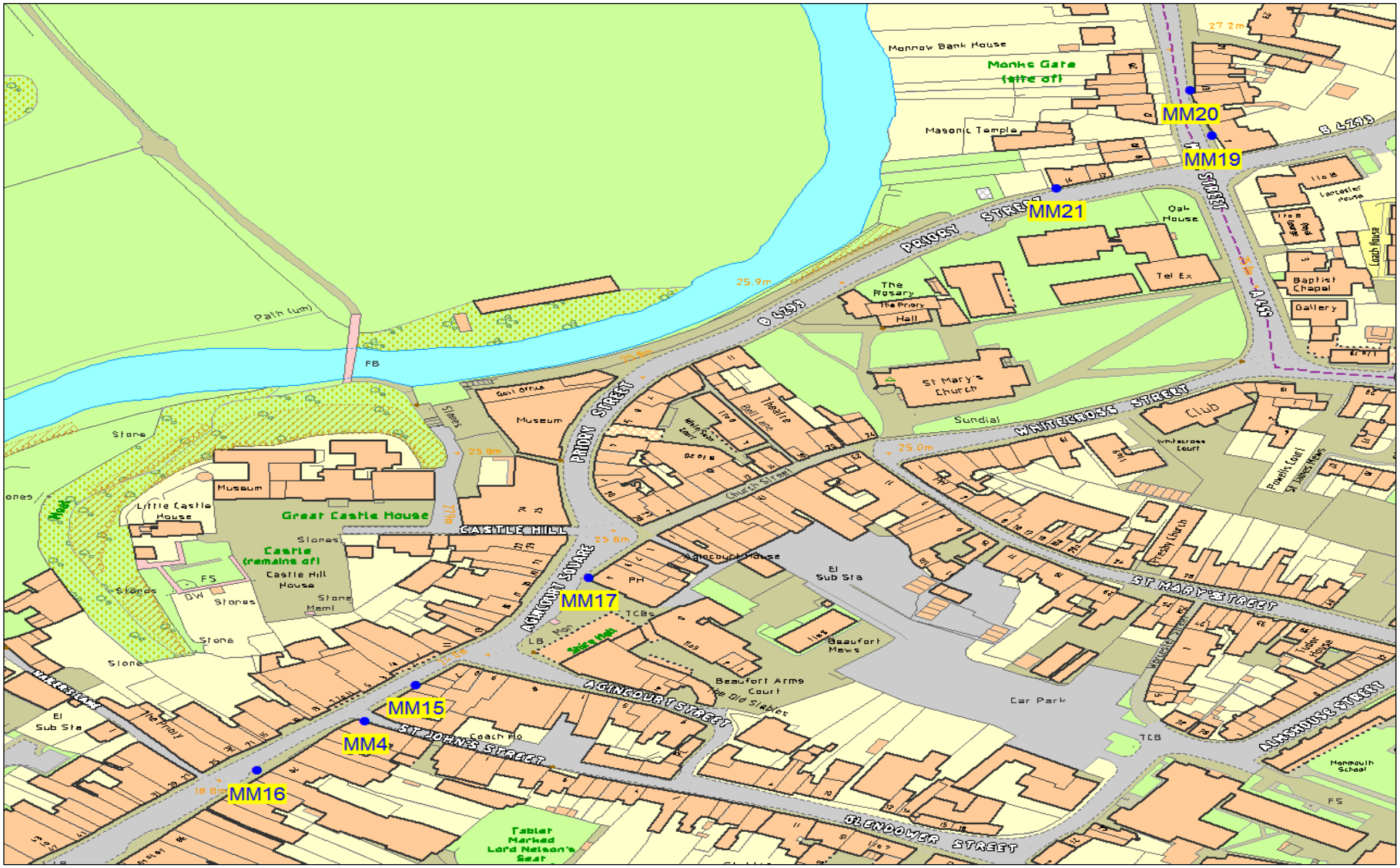
Nitrogen Dioxide Monitoring Locations – Woodside, Usk



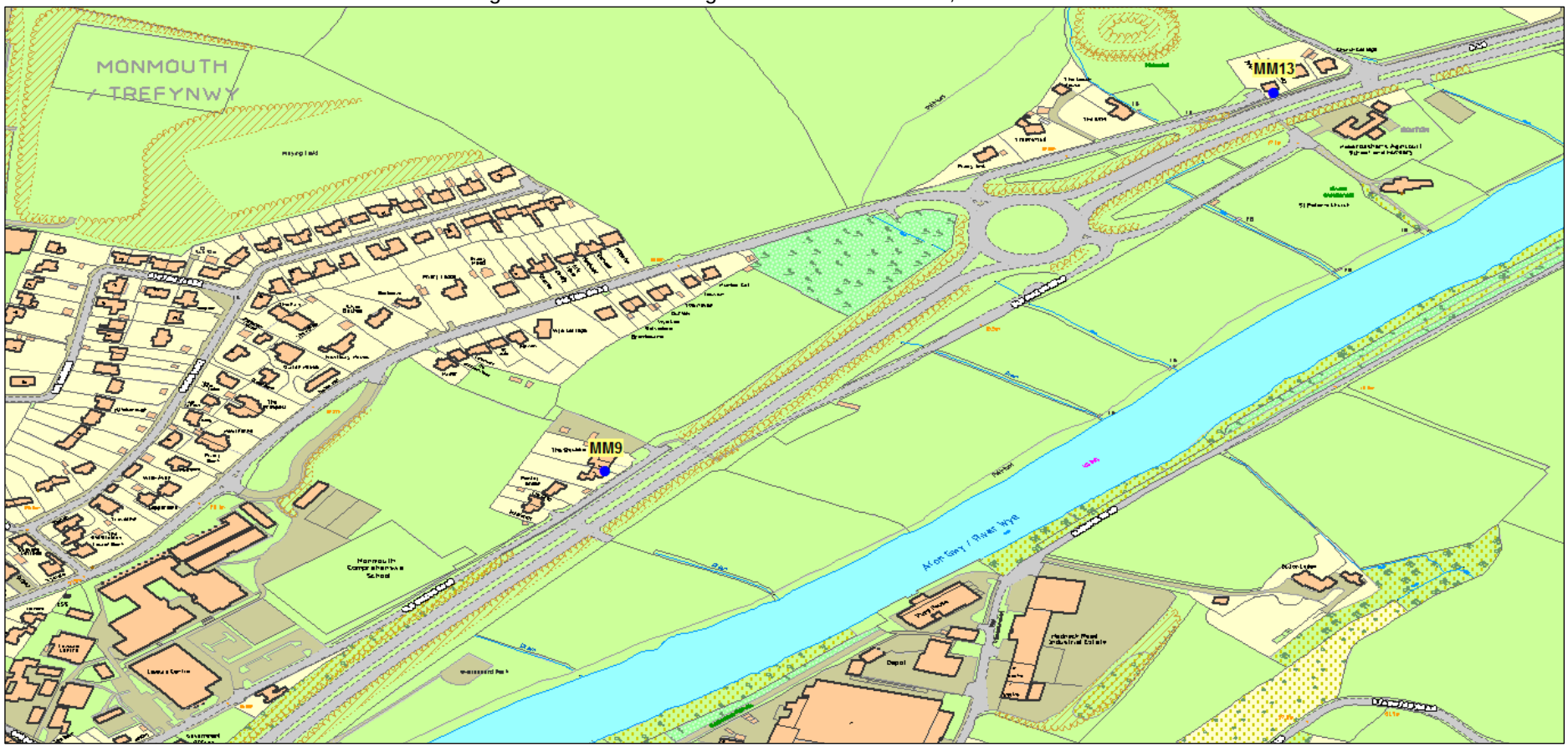
Nitrogen Dioxide Monitoring Locations – Monmouth, A40/Wyebridge Street



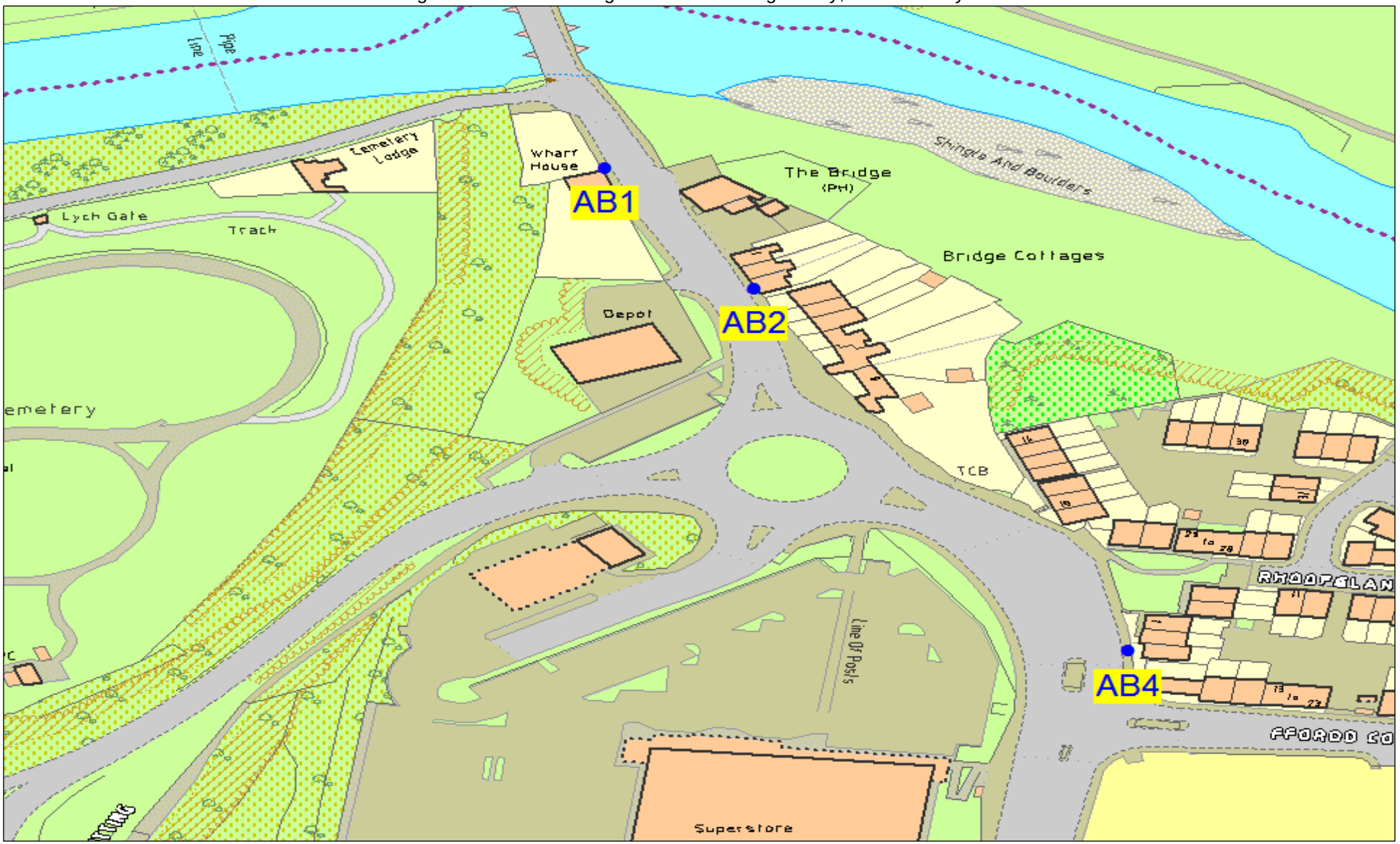
Nitrogen Dioxide Monitoring Locations – Monmouth, Monnow Street & Monk Street/Priory Street junction



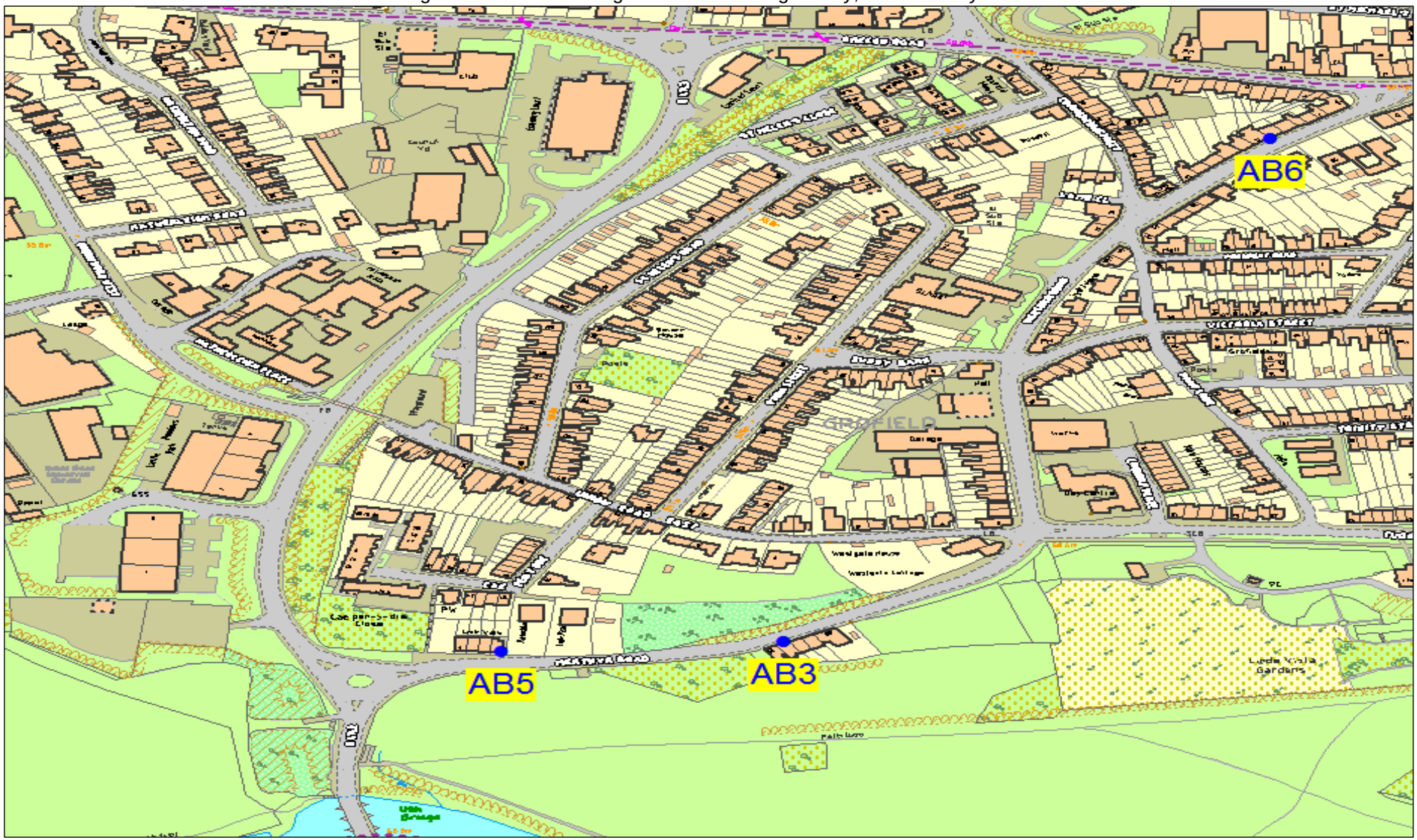
Nitrogen Dioxide Monitoring Locations – Monmouth, Old Dixton Road



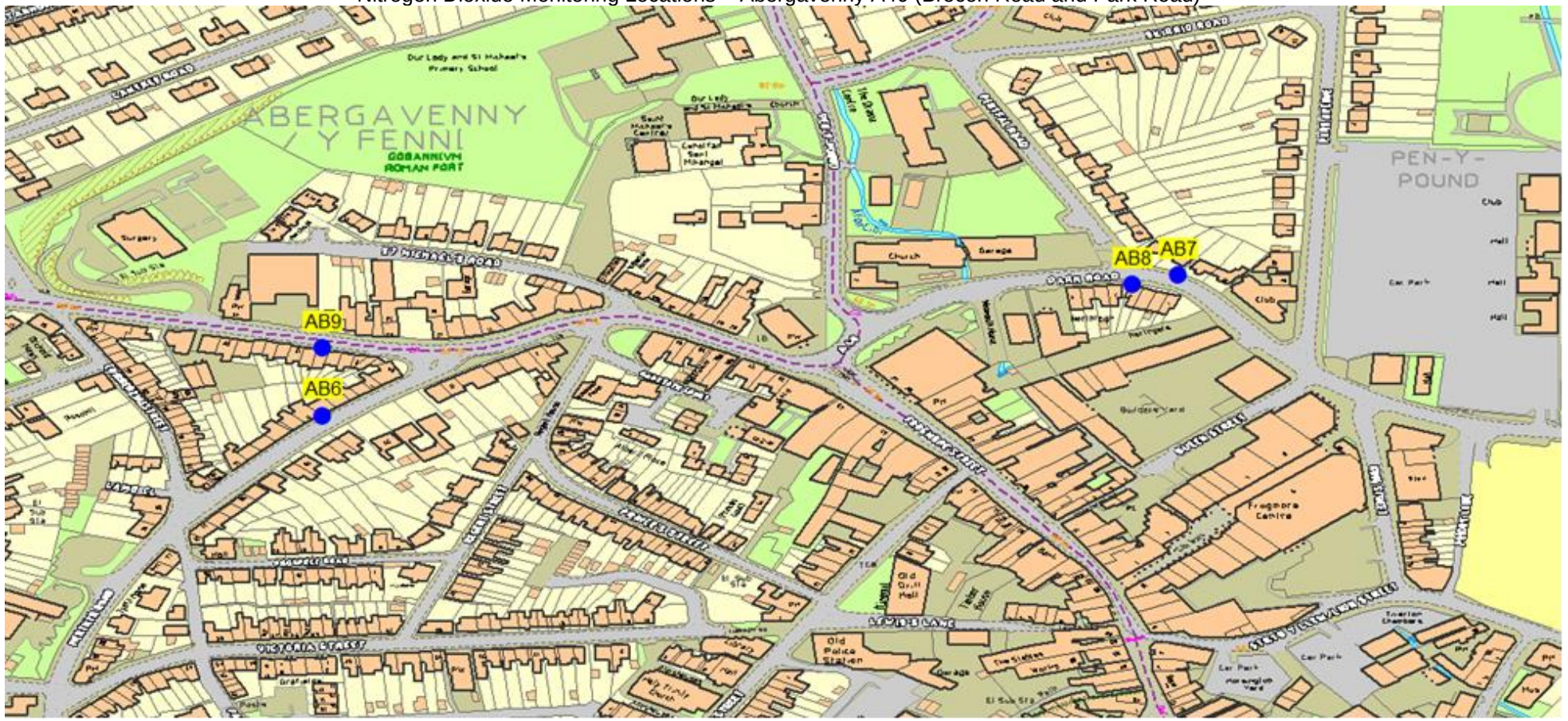
Nitrogen Dioxide Monitoring Locations – Abergavenny, South Merthyr Road



