2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: June, 2021

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Report Reference Number	WBCASR2020
Date	June 2021

Executive Summary: Air Quality in Our Area

Air Quality in West Berkshire Council

Air pollution is associated with a number of adverse health impacts and It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to UK society of the impacts of particulate matter alone is estimated to be around £16 billion[3].

The major source of air quality pollutants in West Berkshire are road transport and in particular the contribution from the A339 and A4 has been identified. The main pollutant is nitrogen dioxide (NO_2) in Newbury & Thatcham and as a consequence, two Air Quality Management Areas (AQMAs) have been declared. The Newbury AQMA was declared for exceedances of both the one-hour and Annual Mean NO_2 objective. The Thatcham AQMA was declared for the Annual Mean NO_2 Objective. Details can be found at: https://uk-air.defra.gov.uk/aqma/list?view=W and maps are in Appendix D.

The Nitrogen dioxide (NO_2) levels in 2020 have showed a decrease on the 2019 levels, and no monitoring locations within West Berkshire exceeded the Annual Objective (40µg/m^3). The 1 Hourly objective NO_2 was exceeded once in 2020 (permitted level of 18 exceedances of 200µg/m^3 per year), on the 21st January 2020 at 18:00 hours.

Over the past 5 years there has been a general decrease of NO_2, at a number of sites both within, close too and away from the existing AQMA's. Through the Newbury AQMA sites have shown increases along with one in Pangbourne, one in Thatcham, Calcot and Theale from 2016 to 2018. However the, overall the levels in West Berkshire have been reducing over the 5 years up to 2020.

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010

[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

No extensions or amendments to the AQMAs are required and no new AQMAs need to be declared.

During the Pandemic we have seen a greater reduction in NO2 during the year, and there was an even greater reduction during the national lockdowns. Regardless of the lock down the overall the levels in West Berkshire have been reducing over the 5 years up to 2020.

As a unitary authority Environmental Health has continued to work in conjunction with the Transport Policy Team with the implementation of Local Transport Plan 3 (2011 –

2026). The Plan includes a Transport Vision setting out the long-term transport

strategy for each of the 4 main geographical areas of the District, as identified in the

Local Development Framework Core Strategy. These Visions have been prepared taking into account a "Mixed Strategy" approach of looking to provide people in the District with more sustainable travel choices. The Plan acknowledges the link with the existing AQAP and any future AQAP's and there is a specific Policy on Air Quality (Policy LTP K6) which states that:

The Council will fulfil its responsibilities for Local Air Quality Management and

focus on the following:

i. Highlighting ways in which air quality can be protected through the development management process
ii. Identifying areas where the Air Quality Objective values are being or are likely to be exceeded
iii. Establishing a framework for air quality improvements
iv. Investigating the feasibility of using mobile alerts to highlight periods of higher pollution levels
v. LTP Strategies continue to be reviewed; no new strategies were implemented in 2020
vi. Working on the link between air quality, particularly from $PM_{2.5}$ and public health in West Berkshire continues. There has been closer working with the Berkshire Strategic Public Health Team and Public Health England.

The major source of air quality pollutants in West Berkshire is road transport and in particular the contribution from the A339 and A4 has been identified. The main pollutant is nitrogen dioxide (NO_2) in Newbury & Thatcham and as a consequence, two Air Quality Management Areas (AQMAs) have been declared. The Newbury AQMA was declared for exceedances

of both the one-hour and Annual Mean NO_2 objective. The Thatcham AQMA was declared for the Annual Mean NO_2 Objective. Details can be found at: https://uk-air.defra.gov.uk/aqma/list?view=W and maps are in Appendix D.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy[4] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[5] sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

West Berkshires Health is working with the development control applications to review the air quality impact. Air quality assessments have been provided where necessary for a variety of applications and appropriate mitigation requested. Applications included significant housing development sites, STOR power generation plant, traffic flow changes to a road scheme, and any applications which may have an impact to the AQMAs.

West Berkshire Council has completed all Pollution Prevention and Control inspections as required for the control of emission to air from industrial processes.

In 2019 the Bear Lane, A339 (Sainsbury's roundabout) improvements works to enable improved traffic flow were completed, and traffic lights were decided against following the modelling impact results. The true impact of these works will not been seen until we have a pandemic free year.

In 2020, 36 Electric vehicle (EV) charging points are available in West Berkshire, the EV chargers are all plotted on the council's web page https://info.westberks.gov.uk/onstreetev

[4] Defra. Clean Air Strategy, 2019

[5] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

National Cycle Network 422 expansion – A4 Newbury to Thatcham and on to Calcot was completed in 2019. This provision of improved cycle ways goes through the Thatcham AQMA, and potentially links Newbury to Legoland, in WIndsor https://osmaps.ordnancesurvey.co.uk/51.40608,-1.41302,10,

Our Policy Guidance Planning for Air Quality document, the joint Public Health and Air Quality website and the Public Protection Partnership website (https://publicprotectionpartnership.org.uk/results/?query=air+quality) all contain information for residents, businesses and consultants regarding air quality and air pollution matters, which is reviewed regularly and updated as necessary.

The bus station at The Wharf, Newbury opened on 7th December 2018, at the start of the Market Street redevelopment, this is a key part of the Newbury Vision 2026. In addition to 232 new homes the scheme will deliver additional parking capacity in the town centre, a new station plaza and landscaped step-free pedestrian routes. This bus station is having Bio-Gas Buses pass through as they run into Reading which has strict AQ standards and West Berkshire benefits from these.

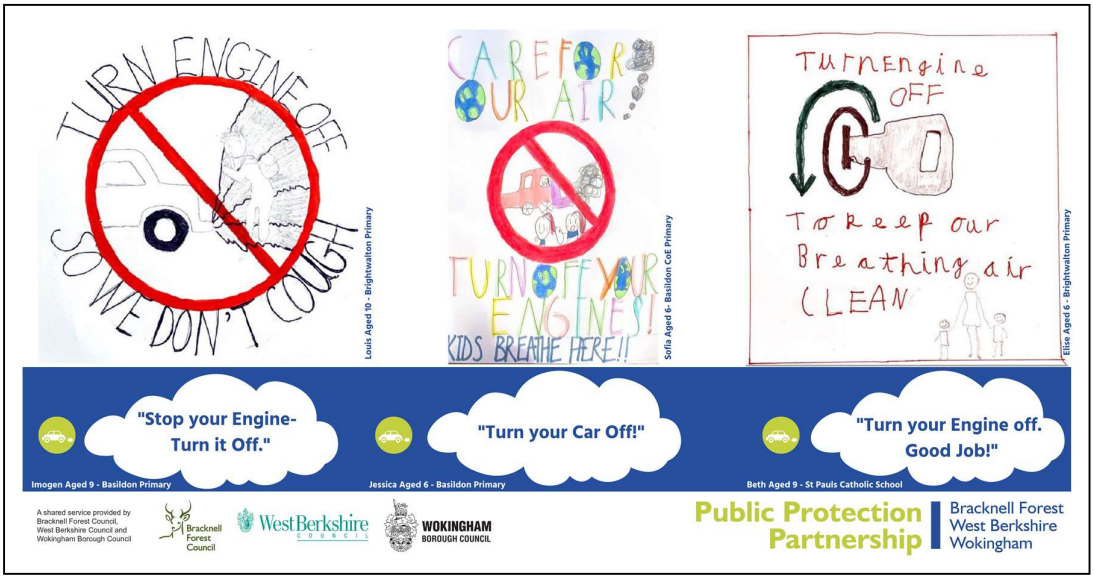
Looking ahead there are a considerable number of road initiatives to be carried out, electric vehicle charging points to be installed, further developments to be made to cycle routes, improvements to the cycle lesson and bike storage facilities at schools.

West Berkshire Council also continues to support and recognises the softer Education, Training and Publicity (ETP) elements provided by the Road Safety Team as well as being active members of the Cycle Forum and wider Berkshire Safer Roads group (other partners include Wokingham, Bracknell, Slough and Windsor and Maidenhead). The collaborative work under Berkshire Safer Roads ensures we maintain a wider and more consistent message across borders.

The Road Safety team aims and objectives are to find opportunities to change behaviour in relation to Active Travel and break down the barriers to encourage more walking and cycling.

For Clean Air Day in 2020 an Anti-idling competition was run in West Berkshire with all the Primary School, to help them spread the message. The winning drawings & strap lines were made into a banner given to the winning school, these banners have been made available for others to purchase as well. See Figure 1 for the Wes Berkshire banner. https://publicprotectionpartnership.org.uk/environmental-health/air-quality/clean-air-day-schools-competition/

Figure S.1 - The Banner from Clean Air Day 2020



A joint application by PPP with West Berkshire and Wokingham Councils was made to the Air Quality Grant Scheme 2020 and was successful in securing £259k funding for a project related to a behaviour change anti-idling campaign, and localised PM2.5 monitoring & action planning, at schools located near to the AQMA.

Conclusions and Priorities

There was no exceedance of the monitored NO_2 Annual Mean Objective (40µg/m$^{3)}$ in 2020, the level was 29.2µg/m^3 at the continuous monitor located in Newbury. The hourly objective (permitted level of 18 exceedances of 200µg/m^3 per year) was also met as there was only 1 occasion when it was exceeded, which was on the 21st January 2020 at 18:00 hours.

There were no exceedances of the Annual Air Quality Objective level of 40µg/m^3 from the ratified and bias adjusted diffusion tubes within the Newbury AQMA or the Thatcham AQMA. There were no locations greater than 60µg/m^3 which indicates no exceedance of the 1-hour Objective. This year (2020) showed that all sites have decreased since 2019. In 2019 a total of 9 sites showed an increase in levels compared to the 2018 results, 26 showed decreased levels, one remained the same and there was one new site.

Overall, the concentrations have been showing a trend of decreasing NO_2 since 2016.

The following local priorities continue to be:

- Nationally exploring the link between public health and $PM_{2.5}$
- Joint working between Public Health and Environmental Health teams and links within the Berkshire Public Health Shared Team
- Continuing to work within the unitary authority with Transport Policy and Highways Teams - There are some localised areas of congestion at peak times which require managing and investment, where improvements are needed to increase capacity at key junctions or effectively manage traffic flow. New development is planned through the Local Development Framework Core Strategy and additional transport and highway measures are planned alongside these new developments which will assist in addressing the impact and manage the additional trips associated with new developments.
- Carry on with the continuous and passive air quality monitoring programmes in 2021.
- The EV chargers continue to be plotted on the interactive map on the intranet, or the council's web page https://info.westberks.gov.uk/onstreetev to help promote the use of the vehicles in the borough.

The following challenges have been identified:

- Budget allocation for progressing measures and actions. Funding applications will be applied for where possible/appropriate.
- Linking of Public Health Outcome Framework and Health profiles to air quality to show any causal relationship.

Local Engagement and How to get Involved

For further details on air quality in West Berkshire please refer to our website at http://info.westberks.gov.uk/index.aspx?articleid=27513 .

Individuals or members of local groups are invited to share any ideas they have to cut nitrogen dioxide levels in West Berkshire by emailing ehadvice@westberkshire.gov.uk

Other useful websites are:

https://uk-air.defra.gov.uk/

https://www.gov.uk/government/publications/2010-to-2015-government-policy-environmental-quality/2010-to-2015-government-policy-environmental-quality#appendix-5-international-european-and-national-standards-for-air-quality

There are a number of ways our residents can help to improve local air quality:

- Public Protection Partnership https://publicprotectionpartnership.org.uk/environmental-health/air-quality/vehicle-idling/
- Domestic Fuel information https://publicprotectionpartnership.org.uk/environmental-health/air-quality/air-quality-domestic-solid-fuels-standards-england-regulations-2020/
- Walk or cycle short distances of less than one or two miles rather than driving (see http://info.westberks.gov.uk/index.aspx?articleid=27868 for routes in West Berkshire).
- Search for car sharing opportunities using Lift share (see https://liftshare.com/uk) or Faxi (https://faxi.co.uk/) to share journeys with work colleagues
- Newbury Car Club (see http://www.co-wheels.org.uk/newbury)
- Use the bus or train regularly and keep up-to-date with the latest bus route timetables (see http://info.westberks.gov.uk/index.aspx?articleid=27888)
- Urban Limits http://urbanlimits.org/
- Safer Steps http://safersteps.co.uk/
- Road Rangers http://theroadrangers.co.uk/
- Travel Planning (Get Your Coat App) https://getyourcoat.app/
- Independent Travel (RouteGuard App) www.routeguard.co.uk

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1 Local Air Quality Management

This report provides an overview of air quality in West Berkshire Council during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by West Berkshire Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by West Berkshire can be found in Table 2.1. The table presents a description of the 2 AQMAs that are currently designated within West Berkshire. .Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 Annual Mean;
- NO_2 1 Hour Mean;

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
Newbury AQMA	Declared 2009	NO2 1 Hour Mean	An area encompassing a very small number of properties at the roundabout junction of A339, A343 St Johns Road and Greenham Road.	NO	61	0	Newbury AQAP	https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=304
Newbury AQMA	Declared 2009	NO2 Annual Mean	An area encompassing a very small number of properties at the roundabout junction of A339, A343 St Johns Road and Greenham Road.	NO	54.4	cm	Newbury AQAP	https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=304
Thatcham AQMA	Declared 2009	NO2 Annual Mean	An area encompassing a very small number of properties along the A4 (Chapel Street)	NO	53.3	17 Chapel Street	Newbury AQAP	https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=304

☒ **West Berkshire confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **West Berkshire confirm that all current AQAPs have been submitted to Defra.**

Progress and Impact of Measures to address Air Quality in West Berkshire

Defra's appraisal of last year's ASR concluded DEFRA commented that the report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to inform future reports.

- Trends are clearly presented and discussed and a robust comparison with air quality objectives is provided.
- The diffusion tube and AQMA mapping is comprehensive and clearly demonstrates the monitoring network.
- The Council have stated they will consider revocation of both the Newbury and Thatcham AQMAs following the results of the 2021 ASR. This decision is supported.
- QA/QC procedures were largely applied appropriately, with detailed information provided regarding the decision between local and national bias adjustment factors.
- The Council have included some mentions of the Public Health Outcomes Framework. In future ASRs, the Council is suggested to include a reference to indicator D01 - Fraction of mortality attributable to particulate air pollution, and how it compares regionally / nationally. This information can be found at: https://fingertips.phe.org.uk/profile/public-health-outcomes-framework

West Berkshire Council has only taken forward a limited number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality, due to the Pandemic. Details of all measures completed, in progress or planned are set out in Table 2.2. 17 measures are included within Table 2.2, with the type of measure and the progress West Berkshire Council have made during the reporting year of 2020 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans. More detail on these measures can be found in their respective Action Plans (http://info.westberks.gov.uk/CHttpHandler.ashx?id=36580&p=0) key measures are:

- Further A339 Bear Lane (Sainsbury's roundabout) improvement works to enable improved traffic flow have been completed and traffic lights were decided against at the

nearby St Johns Road roundabout following the modelling impact results. The results of the impact for the changes will not be available until the 2022/23 reports as we will need at least a year's worth of data without the pandemic impact included.

- Bio-Gas Buses pass through as they run to and from Reading which has strict AQ standards, this in turn benefits Newbury.
- The car club (set up in 2016) continues to grow and now has one electric vehicle. At the end of 2019 the car club had 103 members and the car with the highest use had 374 bookings (this data remains unchanged due to Pandemic)
- Many Electric trains are now running through the district and in December 2019 there was a change to the time table. As a result the Thatcham Level crossing is being monitored by the Transport Policy Team to investigate the knock-on effect of those changes.
- Active work on the reduction of HGVs through Newbury with the erection of Positive Signage in 2019/20 to influence the travel direction of the freight and greater use of the bypass. Further walking, running and cycling groups such as Let's Ride, Run Together and Walking for Health (led walks across West Berkshire) have been set up to provide activities for beginners, mental health groups and other interested parties.
- In 2019 31 Electric vehicle (EV) charging points were installed in West Berkshire, in 2020 an additional 5 were added. The EV chargers are all plotted on the council's web page https://info.westberks.gov.uk/onstreetev
- National Cycle Network 422 expansion – A4 Newbury to Thatcham and on to Calcot was completed in 2019. This provision of improved cycle ways through the Thatcham AQMA, and potentially linking Newbury to Legoland, Windsor https://osmaps.ordnancesurvey.co.uk/51.40608,-1.41302,10,
- Pedestrian and cyclist directional signage – this project commenced in 2018/19 and is continuing to promote and improve walking and cycling facilities.
- Cycle parking – improvements to existing facilities and introduction of new ones began and continues in schools into 2020.
- The Continuous Monitor has also been given a new sign which provides a QR code, in case the Public wish to find out more about what we do (see Figures 2.1 & 2.2).

- Anit-ilding Leaflets have been designed and distributed to all schools and made available on our website. https://publicprotectionpartnership.org.uk/environmental-health/air-quality/vehicle-idling/
- An AQ Newsletter was also sent out to the Councils and Parish Councils.

Figure 2.1: The Newbury Continuous monitor sign.

Figure 2.2: The Newbury Continuous monitor.

West Berkshire Council expects the following measures to continue to be completed over the course of the next reporting year:

Newbury

- New station/Council offices car park at Market Street.
- Improvements to the capacity of Robin Hood Roundabout (subject to external funding).
- A4 cycle track, further improvements.
- A339 Sandleford, create junction for new school and future housing development.
- Start construction of Kings Road Link Road (to be completed 2021/22).
- Further on-street EV charge points throughout the borough.
- New EV charge points in car parks, locations to be confirmed.
- Investment in cycle parking at schools.