Nitrogen Dioxide Monitoring Locations – Abergavenny, North Merthyr Road

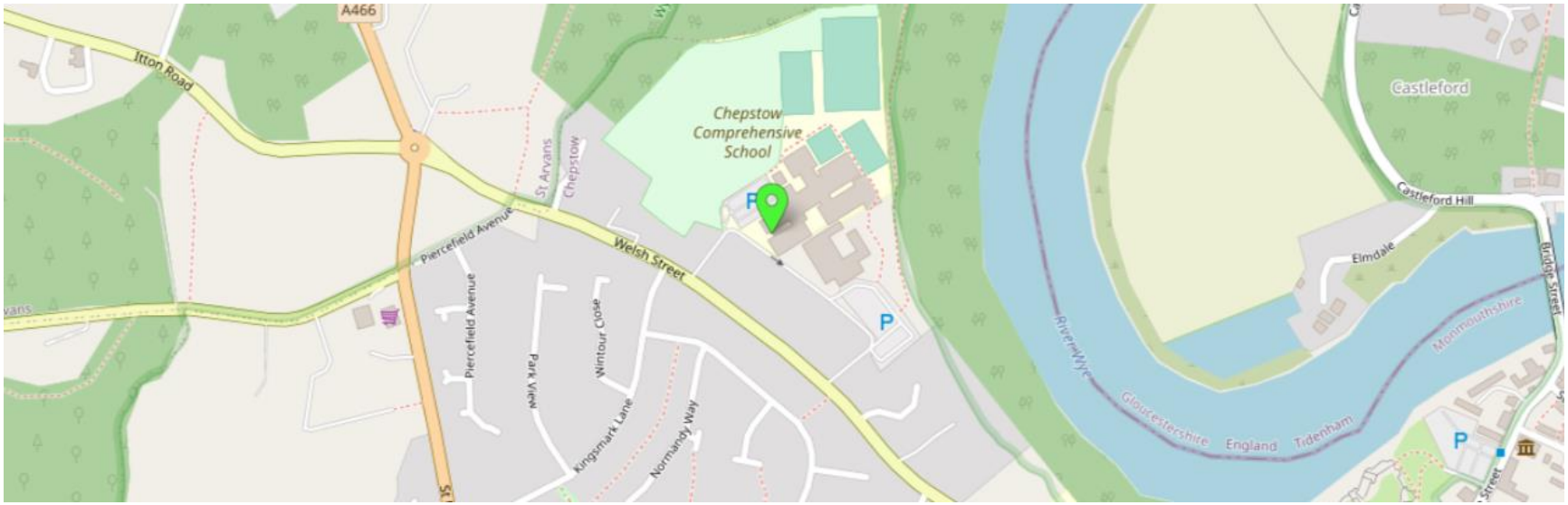


Nitrogen Dioxide Monitoring Locations – Abergavenny A40 (Brecon Road and Park Road)

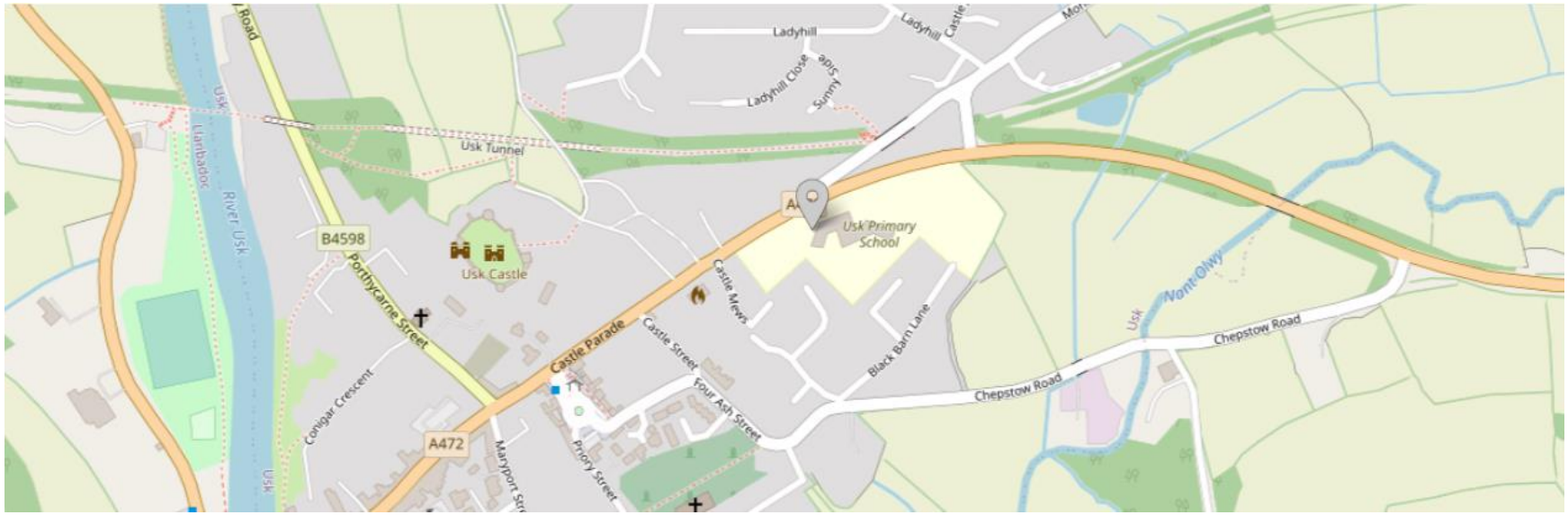


AB6 was removed and AB9 was installed January 2020

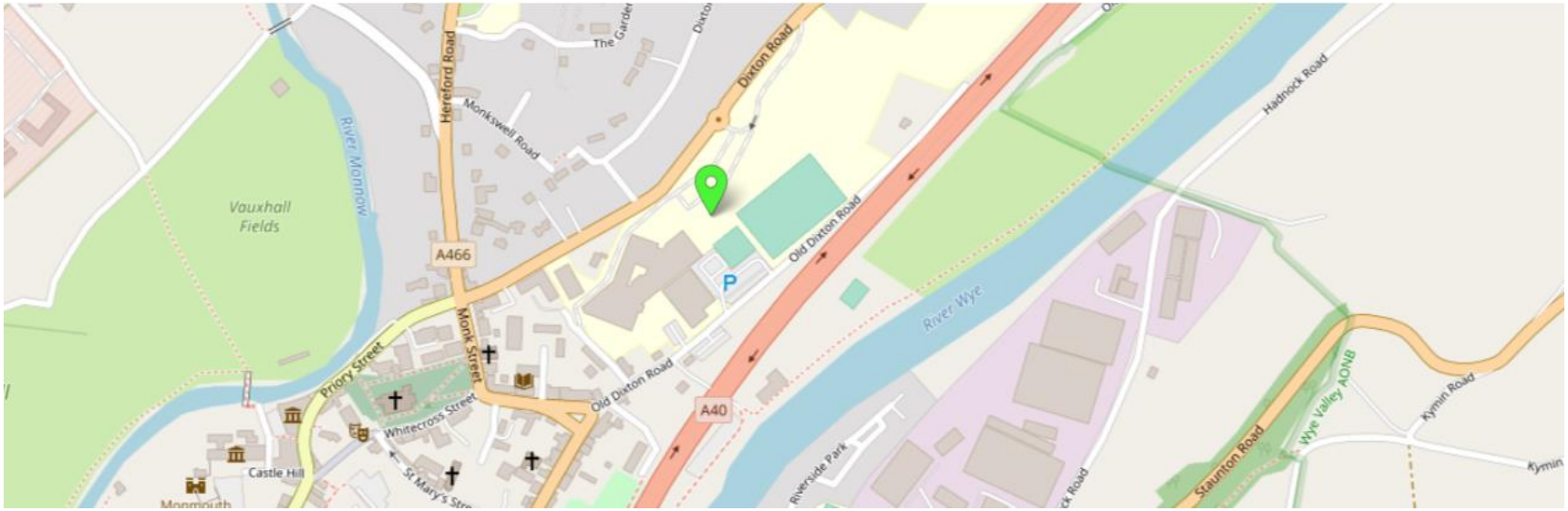
Air Quality Sensor – Chepstow Comprehensive School



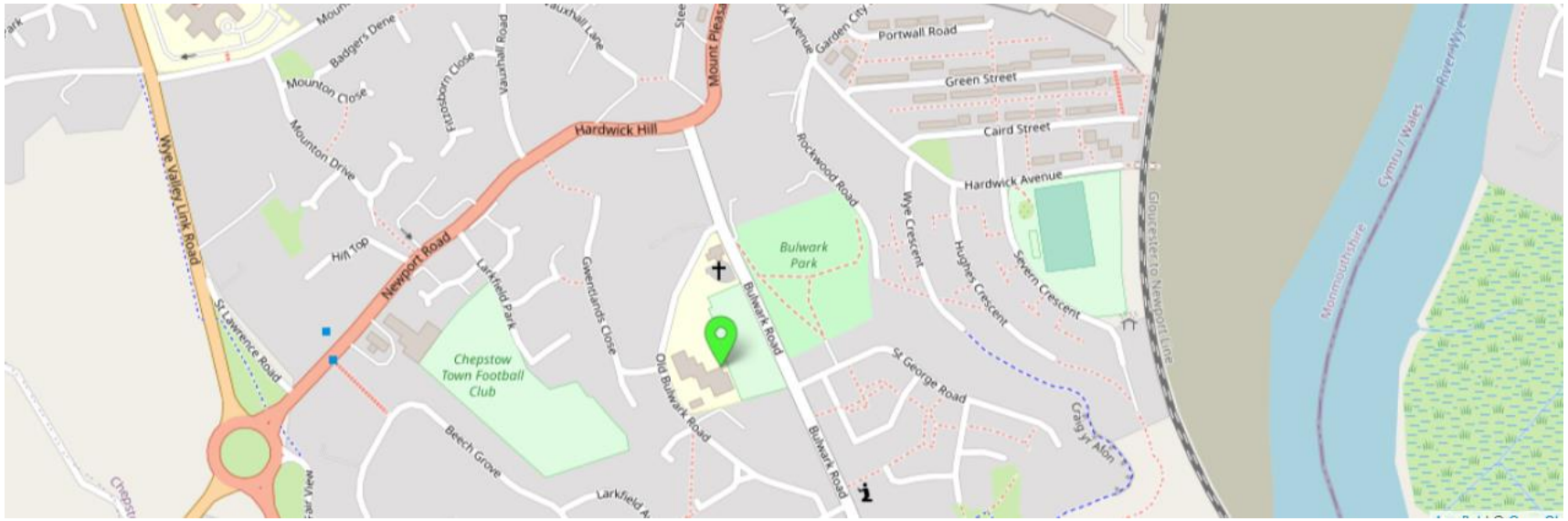
Air Quality Sensor – Usk Primary School



Air Quality Sensor – Monmouth Comprehensive School



Air Quality Sensor – St Mary's Primary School



2.2 2021 Air Quality Monitoring Results

Table 2.3 – Annual Mean NO_2 Monitoring Results ($\mu g/m^3$)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$)														
					2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Annual Bias Adjustment Factor (diffusion tubes only)					0.84	0.85	0.84	0.88	0.89	0.94	0.95	0.91	0.91	0.92	0.87	0.92	0.93	0.77	0.84
AQMS	Roadside	Automatic Chemiluminescence	99	99	36.9	41.9	38.0	39.0	40.0	39.1	34.5	38.6	37	35	35	36	39	26	29
AQT CC	School	Air Quality Sensor	100	100													23	26.1	28.6
AQT UP	School	Air Quality Sensor	91	91													25.1	31.1	34.3
AQT MC	School	Air Quality Sensor	91	91														31.5	33.5
AQTSMP	School	Air Quality Sensor	100	66															12.7
CH1	Roadside	Diffusion Tube	100	100	20.0	24.0	21.0	23.5	22.6	25.3	22.4	21.8	22.5	22.9	22.2	19.1	20.1	13.6	15.6
CH2a [3]	Roadside	Diffusion Tube	92	92	28.0	33.0	30.0	31.0	30.7	32.0	30.4	33.1	30.9	31.0	27.9	27.8	28.4	22.6	27.9
CH3	Roadside	Diffusion Tube	92	92	27.0	31.0	27.0	28.7	32.8	35.5	32.7	32.5	29.8	31.1	29.9	26.5	28.8	20.4	23.4
CH4	Roadside/	Diffusion Tube	92	92	**49.0**	**57.0**	**54.0**	**51.5**	**60.1**	**60.3**	**56.0**	**57.7**	**51.4**	**53.2**	**51.1**	**42.5**	**42.3**	31.6	36.0
CH5	Roadside	Diffusion Tube	100	100	29.0	32.0	30.0	30.3	30.4	33.2	28.4	26.1	25.9	26.7	26.8	23.5	26.0	19.1	19.0
CH6	Roadside	Diffusion Tube	100	100	37.0	**41.0**	36.0	39.2	40.7	**42.6**	**41.7**	**40.0**	36.8	37.6	37.1	34.3	34.7	27.4	28.2
CH7	Roadside	Diffusion Tube	100	100	29.0	32.0	30.0	31.5	30.4	33.7	30.6	28.4	26.9	27.9	25.9	25.1	25.5	18.1	22.0
CH8	Kerbside/ Urban Centre	Diffusion Tube	92	92	28.0	33.0	32.0	32.5	32.9	35.5	31.1	31.8	28.1	27.7	27.1	26.4	26.3	18.3	21.0
CH9	Roadside	Diffusion Tube	100	100	25.0	29.0	28.0	28.7	30.5	30.7	28.1	27.8	25.5	27.2	26.8	23.6	24.2	17.4	20.5
PWLL1[3]	Roadside	Diffusion Tube	100	100													25.5	32.0	35.8

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	NO_2 Annual Mean Concentration (µg/m³)														
					2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Annual Bias Adjustment Factor (diffusion tubes only)					0.84	0.85	0.84	0.88	0.89	0.94	0.95	0.91	0.91	0.92	0.87	0.92	0.93	0.77	0.84
PWLL2[3]	Roadside	Diffusion Tube	100	100													26.5	19.9	23.8
PWLL3[3]	Roadside	Diffusion Tube	100	100													29.9	30.6	32.9
PWLL4	Roadside	Diffusion Tube	100	100													21	14.0	16.4
MM1	Roadside	Diffusion Tube	100	100	39.0	38.5	37.3	36.6	36.9	39.0	34.1	34.9	32.8	33.1	33.9	31.6	30.4	22.9	24.9
MM2	Intermediate	Diffusion Tube	100	100	31.0	31.7	30.0	31.3	31.7	30.2	29.9	30.0	26.1	26.5	26.9	25.7	23.5	15.6	18.7
MM3	Kerbside	Diffusion Tube	92	92	30.0	27.8	27.6	30.0	29.8	27.7	26.3	26.3	22.9	23.4	23.9	22.5	21.2	15.2	16.7
MM4	Kerbside/ Urban Centre	Diffusion Tube	83	83	38.0	37.1	34.6	36.1	34.9	36.7	35.7	29.8	26.0	26.4	25.2	24.1	24.8	15.1	16.9
MM7	Intermediate	Diffusion Tube	100	100								27.4	24.3	25.3	23.8	22.9	21.5	14.3	17.1
MM9	Intermediate	Diffusion Tube	92	92								24.7	21.8	23.2	21.5	20.5	18.7	15.0	14.8
MM11	Roadside	Diffusion Tube	92	92								31.6	26.4	30.2	27.0	29.0	24.6	17.6	22.4
MM13	Roadside	Diffusion Tube	100	100								35.2	32.5	32.1	35.1	32.5	30.0	20.6	22.3
MM15	Roadside/ Urban Centre	Diffusion Tube	100	100								32.9	33.1	33.7	32.3	31.8	30.7	17.4	23.3
MM16	Roadside/ Urban Centre	Diffusion Tube	67	67								24.7	30.0	30.6	27.9	26.6	26.5	15.1	18.9
MM17	Roadside/ Urban Centre	Diffusion Tube	100	100									22.6	24.5	22.7	21.6	21.6	12.2	15.3
MM18	Roadside	Diffusion Tube	100	100									26.7	28.1	28.7	25.9	24.1	15.8	19.5
MM19	Roadside	Diffusion Tube	100	100									29.3	31.2	28.2	30.0	27.6	17.0	21.3
MM21	Roadside	Diffusion Tube	100	100									32.1	34.6	32.6	32.2	29.8	15.9	22.0
AB1[3]	Kerbside	Diffusion Tube	100	100	34.0	36.5	36.0	38.6	39.4	**41.4**	37.5	39.3	36.1	38.4	38.0	36.9	35.4	27.3	29.8

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2021 (%) [2]	NO_2 Annual Mean Concentration (µg/m^3)														
					2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Annual Bias Adjustment Factor (diffusion tubes only)					0.84	0.85	0.84	0.88	0.89	0.94	0.95	0.91	0.91	0.92	0.87	0.92	0.93	0.77	0.84
AB2	Roadside	Diffusion Tube	100	100						**43.9**	36.7	39.1	34.4	35.0	32.7	33.8	31.4	21.7	25.5
AB3	Roadside	Diffusion Tube	100	100						36.8	30.0	29.0	26.1	26.8	25.4	28.5	27.5	17.0	20.6
AB4	Roadside	Diffusion Tube	100	100							27.6	27.8	26.5	26.4	25.5	27.6	25.0	18.5	20.7
AB5	Roadside	Diffusion Tube	92	92							21.4	19.8	17.2	19.4	18.6	19.0	17.9	11.6	13.6
AB7	Kerbside	Diffusion Tube	50	50													22.6	17.2	17.1
AB8	Roadside	Diffusion Tube	58	58													20.1	13.5	16.9
AB9	Roadside	Diffusion Tube																24.3	26.3
USK1	Roadside	Diffusion Tube	100	100	33.0	32.8	31.1	34.9	32.9	33.0	33.5	34.3	30.1	30.5	31.7	27.2	28.5	19.2	19.7
USK2	Roadside/ Urban Centre	Diffusion Tube	100	100	37.0	37.2	34.4	**40.9**	37.0	38.3	37.2	37.3	34.1	34.4	34.7	31.3	31.4	23.5	24.6
USK3	Roadside/ Urban Centre	Diffusion Tube	100	100	**40.0**	38.9	35.3	**40.6**	39.7	**41.9**	**40.3**	37.6	32.8	35.1	36.6	32.1	33.3	20.6	23.0
USK4	Roadside/ Urban Centre	Diffusion Tube	100	100	39.0	39.0	35.4	**41.7**	**40.7**	**43.5**	**42.0**	**40.4**	34.1	35.2	35.1	30.4	31.3	19.6	22.0
USK5	Roadside/ Urban Centre	Diffusion Tube	100	100	**49.0**	**45.6**	**41.9**	**45.0**	39.7	**44.6**	**43.1**	**40.9**	38.2	37.8	35.2	30.0	30.8	24.3	25.0
USK6	Roadside/ Urban Centre	Diffusion Tube	100	100	24.0	21.6	20.9	25.6	20.7	22.6	22.2	20.6	19.2	20.8	20.8	19.6	19.3	14.2	15.5
WS1	Kerbside	Diffusion Tube	100	100											25.8	23.8	23.5	16.3	18.0
WS2	Roadside	Diffusion Tube	92	92											29.6	27.1	27.8	18.5	19.7
WS3	Roadside	Diffusion Tube	100	100											21.3	22.6	20.4	14.0	16.1

Notes:

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

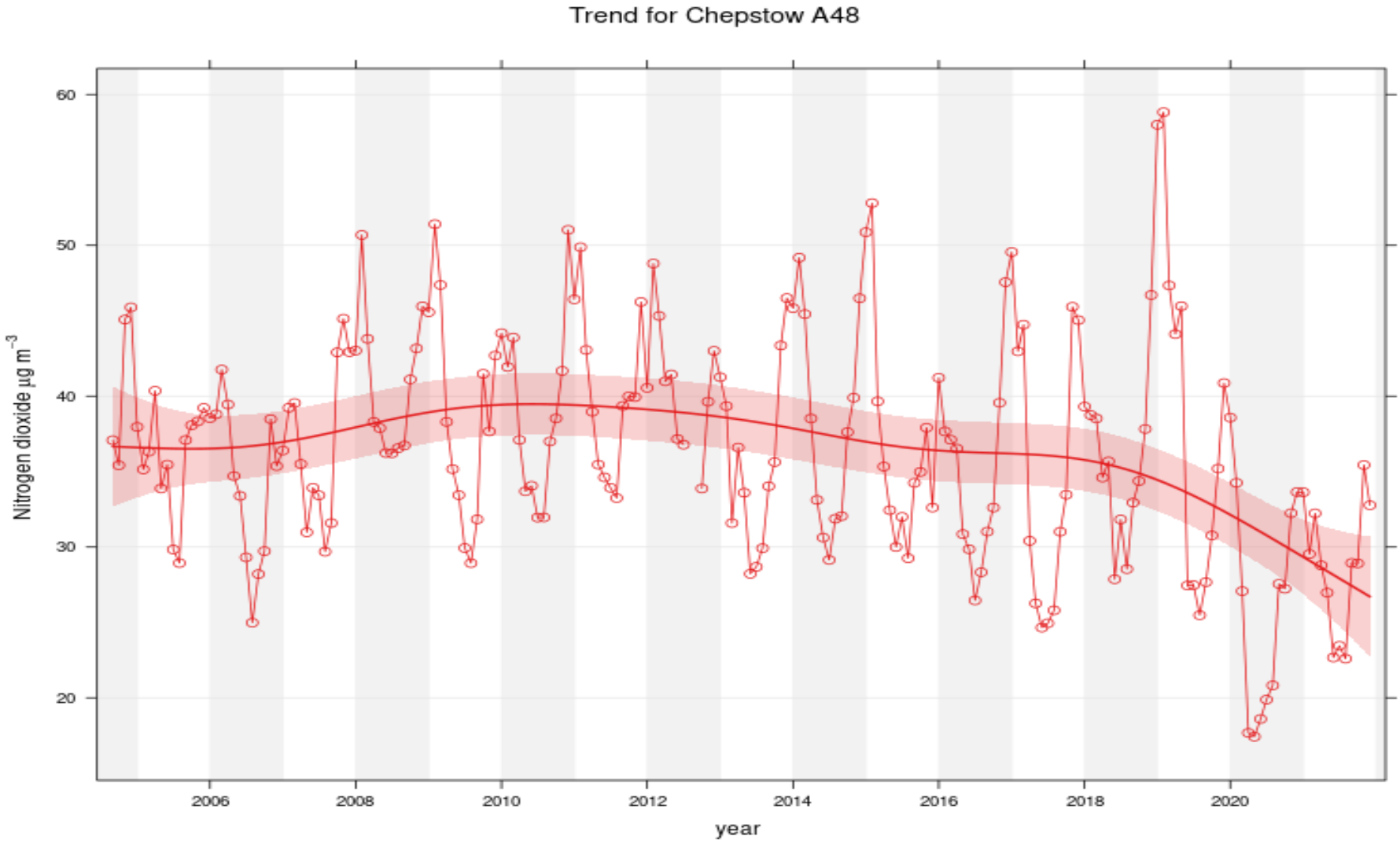
NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

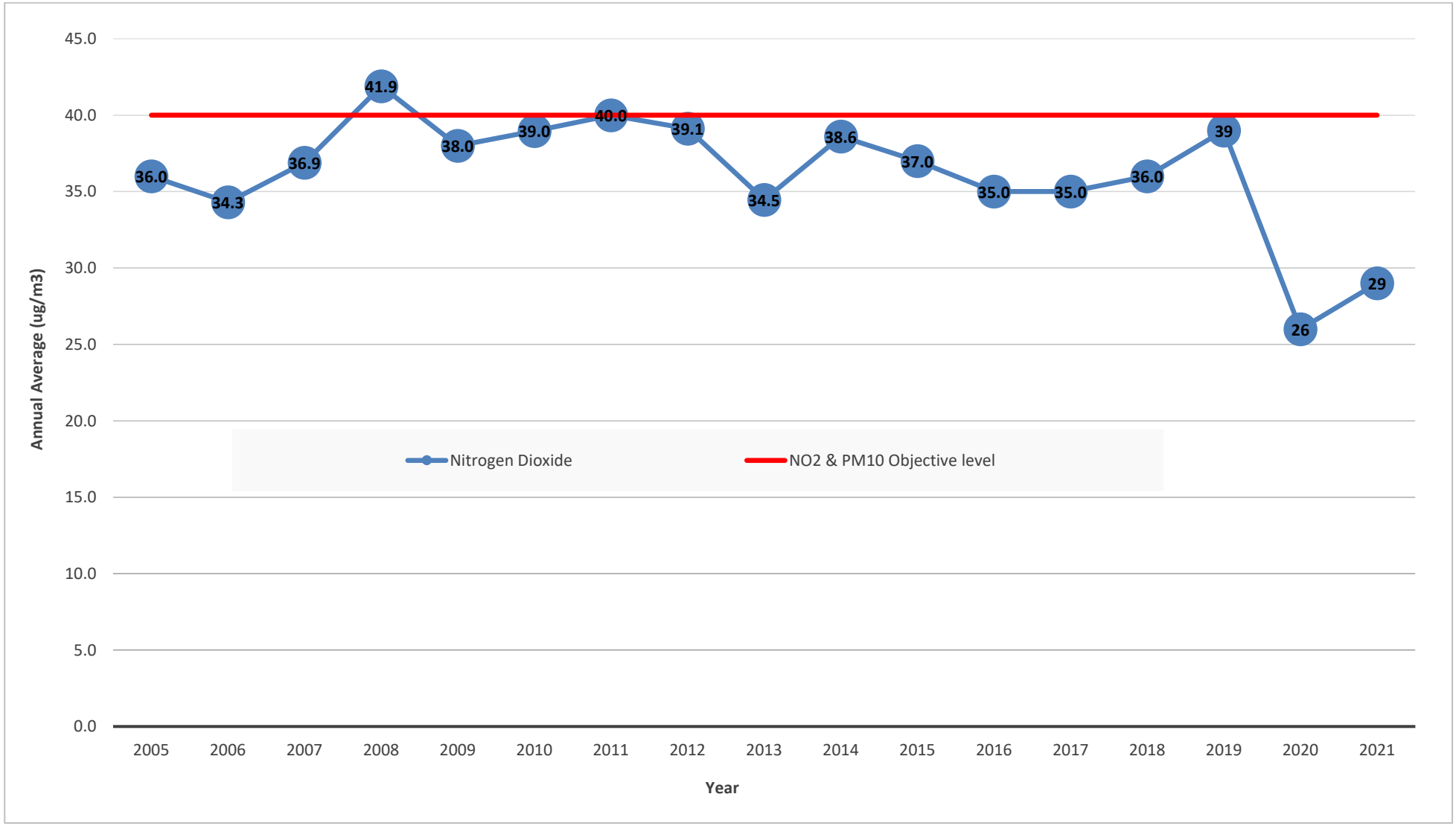
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
In 2020 (due to COVID-19) the valid monitoring period is ten months - March – December 2020 for tubes analysed by SOCOTEC. January and February tubes were analysed by Gradko and were not used in the calculation of the annual mean, or calculation of the BAF
(2) Data capture for the full calendar year (e.g., if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).
(3) Prior to 2020 AB1, CH2a, PWLL1, PWLL2, PWLL3 were distance corrected to the nearest receptor. From 2020 onwards they are only distance corrected if the uncorrected value is within 10% of the objective level (i.e., 36µg/m^3 or above). As such 2020 onwards concentrations for these locations could be higher than previous year's as they show the actual concentration at the tube/kerbside/roadside, rather than the concentration at the nearest receptor, unless their uncorrected concentration is above 36µg/m^3.

Figure 2.3 – Trends in Annual Mean NO_2 Concentrations

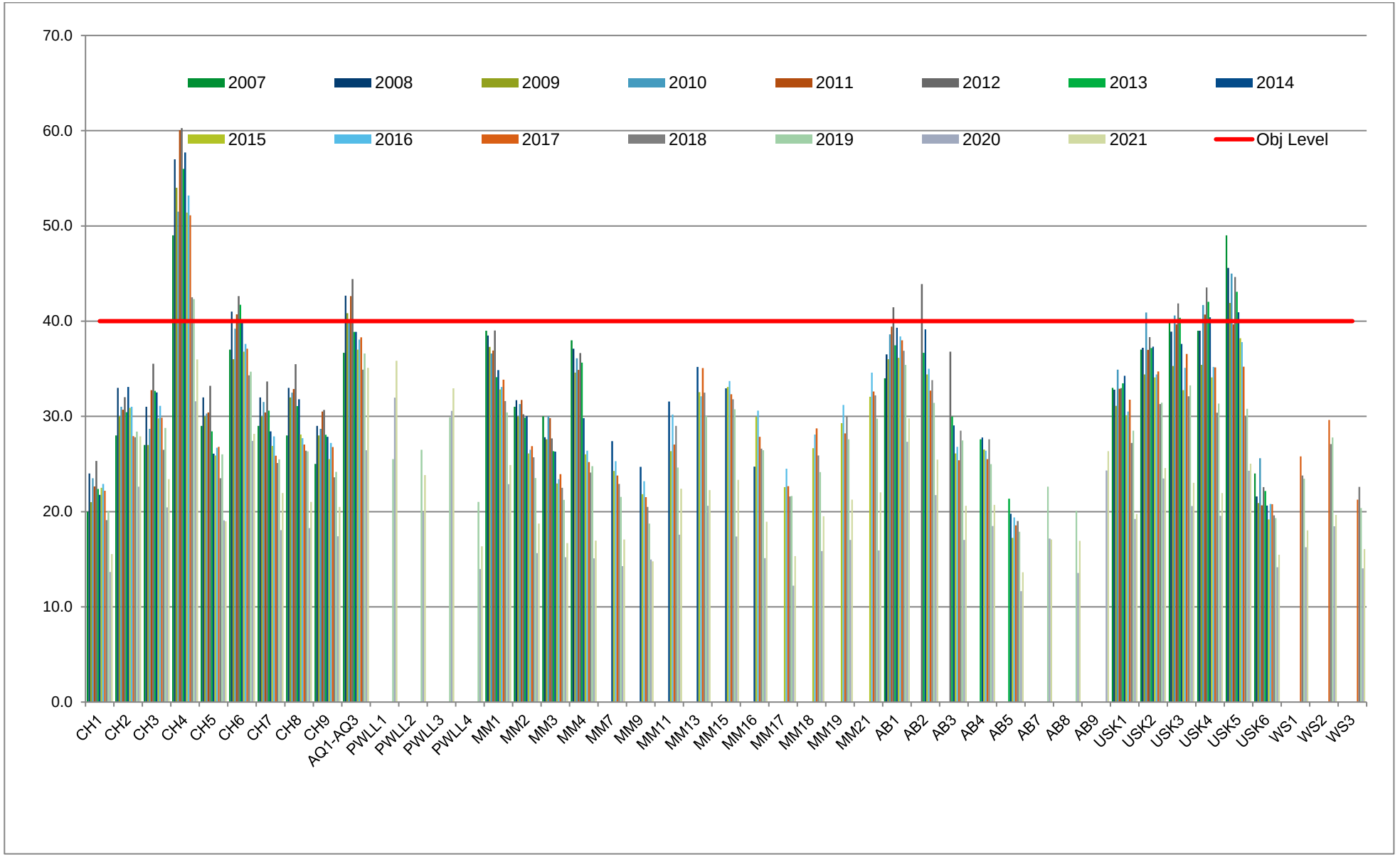
Automatic analyser – (AQMS) nitrogen dioxide monthly average with smoothed trend line 2005-2021



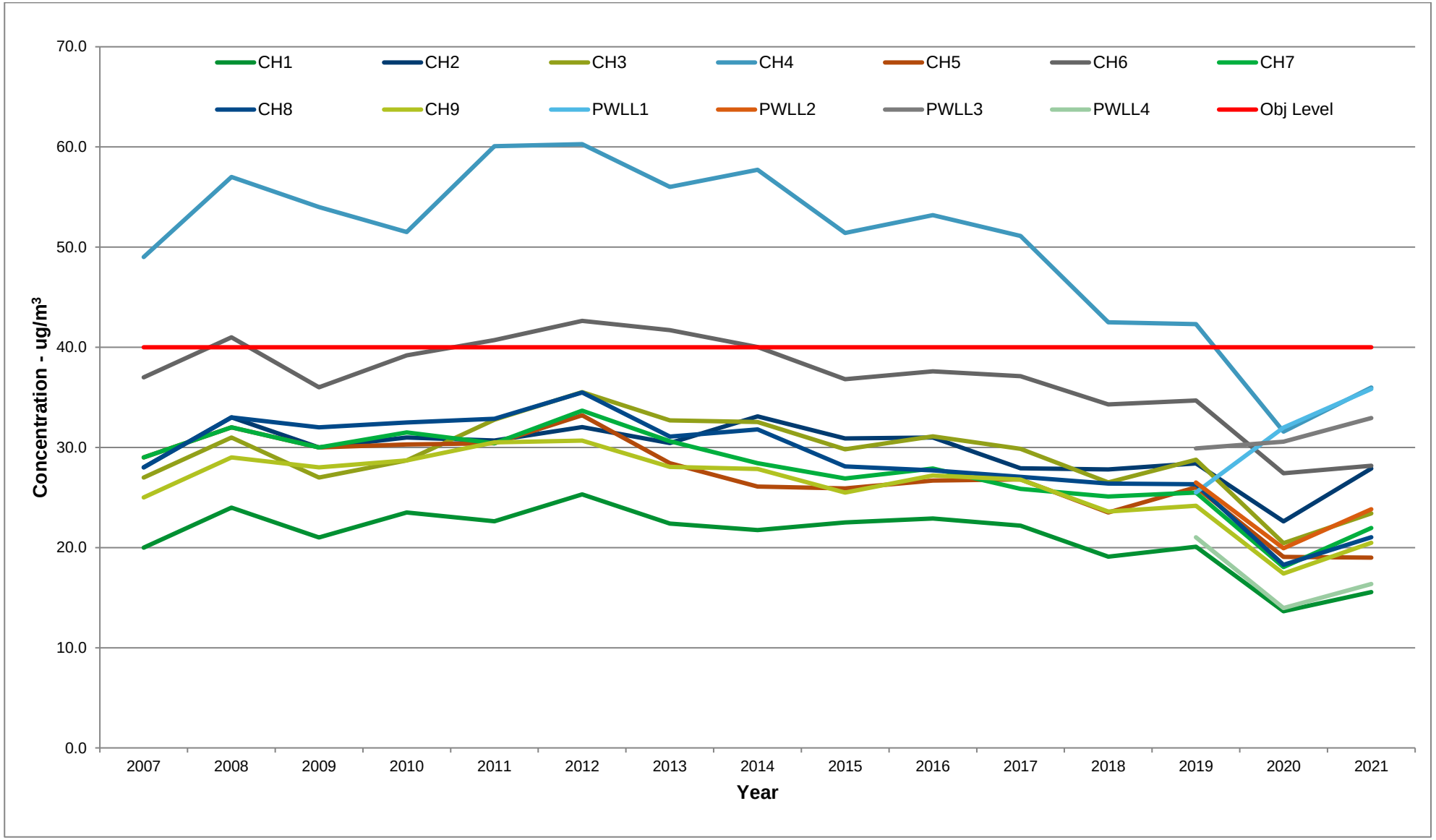
Automatic analyser – (AQMS) nitrogen dioxide annual mean 2005-2021



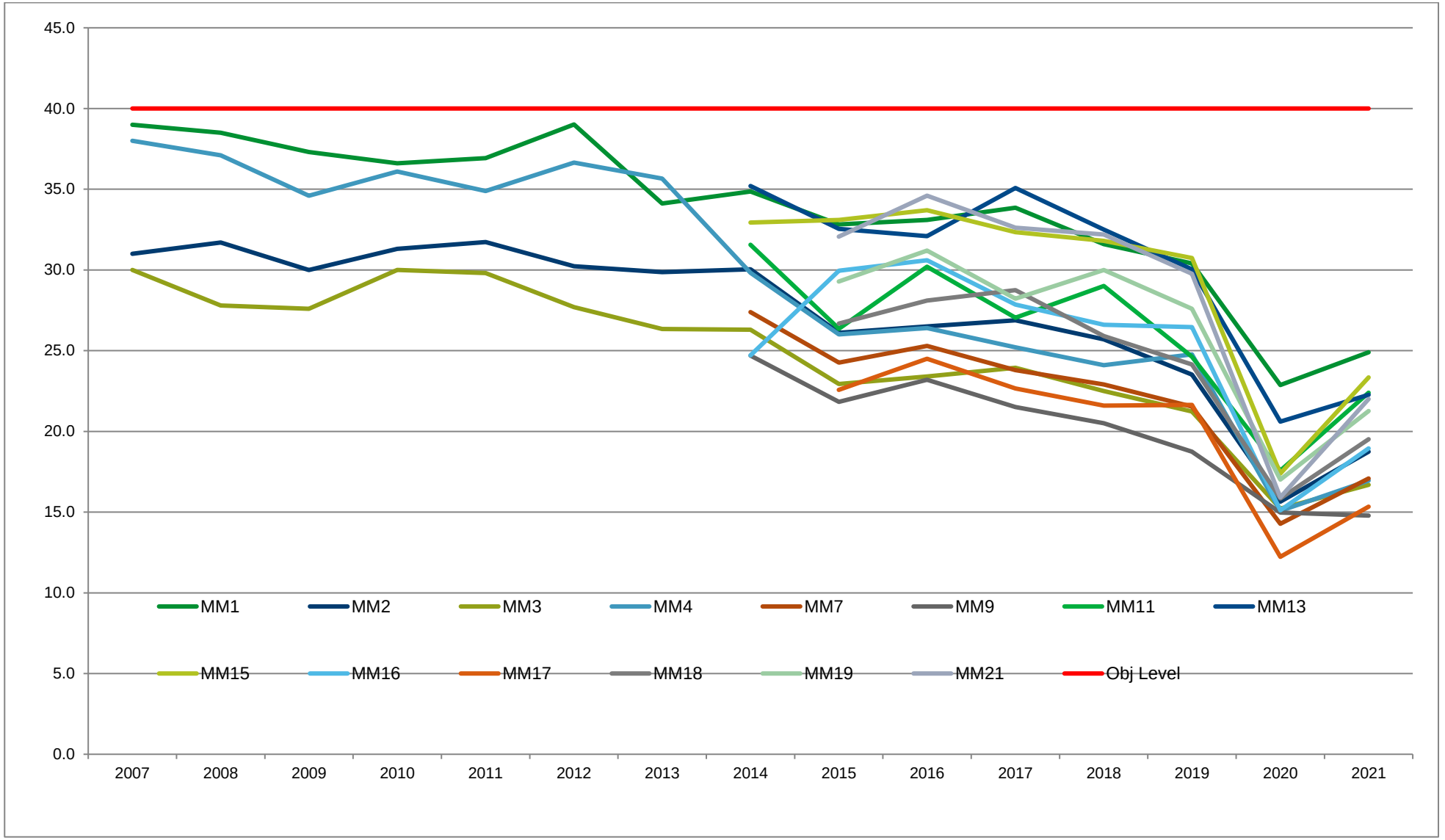
Diffusion Tubes trends (all locations) – 2007-2021