Thatcham

- Further development of A4 cycle route.
- Optimisation of traffic signal timings on A4.
- On-street electric vehicle charge points.

Theale

- On-street electric vehicle charge points.

Pangbourne

- On-street electric vehicle charge points.

District wide

- Clean Air Day in June 2021 to increase awareness and promote health, and anti-idling. We have asked all schools in PPP to pledge that they will help us reduce the AQ in the district.

West Berkshire's priorities for the coming year are:

- Implementation of an Air Quality Guidance Note for planning applications.
- Joint working between Public Health England and the Public Protection Partnership (https://publicprotectionpartnership.org.uk/) and links within the Berkshire Public Health Shared Team.
- Continuing to work within the unitary authority with Transport Policy and Highways Teams as well as Development Control.
- Carry on the continuous and passive air quality monitoring programmes.

- Establish the feasibility of monitoring $PM_{2.5}$, as it is not a statutory requirement from DEFRA.
- Bikeability classes for year 5 in Primary Schools to encourage safe cycling and to give them confidence.
- The erection of 31 signs/posters to be positioned at all approaches to all 6 levels crossings and 6 swing bridges in West Berkshire. The slogan is based on that used by Portsmouth City Council and we have reproduced it with their agreement. The signs/posters are designed to be read by stationary vehicles and not provide a distraction to passing vehicles so might appear smaller than expected (Figure 2.3).

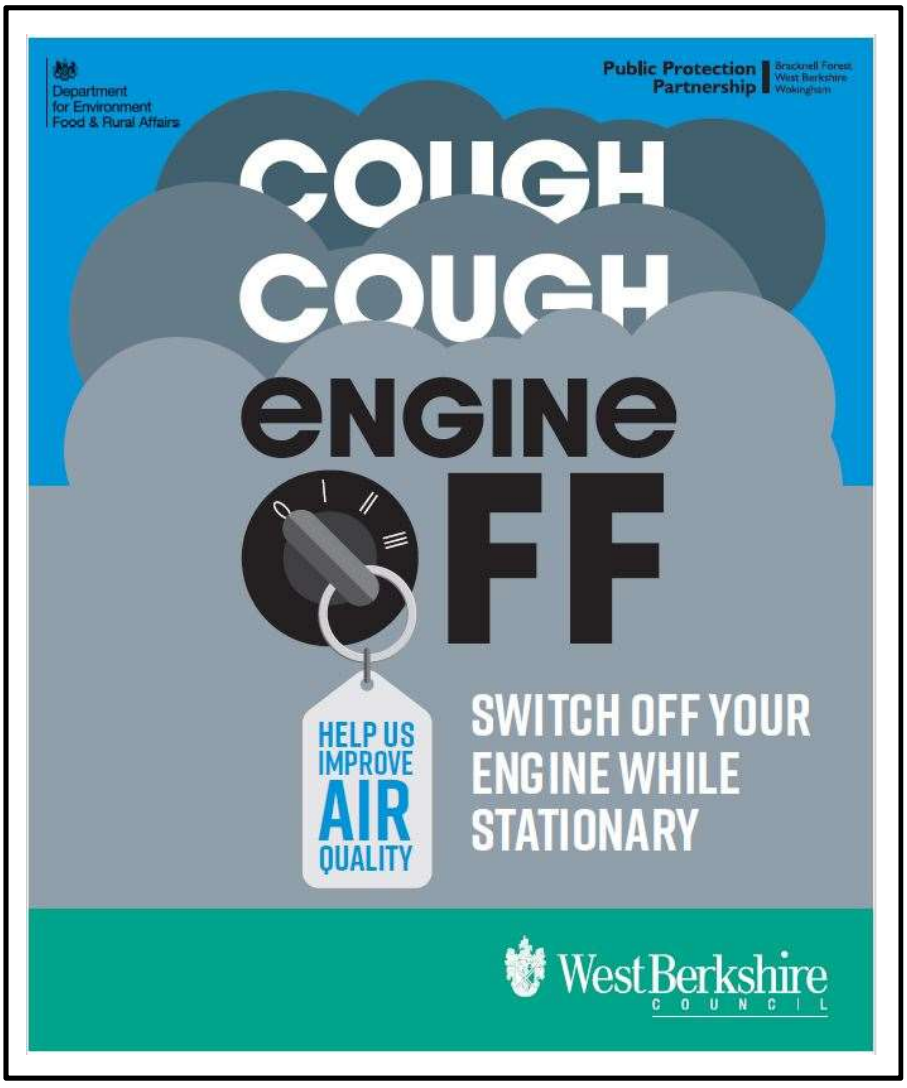

Figure 2.3: Cough Cough Engine Off

- Car Free School Street Programme, which aims to
    - Cut down on traffic & parking pressures outside schools.
    - Discourage car journeys to school & encourage walking & cycling.
    - Make the street outside schools safer at the start & end of the day.
    - Improve air quality and create a more pleasant environment for everyone.
    - https://info.westberks.gov.uk/school-streets

West Berkshire's priorities for the coming year are to continue monitoring the AQ levels through-out the district, run the DEFRA Grant campaign and to work with other agencies to help improve and keep the AQ.

The principal anticipated challenges and barriers to implementation for West Berkshire include lack of funding and resources.

West Berkshire anticipates that the measures stated above and in Table 2.2 will achieve compliance in the AQMAs.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated cost of Measure	Measure Status	Reduction in Pollution / Emission form Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Variable message Signing (VMS) linked to Newbury car Park System	Traffic Management	Other	2011	2011-14	WBC	WBC	NO	Funded		Completed	Negligible	Car park usage	Installed as part of Parkway opening spring 2012	Car Parks Team feedback that the signs are invaluable at directing traffic to available parking especially at busy times. Queuing has reduced at entrances. They also note that there are an increased number of parking spaces available so this may have helped reduce queuing also. Useage reduced due to pandemic
2	Study into signalising junction at Burger King Roundabout	Traffic Management	UTC, Congestion managemen, traffic reduction	2019	Summer 2019	WBC	WBC	NO	Funded		Completed	15 ug/m3 (based on 2008 data)	Reduction in queuing time and congestion within AQMA and reduction in NO2 and emission levels	Surveys ordered March 2017 and model was completed late 2017. Model indicates some benefit to replacing the roundabout with a traffic signal controlled crossroads. No budget is currently in place to deliver such a project, but could be delivered in conjunction with the Sandleford development if funding becomes available.	Await findings of model to assess impact on any proposed scheme, 2019 - from the results it was decided against traffic lights. North bound is nearer receptors, and it has added a lane in the South bound direction, which it has a modest increase in traffic flow.

3	Amendments to Bear Lane (Sainsbury's) Junction of A339, as this junction can impact on A343 Greenham Road Junction	Traffic Management	UTC, Congestion management, traffic reduction	2012	2019	WBC	WBC	NO	Funded		Completed	15 ug/m3(based on 2008 data)	Queuing time and congestion close to AQMA and reduction in NO2 levels	Complete. Changes to roundabout being looked at along with Bear Lane by WBC consultants - see new action. Sainsbury's roundabout, Cheap Street and Market Street have been redesigned to re-route traffic and improve flow. Work began January 2019.	Results regarding the AQ impact will not be available until 2021/22 report, to allow for at least 2 years' worth of monitoring.
4	Improved local bus services to reduce short car journeys	Transport Planning and Infrastructure	Bus route improvements	2015	2016	WBC	WBC	NO	Funded		Implement ation	Negligible	Increase in no. of passenger journeys	Capital works - Complete. New developer-funded bus service – started May 2016	Ongoing monitoring of passenger journeys. Also improvements to Reading Buses fleet to alternative fuels (gas). We are on the Reading buses network and they require strict standards.
5	Smarter Choices(1) Investigate the feasibility of a district wide car share scheme	Alternatives to private vehicle use	Car Clubs	2012	2015	WBC	WBC	NO	Not Funded		Completed	Negligible	No. of car share cars and their useage	Works commenced	Complete: District wide car sharing isn't feasible - a focus on location journeys instead- see (3).
6	Smarter Choices(2) Investigate the feasibility of a car club for Newbury and Thatcham area (Racecourse)	Alternatives to private vehicle use	Car Clubs	2012	2016	WBC	WBC	NO	Not Funded		Implement ation	Negligible	No. of car share cars and their usage	5 Car Newbury scheme was launched in 2016 in partnership with Co-wheels. One of the vehicles is electric. Usage is growing year on year.	2016/17 Public launch, promoting & monitoring uptake. Data will be available on number of members, vehicle usage, number of miles, trips etc. Greater promotion is desired but in 2019 the car club use continued to increase. There is promotion with a short film focused on using the electric car. As at the end of 2019, the car club had 103 Members. The car with the highest use had 374 bookings in 2019. 2020 on hold due to Pandemic.

7	Smarter Choices(3) Promote Car sharing opportunities within the district	Alternatives to private vehicle use	Car Clubs	2012	2032	WBC	WBC	NO	Partially Funded		Implement ation	Negligible	No. of car share cars and their usage	West Berkshire Council FAXI car share/cycling & walking partner website being promoted (44 registered as of 9/3/16) and dedicated Council Car share bays (24 registered users).Car sharing within locally situated schools had been explored but wasn't a great deal of interest. AWE had invested heavily in car sharing and have their own internal system.	Number of people registered and their locations and journey type. FAXI car sharing focused around Newbury Town Centre. Opportunity for greater up take. AWE car share still on going.
8	Electrificatio n of Newbury to Reading railway line	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2017	2018	Network Rail	Network Rail	NO	Not Funded		Completed	Negligible. Some air pollution reductions in and around major urban train stations along route as diesel trains are replaced.	Increased reliability of services and increase passenger usage	Boundary Road bridge over railway line due be carried out in 13/14, NR required to raise bridge due to electrification but there are issues re-sighting. Works have completed on many bridges. Boundary Road Bridge work began in 2015, due for completion Jan 17.). Electric trains started running on Newbury to Reading local services in Jan 2019. London to Bedwyn and London to West Country Services will run on electric	Hendy Review is likely to result in any decision to electrify the Berks and Hants line to the west of Newbury being delayed beyond the end of Network Rail Control Period 6 (2019-2024). Electric trains are all running. In December 2019 there was a change to the time table. Thatcham level crossing has been monitored in terms of the knock-on impact of the new timetable on congestion around the station.

														power as far as Newbury and then switch to diesel.	
9	Supplementary Planning Document for AQ	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2022	WBC	WBC	NO	Not Funded		Implementation	negligible	Reduce reliance of car in new development. Us of s106 funds	Planning and Air quality document drafted and due to be launched in 2019. No current Supplementary Planning Document.	Proposed emissions from large scale developments more quantifiable than from small scale.
10	Reduction of HDVs using A339 through Newbury	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2017	2018	WBC	WBC	NO	Not Funded		Implementation	links with 15 ug/m3(based on 2008 data)	Reduction in HDV journeys along this section of road network and decrease in NO2 levels measured.	Freight Strategy review commenced 2013. Discussions by WBC with HCC held. Options paper to TPTG Jan 15, recommending positive signage at a cost of £15-20k on the local network and £20-30k per sign on the A34. WBC can only really influence northbound traffic from the Swan Roundabout. Freight Route Network Maps had recently been updated- purely advisory. Direction signs now in place northbound to encourage greater use of the bypass by HGVs.	Completed signs are up.

11	Electric charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel	2015	2023	WbC	WBC	NO			Implement ation	negligible	Use of charging points. Increase in EV ownership and use of/demand for (public) charge points	(1) Successful OLEV grant to install charge points on WBC land 2013-15. (2) Ecotricity Rapid charge points installed at motorway service stations. (3) Agreement by FGW to install at Aldermaston and Theale stations. (4) EV Residential Guidance included in the WBC Residential Parking Guidance (5) ULEV Readiness Programme (6) ULEV Strategy proposed (7) Promoting EV Vehicles. A contract has been let to install charge points on the highway in residential areas. Funded by OLEV grant.	(1) Council charge points installed for WBC use at Kennet Centre (Mar 13) and Ampere Road, Newbury (Mar 14) under OLEV Public Sector charging scheme. (2) Run by Ecotricity, data on use not readily available. (3) Once installed, unlikely to have readily available data on use. (4). EVCP to be considered at all residential developments, as a minimum infrastructure enabling installation of EVCP at a later date. (5) Successful Bid for OLEV funding (Aug 15). For 2 further charge points, installed at Kennet Centre Newbury and 1 at Wokingham for the Joint EH&L Service use (Mar 16). 3 EV vans and 2 EV Cars have been procured, awaiting delivery Mar 16. (6) ULEV Strategy began by TP, for Transport Vision and revised LTP. (7) Support of EV-ENT held by WB Green Exchange in May 2016. 2 electric cars provided with Public Protection Service for work use.

12	Health Education	Public Information	Other	2012	2032	WBC/PH	WBC/PH	NO				Decrease in hospital admissions from asthma. Increase in walking and cycling.		Air Quality and health impact link not a priority but seen as a definite link. PH are funding a Schools Active Travel Officer post encouraging walking and cycling to school & previously part funded the personal travel plan project. PH were focussed on active travel i.e. walking and cycling. Cycling promotion- setting up cycling sessions for beginners, getting adults back into cycling. A bike shed would be installed at Northcroft so those that didn't have a cycle could loan one to take part in the sessions. In 2016 closer links with Director of PH for Berkshire, Strategic Berkshire PH Team and PHE developed. Joint AQ and PH website development created with launch in late 2017	Priorities with PCT did not previously relate to improving health due to poor air quality. Improved links with Public Health now within WBC, including joint working. Permanent Healthy Lifestyles Officer post promoting active travel and physical activity in schools. Cycling, running and walking groups across the district. Promotion of physical activity and active travel. Community Physical Activity fund to be launched March 2019.

13	National Cycle Route (Newbury to Legoland)	Promoting Travel Alternatives	Promotion of cycling	2017	2019	WBC	WBC	NO				Negligible	Cycleway usage	WSP commissioned to undertake a wider feasibility into the proposal. Business Case submitted to the TV LEP. The LEP awarded the funds to the scheme in December 2015. The proposed funding for the scheme is £5.5million, with £4.2m from the LEP. West Berkshire has committed a further £100,000 via funds from the annual Capital budget. Other funds and monies will be combined to further support the route, such as developer contributions. Cycle facilities have been improved on the A4 between Newbury and Thatcham. Further improvements planned during 2019-2020.	2016/17 Survey & Planning, 2017/18 & 2018/19 .On-site works NCN Route 422 is the indicative route title for a National Cycle Route potentially linking Newbury through to Ascot and Windsor 2020 objectives have been delivered.
14	Park and Ride	Alternatives to private vehicle use	Bus based Park & Ride			WBC	WBC	NO			Aborted		Reduce emissions within the town centre by reducing the number of cars and congestion.	P&R proposal rejected by TPTG July 2011 due to cost and unsuitability of Newbury.	Closed – not to be carried out.

15	Cycle lane on A343 St Johns Road between Burger King Roundabout and St Johns Roundabout	Transport Planning and Infrastructure	Cycle network	2012	2015	WBC	WBC	NO			Completed	Negligible	Reduction in car journeys along this section of road network and decrease in NO2 levels measured	Implemented	Completed. Part of Cycle way improvement programme for 2011/12. Approx £100k per annum (£50k capital grant & £50k Developer Contributions (S106)
16	Travel Planning	Promoting Travel Alternatives	Personalised Travel Planning	2013	2015	WBC	WBC	NO	Partially Funded		Completed	Negligible	No. of businesses and householders engaged in the Network, with focus on Newbury and Thatcham	Completed: Project ran June 14-Sep 14. Targeting nearly 5000 homes. 39% had consented to participating in the programme. Also resulted in improvements in bus routes in the Wash Common area.	Completed: The survey indicated a shift towards more sustainable travel journeys, with 24% of respondents walking more often, and 10% using the bus more regularly, and an 8% increase in cycling. More importantly, 15% of respondents stated that they now made fewer single occupancy car journeys. Business and school travel planning. LSTF bid for personalised travel planning and personalised travel training unsuccessful summer 2012, but plan to do a Business Travel Plan Network. AQ grant Dec 13 successful for PTP and marketing joint project EH, TP and PH. Contractor appointed and project commenced autumn 2013. Walking reward scheme at preschool near AQMA Bike ability training at 2 schools close to AQMA. Entered a DEFRA BID 2019 for of an anti-idling campaigned and was successful.
17	Low Emission Zone	Promoting Low Emission Transport	Low Emission Zone (LEZ			WBC	WBC	NO	Not Funded		Aborted	15 ug/m3(based on 2008 data)	Reduction in polluting vehicles	Initial scope report for LEZ. Report by TP taken to TPTG agreed not to proceed as not suitable for Newbury	Not suitable for Newbury.

$PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

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The latest $PM_{2.5}$ data available (2017) from DEFRA show that West Berkshire has a maximum level of 11.38 (co-ordinates x 459500 y163500), and the average level of 9.22. (https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017). Table 2.4 shows that 0.81% of $PM_{2.5}$ is produced by road & transport, the other 99.19% is from other factors.

The fraction of mortality attributable to particulate air pollution indicator value for West Berkshire and other Local Authorities within Berkshire, can be seen in Table 2.3. Further information about other areas in the UK can be can be found using the link below.https://fingertips.phe.org.uk/profile/public-health-outcomesframework/data#page/0/gid/1000043/pat/6/par/E12000005/ati/101/-are/E07000194

Table 2.3: Showing the Fraction of Mortality attributable to particulate air pollution indicator value within Berkshire.