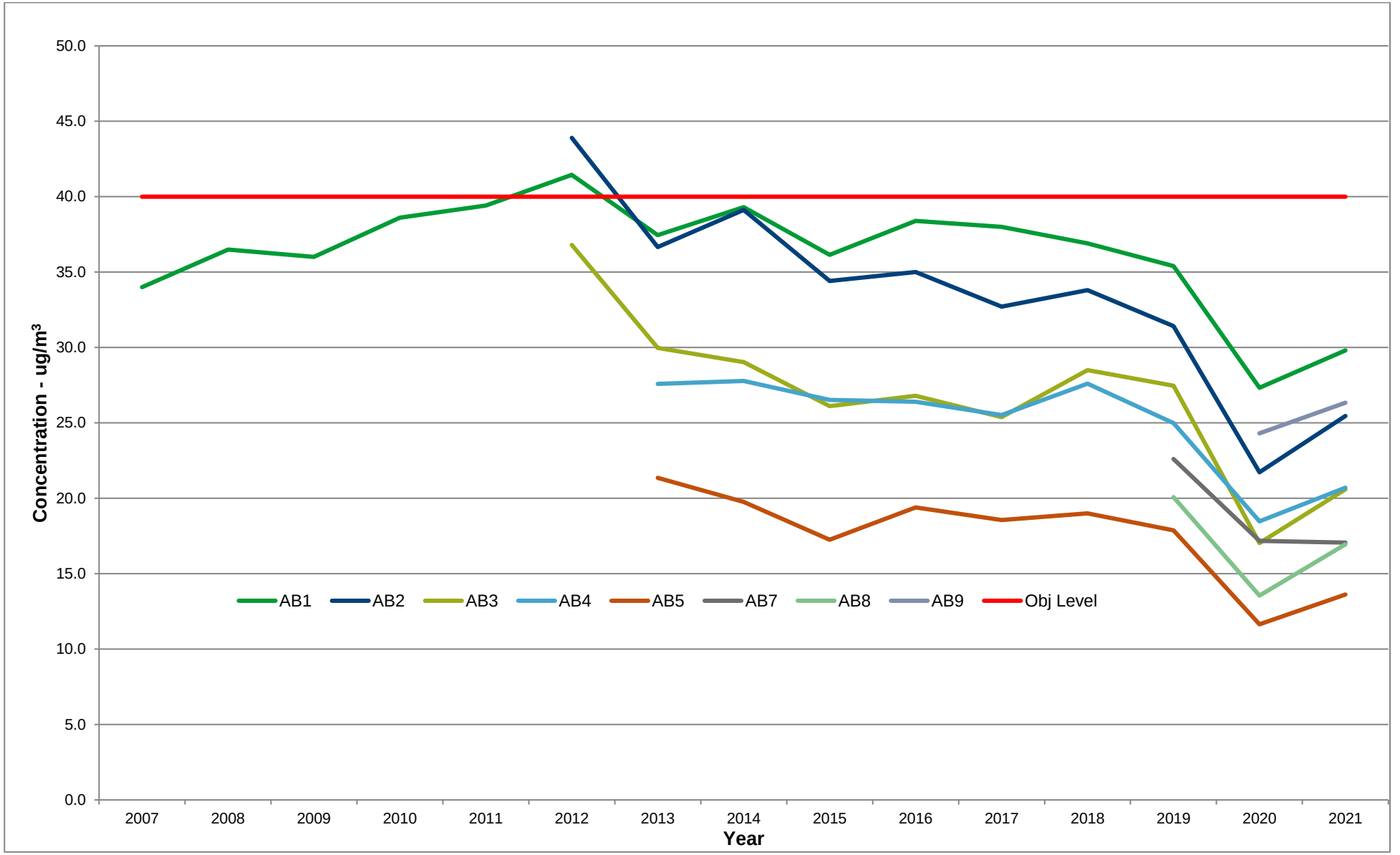
Diffusion Tubes trends (Chepstow & Pwllmeyric) – 2007-2021



Diffusion Tubes trends (Monmouth) – 2007-2021



Diffusion Tubes trends (Abergavenny) – 2007-2021



Diffusion Tubes trends (Usk & Woodside) – 2007-2021

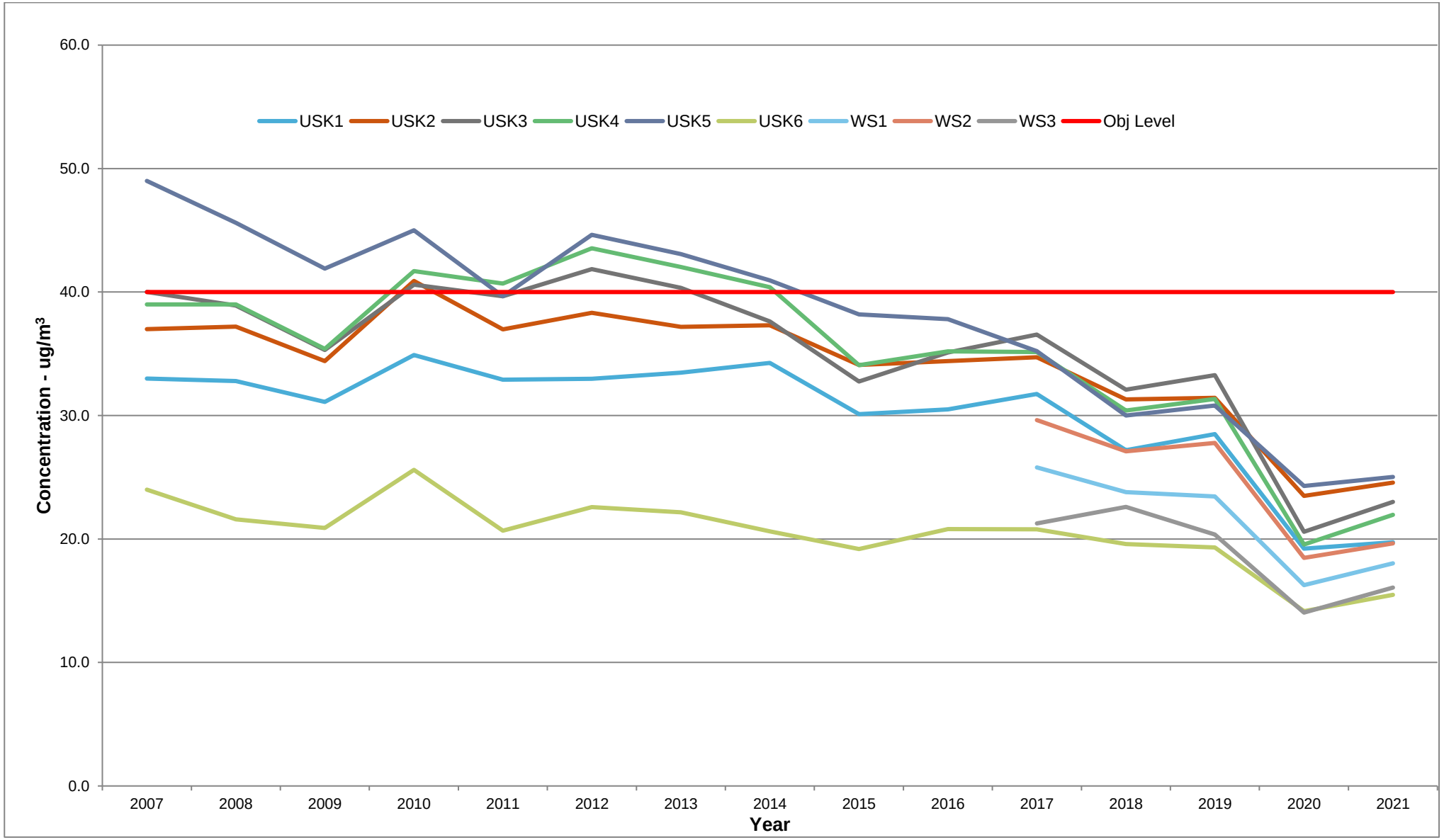


Table 2.4 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	NO_2 1-Hour Means > 200µg/m^3								
					2013	2014	2015	2016	2017	2018	2019	2020	2021
AQMA	Roadside	Automatic Chemiluminescence	99	99	0	0	2	0	0	0	1	0	0
1-hour mean objective					**200µg/m^3 not to be exceeded more than 18 times/year**								

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**.

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

(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%).

Table 2.5 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM_{10} Annual Mean Concentration (µg/m^3)								
					2013	2014	2015	2016	2017	2018	2019	2020	2021
AQMA	Roadside	Automatic BAM	96	96	19	18	17	18	16	18	20	17	16
Annual mean objective					**40µg/m^3**								

Notes:

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

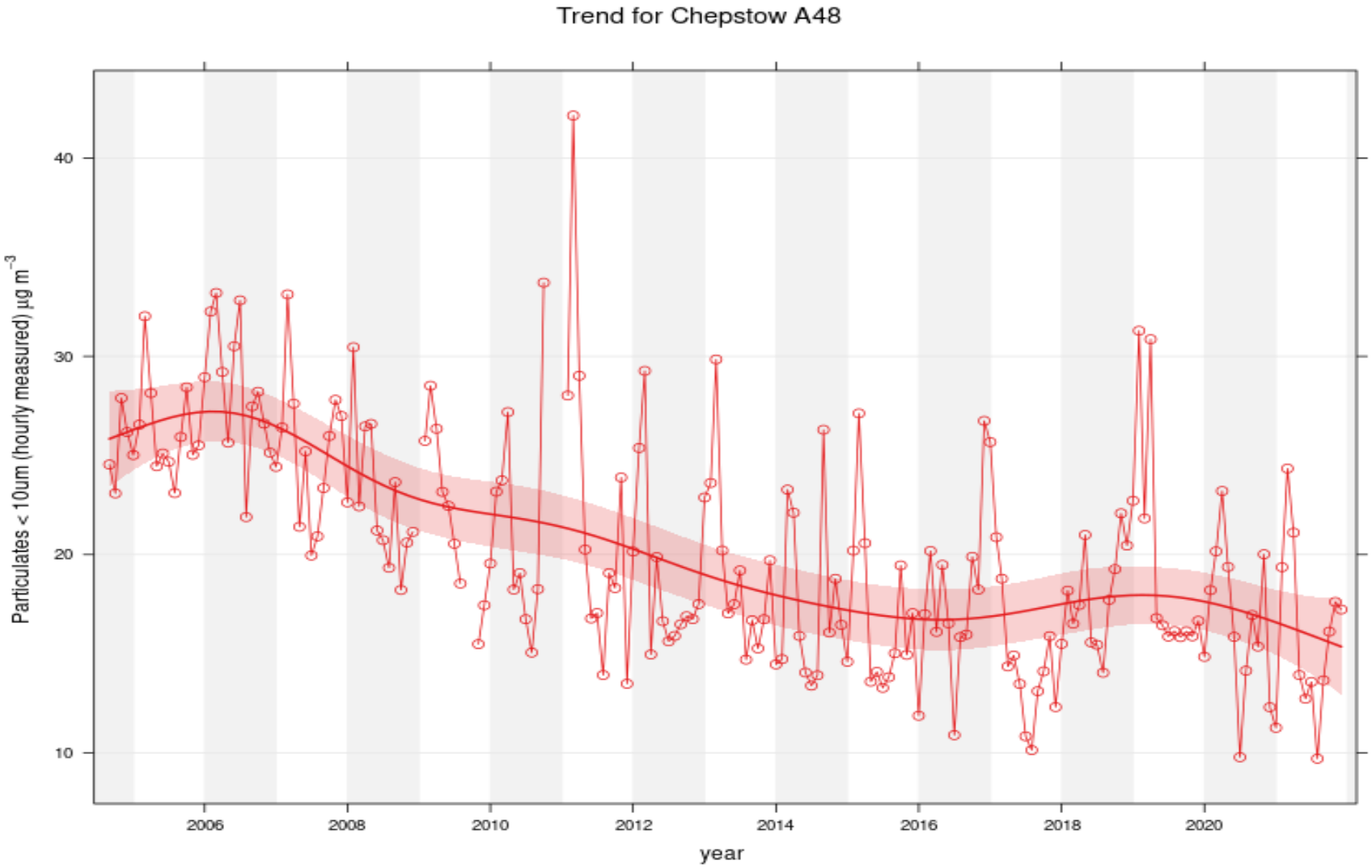
All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

Figure 2.4 – Trends in Annual Mean PM_{10} Concentrations

Automatic analyser – AQMS – PM_{10} monthly average with smoothed trend line



Automatic analyser – (AQMS) PM10 annual mean

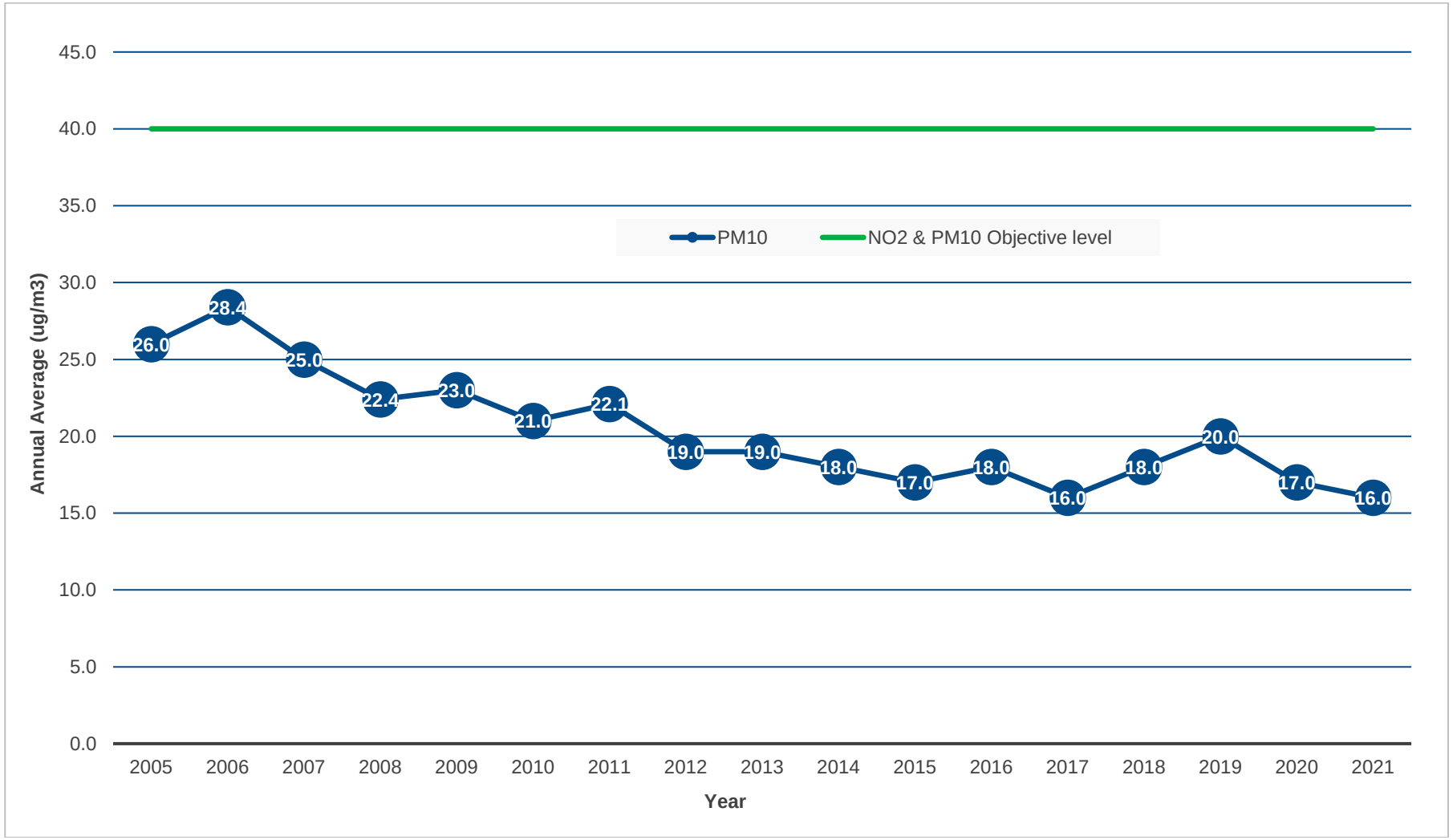


Table 2.6 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3								
					2013	2014	2015	2016	2017	2018	2019	2020	2021
AQMA	Roadside	Automatic BAM	96	96	4	2	5	1	2	0	7	0	1
24-hour mean objective					**50µg/m^3 not to be exceeded more than 35 times/year**								

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**.

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

(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%).

Table 2.7 – $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	$PM_{2.5}$ Annual Mean Concentration (µg/m^3)								
					2013	2014	2015	2016	2017	2018	2019	2020	2021
AQMA	Roadside	Automatic BAM	87	87	14	14	10	11	10	10	13	9	8
Annual mean limit value					25µg/m^3								

Notes:

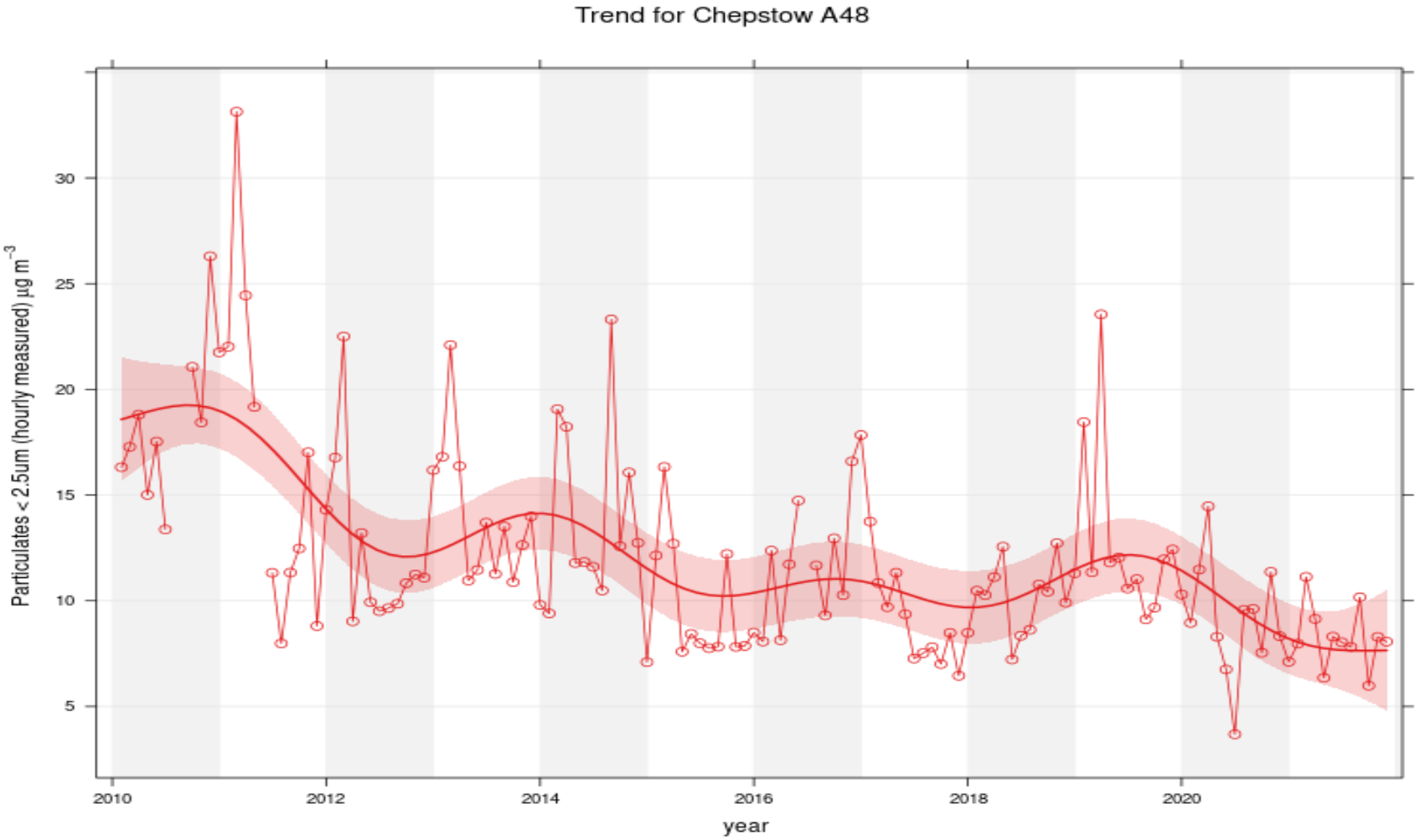
All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

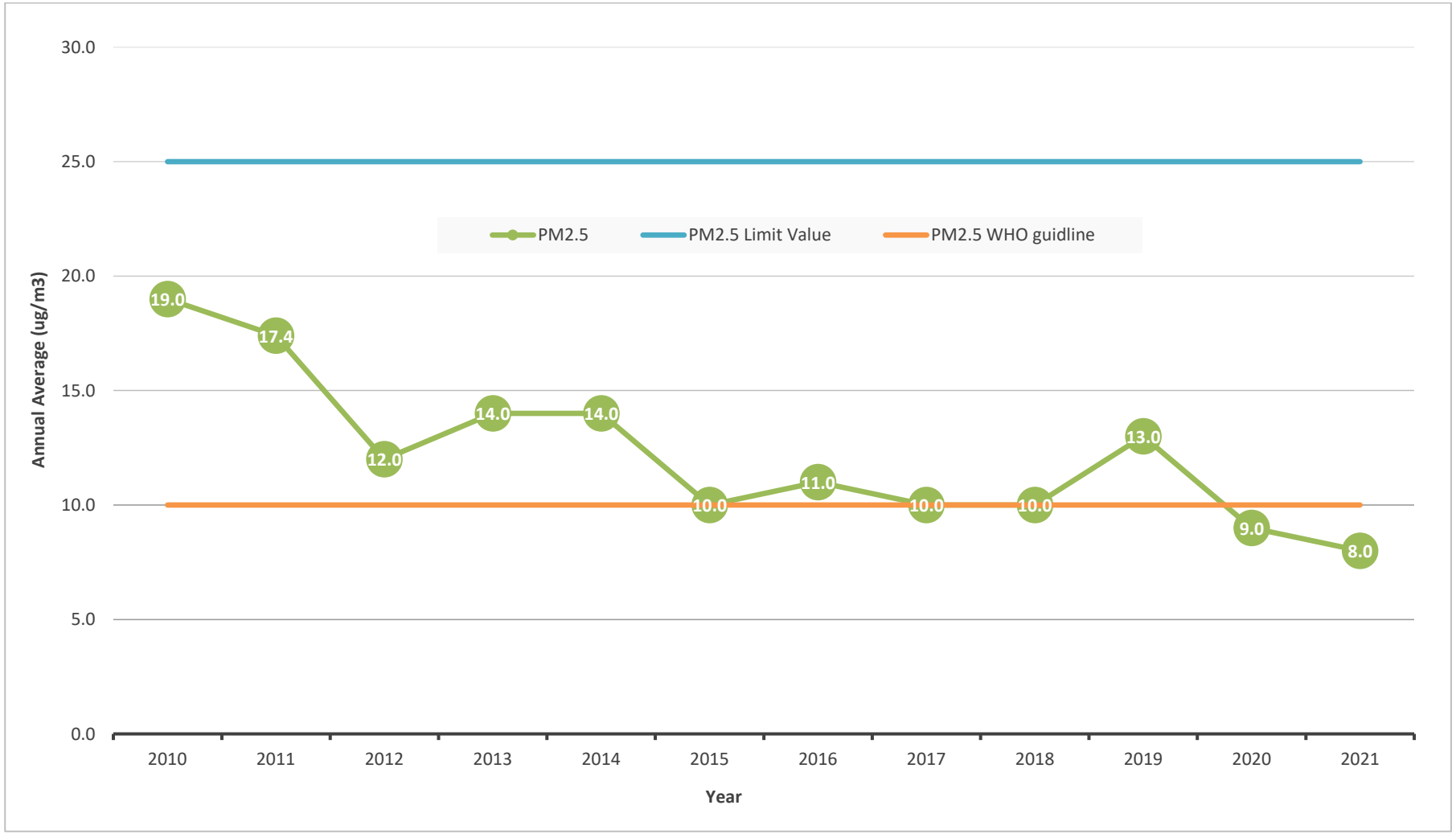
(2) Data capture for the full calendar year (e.g., if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

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

Automatic analyser – AQMS – $PM_{2.5}$ monthly average with smoothed trend line



Automatic analyser – (AQMS) PM2.5 annual mean



2.3 Comparison of 2021 Monitoring Results with Previous Years and the Air Quality Objectives

Summary

All nitrogen dioxide monitoring locations and pollutants were lower in 2020 than any other year recorded due to the impact of the COVID-19 pandemic and lockdowns. In 2021 nitrogen dioxide concentrations increased but did not return to pre-2020 levels and were lower than all other years other than 2020,

PM10 reached its lowest concentration in 2017 and increased slightly in 2018 and again in 2019. In 2020 it decreased, and then decreased further in 2021 to the same concentration as 2017.

PM2.5 had remained stable between 2015 and 2019 but increase in 2019. It decreased in 2020 and decreased further in 2021 to its lowest concentration since monitoring began in 2010

Nitrogen Dioxide Short Term Objective Level

The nitrogen dioxide short term objective level is a one hour mean of 200µg/m^3 not to be exceeded more than 18 times/year. In 2021 there were no 1-hour periods that exceeded 200 µg/m^3 (the highest was 131µg/m^3). As such there was no breach of the objective level. The last time there was an exceedance of the 1-hour mean of 200 µg/m^3 was in 2019, when there was one exceedance, and prior to that in 2015, when there were two 1-hour exceedances.

The World Health Organisation guideline value for short-term exposure for nitrogen dioxide is the same as the current objective levels set by the UK and EU.

Nitrogen Dioxide Long Term Objective Level

There was no exceedance of the NO_2 annual mean objective level of 40 µg/m^3. This is the second year where there have been no exceedances in the County. In 2019 there was one exceedance, and this was measured by diffusion tube. The exceedance occurred in the Chepstow AQMA (monitoring reference - CH4) which recorded 42.3 µg/m^3. In 2020 this same location recorded 31.6µg/m^3, which is the lowest recorded concentration at this location, and the first year that the location has not exceeded the objective level. In 2021 the concentration increased to 36µg/m^3 which is still 10% lower than the objective level.

CH4 has always recorded the highest concentration in the county (in 2012 it reached 60.3µg/m^3) at a relevant exposure (i.e., on a house) and remained the highest recorded relevant exposure location in 2021.

The only location of similar concentration in 2021 was PWLL1 at 35.8µg/m^3, but this is a roadside location with the nearest house 17 metres away. The fall off with distance calculation indicates that the concentration at the house would be 19.3µg/m^3.

The automatic analyser in the AQMA on Hardwick Hill did not exceed the annual objective level and recorded an annual mean of 29µg/m^3 in 2021. This is a 10µg/m^3 decrease from 2019 when it reached 39 µg/m^3, but a 3µg/m^3 increase from its lowest concentration of 26µg/m^3 in 2020. 2019 was the highest concentration since 2012, and a 3 µg/m^3 increase over 2018.

The World Health Organisation guideline value for long term exposure for nitrogen dioxide is the same as the current objective levels set by the UK and EU.

In 2018, nitrogen dioxide concentrations in Monmouthshire decreased, including the Chepstow and Usk Air Quality Management Areas. This built upon a decrease in 2016, which stabilised in 2017, over most previous years. Concentrations in 2018 were the lowest they had ever been at most locations. In 2019 concentrations remained similar to 2018, locations that either increased, or decreased did so by small amounts with a few exceptions.

In 2020 all locations decrease by between 5.2µg/m^3 (USK 6 decreased from 19.3 to 14.2) and 13.8µg/m^3 (MM21 decreased from 29.8 to 15.9). In 2021 all locations increased or remained the same as 2020. The largest increase was 6µg/m^3 at MM15 (17.4 to 23.3µg/m^3) and MM21 (15.9 to 22µg/m^3).

Usk & Woodside

For the seventh year in a row, there were no exceedances of the annual mean objective level in the Usk AQMA, and the fourth year below 36 µg/m^3 (10% of the objective level).

Usk concentrations generally decreased between 2012 and 2015, remained stable until 2017, decreased in 2018, increased slightly in 2019 decreased significantly in 2020 due to the pandemic, and increased in 2021. The largest increases were USK 3 and USK4 which both increased by 2.4µg/m^3 to 23 and 24µg/m^3 respectively.

The highest location in 2021 was Usk 5 at 25 µg/m^3. Historically the highest location in Usk was USK5 in 2007 at 49 µg/m^3. The lowest concentration in Usk in 2021 was USK 6 at 15.5 µg/m^3.

Historically the highest concentrations have been recorded in the middle of Bridge Street at locations Usk 4 and Usk 5, which suffers from a canyon effect, and had a congestion problem from vehicles parked on double yellow lines and wait times for larger vehicles to cross the bridge. However, between 2017 and 2019 Usk 3 and Usk 2 recorded higher concentrations than USK 4 and Usk 5. These locations are near the junction with Abergavenny Road. It is thought that the improvement in double yellow line enforcement, and the implementation of the Lorry Watch scheme has meant that congestion has improved through Bridge Street.

The three tubes in Woodside which were installed in 2017 have all below the objective level. In 2021 the concentrations were 16.1µg/m^3 (WS3), 18 µg/m^3 (WS1), and 19.7 µg/m^3 (WS2). The highest reading for all tubes was 29.6 µg/m^3 in 2017. This part of Usk is not at risk of exceeding the nitrogen dioxide objective level, however monitoring is continuing in 2022.

Chepstow & Pwllmeyric

For the second year in a row, there were no nitrogen dioxide exceedances in the Chepstow AQMA. In total there have been three locations that have historically exceeded the nitrogen dioxide objective level in the Chepstow AQMA.

The Automatic Air Quality Monitoring Station, which last exceeded in 2011, CH6 which last exceeded in 2014, and CH4 which last exceeded in 2019.

General trends in Chepstow from diffusion tube data identifies that concentrations decreased from 2012 until 2015 remained stable until 2017, decreased in 2018 increased slightly in 2019, decreased significantly in 2020, and increased in 2021 but not to 2018 levels.

The automatic analyser showed a decrease from 2008 to 2018, with concentrations remaining somewhat stable between 2015 and 2018 of between 35 and 37µg/m^3. However, there was a 1.0 µg/m^3 increase in 2018 up from 35 in 2016 and 2017 to 36 in 2018, and a further 3 µg/m^3 increase in 2019 to 39 µg/m^3, which was the highest concentration since 2012. In 2020 the concentration decreased to 26µg/m^3, 8µg/m^3 lower than the previous lowest concentration in 2006 and 2013, and increased in 2021 to 29µg/m^3, which is the second lowest concentration recorded.

The one exceedance that still occurred (prior to 2020) is located at CH4 (Hardwick Hill). This location has exceeded the annual mean objective level every year since 2007.

CH4 increased between 2007 and 2012 to a high of 60.3 µg/m^3. However, until 2018 it steadily decreased in concentration to the low 50's between 2015 and 2017. In 2018 there was a large decrease (by 8.6 µg/m^3) to 42.5 µg/m^3, and then further decreased slightly in 2019 to 42.3 µg/m^3, before falling to 31.6µg/m^3 in 2020, and increased in to 36µg/m^3 in 2021.

CH4 has always been highest concentration located at a house or other relevant receptor in the county.

In October 2018 four diffusion tubes were installed in Pwllmeyric alongside the A48, southwest of the Chepstow AQMA. Three of the tubes were located on lampposts near the roadside (due to their being no suitable fixing locations on the nearest houses) and adjusted back to the nearest residential properties. One tube was installed on the downpipe of a house.

Concentrations at nearest receptors were all below the objective level in 2019, with the highest recording at 29.9 µg/m^3. In 2021 roadside concentrations were 23.8 µg/m^3 (PWLL2),

32.9 µg/m^3 (PWLL3) and 35.8 µg/m^3 (PWLL1), and calculated concentrations at the nearest houses were 21 µg/m^3, 24.9 µg/m^3, and 19.3 µg/m^3 respectively.

Monmouth

Within Monmouth, monitoring is undertaken along the A40 and within the town centre. Concentrations over the proceeding eight years generally decreased and then stabilised, with a further drop in 2020 due to the pandemic, and an increase in 2021. For example, one of the longer-term monitoring locations (MM1 – Wyebridge Street) reached its highest concentration in 2012 of 39 µg/m^3, then reduced and stabilised at 33-34 µg/m^3 up until 2017 decreased again to 30.4 in 2019, and 22.9 µg/m^3 in 2020, and increased to 24.9µg/m^3 in 2021.

Of the less well-established locations (installed in 2014 and 2015), the majority decreased in 2017 except for MM13 (Pike House) which increased by almost 3 µg/m^3 to 35.1 µg/m^3, however decreased in 2018 to 32.5, to 30 µg/m^3 in 2019, and 20.6 µg/m^3 in 2020. It also increased in 2021 to 22.3µg/m^3.

Monitoring location MM11 (Fence of Monmouth School), is located next to the School Playground, and therefore installed to indicate the possibility of an exceedance of the short term (1-hour nitrogen dioxide objective level of 200 µg/m^3 not to be exceeded more than 18 times a year. Guidance from DEFRA, based on studies states that if the annual mean objective is below 60 µg/m^3, the 1-hour objective is unlikely to be exceeded, and as MM11 has consistently been in the mid 20 to low 30's (22.4 µg/m3 in 2021) since installation in 2014, MCC are confident that the 1-hour objective level is not being exceeded at this location.

Abergavenny

Nitrogen dioxide diffusion tube monitoring in Abergavenny is mainly located along the A4143 (Merthyr Road), and potential issues have been identified at a pinch point between Llanfoist Bridge and Llanfoist Roundabout.

AB1 is not in an Air Quality Management Area, although due to increases recorded at the location since 2010, and as a result of an exceedance in 2012 (41.5µg/m^3) additional monitoring locations were set up along Merthyr Road in 2012 and 2013 and have remained

in place since those dates. The cause of the increase is possibly due to the additional housing, and retail development that has occurred in Llanfoist and on Merthyr Road in recent years. There could also have been some impacts in recent years with the Heads of The Wales (A465) duelling programme that has been occurring between Govilon and Brynmawr, and before that in Llanfoist. Those works are now complete however, therefore 2022 should not be affected.

AB1 is located on the north bound side of the road next to a bridge across the river Usk. This is the only foot and road bridge across the river to connect Llanfoist and Abergavenny. It is also next to a roundabout that provides access to a Supermarket & Petrol Station, Llanfoist and the A465 itself, and there can be congestion at peak traffic times on the short stretch of road between the bridge and the roundabout.

On that stretch of road there is one house on the northbound side and a Kwik Fit garage, and a Public House and a row of cottages comprising seven residential properties and one business on the southbound side. There is another diffusion tube monitoring location on the southbound side of the road (AB2) that was installed in 2012.

Since the exceedance in 2012 at AB1 and the installation of AB2 opposite it, concentrations have not exceeded again, and there has been a general decrease at both sides of the road. In 2021 AB1 was 29.8 µg/m^3 and AB2 was 25.5 µg/m^3.

In June 2019 two additional monitoring locations (AB7 and AB8) were installed on Park Road (A40) to the north of the town centre, on each side of the road, due to a change in road alignments through the town, and the opening of a supermarket on that road. Of the two full calendar monitoring years in 2020 and 2021 neither location has exceeded 20 µg/m^3

In January 2020 AB6 which was located at the northern section of Merthyr Road, just before its junction with the A40/Brecon Road, was removed due to seven years of consistently low concentrations (range of 21.8 to 24.3 µg/m^3), and instead a location was established around the corner from it on the busier Brecon Road/A40 and labelled AB9. In 2020 the concentration was 24.3 µg/m^3, and in 2021 26.3 µg/m^3.

2.3.1 Particulate Matter (PM_{10})

In 2021 there were no exceedances identified of the PM_{10} short term or long-term objective levels. PM_{10} concentrations as recorded at the Air Quality Monitoring Station on Hardwick Hill in Chepstow have never exceeded the short or long-term objective levels.

Short Term Objective Level

The PM_{10} short term objective level is: -

Not to exceed an average of 50 µg/m^3 in a 24-hour period more than 35 times a year.

The highest daily (12:00am-11:59pm) concentration in 2021 was 62 µg/m^3, which occurred on 3rd March 2021. This was the only 24-hour period with a PM10 concentration over 50 µg/m^3, therefore the short-term objective level (no more than 35 times a year) was not exceeded. The most frequent daily concentration was 16 µg/m^3.

This was an increase compared to 2020 which had no days over 50, but a decrease compared to 2019, when there were 7 days above 50 µg/m^3 (56, 58, 59, 59, 60, 62, 62 µg/m^3). 2019 recorded the greatest number of 24-hour exceedances at Chepstow. The previous highest was five days in 2015. There were no days of exceedance in 2018, therefore 7 days in 2019, whilst low in comparison to the 35 days that can be exceeded before a breach, was an unusual increase, that was not continued in 2020 and 2021.

The cause of the 62 µg/m^3 on 3rd March 2021 was due to a week of light winds, which caused local emissions to accumulate across many parts of England and Wales. Furthermore, easterly, and south-easterly winds brought in contaminated air from continental Europe, increasing PM2.5 and PM10 pollution. This became widespread across parts of central and southern England and Wales on Wednesday 3rd March. This may have been exacerbated by an intrusion of Saharan Dust through the same period.

The highest daily PM2.5 average (52µgm^3) also occurred on 3rd March, although there is short term limit value for PM2.5.

Long Term Objective Level

The PM_{10} long term objective level is:

An annual average of 40 µg/m^3.

The World Health Organisation's guideline concentration for PM_{10} annual mean is 20 µg/m^3.

There has never been an exceedance of this objective level at Chepstow AQMS, and the last time the WHO's guild-line value was exceeded was 2011 (22 µg/m^3).

Between 2005 and 2015 PM10 annual average concentrations steadily decreased year on year. There was a 1 µg/m^3 increase in 2016, but then a further decrease in 2017 when concentrations were at their lowest at 16 µg/m^3. However, in 2018 there was an increase to 18 µg/m^3 and then again in 2019 to 20 µg/m^3. Therefore, prior to COVID there appeared to be some evidence of an increasing trend in concentrations. However, lockdowns in 2020 resulted in a decreased to 17 µg/m^3, which was 15% reduction over 2019, and this decrease continued into 2021 with an annual average of 16 µg/m^3, which is the joint lowest annual average recorded (along with 2017).