Bracknell Forest	Reading	Slough	West Berkshire	Windsor & Maidenhead	Wokingham
5.7	6.3	6.5	5.3	5.8	5.9

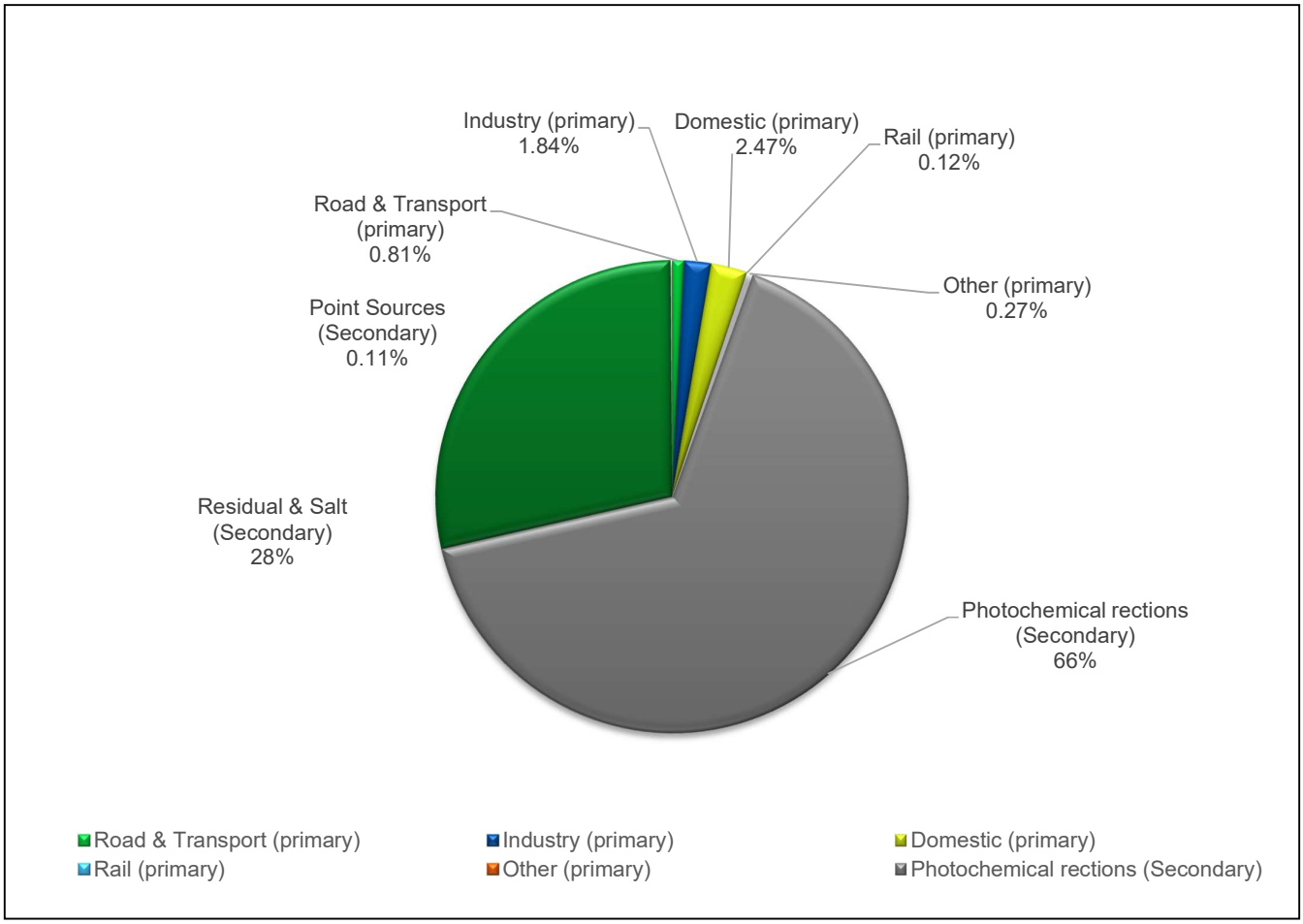
West Berkshire is taking the following measures to address $PM_{2.5}$:

- The link of the Health and Wellbeing Strategy, Public Health Service Plan and the Public Health Action Plan include many actions to increase walking and cycling in order to encourage and increase active travel, to reduce obesity and inactivity. https://info.westberks.gov.uk/wfh
- Joint working between Public Health and Environmental Health teams for air quality will consider in detail how West Berkshire will explore the impact on $PM_{2.5}$ throughout the district and how it may be reduced. The results will be linked to the Public Health Outcomes Framework. It is likely that a marketing plan will be set up to raise awareness of how air quality (which includes $PM_{2.5}$) can be improved by active travel and the uptake of electric vehicles.
- Work on implementing the actions in the Local Transport Plan and the Local Development Framework Core Strategy. For example, a new housing development might contribute to alterations to nearby junctions to increase capacity whilst also improving cycle and pedestrian links, provision of electric vehicle charging infrastructure, contributing to bus services so that the site is served by public transport and linking many other measures together in a site travel plan to encourage people to choose sustainable travel.
- A fresh policy is being used to assess residential developments in West Berkshire. The policy has been in use since 2016 when it was at an advanced stage of development and has since been formally adopted (9th May 2017) so it will continue to be used into the future.
- The new policy 'Policy P1: Residential Parking for New Development' has the following advantages for addressing sustainable travel, therefore less traffic. https://info.westberks.gov.uk/CHttpHandler.ashx?id=45231&p=0. It brings down the threshold for when residential travel plans will be required from 50 dwellings for more urban areas and 80 dwellings for areas with more rural characteristics. This means there is more emphasis on encouraging walking, cycling, public transport and car sharing / car clubs for forthcoming developments than previously across the District.
- There is a requirement for new residential developments to install electric charging points, or at least the basic infrastructure, to enable them to be fitted at a later date. Before, this was simply encouraged by officers on larger developments but now it is part of the policy against which applications are assessed. In 2019 31 Electric vehicle (EV)

charging points were installed in West Berkshire, the EV chargers are all plotted on the council's web page https://info.westberks.gov.uk/onstreetev

- The Council's 'Cycling and Motorcycling Advice and Standards for New Development' is also now embedded within the policy so that appropriate cycle parking provision is included in the plans for new residential developments. This will support the encouragement of greater cycling across the district. https://osmaps.ordnancesurvey.co.uk/51.40608,-1.41302,10,
- Pedestrian and cyclist directional signage – this project commenced in 2018/19 to improve walking and cycling facilities and promotion
- Cycle parking – improvements to existing facilities and introduction of new ones began and continues in schools into 2020/21.
- Air Quality Action Day 2021 in June to help raise awareness, an asking Schools to sign a pledge to ensure that they get involve and send the information out to the parents, with regard to idling at the school pick up and in other areas where they use a vehicle.
- The Public Protection Partnership has been awarded the DEFRA AQ Grant (£259k) to measure into the PM2.5 of the schools located near the AQMA, and to ascertained what mitigation measures can be taken to each specific site to help them achieve the National AQ Objectives.

Table 2.4. A pie chart showing both the Primary and Secondary sources of $PM_{2.5}$



(https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017)

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

This section sets out the monitoring undertaken within 2020 by West Berkshire and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

West Berkshire undertook automatic (continuous) monitoring at 36 sites during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

West Berkshire undertook non- automatic (i.e. passive) monitoring of NO_2 at 36 sites during 2020. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater

than 33%), and distance correction. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

3.1.4 Newbury Continuous Monitor (NO_2)

The data capture at a rate of 99.6 % was higher than last year (70.3%) as there were no electrical faults with the unit.

For 2020 there was 1 exceedance of the annual 1 Hourly Objective (200µg/m^3 not to be exceeded more than 18 times per year), and this was on the 21st January 2020 at 18:00 hours.

The ratified continuous monitored NO_2 annual mean did not exceed the objective with a reduction to 29.2µg/m^3 in 2020, compared to 35.9µg/m^3 in 2019, 36.4µg/m^3in 2018 & 40.3µg/m^3 in 2017. The concentrations were low due to the pandemic and a vehicle reduction of 33% in the district figure worked out from the A339 data.

A review the one hourly exceedance (Tuesday 21st January 2020 at 18:00 hours) shows that this data does not relate to a specific event in Newbury, such as a racing meet. However, the time it happened correlates with the normal rush hour traffic volume at this location.

The trend seen at the Newbury Station is comparable with DTs with May and June data being higher than DTs data. The trend seen from July 2020 can be comparable with AURN monitoring sites at Reading New Town, Oxford St. Ebbes and Swindon Walcot. The average NO2 readings from the Continuous Monitor align well with Diffusion Tube results, within 5µg/m3 of each other. In June the Continuous Monitor average is ~8 ug/m3 above the diffusion tube (or 24%).

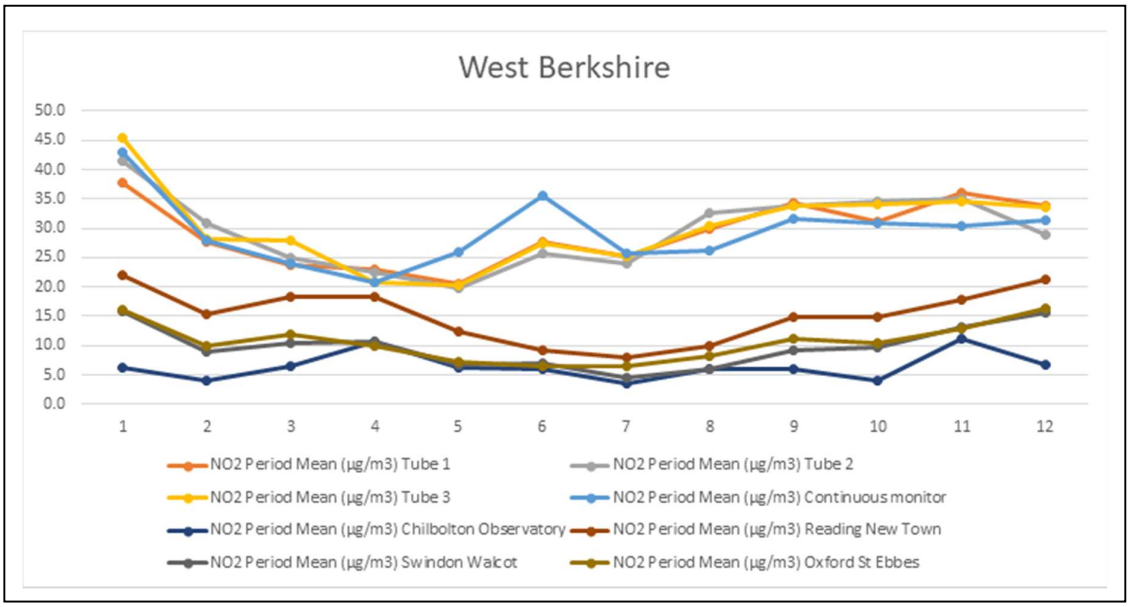


Figure 3.1 - Comparison Graph

NO_2 Diffusion Tube Data

3.1.5 Newbury AQMA

There are five diffusion tubes within the Newbury AQMA and three within close proximity (see Map D.4). There were no exceedances of diffusion tubes within the AQMA however, in 2019 two locations showed an increase on the 2018 levels (St Johns Road & 31 Shaw Road), the rest showed a decrease of NO_2 from 2018. The highest levels of NO_2 in this AQMA were recorded at the continuous monitor (see Map D.3) and the Annual Mean Objective was met, measuring 29.2 µg/m^3 NO_2, the collocated tubes measured 29.2 µg/m^3 For the last five years the results have shown an overall decrease in level (see Figure A.2), monitoring continues at those five sites.

If there continues to be no exceedance in the AQMA in the 2023 ASR (omitting 2020 & 2021 data due to Covid-19 lockdown and the new road lay out) West Berkshire will be recommending to DEFRA that the Newbury AQMA is revoked as we have continual evidence that the NO_2 is below the National Mean Annual Objective of 40.0µg/m^3.

3.1.6 Thatcham AQMA

There are four diffusion tube sites (see Map D.7) within the Thatcham AQMA and two within close proximity. For the last five years the results have shown a decrease of the NO_2 Annual Mean Objective within the AQMA.

If there continues to be no exceedances in the AQMA in the 2023 ASR (omitting 2020 due to Covid-19 lockdown) West Berkshire will consider recommending to DEFRA that the Thatcham AQMA is revoked as we have continual evidence that the NO_2 is below the Annual Mean Objective of 40.0µg/m^3.

The highest levels in this AQMA were recorded at 17 Chapel Street 29.5µg/m^3 and the levels did not exceed the Annual Mean Objective. The site has showed a consistent decrease from 43.1µg/m^3 in 2016 to 40.0µg/m^3 in 2017 to 36.4µg/m^3 in 2018, then to 31. 4µg/m^3 in 2019 (Figure A.3). Monitoring will continue during 2021 at the four sites.

3.1.7 NO_2

Overall, eighteen of the sites showed a decrease in levels compared to 2019 due to the national pandemic and lockdowns However in 2018, nine increased and one was only established in 2019 so has no comparable figures. All the increased levels remain below the Annual Mean Objective (40µg/m^3).

There were no results greater than 60µg/m^3, which indicates no exceedance of the 1-hour Mean Objective.

In Newbury, none of the sites showed an increase in 2020. However five of the nine sites outside the AQMA showed an increase in NO_2 during 2019: A339 Newbury Central, ‘Abbeydale’ Monks Lane, 64 Greenham Road, A339 New Greenham Park and 6 Market Street. This may have been due to road layout, Pandemic free data will allow us to explore this further.

Three monitoring locations were ceased at the end of 2020, St James Church (Pangbourne Hill), Newbury. Willows Edge Nursing Home, Flat 1, South View Gardens as the sites

constantly remain well below the objective levels. The new site in 2019 at Newbury Gardens Day Nursery sits within the in north-west part of the Newbury AQMA and aims to represent relevant exposure. This provided a result of 19.6µg/m^3 in 2019 and 18.2µg/m^3 in 2020.

3.1.8 Particulate Matter (PM_{10})

No particulate matter (PM_{10}) monitoring is undertaken.

3.1.9 Particulate Matter ($PM_{2.5}$)

No particulate matter ($PM_{2.5}$) monitoring is undertaken.

3.1.10 Sulphur Dioxide (SO_2)

No sulphur dioxide monitoring is undertaken as not required by DEFRA.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CM1 Newbury	Newbury A339, A343 and Greenham Road junction	Roadside	477407	166560	NO_2	YES	Chemiluminescent	1	4.7	1.8

Notes:

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

(2) N/A if not applicable

Table A.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) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
31 Chapel Street Thatcham	31 Chapel Street Thatcham	Roadside	451906	167441	NO2	Thatcham AQMA	0.0	1.6	No	2.1
17 Chapel Street Thatcham 1, 17 Chapel Street Thatcham 2	17 Chapel Street Thatcham 2	Roadside	451870	167438	NO2	Thatcham AQMA	0.0	1.5	No	2.4
44 Hambridge Road Newbury	44 Hambridge Road Newbury	Urban Background	448129	166909	NO2	No	0.0	4.3	No	2.5
A339(64) Greenham Road Newbury	A339(64) Greenham Road Newbury	Roadside	447448	166454	NO2	No	12.0	2.0	No	2.2
1 Winchester Court Newbury	1 Winchester Court Newbury	Roadside	447409	166559	NO2	Newbury AQMA	0.0	5.0	No	3.0
Newbury Gardens Day Nursery	Newbury Gardens Day Nursery	Suburban	447343	166612	NO2	Newbury AQMA	0.0	7.0	No	2.0
20 Deadmans Lane Greenham	20 Deadmans Lane Greenham	Suburban	447508	164725	NO2	No	0.0	10.5	No	2.1
A339 Greenham Park	A339 Greenham Park	Kerbside	449805	163882	NO2	No	10.0	1.9	No	2.1
A343 Andover Rd(Parkhouse School)	A343 Andover Rd(Parkhouse School)	Kerbside	445899	164705	NO2	No	18.1	0.8	No	2.3
Abbeydale Monks Lane Newbury	Abbeydale Monks Lane Newbury	Kerbside	446922	163030	NO2	No	21.0	2.0	No	2.5
3 Howard Road Newbury	3 Howard Road Newbury	Roadside	447402	166449	NO2	No	0.0	11.0	No	2.6
63 St Johns Road Newbury	63 St Johns Road Newbury	Urban Background	447377	166533	NO2	No	0.0	6.2	No	2.2
1 St Johns Road Newbury	1 St Johns Road Newbury	Roadside	447036	166436	NO2	No	0.0	4.8	No	2.3
2 Pounds Cottages	2 Pounds Cottages	Suburban			NO2	No	0.0	2.0	No	2.0
7a Bridge Street Hungerford	7a Bridge Street Hungerford	Roadside	433909	168815	NO2	No	0.0	1.5	No	2.7
43 Hawthorn Road Newbury	43 Hawthorn Road Newbury	Urban Background	447487	167870	NO2	No	0.0	13.0	No	2.2
6 Market Place Newbury	6 Market Place Newbury	Urban Centre	447211	167020	NO2	No	9.5	1.3	No	2.1
42 Kings Road Newbury	42 Kings Road Newbury	Roadside	447433	166994	NO2	No	0.0	11.3	No	1.9
40 Bartholomew Street Newbury	40 Bartholomew Street Newbury	Roadside	446939	166848	NO2	No	0.0	2.7	No	2.2
Willows Edge Nursing Home Newbury	Willows Edge Nursing Home Newbury	Urban Background	447540	167970	NO2	No	0.0	20.0	No	2.0
31 Shaw Road Newbury	31 Shaw Road Newbury	Kerbside	447688	167820	NO2	No	0.0	0.6	No	1.7