2.3.2 Particulate Matter ($PM_{2.5}$)

The EU $PM_{2.5}$ annual limit value for PM2.5 is:

An annual average of 25 µg/m^3.

The World Health Organisation's guideline concentration for $PM_{2.5}$ annual mean is 10 µg/m^3.

In 2021 the $PM_{2.5}$ annual average at the Chepstow Air Quality Monitoring Station on Hardwick Hill was 8 µg/m^{3,} and therefore did not exceed wither the EU annual limit value of 25 µg/m^{3,} nor the WHO' guideline concentration of 10 µg/m$^{3.}$

Historically $PM_{2.5}$ concentrations have never exceeded the 25 µg/m^3 EU annual limit value. The highest concentration recorded was 19 µg/m^3 in 2010. Concentrations reduced to 14 µg/m^3 and then 12 µg/m^3 and remained stable between 2015 and 2018 at 10 (2015), 11 (2016) and 10 µg/m^3 (2017 and 2018). In 2019, concentration increased to 13 µg/m^3 and therefore whilst not in breach of the EU annual limit value (25 µg/m^3), was higher than the

World Health Organisation's guideline concentration of 10 µg/m^3. The last time Chepstow exceeded this level was 2016.

In 2020 the concentration reduced to 9 µg/m^3, and further reduced to 8 µg/m^3 in 2021.

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2.4 Summary of Compliance with AQS Objectives as of 2021

General Summary

Monmouthshire County Council has examined the results from monitoring in the County. Concentrations are all below the Objectives, and 2021 resulted in significant decreases in concentrations compared to 2019 (pre-pandemic).

Nitrogen Dioxide did increase slightly in 2021 compared to 2020, but significantly lower than 2019 and there were no exceedances of the annual or hourly objective levels. Particulate Matter (both PM10 and PM2.5) reduced in 2021 compared to 2020 and were at their lowest concentrations and did not exceed annual or daily objective levels.

In 2020 the COVID pandemic and lockdowns had the largest impact on nitrogen dioxide concentration reducing them by 33% compared to 2019. Particulate Matter did not reduce as much (PM2.5 was a 30% decrease and PM10 was a 15% decrease). This is likely due to particulate matter's longer transportation range and an increase in domestic burning due). In 2021 there was slight increase in nitrogen dioxide concentrations due to increase traffic, however Particulate Matter concentrations reduced further

Air Quality Management Areas

When considering the 2019 data, concentrations within the Chepstow AQMA did exceed the objective for long-term nitrogen dioxide in one location, despite a large decrease between 2012 and 2019, therefore this AQMA will remain.

Concentrations of nitrogen dioxide have not exceeded within the Usk AQMA for seven years (including 2020), however MCC does not intend to revoke the AQMA until five years of non-exceedance of 36 µg/m^3 have been achieved (to account for the stated 10% uncertainty

with diffusion tube monitoring). Including 2020 there have now been four years below 36 µg/m^3 in Usk.

Other than 2020 all the 2021 nitrogen dioxide monitoring locations were at their lowest concentrations, and most of the 2019 monitoring locations were at or close to their lowest ever recorded, therefore there appears to be a countywide trend of improving air quality. The exception to this is at the AQMS on Hardwick Hill, Chepstow, where concentrations of nitrogen dioxide, PM10 and PM2.5 (both long term, and shorty term) increased in 2019, however they did both reduce in 2020 and reduced further in 2021 to their lowest concentrations.

3 New Local Developments

There are no specific new local developments confirmed that have not already been identified in previous reports.

There is concern that new developments in the south of the County and in Forest of Dean will impact on the Chepstow AQMA, and surrounding area.

The Local Development Plan is being revised and consulted upon in 2021. The outcome of this was to be reported on in the 2022 Progress Report however delays in the LDP process have occurred, and there is no update yet.

Air Quality is a consideration in the LDP and planning applications

3.1 Road Traffic Sources (and Other Transport)

There are no newly identified road traffic sources since the last assessment.

3.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

There are no newly identified road traffic sources since the last assessment.

3.3 Other Sources

There have been no Other Sources (bonfires, firework displays, domestic wood burners) that have contributed to identified air pollution.

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

Monmouthshire County Council confirms that all the following have been considered:

- Road traffic sources
- Other transport sources
- Industrial sources
- Commercial and domestic sources
- New developments with fugitive or uncontrolled sources.

4 Policies and Strategies Affecting Airborne Pollution

4.1 Air Quality Planning Policies

At a national level planning policy on air quality issues is set out in section 6.7 – Air Quality and Soundscape of Planning Policy Wales (Ed 11 – Feb 2021). This requires Local Planning Authorities to consider the effects which proposed developments may have on air quality and the effects which existing air quality may have on proposed developments. In considering the relationship between development and air quality planning authorities and developers must address any implications of any association with, or location within, an Air Quality Management Area, not create areas of poor air quality and seek to incorporate measures which reduce overall exposure to air pollution.

At a local level planning policy is set out in the Adopted Monmouthshire Local Development Plan (Feb 2014). Policy EP1 – Amenity and Environmental Protection, seeks to ensure development has regard to the amenity and health of occupiers in the locality of the development. It seeks to prevent development proposals that would result in unacceptable risk or harm due to air, light, noise or water pollution, contamination or land instability. Development proposals that would cause unacceptable risk/harm to local amenity, health, the character/quality of the countryside or interests of nature conservation, landscape or built heritage importance due to risks associated with pollution, including air, will not be permitted. The LDP notes that where it is considered a development proposal may impact on an Air Quality Management Area (AQMA), or exacerbate an existing problem, developers will be required to provide an assessment of air quality impact, together with proposals for mitigation. A copy of Policy EP1 is set out below for information.

EP1 - Amenity and Environmental Protection

Development, including proposals for new buildings, extensions to existing buildings and advertisements, should have regard to the privacy, amenity and health of occupiers of neighbouring properties.

Development proposals that would cause or result in an unacceptable risk /harm to local amenity, health, the character /quality of the countryside or interests of nature conservation, landscape or built heritage importance due to the following will not be permitted, unless it can be demonstrated that measures can be taken to overcome any significant risk:

• Air pollution.

• Light pollution.

• Noise pollution.

• Water pollution.

• Contamination.

• Land instability.

• Or any identified risk to public health or safety

Planning Policy Wales can be viewed via the following link: https://gov.wales/planning-policy-wales

The Adopted Local Development Plan can be viewed via the following link:

https://www.monmouthshire.gov.uk/app/uploads/2017/05/Adopted-Local-Development-Plan-with-PDF-tags.pdf

4.2 Local Transport Plans and Strategies

The Monmouthshire LTP identifies the key transport issues relevant to the county, the high-level interventions needed to address these and the specific priorities for the local authority. The LTP includes a prioritised five-year programme of projects the council wishes to see delivered within between 2015 and 2020 as well as medium- and longer-term aspirations up to 2030.

The programme outlined in the LTP includes walking and cycling infrastructure, bus network, station and highways improvements, Cardiff Capital Region Metro schemes, 20mph limits and road safety schemes. In accordance with the guidance, it does not contain specific rail service and trunk road proposals.

The aim of the LTP is to facilitate and support the development of a modern, accessible, integrated and sustainable transport system for Southeast Wales, which increases opportunity, promotes prosperity for all and protects the environment; where walking, cycling, public transport, and sustainable freight provide real travel alternatives

Delivery of proposals featured in the LTP will be subject to sufficient funding being available from external grant sources and from the Council's own budgets. The LTP will be the primary reference for bids for annual capital funding from the Welsh Government for transport infrastructure.

The Monmouthshire Local Transport Plan was approved by Welsh Ministers in May 2015 and can be viewed at the following link: -

https://www.monmouthshire.gov.uk/app/uploads/2015/07/MLTP-MASTER-v1-1.pdf

Transport in Monmouthshire

As a rural county access to employment, education, and services is a major issue. Analysis from the Welsh Index of Multiple Deprivation 2011 suggests that access to services in our most isolated rural communities is poor. Of the 58 lower super output areas in Monmouthshire, 22.4% are in the most deprived 10% in Wales for access to services.

Transport relies heavily on the household car. 84.8% of households own a vehicle in Monmouthshire, compared to 77.1% in Wales, and 8.7% of households who own 3 or more cars.

In terms of commuting, more than 40% residents commute to work outside the county, compared to less than 30% across Wales. The most important destination is Newport, because of the counties' closeness to the English border there are also substantial flows to Bristol and Gloucestershire.

Highways

The only motorways in the area are the M4 from Cardiff towards the second Severn Crossing and the M48 branch to Chepstow and the Severn crossing. There are regular issues with congestion on the M4 near Newport and this affects connectivity between Monmouthshire and Cardiff.

The following trunk roads go through Monmouthshire:

- A40, linking the M50 via Monmouth and Abergavenny with Brecon and west Wales
- A465, linking the Heads of the Valleys with Abergavenny and continuing towards Hereford
- A449, connecting Newport with the A40 towards Monmouth and the M50
- A4042, connecting Newport with Abergavenny
- A48/A466, from the M48 through Chepstow to the English border.

The motorways and trunk together make up the strategic road network in Monmouthshire. They play an important role in connecting Monmouthshire's key settlements with each other and with other key destinations within the Cardiff Capital Region and other neighbouring counties.

Below these there are county strategic roads which provide connections between key settlements and centres where these are not catered for by the trunk road network:

- A48 from Chepstow to the M4 Junction 24 the Coldra and Newport.
- A466 from Chepstow via Monmouth towards Hereford.
- A472 connecting the A449 near Usk with the A4042 near Pontypool.
- A4077 from Gilwern to Powys boundary.
- A4136 from Monmouth to Gloucestershire boundary.
- A4143 from Llanfoist to Brecon Road in Abergavenny.
- A4810 (former Llanwern Steelwork Road), linking the M4 Junction 23a at Magor with the A48 in Newport.
- B4245 from the A48 towards Magor

Rail

Monmouthshire is served by three railway lines. In the south lies the South Wales Western Mainline (SWML), linking South Wales with Bristol and London. The sole station within Monmouthshire is Severn Tunnel Junction, which is served by trains towards Bristol and

southwest England. It functions as parkway station for a wide area. Services are generally hourly with some additional peak services, however in the peak hours many trains are overcrowded, esp. towards Bristol. It is expected that Great Western line is to be electrified in about 2017 (including Cardiff – Bristol services).

The line to Gloucester branches off the SWML east of Severn Tunnel Junction, with stations at Caldicot and Chepstow. Local services are up to hourly, some fast services also serve Chepstow. The Marches Line, connecting south Wales and North Wales and Manchester, passes through the west and north of the county with a station at Abergavenny, which acts as a hub for a substantial hinterland. It is served by 1-2 trains per hour.

Train services from Monmouthshire stations to Cardiff are notably more expensive than services of equivalent distance on the core Valley Lines. For example, a day return from Ebbw Vale or Maesteg to Cardiff (28¾ and 28½ miles respectively) is £7.80 (Jan. 2015), while it is £9.40 from Severn Tunnel Junction (21¾ miles), £12.40 from Chepstow (29¼ miles) and £13.90 from Abergavenny (31¼ miles). For those commuting to work the difference is even greater – annual season tickets are £1076 from Ebbw Vale or Maesteg, £1664 from Severn Tunnel Junction, £2228 from Chepstow and £2316 from Abergavenny.

The Passenger growth of the stations in Monmouthshire has been substantial. Over the ten years of the Arriva Trains Wales franchise has been Abergavenny has seen growth of 43%, Caldicot 88%, Severn Tunnel Junction 92% and Chepstow 136%. Interchanges at Severn Tunnel Junction are estimated to have increased by more than 300%.

Bus

Buses are the predominant public transport mode in Monmouthshire. There are hourly (or more frequent) services along the Newport – Caldicot – Chepstow corridor and from Abergavenny towards Pontypool and the Heads of the Valleys, predominantly operated on a commercial basis by Stagecoach and Newport Bus. Other trunk routes connecting Abergavenny, Newport and Chepstow with Usk and Monmouth as well as local services in Monmouth, Chepstow and Abergavenny are contracted by Monmouthshire County Council.

Monmouthshire County Council also operates the award-winning Grass Routes community transport flexible bus services serving all main towns and outlying areas. It is available to all residents of Monmouthshire, and those living in areas without any other regular service or those unable to use normal bus services.

4.3 Active Travel Plans and Strategies

Under the The Active Travel (Wales) Act 2013, there is a requirement for authorities to continuously improve facilities and routes for pedestrians and cyclists (for AT journeys not leisure). The overall objective is to create a modal shift away from the car. The production of Active Travel Network Maps, which identify current and potential future routes, is a key legal requirement of the Act, as is for any new road schemes to consider the needs of pedestrians and cyclists at design stage. Active Travel has an important part to play in several existing policies adopted by Monmouthshire County Council, including reducing the carbon footprint with a move away from short car journeys.

Monmouthshire submitted their maps in December 2021 following a 2-year consultation process and have since had these signed off by the Welsh Government.

Each year, Welsh Government allows each Local Authority four strategic bids to be submitted for consideration to develop the Active Travel network for those routes identified on the Active Travel Network Maps. In 2022, Monmouthshire County Council was successful in their three geographical bids: Abergavenny, Caldicot x2 and Monmouth

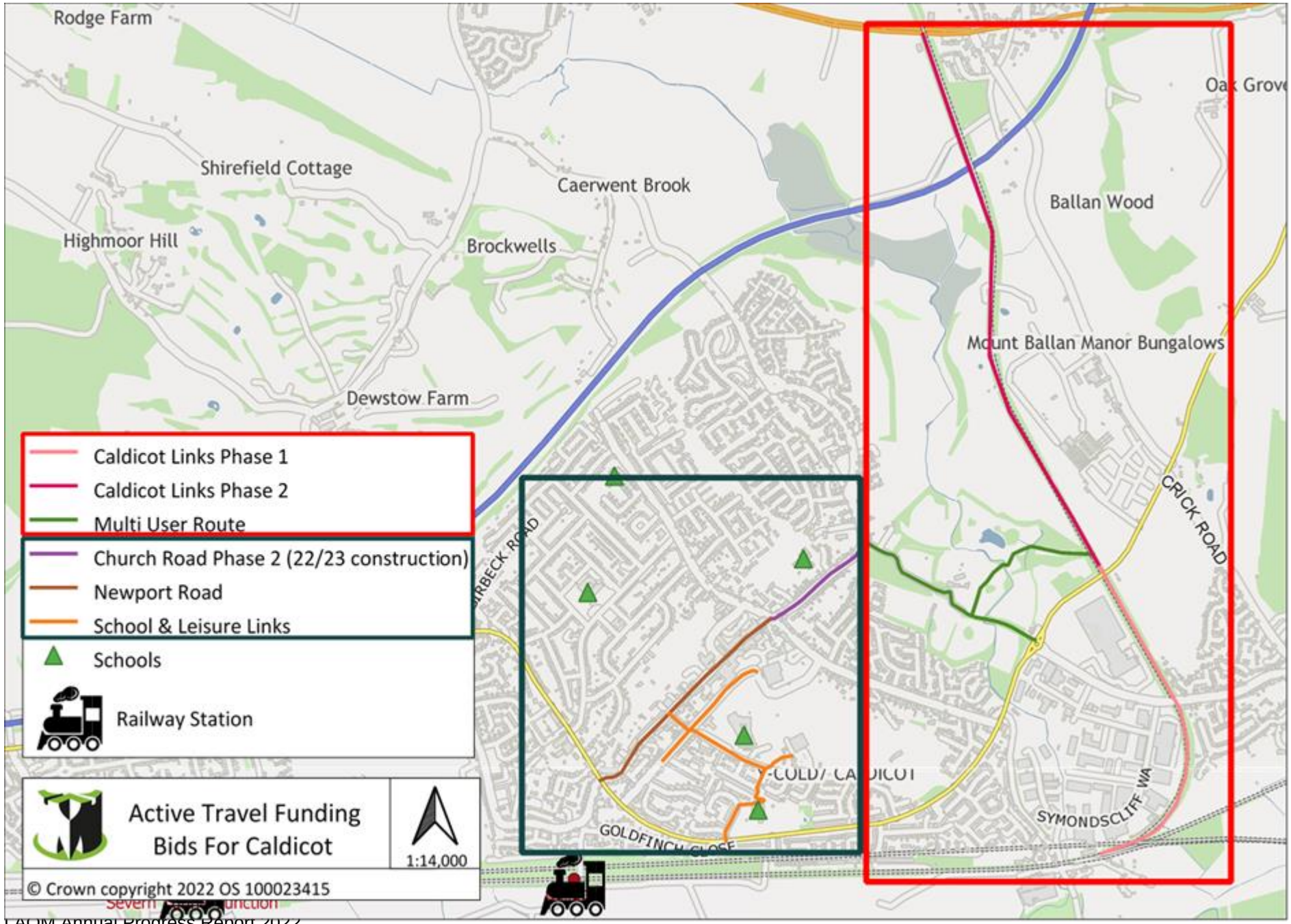
In 2022, Welsh Government approved the schemes detailed below. The text summarises the aspiration of each of the schemes. Many of the schemes will take over two years to complete.

- **Overview for Caldicot Strategic Scheme**
- **Overview for Abergavenny Strategic Scheme**
- **Overview for Monmouth Strategic Scheme**

NAME	OVERVIEW FOR CALDICOT STRATEGIC SCHEME
Church Road	This scheme (subject to funding) seeks to: • To realise the aspirations of maximum modal shift, this proposal seeks to continue the enhancement of Church Rd into a Street through the adoption of a Quiet Street principle, wider pavements, pedestrian priority crossings at junctions, a shared space scheme and other measures that change the priorities for pedestrians. The scheme will also integrate GI features and wider well-being for the community.
Caldicot Multi User Route /Castle country park	This proposal seeks to: • Connect into MCC-INM-S3 so that an integrated approach to active travel within the eastern side links residents to employment, education and local services as well as onto public transport nodes. • Connect from entrance to Castle (including car park reconfiguration) to Caldicot Links (planned in two distinct phases). • In 2022/23 continue with design and development up to pre-construction. • To upgrade MCC-INM-S23 as a diagonal link between employment sites at Mitel, Castlegate and Severn bridge Industrial Estate with the Castle and Country Park acting as a key off-road link between neighbourhoods – as well as providing a future link into the 'Caldicot Links' route

Caldicot Links	Construction Phase 1, Scheme Development Phase 2 and 3: • Construction of Phase 1 (Portskewett to Caldicot Castle) in 2022/23. • Continue with the detailed design, survey and consultation for Phases 2&3 (Caldicot Castle to Crick/Caerwent) in 2022/23. • To develop 2.81km long railway line into an Active Travel route serving several communities. • This proposal seeks to create a new dedicated walking/cycling and in places horse riding, multi-user route, accessible for residents and visitors of the communities of Portskewett, Caldicot and Caerwent to access key destinations of employment and services. • A phased construction of the project will be in 2022/23 to connect with other housing settlements in Caldicot and proposed new developments.
Newport Road	This scheme (subject to funding) seeks to: • Deliver improvements to walking and cycling provision alongside broader placemaking interventions along the part of Newport Road between the edge of the town centre and the junction with the B4245. This will build on the precedent to be established in Church Road, introducing Quiet Street principles with wider pavements, pedestrian priority crossings at junctions and other measures. Newport Road town centre is on pause whilst waiting for the outcome of the Transforming Towns scheme

Education and Leisure Link	This scheme (subject to funding) seeks to: • Take the recommendations of the WelTAG 1 study completed in Q4 2021/22 through the WelTAG process to the detailed design stage. This project plays an essential role in the Caldicot network, providing improved access to 2 educational settings, leisure facilities, health establishments and all other key localities within the town centre.