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) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
13 Shaw Road Newbury	13 Shaw Road Newbury	Urban Background	447630	167770	NO2	No	0.0	7.0	No	2.4
132 London Road Newbury	132 London Road Newbury	Roadside	447720	167678	NO2	No	0.0	3.0	No	2.6
Flat 1 Southview Gardens Newbury	Flat 1 Southview Gardens Newbury	Urban Background	447752	167667	NO2	No	0.0	5.0	No	1.5
A339 Newbury Central	A339 Newbury Central	Kerbside	447463	167318	NO2	No	204.0	4.0	No	2.3
374 London Road Newbury	374 London Road Newbury	Urban Background	449034	167520	NO2	No	0.0	12.5	No	2.1
Old Bakery Tidmarsh	Old Bakery Tidmarsh	Roadside	463504	174864	NO2	No	0.0	2.2	No	1.9
Pangbourne Hill	Pangbourne Hill	Roadside	463418	176405	NO2	No	6.5	1.0	No	2.0
The Cross Key Inn Pangbourne	The Cross Key Inn Pangbourne	Roadside	463468	176433	NO2	No	0.0	4.0	No	2.6
4Willows Court Pangbourne	4Willows Court Pangbourne	Roadside	463224	176523	NO2	No	0.0	3.0	No	2.3
Calcot Hotel	Calcot Hotel	Kerbside	466302	171865	NO2	No	16.0	2.0	No	2.3
Elizabeth Court Theale	Elizabeth Court Theale	Urban Background	464574	171294	NO2	No	0.0	32.0	No	2.0
75 Chapel Street Thatcham	75 Chapel Street Thatcham	Roadside	452288	167445	NO2	Thatcham AQMA	0.0	3.4	No	2.2
A4(80-82) Chapel St Thatcham	A4(80-82) Chapel St Thatcham	Roadside	452071	167468	NO2	Thatcham AQMA	0.0	1.8	No	2.0
130 Park Avenue Thatcham	130 Park Avenue Thatcham	Roadside	451965	167498	NO2	Thatcham AQMA	7.0	2.0	No	2.1
40 Chapel Street Thatcham 3, 40 Chapel Street Thatcham 1, 40 Chapel Street Thatcham 2	40 Chapel Street Thatcham 2	Kerbside	451926	167460	NO2	Thatcham AQMA	0.0	3.5	No	2.2

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	477407	166560	Roadside	100	99.6	**41.7**	**40.3**	36	35.9	29.2

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16**

☒ **Reported concentrations are those at the location of the monitoring site (annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 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.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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 A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
31 Chapel Street Thatcham	451906	167441	Roadside	100	92.3	**43.1**	39.5	36.0	31.7	27.7
17 Chapel Street Thatcham 1, 17 Chapel Street Thatcham 2	451870	167438	Roadside	100	100.0	**43.1**	**40.0**	36.4	31.6	29.5
44 Hambridge Road Newbury	448129	166909	Urban Background	100	92.3	27.0	27.3	26.0	24.1	22.3
A339(64) Greenham Road Newbury	447448	166454	Roadside	100	82.7	27.3	23.4	26.2	29.9	26.6
1 Winchester Court Newbury	447409	166559	Roadside	100	82.7	**43.0**	38.0	36.0	32.7	29.8
Newbury Gardens Day Nursery	447343	166612	Suburban	100	73.1				19.6	18.2
20 Deadmans Lane Greenham	447508	164725	Suburban	100	92.3	27.8	24.0	23.0	20.2	19.4
A339 Greenham Park	449805	163882	Kerbside	100	73.1	39.3	33.8	18.5	31.2	31.3
A343 Andover Rd(Parkhouse School)	445899	164705	Kerbside	100	73.1	15.0	11.4	14.2	15.5	13.1
Abbeydale Monks Lane Newbury	446922	163030	Kerbside	100	75.0	15.2	13.2	15.4	19.9	15.2
3 Howard Road Newbury	447402	166449	Roadside	100	80.8	22.9	17.7	22.0	18.6	15.4
63 St Johns Road Newbury	447377	166533	Urban Background	100	100.0	26.5	21.8	25.0	22.4	16.7
1 St Johns Road Newbury	447036	166436	Roadside	100	100.0	32.6	28.4	31.0	26.8	22.1
2 Pounds Cottages			Suburban	100	76.9					9.6
7a Bridge Street Hungerford	433909	168815	Roadside	100	100.0	29.4	28.8	26.0	23.1	21.0
43 Hawthorn Road Newbury	447487	167870	Urban Background	100	92.3	23.5	20.5	21.0	18.5	16.3
6 Market Place Newbury	447211	167020	Urban Centre	100	90.4	25.7	22.4	24.9	26.0	20.8
42 Kings Road Newbury	447433	166994	Roadside	100	100.0	26.1	23.4	23.0	20.3	18.9
40 Bartholomew Street Newbury	446939	166848	Roadside	100	82.7	36.0	31.7	29.0	27.4	23.3
Willows Edge Nursing Home Newbury	447540	167970	Urban Background	100	82.7	22.9	23.8	23.0	20.6	20.8

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
31 Shaw Road Newbury	447688	167820	Kerbside	100	100.0	30.5	28.7	28.0	25.6	25.6
13 Shaw Road Newbury	447630	167770	Urban Background	100	100.0	37.8	33.2	30.0	26.5	25.6
132 London Road Newbury	447720	167678	Roadside	100	100.0	**41.8**	35.4	32.0	28.1	25.1
Flat 1 Southview Gardens Newbury	447752	167667	Urban Background	100	84.6	31.5	28.6	25.0	22.7	20.4
A339 Newbury Central	447463	167318	Kerbside	100	100.0	30.9	28.1	29.4	29.9	30.6
374 London Road Newbury	449034	167520	Urban Background	100	82.7	25.7	23.4	23.0	22.1	18.1
Old Bakery Tidmarsh	463504	174864	Roadside	100	100.0	35.9	31.8	29.0	29.5	20.9
Pangbourne Hill	463418	176405	Roadside	100	90.4	24.3	21.3	18.7	20.4	19.9
The Cross Key Inn Pangbourne	463468	176433	Roadside	100	84.6	**40.2**	34.2	34.0	29.6	26.2
4Willows Court Pangbourne	463224	176523	Roadside	100	92.3	32.2	29.3	28.0	24.8	20.5
Calcot Hotel	466302	171865	Kerbside	100	100.0	23.1	23.1	19.3	28.4	25.6
Elizabeth Court Theale	464574	171294	Urban Background	100	100.0	24.3	21.6	22.0	20.3	18.3
75 Chapel Street Thatcham	452288	167445	Roadside	100	84.6	31.7	29.6	27.0	27.8	21.8
A4(80-82) Chapel St Thatcham	452071	167468	Roadside	100	82.7	33.8	31.1	28.0	22.2	24.4
130 Park Avenue Thatcham	451965	167498	Roadside	100	80.8	19.2	21.7	18.3	19.4	18.0
40 Chapel Street Thatcham 3, 40 Chapel Street Thatcham 1, 40 Chapel Street Thatcham 2	451926	167460	Kerbside	100	100.0	39.9	34.8	31.8	28.6	27.7

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

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.
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.
(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 A.1 – Trends in Annual Mean NO_2 Concentrations for all the diffusion tubes

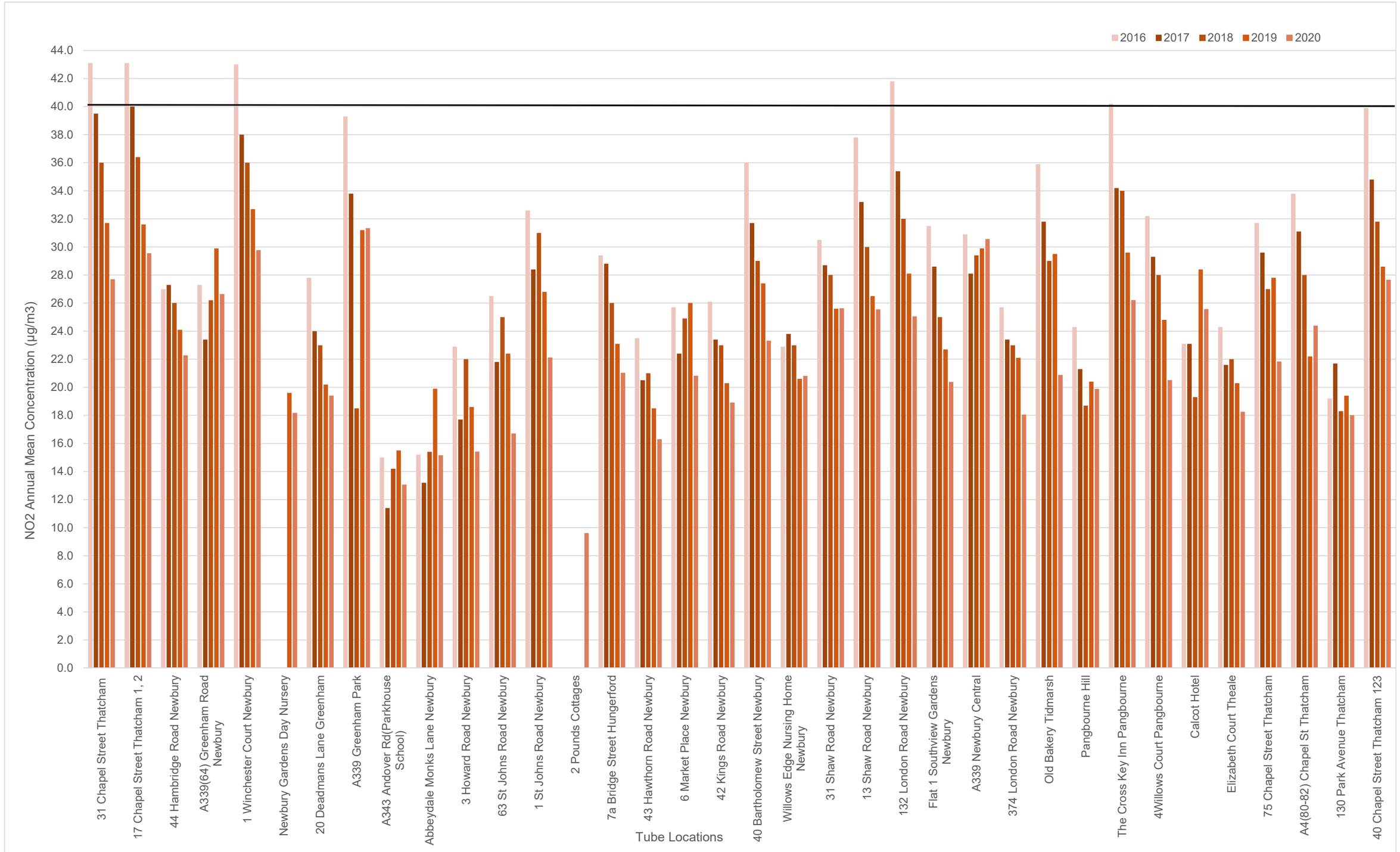


Figure A.2 – Trends in Annual Mean NO2 Concentrations for the Continuous Monitor

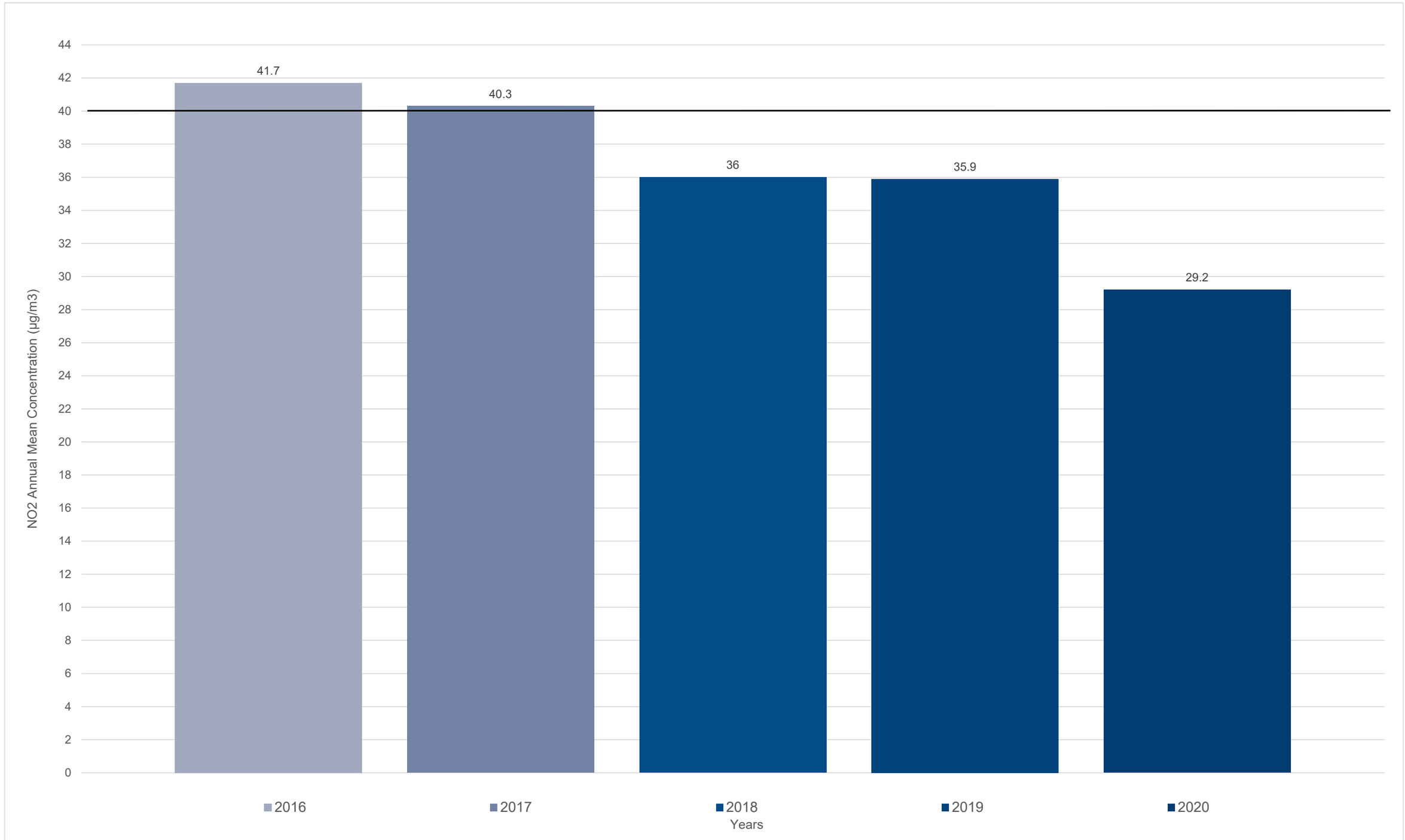


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	477407	166560	Roadside	100	99.6	**21**	8	1	2	1

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.

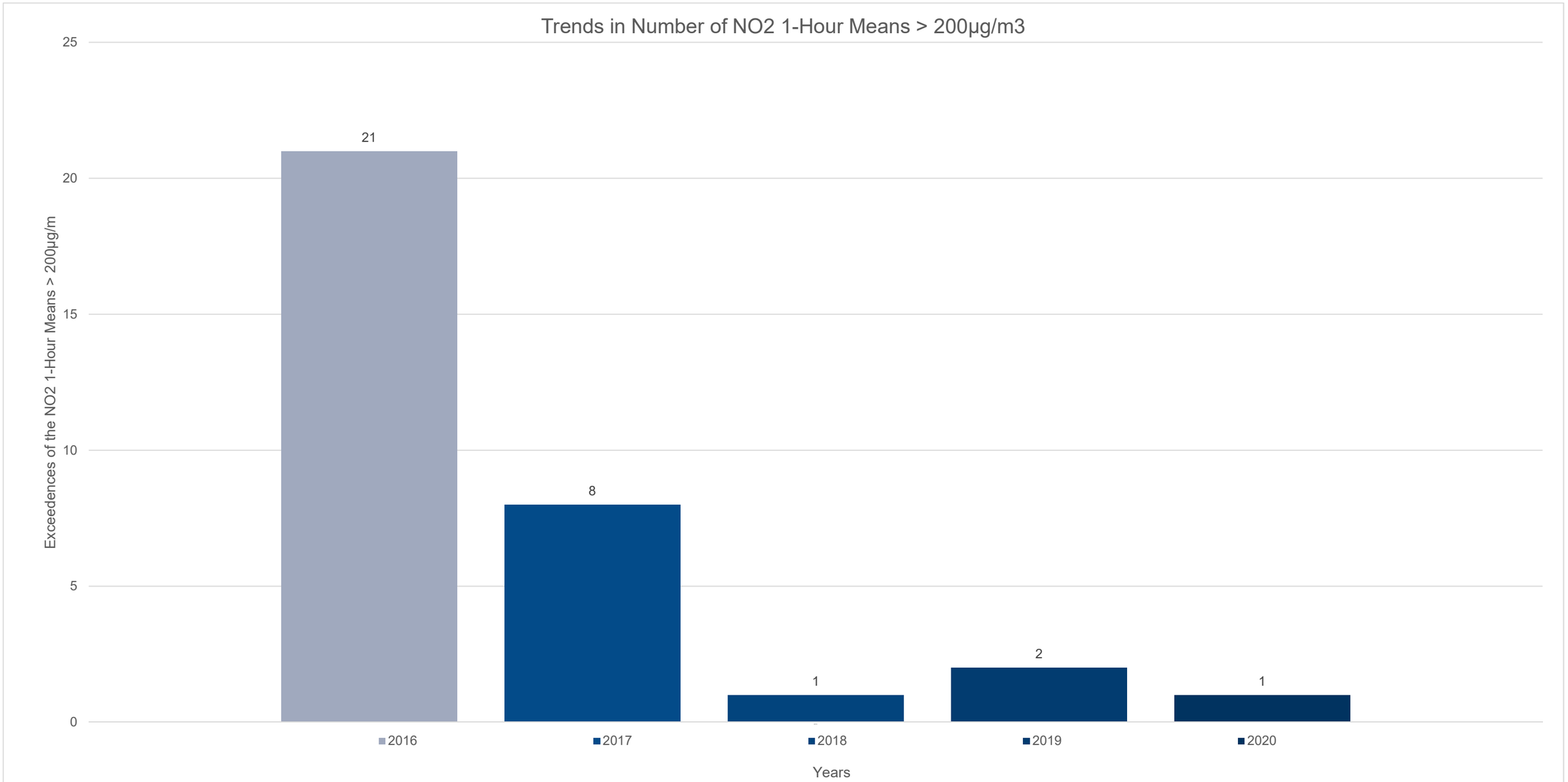
Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

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%).