Rodge Farm
Shirefield Cottage
Highmoor Hill
Caerwent Brook
Brockwells
Dewstow Farm
Ballan Wood
Mount Ballan Manor Bungalows
CRICK ROAD
GOLDFINCH CLOSE
SYMONDSCLIFF WA
Caldicot Links Phase 1
Caldicot Links Phase 2
Multi User Route
Church Road Phase 2 (22/23 construction)
Newport Road
School & Leisure Links
Schools
Railway Station
Active Travel Funding
Bids For Caldicot
1:14,000
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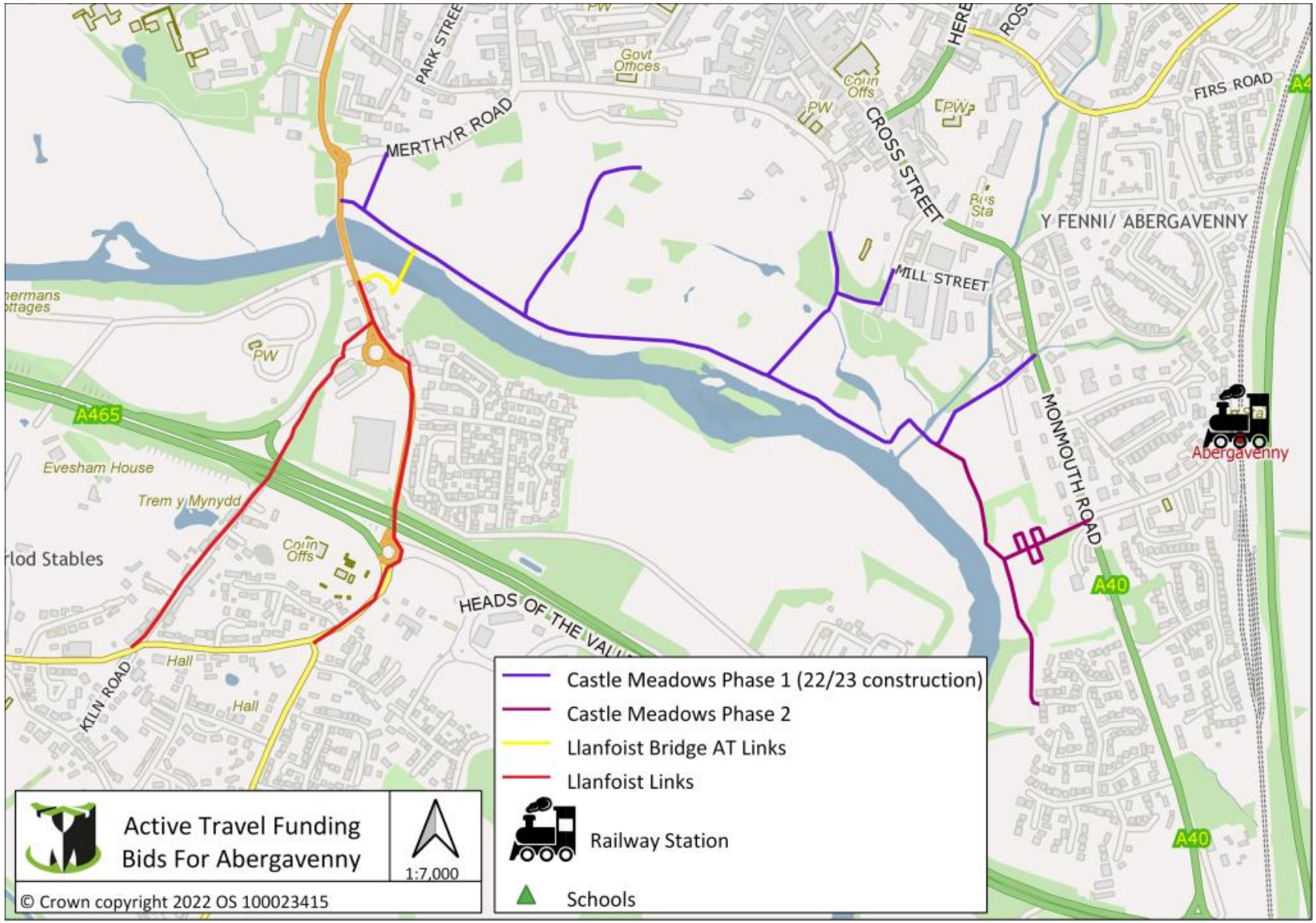
NAME	OVERVIEW FOR ABERGAVENNY STRATEGIC SCHEMES
Llanfoist Foot & Cycle Bridge	This scheme (subject to funding) seeks to: • The scheme is listed in the LTP programme as 4th highest non-Metro priority. The scheme is MCC's highest Active Travel INM priority for Abergavenny based on our recent Engagement phase and previous data. The scheme seeks to deliver a new pedestrian/cycle bridge across the River Usk about 50 metres east of the existing Stone bridge which is a Scheduled Monument and Grade II* listed. The new bridge has been sympathetically designed by a renowned bridge Architect and it is proposed that it will become the main river crossing between Llanfoist and Abergavenny for non-motorised users. This will significantly reduce the health and safety risks associated with the existing narrow footway over the existing Bridge. Tasks to include: address pre-commencement planning conditions
Bridge Connection To Llanfoist	• Provide improved active travel compliant pedestrian and cycle links between Llanfoist and the new Llanfoist foot and cycle bridge – where pedestrians and cyclists can then continue their journey onwards via Castle Meadows and Ysbytty Fields to Abergavenny Town Centre and Abergavenny Rail Station. Tasks to include: undertake WelTAG Stage 3 Study (including associated surveys, and design), consult with Stakeholders and Public, undertake detailed design/prepare tender pack, enquire and submit planning (if required) and any pre-commencement planning conditions, procure contractor('s).

Castle Meadows Link	This scheme (subject to funding) seeks to: • Provide improved Active Travel compliant pedestrian and cycle links across Castle Meadows and Ysbytty Fields linking Llanfoist (via Llanfoist foot and cycle bridge) to Abergavenny Town Centre and Abergavenny Rail Station. Tasks to include: • Castle Meadows – address any pre-commencement conditions, procure a contractor, and begin construction. • Ysbytty Fields (including A40/Station Road crossing) – subject to successful land negotiations, undertake further surveys, firm up design, submit planning, address any pre-commencement conditions, procure a contractor (construction to occur 2023/24).


MERTHYR ROAD
PARK STREET
Govt Offices
CROSS STREET
MILL STREET
FIRS ROAD
Y FENNI/ ABERGAVENNY
MONMOUTH ROAD
Abergavenny
A465
A40
Evesham House
Trem y Mynydd
KILN ROAD
HEADS OF THE VALL
Castle Meadows Phase 1 (22/23 construction)
Castle Meadows Phase 2
Llanfoist Bridge AT Links
Llanfoist Links
Railway Station
Schools
Active Travel Funding
Bids For Abergavenny
1:7,000
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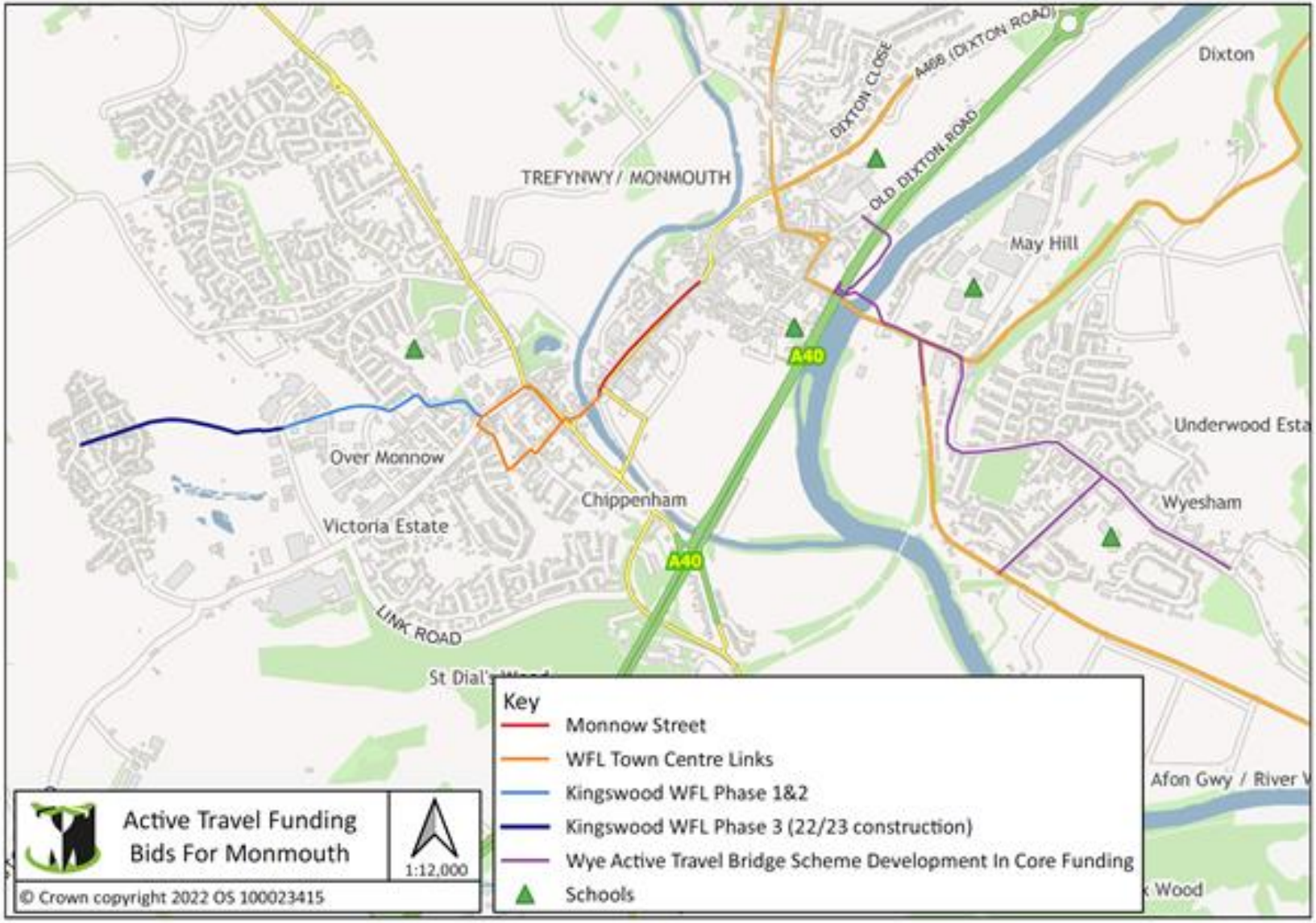
NAME	OVERVIEW FOR MONMOUTH STRATEGIC SCHEMES
Kingswood Gate-Williams Field Lane Route	This scheme (subject to funding) seeks to: • Complete the third phase (of a three-phase scheme) of a critically important route. The public response to the Active Travel Consultation in 2020 identified this route as one that needed significant improvement. This scheme will upgrade an existing off road informal path to create a new route to Active Travel standards. Phase 2 will be completed by the end of Mar 2022
Monnow Street	This proposal seeks to: • Continue with the WelTAG process in order to achieve a shortlist of options moving on to detailed design. This scheme connects Monnow St, Monnow Bridge, ending before the roundabout on Drybridge Street. • Monnow Street remains a critical route for Active Travel not only to access services in the town but as route through to other services e.g., Monmouth Comprehensive School and Osbaston Primary School. The WelTAG 1 clearly demonstrated the need for intervention. It is a clear AT route for walking to services in the town, to the secondary school and leisure centre. Current Covid temporary arrangements and the Active Travel consultation has polarised opinions for cycling and therefore more work is needed. Consultation demonstrated the need for; deeper understanding of traffic movements, cycling and walking

	movements and to also re-visit the long list of Active travel potential routes before any final schemes can be agreed. There is a need for the Covid temporary measures to be fully assessed before a final AT design can be agreed
Williams Field Lane Link to Town Centre	This scheme (subject to funding) seeks to: • Assess the feasibility (WelTAG 2) of creating improved walking and cycling connections between the start of Williams Field Lane and the town centre. The feasibility study will include traffic counts, pedestrian counts. Pedestrian path analysis, vehicular speeds, usage studies, and safety assessments – building on base line data captured during 21/22. • Post consultation (Q4 21/22), the chosen scheme will be developed through WelTAG3 and onto detail design and construction.


Dixton
A466 (DIXTON ROAD)
DIXTON CLOSE
OLD DIXTON ROAD
TREFYNWY / MONMOUTH
May Hill
A40
Underwood Esta
Over Monnow
Chippenham
Victoria Estate
Wyesham
A40
LINK ROAD
St Dial's Wood
Afon Gwy / River W
Wood
Key
Monnow Street
WFL Town Centre Links
Kingswood WFL Phase 1&2
Kingswood WFL Phase 3 (22/23 construction)
Wye Active Travel Bridge Scheme Development In Core Funding
Schools
Active Travel Funding
Bids For Monmouth
1:12,000
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Other small-scale areas of work agreed by Welsh Government include:

	Project
1	Chepstow High School AT route feasibility
2	Caldicot Comprehensive School/leisure centre feasibility;
3	Abergavenny Station Road; Train Station Link
4	AT Network Maps Public Consultation
5	Increased Cycling Infrastructure - Primary School Settings
6	AT signage Improvement
7	Increased AT Walking Infrastructure – Benches
8	Usk – Little Mill cycling and walking development feasibility
9	AT Camera Monitoring – B4245
10	AT Monitoring and Evaluation – Counters
11	Increased Cycling Infrastructure – Town Centre Locations
12	Chepstow Transport Study

4.4 Local Authorities Well-being Objectives

The Well-being of Future Generations (Wales) Act 2015 (Assessments of Local Well-being) Regulations 2017 require Public Services Boards, when preparing an assessment of local well-being under section 37 of the Act, to take into account the most recent review of air quality for their local authority area carried out under section 82 of the Environment Act 1995 (“the 1995 Act”) and the most recent strategic noise maps made under Chapter 2 of the

Environmental Noise (Wales) Regulations 2006 ("the 2006 Regulations") and adopted by the Welsh Ministers.

Monmouthshire County Council have incorporated the Well-being Objectives into its Corporate Plan, and Monmouthshire Public Service Board considered air quality in its 2017 Well-Being Assessment, which was updated in 2022

https://www.monmouthshire.gov.uk/app/uploads/2022/05/Well-Being-Assessment-22-27_Monmouthshire_Final.pdf

This forms part of a wider Gwent Wellbeing Assessment: http://www.gwentpsb.org/well-being-plan/well-being-assessment/

Monmouthshire Public Service Board has been replaced by a Gwent Public Service Board, and they are in the process of producing the Wellbeing Plan.

Until the new Plan has been developed the original Monmouthshire Wellbeing Plan is still valid until May 2023, by which time the new Plan needs to be adopted.

https://www.monmouthshire.gov.uk/app/uploads/2018/05/Monmouthshire-PSB-Well-being-plan.pdf

Actions in the Gwent PSB plan will be overseen and delivered locally in Monmouthshire via a Local Delivery Group.

4.5 Green Infrastructure Plans and Strategies

Monmouthshire County Council's Green Infrastructure team have several projects planned or underway. Examples include: -

- the installation of a green screen along the A48 in Chepstow.
- Over the last three years have planted 14,000 tree whips and 600 trees as part of the climate change strategy
- Participating in an i-Tree Eco study in the Severnside settlements. The study will give an indication of the environmental benefits of trees and recommendations for

planting and management. The study has been completed and the report is currently in draft, and due to be published late 2022.

4.6 Climate Change Strategies

Monmouthshire County Council declared a Climate Emergency in 2019 and published its first Climate Emergency Strategy and Action Plan in 2019. The action plan was refreshed in 2021 with a greater focus on nature recovery and climate adaptation, and can be seen here:

https://www.monmouthshire.gov.uk/app/uploads/2021/12/Climate-and-Decarbonisation_Action-Plan-2021_v2.0.docx

The council is striving to become carbon neutral by 2030 and intends to work with communities and local businesses to help them reduce their emissions.

5 Conclusion and Proposed Actions

5.1 Conclusions from New Monitoring Data

The 2022 Progress Report did not identify any exceedances of nitrogen dioxide, PM_{10} or $PM_{2.5}$ in 2021. However, 2021 could have been an unusual year with decreased traffic as some COVID restrictions were still in effect for part of the year.

This was the second year in a row with no exceedances of nitrogen dioxide objective level. Prior to 2020 there continued to be one exceedance, in the Chepstow AQMA

2021 was the seventh year with no nitrogen dioxide exceedances in the Usk AQMA. The Usk AQMA will remain in place however, until five years below 36 µg/m^3 (10% uncertainty margin of error) of compliance have been achieved. 2021 marked the fourth such year. It is likely that 2020 will be excluded from this five-year period, therefore six continuous years will be required.

Generally, nitrogen dioxide diffusion tube concentrations reduced from 2012 until 2018 and remained consistent in 2019, with a drop (due to the COVID-19 pandemic) in 2020, and slight increase in 2021 but still lower than other previous years. Regarding the automatic analysers in the AQMS, nitrogen dioxide, PM_{10} and $PM_{2.5}$ concentrations reduced between 2011 and 2015, remained consistent until 2018, but increased in 2019. They all decreased in 2020, however nitrogen dioxide increased by 3 µg/m^3 in 2021 (but still 10 µg/m^3 lower than 2019 (29 µg/m^3 compared to 36 µg/m^3), but PM10 and PM2.5 decreased further (both by 1 µg/m^3 to 16 and 8 µg/m^3 respectively).

5.2 Conclusions relating to New Local Developments

There were no additional confirmed local developments, over those identified in the 2017 Progress Report

5.3 Other Conclusions

Air quality appears to be improving in the two Air Quality Monitoring Areas; however, the two Air Quality Action Plans will continue to be progressed through regular meetings of the Air Quality Steering Groups.

5.4 Proposed Actions

- The new monitoring has identified that there is no need to declare a new AQMA and no need for further investigation or assessment of any pollutant.
- There are no changes are proposed to the two AQMAs, which will remain in place.
- Extended monitoring will continue in Abergavenny, Monmouth, Pwllmeyric and Woodside, but no additional monitoring will be required in 2022 over that already being undertaken.
- Action plan Steering Group meetings will continue to be held to attempt to achieve progress with the proposed measures and identify additional measures to improve air quality.
- The Air Quality Progress Report will be completed in 2023.