Figure A.3 – Trends in Number of NO_2 1-Hour Means > 200µg/m^3



Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.99)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
40 Chapel Street Thatcham 3	451926	167460	35.1	29.3	24.7	28.1	21.5	24.6	19.6	25.7	31.8	29.1	34.9	33.0	-	-	-	Triplicate Site with 40 Chapel Street Thatcham 3, 40 Chapel Street Thatcham 1 and 40 Chapel Street Thatcham 2 - Annual data provided for 40 Chapel Street Thatcham 2 only
31 Chapel Street Thatcham	451906	167441	**40.9**	30.6	27.3	25.5	20.5		21.3	30.0	32.5	16.3	33.2	29.9	28.0	27.7	-	
17 Chapel Street Thatcham 1	451870	167438	**40.8**	31.4	28.4	30.0	21.3	26.4	21.6	30.6	34.3	33.4	35.8	21.8	-	-	-	Duplicate Site with 17 Chapel Street Thatcham 1 and 17 Chapel Street Thatcham 2 - Annual data provided for 17 Chapel Street Thatcham 2 only
17 Chapel Street Thatcham 2	451870	167438	**40.6**	31.1	28.5	28.9	22.2	27.5	22.1	29.2	34.2	31.4	43.2		29.8	29.5	-	Duplicate Site with 17 Chapel Street Thatcham 1 and 17 Chapel Street Thatcham 2 - Annual data provided for 17 Chapel Street Thatcham 2 only
44 Hambridge Road Newbury	448129	166909	29.9	17.2	24.0	22.2	18.7	21.7	16.3	24.3		24.4	24.9	24.1	22.5	22.3	-	
A339(64) Greenham Road Newbury	447448	166454	35.0	23.2	25.5	20.7	20.9	22.3	28.6			32.0	32.0	29.0	26.9	26.6	-	
1 Winchester Court Newbury	447409	166559	43.6		28.5	23.5		25.0	24.3	31.5	30.7	32.9	33.0	27.8	30.1	29.8	-	
Newbury Gardens Day Nursery	447343	166612	19.6	14.4	18.6	23.1	17.1	17.8	9.8	21.2			23.6		18.4	18.2	-	
20 Deadmans Lane Greenham	447508	164725	29.5	18.0	16.8	13.0	10.9	14.2	17.8	17.3	19.9	17.9		40.5	19.6	19.4	-	
A339 Greenham Park	449805	163882	29.8	26.9	30.6	32.5		21.7	28.6		67.5	20.7		26.8	31.7	31.3	-	
A343 Andover Rd(Parkhouse School)	445899	164705	20.8	15.8	15.6	10.9	8.7	8.2	8.4		12.9			17.4	13.2	13.1	-	
Abbeydale Monks Lane Newbury	446922	163030	24.3	16.1	16.0	14.5	10.3	12.3			18.2	8.1		18.0	15.3	15.2	-	
3 Howard Road Newbury	447402	166449	19.9	12.3	14.5	18.3		11.1	8.2		14.7	15.9	20.9	20.0	15.6	15.4	-	
63 St Johns Road Newbury	447377	166533	20.3	16.1	17.6	15.7	13.9	11.8	12.5	18.0	17.5	15.8	23.3	20.2	16.9	16.7	-	
1 St Johns Road Newbury	447036	166436	32.3	18.1	10.0	24.9	18.3	20.4	15.8	24.6	23.6	26.6	26.6	26.9	22.3	22.1	-	
2 Pounds Cottages						11.4	8.4	7.2	7.9	8.5	9.7	8.0	14.5	11.8	9.7	9.6	-	
7a Bridge Street Hungerford	433909	168815	32.7	20.8	22.0	14.8	15.0	16.3	17.7	20.4	22.9	24.6	25.8	21.8	21.2	21.0	-	
43 Hawthorn Road Newbury	447487	167870	21.4	15.0	17.3	21.0	15.1	15.5	8.7	17.4	17.2	14.9		17.6	16.5	16.3	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.99)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
6 Market Place Newbury	447211	167020	30.7	24.0	22.2	17.8	12.0	16.0	11.6		20.3	23.2	29.4	24.0	21.0	20.8	-	
42 Kings Road Newbury	447433	166994	28.1	22.1	18.9	15.7	12.3	14.4	15.2	17.5	18.3	20.0	25.6	21.3	19.1	18.9	-	
40 Bartholomew Street Newbury	446939	166848	35.3	25.8	25.6	22.7	18.1	17.1	16.7	21.7	25.5			27.1	23.6	23.3	-	
Willows Edge Nursing Home Newbury	447540	167970	32.5	20.4	21.1	16.0	11.8	15.6	15.8			23.0	28.3	25.8	21.0	20.8	-	
31 Shaw Road Newbury	447688	167820	36.6	28.4	21.9	18.8	14.5	23.0	8.9	22.9	27.0	26.7	29.9	51.9	25.9	25.6	-	
13 Shaw Road Newbury	447630	167770	37.0	31.6	22.2	19.2	16.7	23.3	17.4	25.7	26.3	28.6	35.6	26.3	25.8	25.6	-	
132 London Road Newbury	447720	167678	35.3	24.2	24.4	22.7	20.2	20.3	19.7	25.8	25.4	26.1	27.2	32.4	25.3	25.1	-	
Flat 1 Southview Gardens Newbury	447752	167667	30.0		20.5	17.6	13.7	18.5		21.1	19.8	18.9	22.5	23.2	20.6	20.4	-	
A339 Newbury Central	447463	167318	**45.1**	30.9	30.7	24.9	27.0	30.4	34.7	38.3	39.6	20.7	32.8	15.5	30.9	30.6	-	
374 London Road Newbury	449034	167520	23.6	19.7	16.9	20.1	16.1	18.1	12.2	18.1	16.8			20.7	18.2	18.1	-	
Old Bakery Tidmarsh	463504	174864	34.3	23.4	20.3	17.1	15.1	18.5	19.2	21.5	23.0	21.6	27.0	12.1	21.1	20.9	-	
Pangbourne Hill	463418	176405	27.6	21.6	18.2	29.5	12.7	14.4	13.9	17.6	20.8	18.5	26.1		20.1	19.9	-	
The Cross Key Inn Pangbourne	463468	176433	35.4	25.6	24.9	17.6	13.5			28.3	31.7	28.1	32.3	27.4	26.5	26.2	-	
4Willows Court Pangbourne	463224	176523	31.3	20.2	20.9	21.5	15.8	18.4	13.0	19.7	23.1	17.7		26.4	20.7	20.5	-	
Calcot Hotel	466302	171865	36.1	28.0	22.9	26.6	16.7	25.2	12.5	26.7	26.9	24.2	33.8	30.5	25.8	25.6	-	
Elizabeth Court Theale	464574	171294	25.3	19.4	17.7	19.0	12.4	15.5	11.1	17.1	18.8	16.3	25.9	22.8	18.4	18.3	-	
75 Chapel Street Thatcham	452288	167445	32.2	24.1	21.3	20.6	16.2	19.7	17.0	19.7		24.7		25.1	22.1	21.8	-	
A4(80-82) Chapel St Thatcham	452071	167468	32.8	23.3	23.2	23.9	19.5	20.3	20.1	22.5		28.1	32.8		24.6	24.4	-	
130 Park Avenue Thatcham	451965	167498	24.8	16.5	16.0	15.2	10.1	13.4	9.0	14.2	17.2		45.6		18.2	18.0	-	
40 Chapel Street Thatcham 1	451926	167460	38.3	24.0	26.6	27.9	21.8	22.8	19.4	28.8	29.6	32.2	34.0	28.7	-	-	-	Triplicate Site with 40 Chapel Street Thatcham 3, 40 Chapel Street Thatcham 1 and 40 Chapel Street Thatcham 2 - Annual data provided for 40 Chapel Street Thatcham 2 only
40 Chapel Street Thatcham 2	451926	167460	35.2	25.7	26.5	26.2	20.9	23.0	20.7	26.0	31.3	29.4	36.5	33.0	27.9	27.7	-	Triplicate Site with 40 Chapel Street Thatcham 3, 40 Chapel Street Thatcham 1 and 40 Chapel Street

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.99)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
																		Thatcham 2 - Annual data provided for 40 Chapel Street Thatcham 2 only
Continous Monitor 1, A343, A339 and Greenham Road Newbury	447379	166557	37.7	27.8	23.7	22.9	20.5	27.7	25.2	29.9	34.3	31.0	36.0	33.9	-	**-**	-	Triplicate Site with Continous Monitor 1, A343, A339 and Greenham Road Newbury, Continous Monitor 1, A343, A339 and Greenham Road Newbury and Continous Monitor 1, A343, A339 and Greenham Road Newbury - Annual data provided for Continous Monitor 1, A343, A339 and Greenham Road Newbury only
Continous Monitor 1, A343, A339 and Greenham Road Newbury	447379	166557	37.7	27.8	23.7	22.9	20.5	27.7	25.2	29.9	34.3	31.0	36.0	33.9	-	**-**	-	Triplicate Site with Continous Monitor 1, A343, A339 and Greenham Road Newbury, Continous Monitor 1, A343, A339 and Greenham Road Newbury and Continous Monitor 1, A343, A339 and Greenham Road Newbury - Annual data provided for Continous Monitor 1, A343, A339 and Greenham Road Newbury only
Continous Monitor 1, A343, A339 and Greenham Road Newbury	447379	166557	37.7	27.8	23.7	22.9	20.5	27.7	25.2	29.9	34.3	31.0	36.0	33.9	-	**-**	-	Triplicate Site with Continous Monitor 1, A343, A339 and Greenham Road Newbury, Continous Monitor 1, A343, A339 and Greenham Road Newbury and Continous Monitor 1, A343, A339 and Greenham Road Newbury - Annual data provided for Continous Monitor 1, A343, A339 and Greenham Road Newbury only

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1**

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16**

☒ **Local bias adjustment factor used**

☐ **National bias adjustment factor used**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column**

☒ **West Berkshire confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

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 **<u>bold and underlined</u>**.

See Appendix C for details on bias adjustment and annualisation.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

New or Changed Sources Identified Within West Berkshire During 2020.

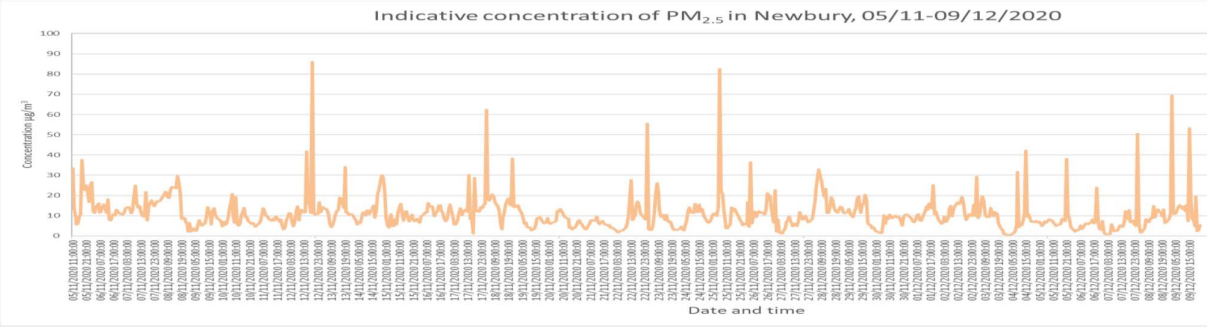
West Berkshire Council has not identified any new sources relating to air quality within the reporting year of 2020.

Additional Air Quality Works Undertaken by West Berkshire During 2020.

TRL $PM_{2.5}$ Monitoring

During the 5th November 2020 to 9th December 2020 TRL installed indicative monitoring devices to measure PM2.5. The MCERTS certified Osiris instrument was located next to the Continuous monitor on the A339. The instrument employs a light scattering measuring technique and provide continuous and simultaneous, indicative concentrations of the airbourne particulate matter. The air is continuously passed through a nephelometer, where a laser beam analyses individual particles and finally collects them on the reference filter. The period average for the A339 was 10.9 µg/m^3, and had no exceedances of the 24-hour mean. The WHO advised limited of 10 µg/m^3 for an annual mean and 25 µg/m^3 as a 24-hour mean.

Figure C-1 The Indicative concentration of PM2.5 at the A339 continuous Monitor



QA/QC of Diffusion Tube Monitoring

The Workplace Analysis Scheme for Proficiency (WASP) is an independent analytical performance testing scheme, operated by the Health and Safety Laboratory (HSL). WASP formed a key part of the former UK NO_2 Network's QA/QC and remains an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management. The laboratory participants analyse four spiked tubes and report the results to HSL. HSL assign a performance score to each laboratory's result, based on their deviation from the known mass of nitrite in the analyte. The Performance criteria are due to be changed, at present the criteria are based on the z-score method, and equates to the following:

GOOD: Results obtained by the participating laboratory are on average within 13% of the assigned value. This equates to a Rolling Performance Index (RPI) of 169 or less.

ACCEPTABLE: Results obtained by the participating laboratory are on average within 13-26% of the assigned value. This equates to an RPI of 169 - 676.

WARNING: Results obtained by the participating laboratory are on average within 26 – 39% of the assigned value. This equates to an RPI of 676 - 1521.

FAILURE: Results obtained by the participating laboratory differ by more than 39% of the assigned value. This equates to an RPI of greater than 1521.

However, from April 2009, the criteria has been based upon the Rolling Performance Index (RPI) statistic and will be tightened to the following:

GOOD: Results obtained by the participating laboratory are on average within 7.5% of the assigned value. This equates to an RPI of 56.25 or less.

ACCEPTABLE: Results obtained by the participating laboratory are on average within 15% of the assigned value. This equates to an RPI of 225 or less.

UNACCEPTABLE: Results obtained by the participating laboratory differ by more than 15% of the assigned value. This equates to an RPI of greater than 225.

West Berkshire Council use Gradko International for the supply and analysis of the nitrogen dioxide diffusion tubes for their non-automatic monitoring programme. Gradko's performance for AIR PT 36 (Feb-20) = -4.025 (average) and AIR PT 34 (Oct-20) = -7.95 (average), which relates GOOD and ACCEPTABLE performance.

The diffusion tubes monitoring has not been completed in adherence with the 2020 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within West Berkshire 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

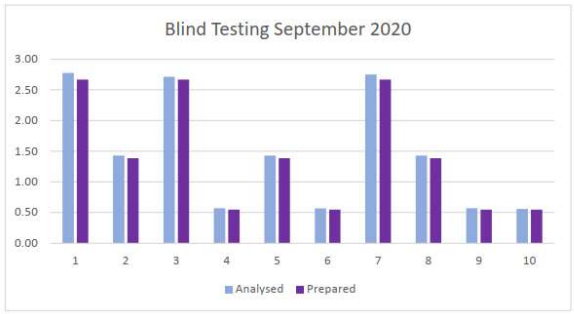
The diffusion tube data presented within the 2020 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Gradko International Ltd of St Martin's House 77 Wales Street Winchester Hampshire is the supplier and analyst of the nitrogen dioxide diffusion tubes. The tubes are analysed by U.V. spectrophotometry. The limit of detection is 50% TEA /Acetone.

Figure C-2 Gradko Report

Sep-20

	Analysed	Prepared	%Bias
1	2.78	2.67	4.1
2	1.43	1.38	3.1
3	2.71	2.67	1.7
4	0.57	0.55	4.3
5	1.43	1.38	3.1
6	0.57	0.55	4.1
7	2.75	2.67	3.1
8	1.43	1.38	3.1
9	0.57	0.55	4.3
10	0.56	0.55	2.3
			Average %bias
	RSD 0.55	0.95	3.33
	RSD 1.38	0.04	
	RSD 2.67	1.15	



West Berkshire Council have applied a local bias adjustment factor of 0.99 to the 2020 monitoring data. A summary of bias adjustment factors used by West Berkshire over the past five years is presented in Table C.1.

Factor from Local Co-location Studies and Discussion of Choice of Factor to Use

The national study of bias adjustment factors spreadsheet (ref. 03/21 update) suggested a national bias adjustment factor of 0.82 be applied. A copy of the co-location spreadsheet used is provided below (Table C.1).

In determining the bias adjustment factor for the 2020 data the following was taken into consideration:

Cases where the locally obtained bias adjustment factor may be more representative:

- Where the diffusion tube exposure periods are weekly or fortnightly – co-location study in Newbury is monthly.
- If the co-location site is unusual in some way: for example, affected by specific large nitrogen oxides (NOx) sources other than road traffic, such as local industrial installations – the co-location study of Newbury location is predominantly influenced by road traffic.
- For tubes exposed in a similar setting to the co-location site – the co-location study of Newbury site is a roadside location, as are over 95% of the diffusion tubes located in West Berkshire. Therefore, the bias adjustment factor determined from either of these locations may not be of deemed appropriate to apply to the West Berkshire non-roadside sites.
- Where the duration of the whole diffusion tube study is less than one year, especially if it is less than nine months – the co-location study at Newbury and diffusion tube surveys are all for a full calendar year (automatic monitoring is for the full year, however due to some data loss, the data capture is less than 90% in December 2020).
- Where the Review and Assessment Helpdesk spreadsheet (national database) contains data from fewer than five other studies using the same laboratory and preparation. – The national database contains 14 studies therefore both co-location or National factors can be used.
- For co-location sites with “good” precision for the diffusion tubes and with high quality chemiluminescence results – It can be seen from the table below that the co-location study in Newbury achieved “good” precision, where data is available and the automatic

monitoring results from Newbury chemiluminescence are high quality (see the QA/QC of Automatic Monitoring section above).

Cases where the combined (national) bias adjustment factor may be more representative:

- Where the survey consists of tubes exposed over a range of settings, which differ from the co-location site – this is not the case for West Berkshire (Newbury).
- Where the co-location study is for less than nine months, although the diffusion tube monitoring is for a longer period - The West Berkshire co-location study and diffusion tube surveys are for a full calendar year (2020).
- Where the automatic analyser has been operated using local, rather than national, QA/QC procedures - The West Berkshire chemiluminescence results (automatic monitoring) are high quality, see the QA/QC of Automatic Monitoring section above.
- Where data capture from the automatic analyser is less than 90%, or there have been problems with data quality – Data capture from Newbury automatic monitor was 99.6% in 2020, hence local bias adjustment factor can be used.
- For co-location sites with “poor” precision or laboratories with predominately “poor” precision, as set out on the Review & Assessment Helpdesk website - It can be seen from the table below that the co-location study in Newbury achieved “good” precision and the laboratory precision was “good”. See the QA/QC of Diffusion Tube Monitoring section above.

In conclusion it can be seen from the discussion above that the local bias adjustment factor of 0.99 should be used to adjust the 2020 data, not the National of 0.81.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	Local	-	0.99
2019	Local	09/20	0.91
2018	Local	06/19	1.0
2017	Local	09/18	1.01
2016	Local	06/17	0.90

NO_2 Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within West Berkshire required distance correction during 2020.

QA/QC of Automatic Monitoring

TRL carry out the QA/QC on behalf of West Berkshire Council, below are details of TRL's process of QA/QC.

Site operation

Routine instrument calibrations are conducted approximately once per fortnight, which involve zero and span checks, a written record of the gas analyser diagnostics and a general visual inspection of all equipment is undertaken. There is a written operating procedure and a calibration record sheet is completed at every site visit.

Data retrieval and daily data checking

Data from the monitoring station is retrieved and processed on a Campbell CR10x data logger as 15-minute mean data. The logger was interrogated via a Siemens TC35i GSM modem at 8-hourly intervals by the ENVIEW 2000 software hosted at TRL. This was used to retrieve, check and archive data. TRL's internal QA/QC procedures require all data to be backed up on a secure server and all documentation associated with each site to be uniquely identified and securely stored to provide an audit trail. Daily data inspections are undertaken during office hours using the facilities of the Data Management System. Initial observations of the Management System indicate whether the site has been contacted during its nominated 'poll time' overnight. If this has not been successful a manual poll of the site may be required. If this is not successful further investigation of the communications integrity will be required to establish contact with the site modem and data logger. Three day plots of recorded data are viewed for the requested site, and these are inspected and assessed for

continuity, validity, minimum and maximum values, date and time, power failures and general integrity. All anomalies are recorded on the Daily Check sheet, as required. Any anomalies or queries arising from daily inspection of data, or system operation, are brought to the attention of the Project Manager who will evaluate the situation, and initialise any necessary action. In the event that the PM is not available, contact will be made with the next available senior person within the monitoring team. Any issues identified with equipment operation will be referred to the client for attention within 24 hours (excluding weekends). On a weekly basis, data are examined using summary statistics and outlier analysis to establish data validity. If unusual data episodes are recorded, these would be routinely examined over longer data periods to establish their impact on trends but would also be cross referenced with data peaks and troughs recorded at other national monitoring stations. In addition, integrity and validity of data logger clock times are checked, and any significant errors recorded in the Data Management System logbook. All site data recorded through the Data Management System is archived on TRL's Network. The data is backed up daily, and the TRL IT Department maintains these data within their long-term and secure archives. This secures all data in the event of any system failure.

Data calibration and ratification

Data is ratified as per AURN recommended procedures. The calibration and ratification process for automatic gas analysers corrects the raw dataset for any drift in the zero baseline and the upper range of the instrument. This is done using a Evista-based calibration and ratification file which incorporates the zero and span check information from the calibration visits. The zero reading recorded during the calibration visits is used to adjust any offset of the baseline of the data. The difference between the span value obtained between one calibration visit and the next visit is used to calculate a factor. This change is assumed to occur at the same rate over the period between calibrations and as such the factor is used as a linear data scaler. This effectively results in the start of the period having no factor applied and the end of the period being scaled with the full factor with a sliding scale of the factor in-between. After applying the calibration factors, it is essential to screen the data, by visual examination, to see if they contain any unusual measurements or outliers. Errors in the data may occur as a result of equipment failure, human error, power failures, interference or other disturbances. Data validation and ratification is an important step in the monitoring process. Ratification involves considerable knowledge of pollutant behaviour and dispersion, instrumentation characteristics, field experience and judgement. On completion of this data correction procedure, these data were converted to hourly means and a

summary of these data were provided to West Berkshire Council at quarterly intervals and a calendar year annual report is prepared.

Independent Site Audits

In addition to these checks an independent site audit is carried out every 12 months to ensure the nitrogen dioxide analyser is operating correctly. The audits that are carried out utilise procedures that are applied within DEFRA's National Automatic Air Monitoring Networks Quality Control Programme. The efficiency of the analyser's convertor is checked and the analyser is also leak tested. The gas bottle used for calibrations on site is also checked against the auditor's gas bottle to ensure the stability of the gas concentration.

The site audit for the West Berkshire, Newbury automatic monitoring unit was carried out on 7th December 2020.

A major factor governing the analyser's performance is the NOx analyser's converter and its ability to reduce the nitrogen dioxide to nitric oxide. The recommended range for instrumentation in the national automatic air monitoring network is in the range of 98% - 102% efficient. Our tests show the converter in the West Berkshire, Newbury

analyser to be 101.7% efficient at an NO2 concentration of 277 ppb. This is a good result.

To ensure that the analysers are sampling only ambient air the instruments were leak checked. The results were satisfactory, indicating that the analyser sampling systems were free of significant leaks. The analyser exhibited some instability with its responses to both zero and span (calibration) gases with increased levels of variation (noise), this should be investigated at the next routine service.

The NOx analyser flow rate was measured using a calibrated flow meter and compared against the analyser's flow rate sensor to evaluate its accuracy. The measured flow rate result was outside the (±10%) recommended limit and it was advised the underlying reason be investigated at the next service.

Please note the following cylinder recalculation test was undertaken at the Twyford station on the same day.

Based on the Twyford NOx analyser's response to the audit standard and audit zero, the concentrations of the stations NO cylinder have been reassessed. This provides an indication of the site standards stability. For the purpose of these stability checks, the criteria

adopted within the national network, and used here, is that the recalculated concentration should lie within 10% of the stated concentrations.

The results of the recalculations are presented in Table C.2.

Table C.2 West Berkshire, Newbury and Twyford

TRL Wokingham – NO cylinder 21901300088296				
	NOx (ppb)	% change from stated	NO (ppb)	% change from stated
Manufacturers Stated Concentration	**464**	---	**464**	---
Recalculated Concentration (07/12/20)	450	-3.1	476	2.6

The recalculated results for the site NO cylinder 21901300088296 indicates the concentrations are stable, within the definition adopted above, and can therefore reliably be used to scale ambient data.

All the recommendations of the audit have been investigated accordingly by TRL engineers.

Certificate of Calibration

Calibration factors and zeros have been produced on the basis of the audit calibrations conducted. All of these calibrations were conducted with transfer standards traceable to national metrology standards. The Certificate of Calibration provides the calibration and zero response factors for the oxides of nitrogen analysers under test on the day of the audits. It is available upon request from TRL.

Data Management

The following recommendations and comments can be made as a result of these audits:

- Compare the TRL database scaling factors for the day of the audit with the factors and zeros on the Certificate of Calibration. If a deviation greater than the uncertainty associated with the calibration factor on the certificate is found, investigate the underlying reason and implement suitable data management actions.

Automatic Monitoring Annualisation

All automatic monitoring locations within West Berkshire 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

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No automatic NO_2 monitoring locations within West Berkshire Council required distance correction during 2020.

Table C.2 – Local Bias Adjustment Calculation

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	08/01/2020	05/02/2020	37.7	41.5	45.3	41	3.8	9	9.5	41.48614	100	Good	Good
2	05/02/2020	04/03/2020	27.8	31.0	28.2	29	1.7	6	4.3	29.84581	100	Good	Good
3	04/03/2020	01/04/2020	23.7	24.9	27.9	25	2.2	8	5.4	24.08581	100	Good	Good
4	01/04/2020	29/04/2020	22.9	22.6	20.8	22	1.2	5	2.9	21.3632	100	Good	Good
5	29/04/2020	03/06/2020	20.5	19.7	20.4	20	0.4	2	1.1	24	100	Good	Good
6	03/06/2020	01/07/2020	27.7	25.7	27.5	27	1.1	4	2.8	35	100	Good	Good
7	01/07/2020	29/07/2020	25.2	23.9	25.3	25	0.7	3	1.8	26	100	Good	Good
8	29/07/2020	02/09/2020	29.9	32.6	30.4	31	1.4	5	3.5	26	100	Good	Good
9	02/09/2020	30/09/2020	34.3	33.9	33.9	34	0.3	1	0.6	32	100	Good	Good
10	30/09/2020	04/11/2020	31.0	34.6	34.1	33	1.9	6	4.8	30	100	Good	Good
11	04/11/2020	02/12/2020	36.0	35.0	34.6	35	0.7	2	1.8	30.72788	100	Good	Good
12	02/12/2020	06/01/2021	33.9	28.8	33.6	32	2.8	9	7.0	31.33335	84.3	Good	Good
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey --> Good precision | Good Overall DC

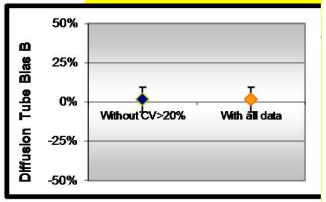
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision: 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 12 periods of data	
Bias factor A	0.99 (0.92 - 1.07)
Bias B	1% (-7% - 9%)
Diffusion Tubes Mean:	30 μgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	29 μgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	29 (27 - 32) μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	0.99 (0.92 - 1.07)
Bias B	1% (-7% - 9%)
Diffusion Tubes Mean:	30 μgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	29 μgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	29 (27 - 32) μgm^{-3}



Jaume Targa, for AEA

Notes: A single local bias adjustment factor has been used to bias adjust the 2020 diffusion tube results.

Appendix D: Map(s) of Monitoring Locations and AQMAs

Figure D-1 Map of Newbury AQMA

Figure D-2 - Map of Thatcham AQMA

Figure D-3 Automatic monitoring site in Newbury

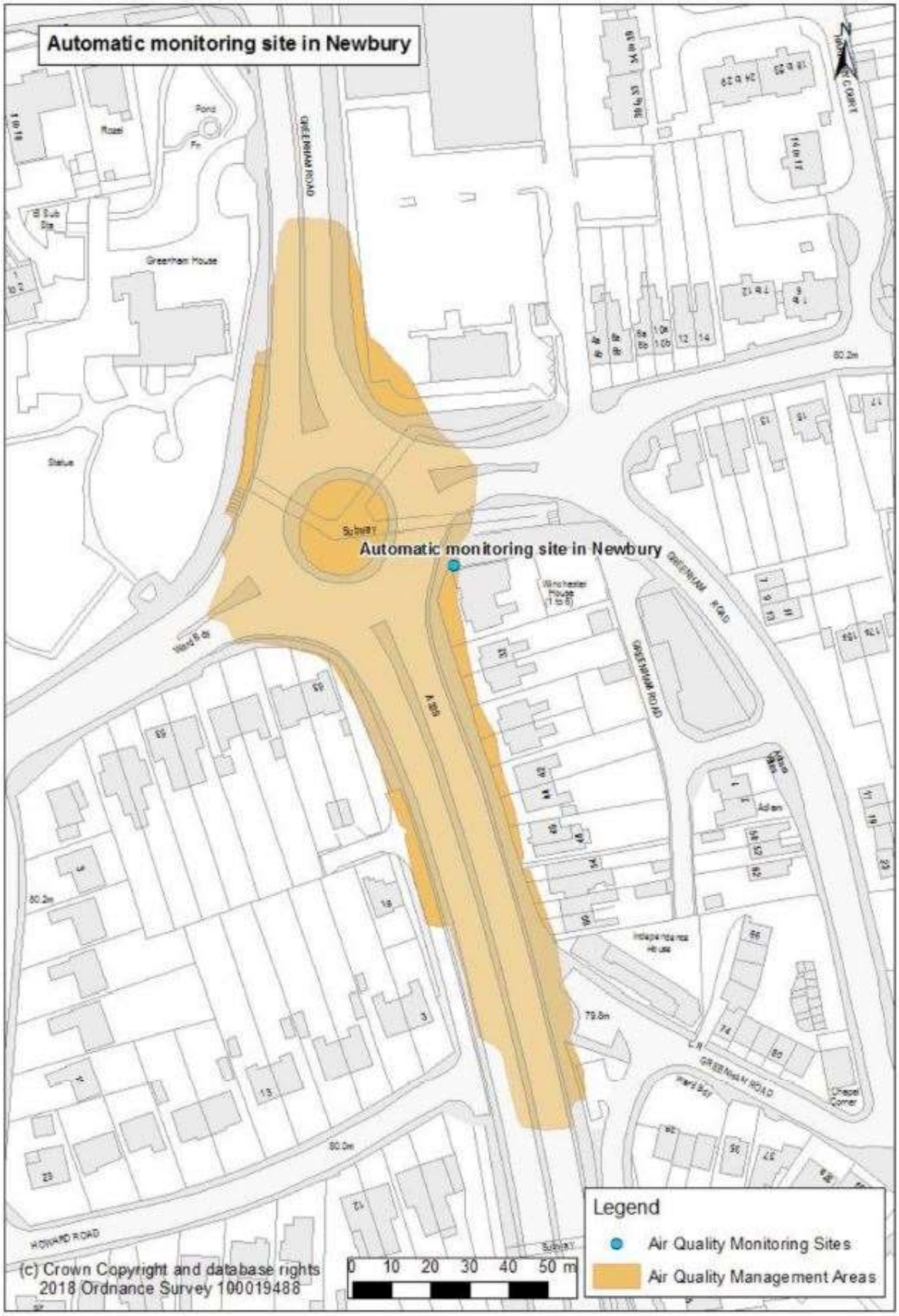


Figure D-4 Diffusion Tube monitoring sites in and close to Newbury AQMA

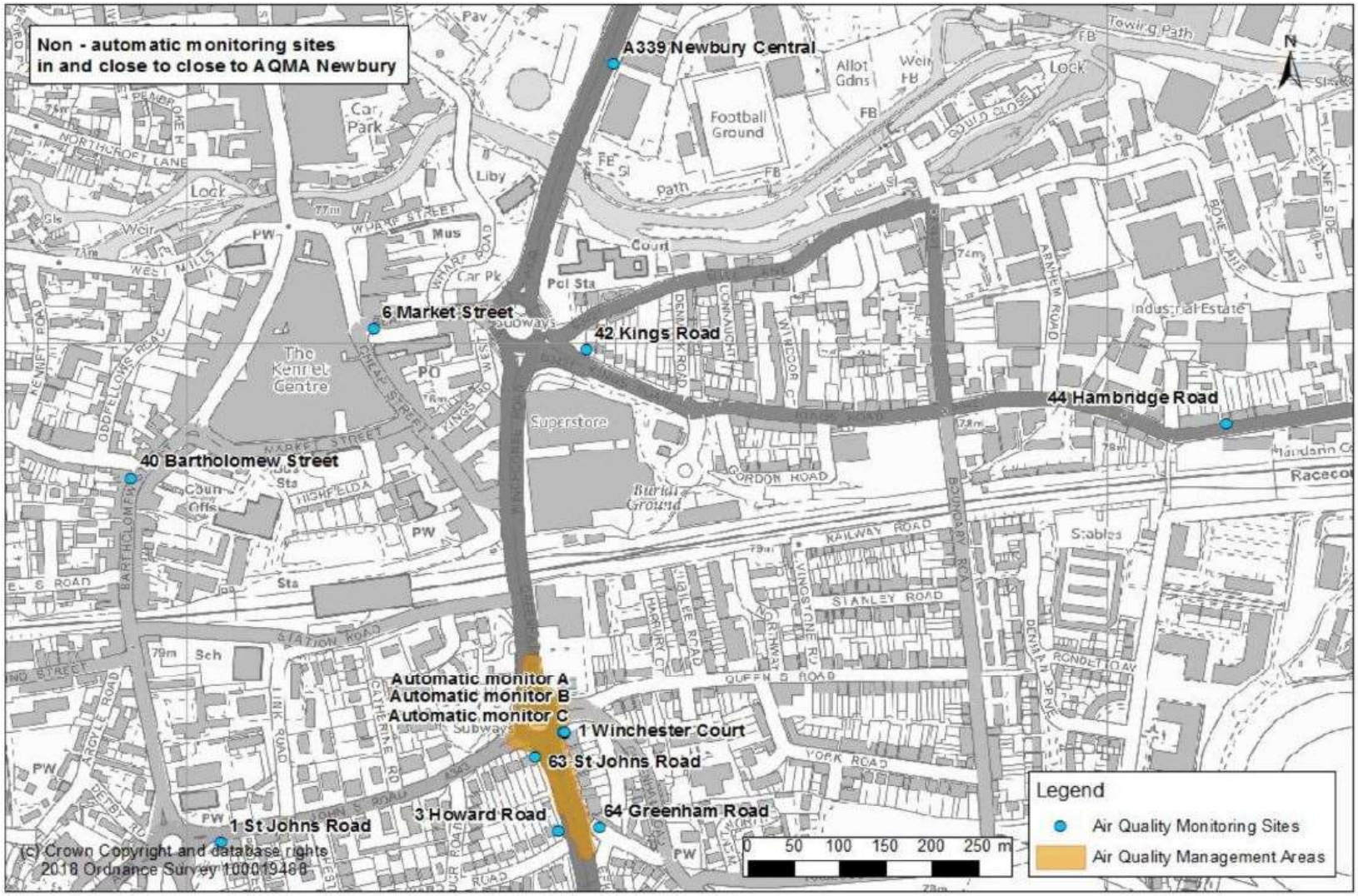


Figure D-5 Diffusion Tube monitoring sites in Newbury (North)

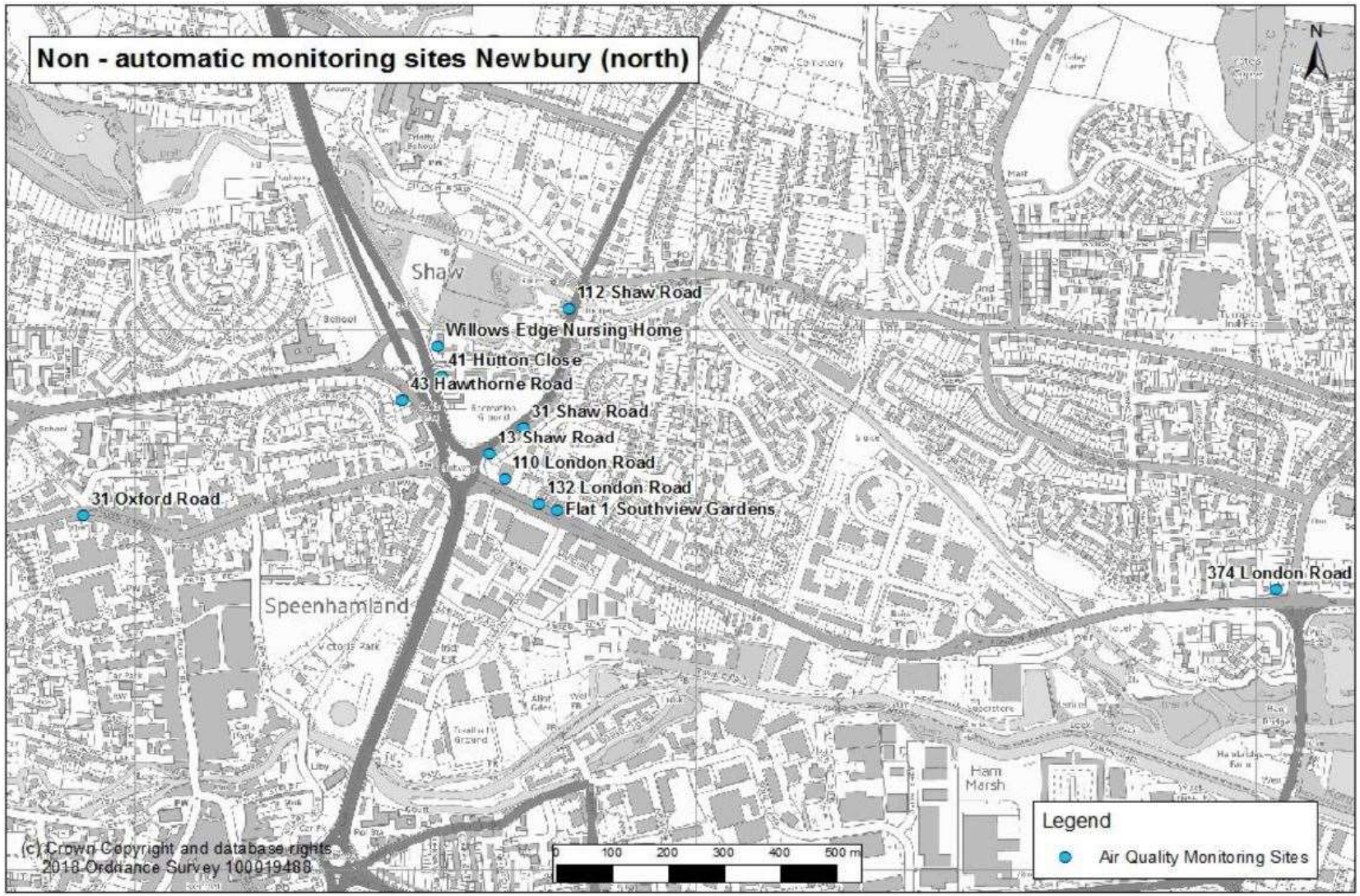


Figure D-6- Diffusion Tube monitoring sites in Newbury (South)

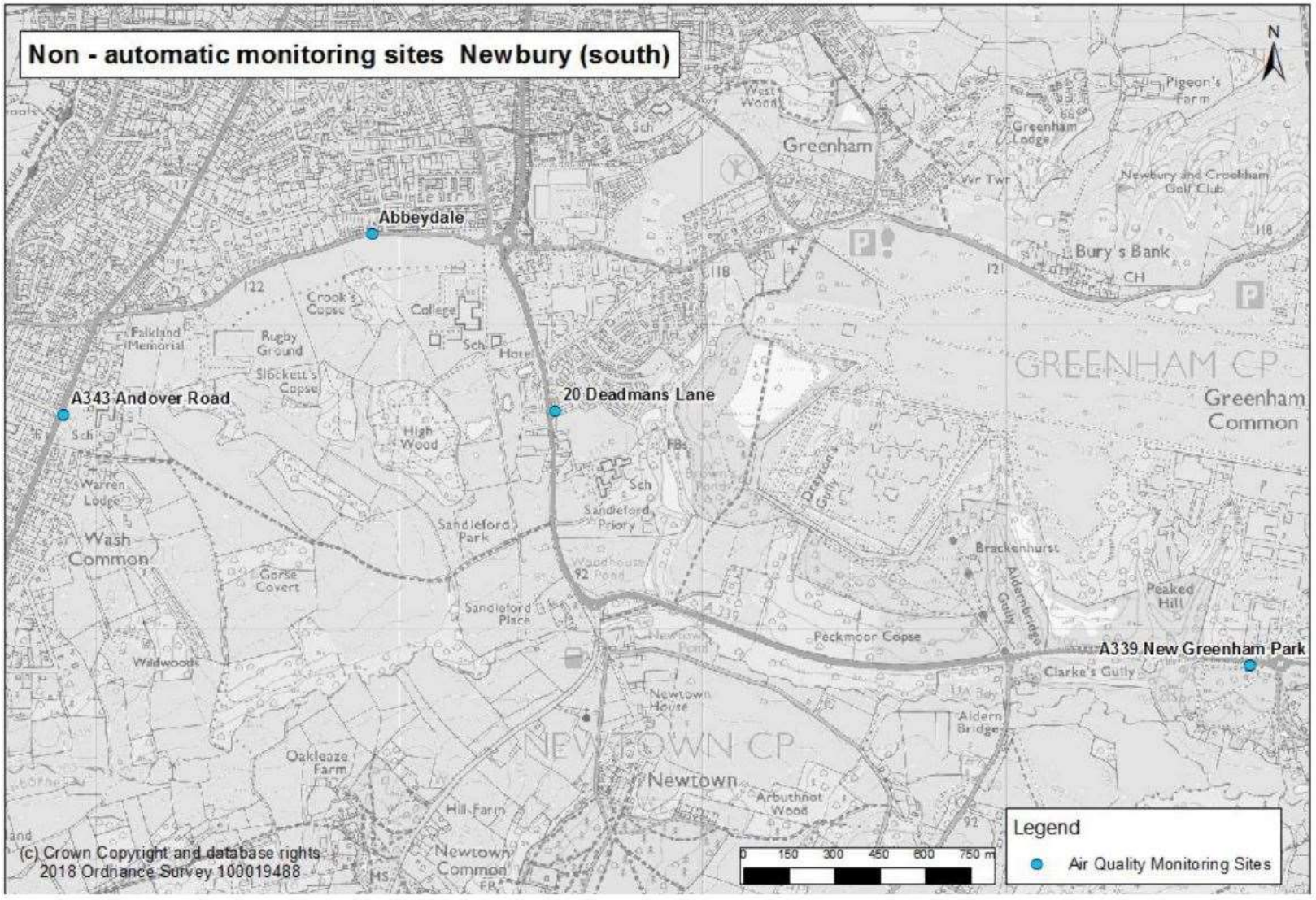


Figure D-7 Diffusion Tube Monitoring sites in and close to the AQMA in Thatcham

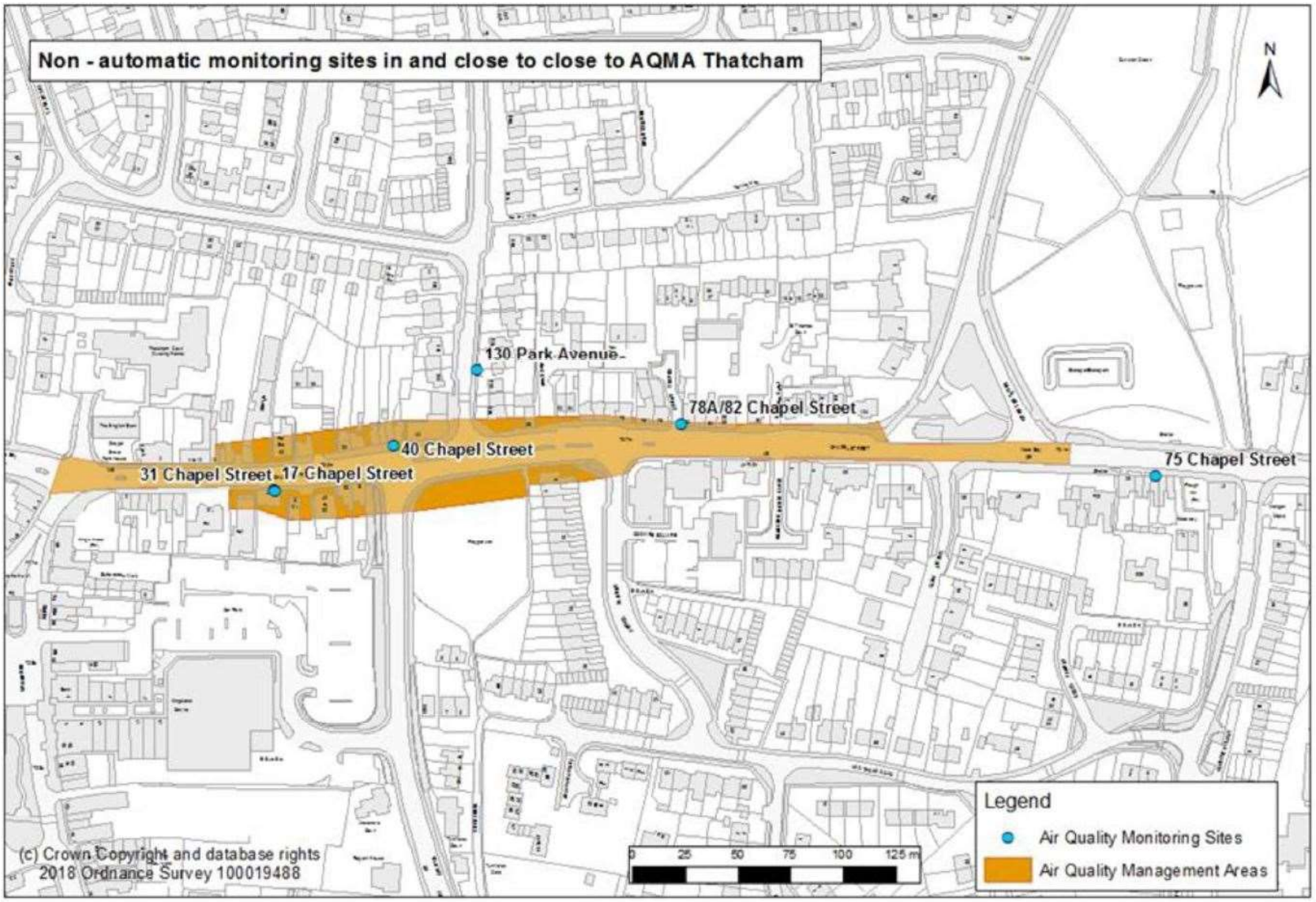


Figure D-8 Diffusion Tube Monitoring sites in and close to the AQMA in Thatcham

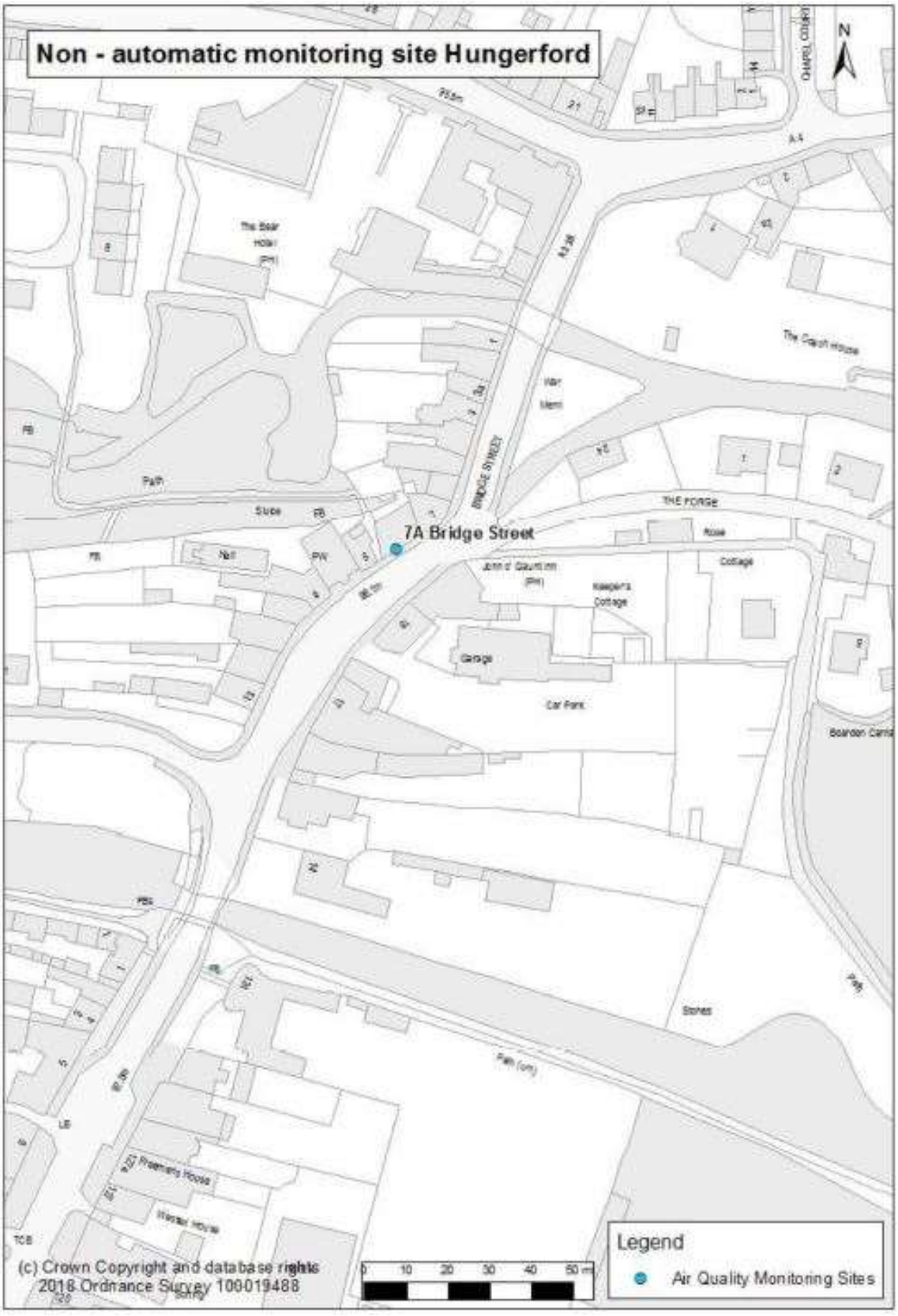


Figure D-9 Diffusion Tube sites in Tidmarsh & Pangbourne

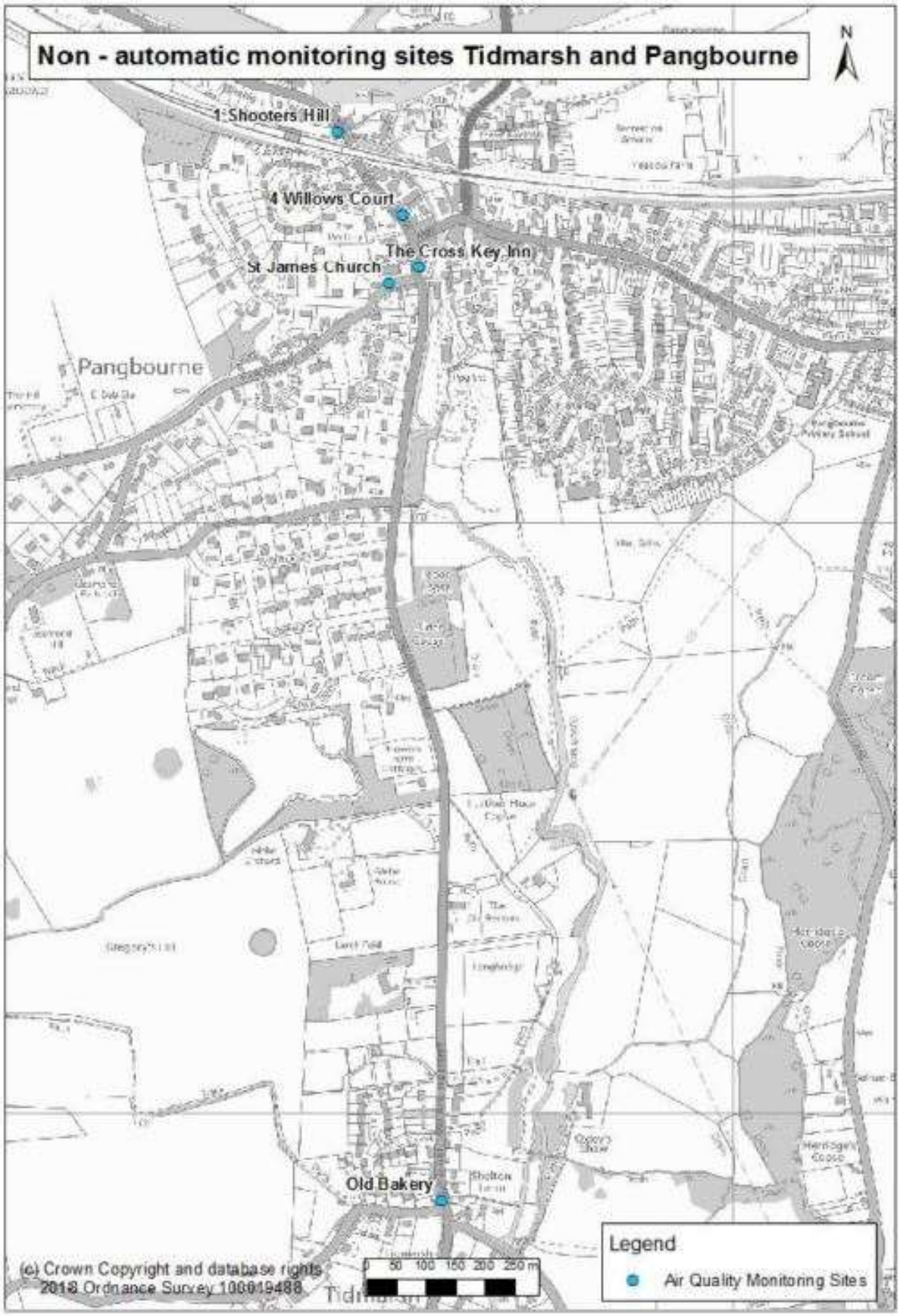
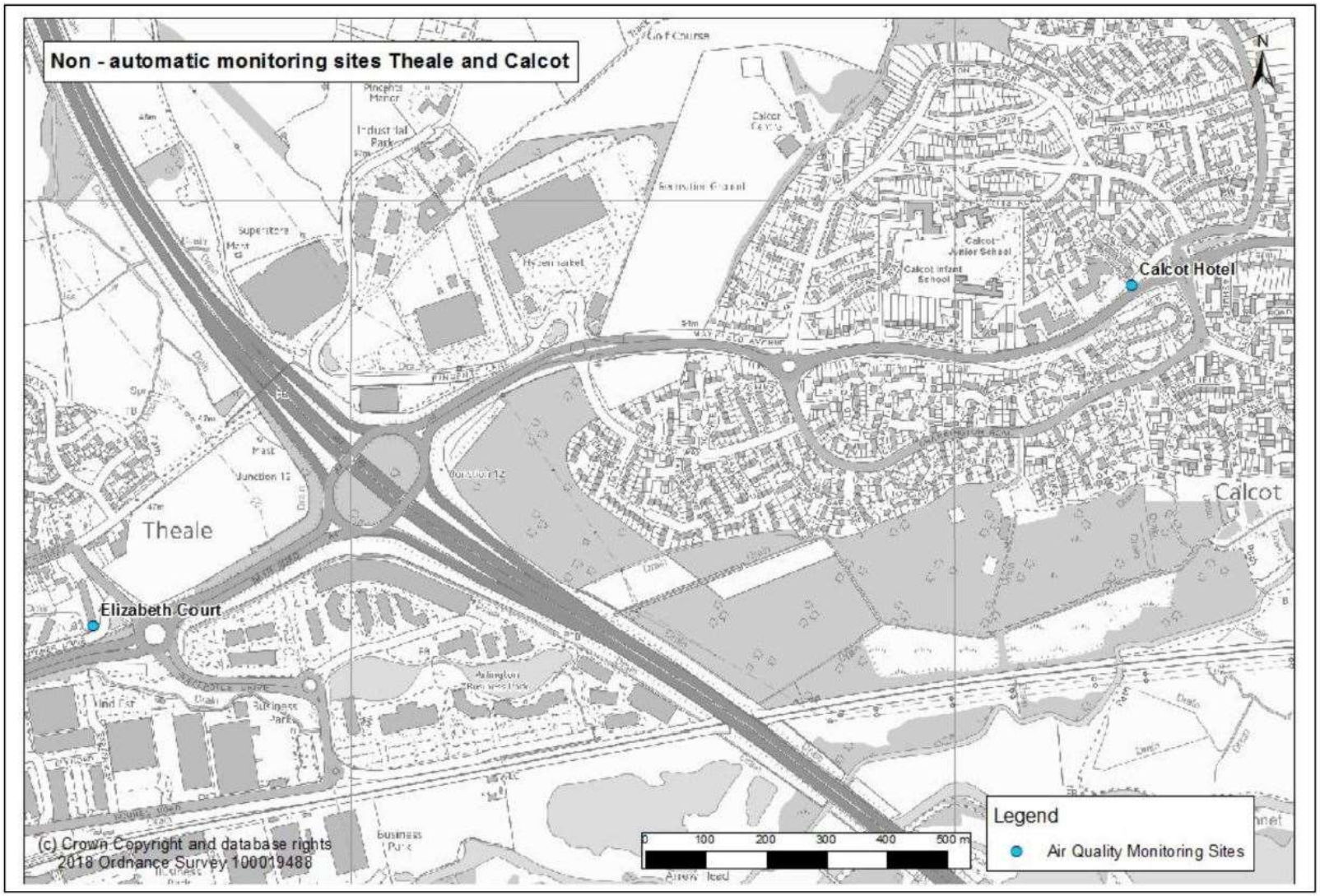


Figure D-10 Diffusion Tubes in Calcot & Theale



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[6]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[6] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data[7] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)[8] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

[7] Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

[8] Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

represents an absolute reduction of between 10 to 20μg/m^3 if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5μg/m^3 lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within West Berkshire Council

- The Pandemic has had a positive impact on the air quality throughout the whole of the borough, this can be seen clearly in Figure E.1 for the diffusion tubes, and the percentage reductions of NO_2 during the national lock downs can be seen in Table E.1. During the first nation lockdown from the 23rd March 2020 to the 1st June 2020 (when the schools reopened) the reduction of NO2 was between - 20% to +19%. This equated to a 15% reduction (between March and June) NO_2 concentration relative to 2019. The annual reduction in NO_2 is -10.13%. The reduction in NO_2 experienced within 2020 has allowed the Council to provide an evidence base in relation to the annual mean objective being achievable, if the low volume of vehicles continue to use the roads. There was an increase of the average NO_2 in June compared to 2019; this may have been due to the opening of schools, and that people were encouraged not to use public transport or car share, thus increasing the number of journeys. Also the number increase in September 2020 which may be due to the increase in “Stay at Home Holidays” and the returning to school.

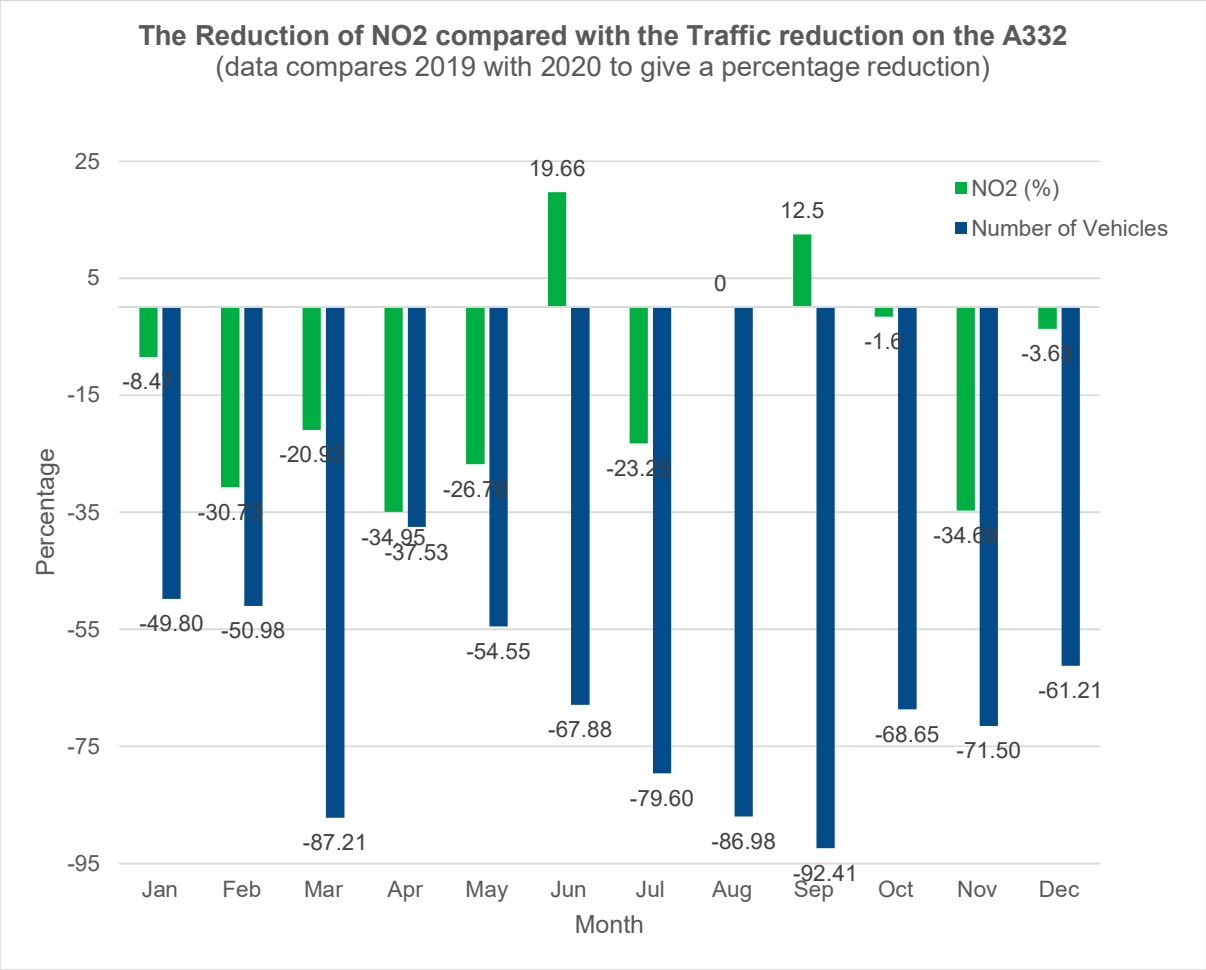
Table E.1 - Showing the Comparison of the 2020 Data NO2 with the pervious years in Newbury AQMA (data captured by the CM).

Month	Average NO_2 ($\mu g/m^3$) 2019	Average NO_2 ($\mu g/m^3$) 2020	Difference (%)
January	43.7	40.0	-8.47
February	41.0	28.4	-30.73
March	32.5	25.7	-20.92
April	32.9	21.4	-34.95
May	32.5	23.8	-26.76
June	29.5	35.3	+19.66
July	35.7	27.4	-23.25
August	n/a	23.8	-
September	28.8	32.4	+12.5
October	31.2	30.7	-1.60
November	44.1	28.8	-34.69
December	33.1	31.9	-3.63
Annual Average	32.4	29.1	-10.13

- Traffic counts on the A332 were in operation during 2020 and have allowed a comparison of traffic numbers with the reduction of monthly NO_2 concentrations experienced at the CM monitoring location. This has allowed estimations to be made for the reduction in traffic numbers required to continue to achieve compliance with the annual mean NO_2 objective in the Newbury AQMA.

Figure E-1 The Reduction of NO2 compared with the Traffic reduction on the A332

(data compares 2019 with 2020 to give a percentage reduction)



Opportunities Presented by COVID-19 upon LAQM within West Berkshire Council

During the pandemic the following occurred within WBC.

- The Passive and CM AQ monitoring was continued throughout the whole of the pandemic, in line with the national monitoring calendar for a number of sites. This was decided as high priority as this gave the borough the unique opportunity to see WBC with reduced traffic data that make up the daily commute, the school run and those who are just getting on with their lives using the roads. We could gauge a baseline within the two AQMA's.

- Home working has had a positive impact on the West Berkshire Council AQMAs, as the A339 and A4 are both commuter & HGV link road, the table below shows the CM monthly results and percentage reductions. It is hoped that as the technology is now in place for many businesses that this will continue. Newbury is also home to large businesses such as Vodaphone and the Newbury Race Course. Unfortunately the results to the CM are missing from August, however graph E.1 show the AQ is reducing alongside the traffic reductions. The NO_2 does increase in June & September mainly round the time of 3pm to 6pm, this could be due to temperature inversions or an increase in those using the road for the school run, shopping or returning from work? From speaking to those with idling engines, it is unlikely that they would turn them off in a traffic jam, as I have been told many times that they like to keep the air conditioning on.

- The residents of the district are now more aware on the impact that their journeys (big or small) have on both the national and local AQ, so hopefully the new habits they have made, for example, WFH, doing a weekly rather than daily shops, walking & cycling to school as they have more time (they don't have to commute) as the roads are quieter will continue. People seem to have established a better life work balance and use the car less. The increase in internet Food Shopping has also reduced the amount of vehicles on the roads, as one lorry can take up to 10+ households shop in one delivery slot.

Challenges and Constraints Imposed by COVID-19 upon LAQM within West Berkshire Council

Whilst PPP successfully carried out the Passive and Continuous AQ Monitoring throughout the Pandemic we were not without challenges and constraints from other departments, as AQ is not just about monitoring, it is about working with many different departments who strive together to create an action plan to reduce the pollutants. The Pandemic placed many restrictions and problems; all of a different nature throughout the Council as a whole, and as a result of this many projects have naturally been delayed.

- The updating of the AQAP for this report, was carried out but the WBC has not moved forward with many projects, owing to the reallocation of Council resources during 2020, therefore the implementation of the AQAP has been delayed. Also as the residents behaviour has been changing and people are now naturally reducing none essential

journeys, and having weekly shops not daily, we may need to look at alternative options and create a new AQAP in light of what we have learnt from recent traffic patterns & habits. This will now be looked into further, once we have examined the changes of people's habits in greater depth and what our residents need from us to help reduce the pollution.
High Impact.

- Unfortunately we cannot use this years or last year's data to establish whether we can revoke any of our AQMAs, also as the Pandemic pans out we do not know if we can use any of 2022 data either, it is still too early to tell. Also we need to establish what the residents "normal" travel patterns are now to ensure that we revoke the AQMAs at the correct time. **High Impact.**

The impacts as presented above are aligned with the criteria as defined in Table F 1, with professional judgement considered as part of their application.

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: High
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority 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
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
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 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

References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.