References

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Monmouthshire County Council (2019) Progress Report

Monmouthshire County Council (2019) Climate Emergency Strategy

Monmouthshire County Council (2020) Progress Report

Monmouthshire Public Service Board (2021) Well-being Plan Annual Report

Monmouthshire County Council (2021) Progress Report

Appendices

Appendix A: Monthly Diffusion Tube Monitoring Results

Appendix B: A Summary of Local Air Quality Management

Appendix C: Air Quality Monitoring Data QA/QC

Appendix D: AQMA Boundary Maps

Appendix E: Impact of COVID-19 upon LAQM

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

Table A.1 – Full Monthly Diffusion Tube Results for 2021 (µg/m^3)

Diffusion Tube ID	NO_2 Mean Concentrations (µg/m^3)												Simple Annual Mean (µg/m3)		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.84)[1]	Distance Corrected to Nearest Exposure[2]
CH1	18.8	19.6	20.9	14.7	16.2	15.8	14.6	15.9	18.1	20.6	26.8	20.1	18.5	15.6	
CH2a	33.9	40.3	35.2	30.0	32.0	30.7	31.5	30.0	38.4	27.4	35.4	34.1	33.2	27.9	
CH3	29.2	30.2	29.1	23.4	29.3	22.0	24.7	23.6	31.0	31.7	31.3	29.0	27.9	23.4	
CH4	44.1	44.9	44.0	33.2	43.5	39.0	43.1	39.2	50.8	47.5	41.7	43.0	42.8	36.0	
CH5		22.8	26.1	17.9	18.7	18.0	18.7	18.6	25.1	30.1	30.4	22.3	22.6	19.0	
CH6	46.0	44.5	39.7	26.5	31.6	22.7	24.0	25.2	31.8	32.9	38.2	39.2	33.5	28.2	
CH7	27.8	30.2	25.1	24.7	25.9	23.5	24.3	20.2	30.6	26.6	27.1	27.6	26.1	22.0	
CH8	27.8	27.4	23.3	20.5	23.1	20.4	22.0	19.2	28.4	29.8	29.5	29.1	25.0	21.0	

CH9	23.1	28.3	23.3	19.9	24.4	22.3	21.8	22.5	27.9	28.7	27.1	23.3	24.4	20.5	
AQ1	41.8	34.9	39.3		33.5	28.1	30.1	30.2	36.0	33.6	42.0	35.7	-	-	
AQ2	40.3	34.0	37.0		33.4	30.8	29.8	30.2	35.9	36.8	37.6	33.5	-	-	
AQ3	37.9	35.6	38.8		35.2	29.9	30.9	33.5	37.5	38.6	42.0	35.9	35.1	29.5	
PWLL1	46.9	43.7	44.8	35.2	38.6	40.0	40.6	38.4	44.5	44.8	52.5	41.9	42.7	35.8	
PWLL2	30.2	31.9	28.6	25.6	25.7	24.1	26.6	23.2	33.8	30.7	31.4	28.8	28.4	23.8	
PWLL3	36.8	37.5	37.3	38.9	38.9	37.4	36.5	40.3	41.0	40.9	46.5	38.3	39.2	32.9	
PWLL4	22.2	22.6	18.6	19.6	16.9	14.7	15.5	18.0	21.5	17.8	24.5	21.8	19.5	16.4	
MM1	28.4	30.5	28.0	25.3	29.7	25.2	27.6	25.6	35.2	33.6	36.0	30.7	29.6	24.9	
MM2	20.8	23.3	19.4	21.9	23.7	17.9			25.9	23.4	25.7	21.0	22.3	18.7	
MM3	23.3	20.4	18.4	17.4	19.0	15.0	16.8	15.5	23.5	21.6	27.4	20.0	19.9	16.7	
MM4	14.5	17.7	19.5	17.7	19.7	17.7	18.9	19.2	16.2	25.8	30.5	24.8	20.2	16.9	
MM7	18.9	23.0	17.7	18.5	23.2	16.7	20.0	17.4	22.9	22.1	23.9	20.0	20.3	17.1	
MM9	21.4	19.1	15.2	15.9	16.1	13.7	15.0	16.0	20.3	17.8	22.0	18.8	17.6	14.8	
MM11	25.2	28.1	23.0	29.2	26.6	25.9	26.7	26.9	32.7	23.8	29.2	22.7	26.7	22.4	

MM13	15.5	19.2	19.6	22.9	30.7	25.6	28.1	32.2	34.8	33.5	25.7	30.2	26.5	22.3	
MM15	22.8	25.1	26.2	26.1	30.9	24.4	27.3	25.5	32.9	29.4	32.9	29.9	27.8	23.3	
MM16	23.7	24.4	20.9	21.4	23.0	19.1	22.4	15.8	24.7		28.4	24.1	22.6	18.9	
MM17	21.4	19.4	17.3	17.2	16.0	14.8	15.6	21.2	18.0	16.1	22.5	19.7	18.3	15.3	
MM18	23.1	22.7	21.8	21.1	23.2	19.2	22.3	21.4	29.3	24.6	28.1	21.8	23.2	19.5	
MM19	25.5	26.8	23.9	24.8	26.1	24.3	24.1	22.8	26.9	24.9	30.7	22.9	25.3	21.3	
MM21	23.4	25.2	25.2	28.7	28.6	24.8	25.2	27.8	26.5	24.2	31.0	23.8	26.2	22.0	
AB1	35.6	37.4	37.7	29.9	33.7	27.5	34.5	33.4		47.0		38.5	35.5	29.8	
AB2	31.5	32.7	30.1	25.4	29.2	25.4	27.6	26.4	33.0	32.1	34.9	35.3	30.3	25.5	
AB3	25.5	25.2	21.5	20.9		22.7	23.6	24.1	27.0	25.4	28.1	25.8	24.5	20.6	
AB4	26.8	25.9	22.9	22.7	23.1	20.5	22.0	24.3	28.7	26.3	26.7	25.6	24.6	20.7	
AB5	17.6	19.4	15.5	14.2	14.6	11.9	14.5	14.8	15.1	18.5	20.1	18.5	16.2	13.6	
AB7	25.7	28.1	18.9	19.5	21.7	18.9	16.6	15.9	18.7	20.9	19.7	19.2	20.3	17.1	
AB8	20.2	19.5	16.4	12.5	17.8	10.5	22.3	19.6	25.7	25.0	27.3	25.2	20.2	16.9	
AB9	34.1	34.4	30.3	24.6	32.0	25.5	29.1	25.7	37.7	37.7	35.4	29.7	31.4	26.3	

USK1	26.5	25.3	24.5	19.0	20.3	17.1	18.6	21.4	31.4	24.6	28.9	24.5	23.5	19.7	
USK2	32.8	36.1	34.6	30.8	27.6	24.2	25.8	22.9	30.4	26.2	31.1	28.6	29.3	24.6	
USK3	28.5	26.2	23.5	22.0	26.3	25.0	24.4	23.1	33.0	30.1	36.3	30.4	27.4	23.0	
USK4	22.3	26.0	22.6	19.6	24.8	22.1	23.7	22.9	34.2	30.5	35.5	29.4	26.1	22.0	
USK5	35.5	34.7	34.7	29.3	26.3	24.5	27.6	26.8	25.8	29.3	34.3	28.6	29.8	25.0	
USK6	23.2	23.0	21.2	18.4	16.9	14.0	14.7	14.2	17.8	16.8	22.9	18.1	18.4	15.5	
WS1	25.1	21.1	22.5	19.8	18.9	18.1	19.9	19.0	24.4	20.4	27.2	21.2	21.5	18.0	
WS2	21.2	21.7	21.4	20.8	22.7	21.4	24.8	21.1	27.6	24.9	28.5	24.6	23.4	19.7	
WS3	21.2	20.4	16.8	19.4	16.6	18.0	17.4	16.9	20.6	18.2	24.2	19.7	19.1	16.1	

Notes:

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

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

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

(2) Distance corrected to the nearest relevant public exposure only if uncorrected concentration is over 36µg/m^3 (10% of objective level).

Appendix B: A Summary of Local Air Quality Management

Purpose of an Annual Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995 and associated government guidance. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas and to determine whether 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 five years.

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

Air Quality Objectives

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

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

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

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as	Date to be achieved by
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
Particulate Matter (PM_{10})	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
Sulphur dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO_2)	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
Benzene	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	Maximum Daily Running 8-Hour mean	31.12.2003
Lead	0.25µg/m^3	Annual Mean	31.12.2008

Appendix C: Air Quality Monitoring Data QA/QC

QA/QC of Diffusion Tube Monitoring

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Monmouthshire recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 33% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

Monmouthshire County Council have applied a national bias adjustment factor (BAF) of 0.84 to the 2021 monitoring data. A summary of bias adjustment factors used over the past five years is presented in table C.2

Since May 2010 Monmouthshire County Council has used diffusion tubes prepared and analysed by Gradko International Limited using 20% TEA in Water**.**

The 2021 national Bias Adjustment Factor calculated for Gradko in March 2022 (03/22) based on 32 studies, and the one in July 2022 (07/22) which included an additional 2 studies (34 total), both including the study undertaken by Monmouthshire County Council (see below – Local Co-location Studies), was 0.84.

http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Factor from Local Co-location Studies

Monmouthshire County Council undertakes its own triplicate co-Location study to obtain a Local Bias Adjustment Factor, and that factor is shared with other authorities via the National Bias Adjustment Factor database.

A local bias adjustment factor (BAF) has been calculated for the Hardwick Hill, Chepstow automatic site. The triplicate tubes in eleven months showed good precision with each other (with a Coefficient of Variation below 20% in each month (CV range was 2-7%), and 100% data capture. The calculations are shown in Table C.1

Table C.1 – Local Bias Adjustment Calculations

	Local Bias Adjustment
Periods used to calculate bias	11
Bias Adjustment Factor A	0.82 (0.79 - 0.87)
Diffusion Tube Bias B	21% (15% - 27%)
Diffusion Tube Mean (µg/m^3)	35.1
Mean CV (Precision)	4.1%
Automatic Mean (µg/m^3)	29.0
Data Capture	100%
Adjusted Tube Mean (µg/m^3)	29 (28 - 31)

Overall Diffusion Tube Precision	**Good Overall Precision**
Overall Continuous Monitor Data Capture	**Good Overall Data Capture**

Local Bias Adjustment Factor	**0.82**

Discussion of Choice of Factor to Use

The national bias adjustment factor based on the co-location studies of 32 local authorities who submitted by March was 0.84, and 0.84 in July from 34 local authorities, whilst the local bias adjustment factor based on the Chepstow co-location study was 0.82. The national factor was used, as it included 34 studies of good precision and is more conservative than the Chepstow local BAF.

Below is a comparison of using the two different BAF for the highest location diffusion tube in each town). No conclusions or discussions in this report would have changed based on the use of either of the two Bias Adjustment Factors

Location/Reference	0.84 National	0.82 Chepstow Local
Chepstow - CH4	36	35.1
Monmouth -MM1	24.9	24.3

Abergavenny – AB1	29.8	29.1
Usk – USK5	25	24.4

Table C.2 – Bias Adjustment Factor – last 5 years

Year	Local or National	If National, Version of National Spreadsheet	**Adjustment Factor**
2021	National	03/22 07/22	0.84
2020	National	03/21	0.77
2019	National	03/20	0.93
2018	National	06/19	0.92
2017	National	09/18 & 06/18	0.87

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Monmouthshire County Council required distance correction as none of the 4 locations that have been distance corrected in the past had concentrations greater than 36µg/m^3

QA/QC of Automatic Monitoring

- Ricardo & Bureau Veritas completes the data management and Monmouthshire County Council – Environmental Health undertake the Local Site Operator (LSO) duties for the automatic monitoring site within the authority.
- Calibrations, audit and servicing are carried out every six months.
- Ricardo AEA undertake the Ratification process. The monitoring data presented within the APR is ratified.
- Live/historic data is available through the Welsh Air Quality Forum website https://airquality.gov.wales/

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The type of PM_{10}/$PM_{2.5}$ monitor(s) utilised within Monmouthshire County Council are BAM and thus do not require the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within Monmouthshire County Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 33% do not require annualisation.

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Monmouthshire County Council required distance correction.

Appendix D: AQMA Boundary Maps

Figure D.1 – Chepstow AQMA

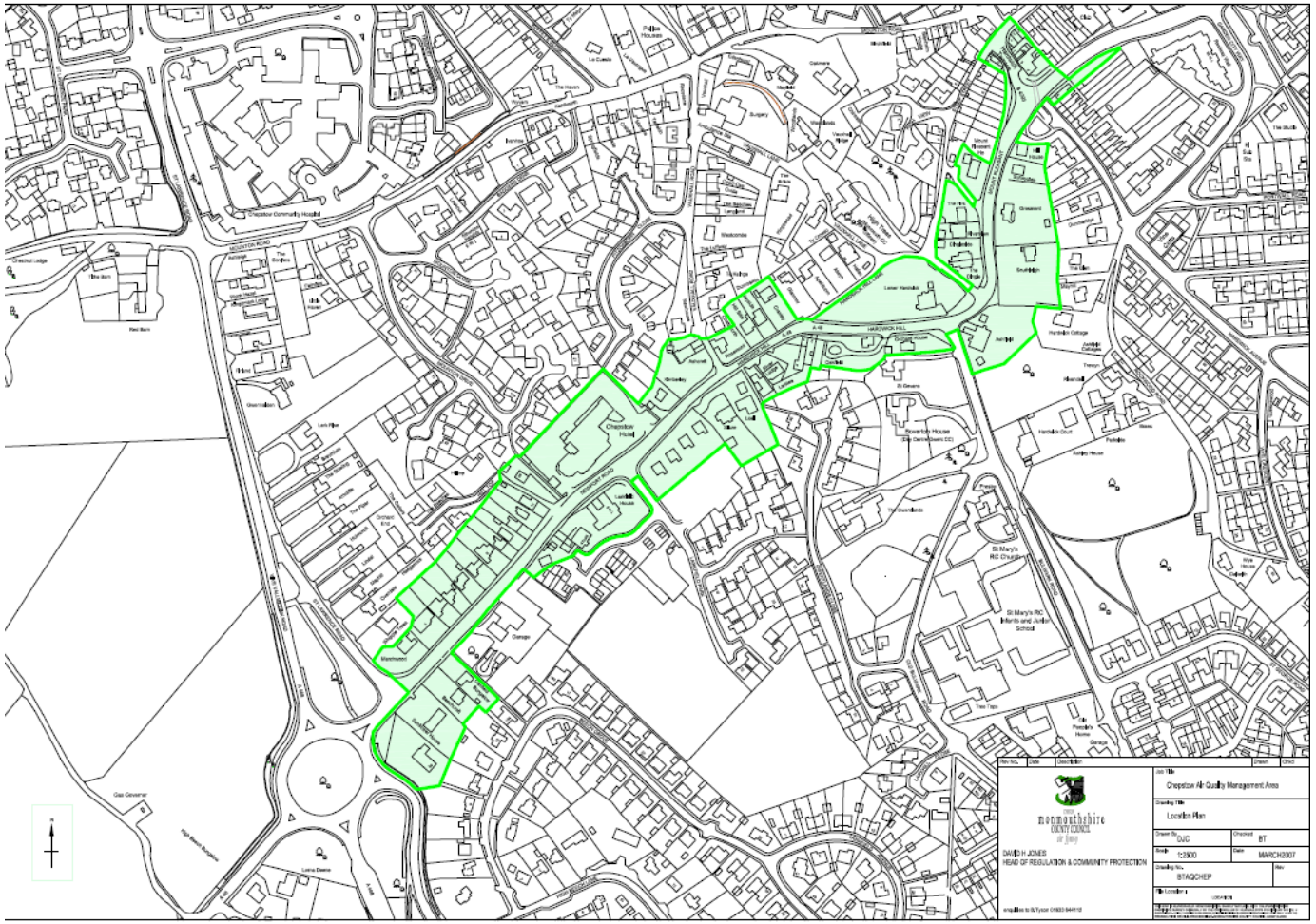
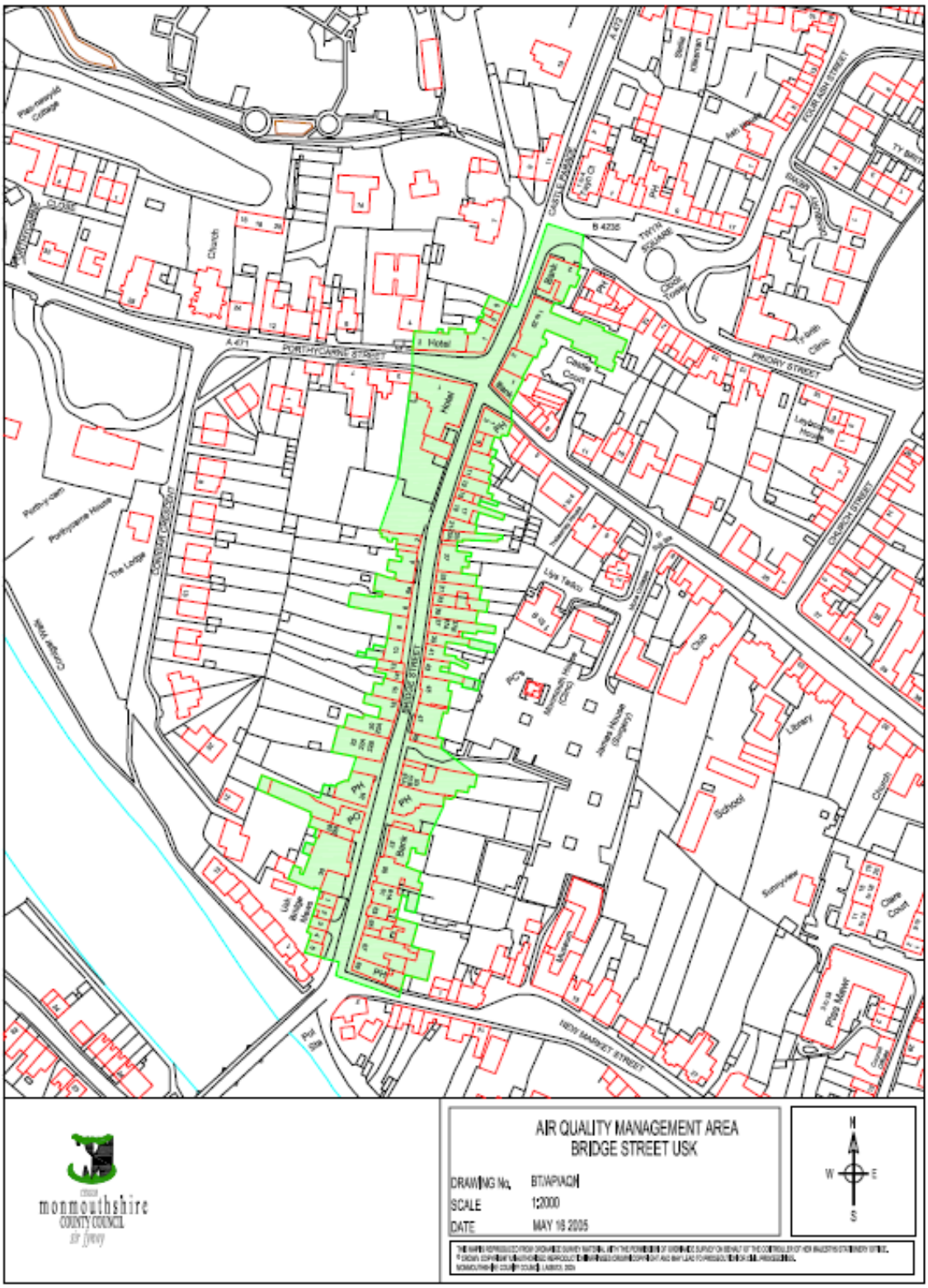


Figure D.2 – Usk AQMA



Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide