2022 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: April, 2022

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Executive Summary: Air Quality in Our Area

Air Quality in Telford and Wrekin Council

Air pollution is associated with a number of adverse health impacts. 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, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

Air quality in the borough of Telford and Wrekin is overall very good however there are locations where pollutants build close to the kerbside of busy roads. The main pollutant of concern in the borough is nitrogen dioxide (NO_2) which is mainly linked to road traffic emissions.

The borough of Telford and Wrekin is a predominantly rural area on the north-eastern edge of Shropshire. The borough has a population of 166,641 (2011 census, Office for National Statistics) covering 29,000 hectares with its major settlement being Telford, which incorporated the existing towns of Dawley, Madeley, Oakengates and Wellington upon its construction as a ‘new town’.

The M54 traverses the borough across the main central urban area, and the majority of the main roads within the borough are also focussed in this area, including the A41, the A518, the A5, A442, A4169, and the A4640. There is a main railway line crossing the centre of the borough, as well as an unused rail freight terminal.

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[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

[3] Defra. Air quality appraisal: damage cost guidance, July 2021

[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

In 2021 there were 11 Part A2 permitted processes, 1 SWIP and 52 part B permitted processes (including petrol filling stations, dry cleaners and mobile plant) within the borough, which are regulated for emissions to the environment by Telford and Wrekin Council. There are more permitted sites that are regulated by the Environment Agency.

Monitoring undertaken for 2021 shows that air quality within the borough is below the national objective levels set out in law. Historically there has been a hotspot for higher pollutant levels for nitrogen dioxide at the Mill Bank in Wellington, near to the Watling Street Junction and again at Coach Central, the bus station in Telford Town centre. Neither of these sites are considered to expose the public to long term exposure of pollutants such as a school or a person's home would. During 2021 there has been a small increase in levels of pollutants from that of 2020 at both of these areas this is attributable to the travel restrictions imposed by the Coronavirus restrictions being lifted. Levels at these locations are still below the levels recorded pre-COVID.

Telford and Wrekin do not have any AQMAs but there is an Air Quality Strategy, which ensures that air quality is given due consideration and demonstrates the Council's commitment to air quality review and management. Telford and Wrekin Council are in the process of reviewing and updating their Air Quality Strategy to ensure that a proactive approach to Air Quality is taken within the borough, more information on the outcomes and objectives of the new Air Quality Strategy will be provided in next year's ASR.

Many methods employed to improve air quality are council wide initiatives and cross over a number of teams including Public Protection, Public Health, Transport and Highways, all of these teams are considered stakeholders for the revised Air Quality Strategy and are instrumental to developing the new strategy.

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[5] sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero[6] 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.

In 2017, the Council introduced additional diffusion tubes at four locations that represent relevant exposure in close proximity to Coach Central near the town centre where NO_2 concentrations were identified as some of the highest in the borough.

After liaising with DEFRA, we understood that the individual diffusion tube located at Coach Central in 2016 monitoring did not represent relevant exposure based the NAQO. These additional four monitoring locations were Withywood Drive, Lawnswood, Deercote (top) and Deercote (bottom). Further monitoring in these locations show that relevant exposure is well below the NAQO NO_2 Annual Mean Concentration of 40 µg/m^3 (Appendix E). As a result, it was decided that the four diffusion tubes in this area should be removed in 2020 with no further review or measures deemed necessary at these locations. This has allowed for resources to be focused at priority locations.

In 2016, a further five diffusion tubes were introduced on each of the roads that intersect the B5061 Junction by Watling Street, Wellington. This was to support the pre-existing monitoring location which was introduced in 2016. These locations were Mill Bank, Holyhead Road, Watling Street, Dawley Road and Watling Street/ Regent Street Junction. This decision was made as NO_2 concentrations in 2017 raised concern. The Council has obtained further data from these monitoring locations which identified Mill Bank and Watling Street/ Regent Street Junction, two of the roads that intersect this junction, as having the highest

[5] Defra. Clean Air Strategy, 2019

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

NO_2 levels within the borough. Although the NAQO was not exceeded, this has prompted the Council to take further action.

The actions taken so far at the B5061 Junction have included Intelligent Traffic Management through the introduction of intelligent signalling and also anti-idling signage. The introduction of the intelligent signalling aims to improve traffic flow at the junction by allowing the traffic lights to prioritise the roads at the intersection with the most traffic. This is to facilitate regular traffic flow and reduce the amount of time vehicles spend in this location. The aim of the anti-idling signage is to encourage motorists to turn off their engines whilst stationary at the junction in a bid to reduce preventable emissions. It is envisaged this will change motorist's behaviour.

These measures have been in place for 3 years and monitoring results from these locations are still fluctuating annually; as a result it does not provide strong evidence of improvements in NO_2 concentrations at this location as a direct result of such measures. The Council will continue to monitor at these locations to understand if the measures introduced are having any long-term impact.

Schemes and funding

The Council have taken measures to encourage the use and make more accessible public transport as an alternative to private vehicle use. The Council have worked with owners of Telford Shopping Centre and secured Local Enterprise Partnership Growth Deal funding which has been used to fund a new bus station at Telford Shopping Centre which is now complete.

The Council also have a Cycling and Walking Strategy which was implemented in September 2017. The strategy was introduced in recognition of Telford's walking and cycling infrastructure to encourage residents and those who work in the borough to utilise this infrastructure while promoting the health benefits of cycling and walking. It is intended to support the vision of the overarching Local Transport Plan for 2011-2026. The strategy can be accessed via

http://www.telford.gov.uk/downloads/file/7995/cycling_and_walking_strategy

The implementation of the updated action plan of the Cycling and Walking strategy will complement the delivery of the borough's Local Transport Plan for 2011-2026; furthermore by encouraging more people to take regular exercise will contribute to people in Telford and Wrekin enjoying healthier, happier and longer lives.

Cabinet adopted the Ultra-low vehicle emission strategy in August 2018 which sets out how the Council will support and encourage growth in the ULEV market. The strategy's action plan will guide priorities and funding to those measures that are considered to be the most effective methods to encourage and support ULEVs.

Atkins have been commissioned by Telford & Wrekin Council to undertake a review of its existing local Air Quality Strategy (AQS) with a view to taking a proactive approach to monitoring and managing levels of pollution to ensure that air quality remains good within its borough for the benefit of public health.

Although Telford & Wrekin Council are meeting national air quality objectives and do not have any Air Quality Management Areas (AQMAs) within their borough, Telford & Wrekin Council do not wish to be complacent in their attitude to air quality, particularly given the expectation of new proposed development within the borough and would like to ensure a proactive approach in its efforts to improve air quality, and the inherently linked public health outcomes, with the view to developing a new AQS to achieve these aims. This is in line with DEFRA guidance which recommends that all local authorities should consider drawing up an Air Quality Strategy. It is anticipated that the first draft of the AQS will be completed by June 2022 with the associated air quality action plan being developed and implemented after its adoption.

Conclusions and Priorities

Monitoring data from 2021 has shown overall that air quality in relation to NO_2 concentrations is fairly stable. NO_2 concentrations are not completely stable and do fluctuate slightly year to year due to many influencing factors i.e. weather conditions and road use, another factor this year has been the impact of the lifting of the coronavirus travel restrictions, this has seen the concentrations of NO_2 increase slightly on the levels seen in 2020, however the levels have remained lower than that of 2019.

Although this year there has been no exceedances of the National Air Quality Objectives, the Council is making progress in identifying areas of poorer air quality within the borough through air quality review. The Council's main priorities for the coming year are to continue diffusion tube monitoring for NO_2. The Council will continue to take a pragmatic approach in addressing any further locations identified to have poorer air quality and where necessary liaise with DEFRA. The main aims for the coming year are;

- Complete and implement the review of our air quality strategy to include strengthening links between inequalities of health and air quality, a review of our current LAQM monitoring, a review of planning policy to ensure that Air Quality is appropriately considered during development and an action plan to improve Air Quality levels in the borough with the ambition of meeting the World Health Organisation's new Air Quality targets.
- Continue with parking enforcement across the borough with the intention that parked vehicles do not disrupt traffic flow and cause congestion.
- Continued inspection and maintenance review of the borough cycling and walking routes to identify immediate and longer term improvements as part of the £2.6m Travel Telford Sustainable Transport Fund; and
- Continued consideration and engagement with external stakeholders to improving our electric vehicle charging network across the borough;

Local Engagement and How to get Involved

To reduce air pollution and contribution to clean air everyone living, working and visit the area has the ability to contribute. Every individual and business can promote clean air and help make a difference by considering the following actions:

- Consider using walking, cycling or using public transport for trips including to school, when moving around the borough
- Utilise waking and cycling route maps (available here https://www.telford.gov.uk/downloads/file/1743/walking_and_cycling_map_of_telford_and_wrekin)
- Consider car sharing where possible
- Consider electric/low emission/hybrid vehicle as an option for your next car purchase.
- When travelling by vehicle, try to utilise less busy and congested routes.
- Switch engine off and don't leave it running when your car is waiting stationary.
- Maintain your vehicle by having it serviced regularly and ensure an optimum tyre pressure

For further information please see the information on Telford and Wrekin's website:

http://www.telford.gov.uk/info/20150/pollution/104/air_quality

https://www.telford.gov.uk/info/20465/walking/3621/cycling_and_walking_strategy

Or contact us by phone on 01952 381818

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Protection Team of Telford and Wrekin Council with the support and agreement of the following officers and departments:

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This ASR has been approved by:

Dean Sargeant – Director, Neighbourhood and Enforcement services

Liz Noakes – Director, Public Health

This ASR has been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to The Environmental Protection Team at:

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1 Local Air Quality Management

This report provides an overview of air quality in Telford & Wrekin Council during 2021. 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 Telford & Wrekin 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.

The Borough of Telford and Wrekin currently does not have any AQMAs but there is a network of diffusion tubes used to monitor the air quality in the Borough. For reference, a map of the Borough of Telford and Wrekin's monitoring locations is available in Appendix D.

Progress and Impact of Measures to address Air Quality in Telford & Wrekin

Defra's appraisal of last year's ASR concluded:

1. Trends are presented and discussed, and a robust comparison to air quality objectives is provided.

2. They show a good commitment to air quality monitoring despite low pollutant concentration levels across the board.

3. The Council has provided an extensive list of measures and all the relevant fields have been completed with detailed comments even though they have no published AQAP.

4. Robust and accurate QA/QC procedures were applied. Calculations for bias adjustment and the annualisation completed were outlined in detail which enhances the reader's understanding. The deliberation over the choice of bias adjustment used was appropriate and considered robust

5. The Council has responded to last year's appraisal comments and made changes to the report based on the comments. This is encouraging to see.

6. Overall, the report is detailed, concise and satisfies the criteria of relevant standards. The Council should continue their good and thorough work.

Telford & Wrekin Council does not currently have an Air Quality Action Plan (AQAP), we are in the process of reviewing our Air Quality Strategy which will inform an AQAP, and more information on the measures from the new AQAP will be reported in the 2023 ASR. Details included in 2021's ASR have either been completed or are ongoing work streams therefore they have not been included again this year as it was seen as a duplication of last year's ASR.

Telford & Wrekin Council expects the following measures to be completed over the course of the next reporting year:

- Complete and implement the review of our air quality strategy to include strengthening links between inequalities of health and air quality, a review of our current LAQM monitoring, a review of planning policy to ensure that Air Quality is appropriately considered during development and an action plan to improve Air

Quality levels in the borough with the ambition of meeting the World Health Organisation's new Air Quality targets.

- Continued development of Urban Traffic Control, which is a LA funded initiative to improve traffic flow rates and reduce congestion.
- Continued inspection and maintenance review of the borough cycling and walking routes to identify immediate and longer term improvements as part of the £2.6m Travel Telford Sustainable Transport Fund.
- Ensure air quality comments continue to be provided to the development team of the Local Plan to help prioritise potential development sites and highlight methods to ensure future developments do not negatively impact the local air quality.
- Continued consideration and engagement with external stakeholders to improving our electric vehicle charging network across the borough.

Whilst the measures stated above will help to contribute towards compliance, Telford & Wrekin Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance, particularly at hotspot locations and continue to improve air quality across the Borough of Telford and Wrekin as a whole, it is hoped that this will be achieved through the implementation of our new Air Quality Strategy and associated Air Quality Action Plan

$PM_{2.5}$ – 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.

Telford & Wrekin Council is taking the following measures to address $PM_{2.5}$:

$PM_{2.5}$ emissions are regulated across the Borough through various legislative framework. This includes the LAPPC and LA-IPPC regimes under the provision of the Environmental Permitting (England and Wales) Regulations 2016 and smoke control areas brought in under the Clean Air Act 1993. More information relating the locations of Telford and Wrekin Council Smoke Control Areas are found here:

https://www.telford.gov.uk/info/20358/pollution/1038/smoke_control_zones/2

Telford & Wrekin Council are aiming to review their smoke control areas as part of the Air Quality Strategy Review, more information on this review will be provided in the ASR for 2022.

In considering the need for additional actions relating to $PM_{2.5}$ it is noted that the Public Health Outcomes Framework Indicator number 3.01 – Fraction of mortality attributable to particulate air pollution for the borough of Telford and Wrekin was noted to be 4.6% in 2019 (2020/2021 data is not available currently). This is the third lowest for the whole of the West Midlands region which has an average of 5.3% for 2019. The two authorities, both with lower values of 4.1% in Shropshire Council and 4.2% in Staffordshire Moorlands. The West Midlands figure is slightly higher than England's average of 5.1%. As the PHOF indicator for PM2.5 shows the mortality due to human-made $PM_{2.5,}$ the fraction is significantly below the national and regional levels and as such it is not considered necessary for any specific actions to be carried out while there are other non-specific interventions taking place which will contribute to reducing anthropogenic $PM_{2.5.}$

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

This section sets out the monitoring undertaken within 2021 by Telford & Wrekin Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Telford & Wrekin Council does not have any automatic monitoring sites.

3.1.2 Non-Automatic Monitoring Sites

Telford and Wrekin Council undertook non- automatic (passive) monitoring of NO_2 at 21 sites during 2021. **Error! Reference source not found.** in Appendix A shows the details of the 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 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO_2)

Error! Reference source not found. and Table A.2 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 2021 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.

Error! Reference source not found. 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.

There were no exceedances of the air quality objectives in 2021 at any monitoring location.

3.1.4 Particulate Matter (PM_{10})

Telford and Wrekin Council do not currently monitor for this pollutant. There is no evidence that PM_{10} annual mean concentrations for the past 5 years is likely to exceed the air quality objective of 40µg/m^3.

3.1.5 Particulate Matter ($PM_{2.5}$)

Telford and Wrekin Council do not currently monitor for this pollutant.

3.1.6 Sulphur Dioxide (SO_2)

Telford and Wrekin Council do not currently monitor for this pollutant. There are no concerns that air quality objectives for SO_2 are likely to be exceeded.

Appendix A: Monitoring Results

Table A.1 – 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)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser	Height (m)
1	Uxacona Way, Oakengates	Roadside	369706	311063	NO2	No	25.0	0.0	No	2.5
2	New Road	Kerbside	370013	312166	NO2	No	13.2	0.1	No	2.4
3	Behind Bluebell Lane	Kerbside	374214	318134	NO2	No	8.0	10.0	No	2.5
4	Barrack Lane	Roadside	373202	316555	NO2	No	5.1	2.1	No	2.3
5	Horton Road	Kerbside	368742	312775	NO2	No	4.2	0.4	No	2.6
6	Apley Avenue	Roadside	365095	312402	NO2	No	41.4	2.5	No	2.4
7	Haybridge Rd	Roadside	366626	311627	NO2	No	10.0	0.0	No	2.5
8	Watling Street Outside Swan	Roadside	365918	311056	NO2	No	5.4	2.3	No	2.5
9	Mill Bank	Roadside	365911	311061	NO2	No	2.8	1.2	No	2.4
10	Watling Street	Roadside	366092	311083	NO2	No	4.4	3.9	No	2.3
11	Hollyhead Road	Roadside	365895	311024	NO2	No	20.0	1.6	No	2.4

12	Dawley Road	Roadside	365939	311013	NO2	No	7.8	1.6	No	2.4
13	Watling Street/Rejent Street Junction	Roadside	366065	311068	NO2	No	4.4	3.9	No	2.4
14	Mossey Green Way	Roadside	368727	310040	NO2	No	5.4	2.3	No	2.4
15	Newdale/Lawley Junction	Kerbside	367560	308854	NO2	No	11.2	1.0	No	2.5
16	Madeley Road Ironbridge	Roadside	367513	303444	NO2	No	10.0	0.0	No	2.6
17	Coach Central	Urban Centre	369893	308650	NO2	No	239.0	1.3	No	2.7
18	Dudmaston	Kerbside	370990	308497	NO2	No	7.1	0.5	No	2.5
19	Castle Farm Way	Roadside	372232	309922	NO2	No	20.0	0.0	No	2.3
20	Sneadsheill Way/Hollyhead Road Junction	Roadside	370415	309918	NO2	No	20.0	6.5	No	2.3
21	Shifnal Road	Roadside	371117	309458	NO2	No	33.0	1.5	No	2.5

Notes:

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

(2) N/A if not applicable.

Table A.2 – 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 (%)	Valid Data Capture 2021 (%)	NO_2 Annual Mean Concentration (µg/m^3)				
						2017	2018	2019	2020	2021
1	369706	311063	Roadside	100	100.0	-	-	-	23.2	24.8
2	370013	312166	Kerbside	100	100.0	16.0	17.5	13.9	11.5	13.3
3	374214	318134	Kerbside	100	100.0	-	-	-	8.4	9.2
4	373202	316555	Roadside	100	100.0	17.2	18.2	17.0	12.3	12.6
5	368742	312775	Kerbside	90.4	90.4	15.6	17.4	16.2	13.0	13.2
6	365095	312402	Roadside	100	100.0	23.9	25.4	24.2	18.6	20.4
7	366626	311627	Roadside	82.7	82.7	-	-	-	24.3	24.8
8	365918	311056	Roadside	100	100.0	32.5	33.9	31.2	24.6	27.4
9	365911	311061	Roadside	100	100.0	38.2	**42.2**	**40.0**	28.4	33.5
10	366092	311083	Roadside	92.3	92.3	23.5	25.8	25.6	17.1	21.8
11	365895	311024	Roadside	100	100.0	18.6	20.5	20.0	16.2	16.5

12	365939	311013	Roadside	100	100.0	21.6	23.9	22.4	17.2	19.0
13	366065	311068	Roadside	92.3	92.3	32.1	33.9	32.2	23.9	25.8
14	368727	310040	Roadside	100	100.0	38.2	28.5	27.5	19.9	23.9
15	367560	308854	Kerbside	100	100.0	32.0	19.7	15.7	11.9	12.4
16	367513	303444	Roadside	92.3	92.3	-	-	-	15.7	15.9
17	369893	308650	Urban Centre	100	100.0	27.0	37.0	36.5	25.8	29.1
18	370990	308497	Kerbside	90.4	90.4	16.8	18.3	18.3	13.0	14.7
19	372232	309922	Roadside	100	100.0	-	-	-	13.5	15.2
20	370415	309918	Roadside	100	100.0	-	-	-	17.3	18.8
21	371117	309458	Roadside	100	100.0	18.6	24.0	24.9	17.7	18.2

☒ **Annualisation has been conducted where data capture is <75% and >25% 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**.

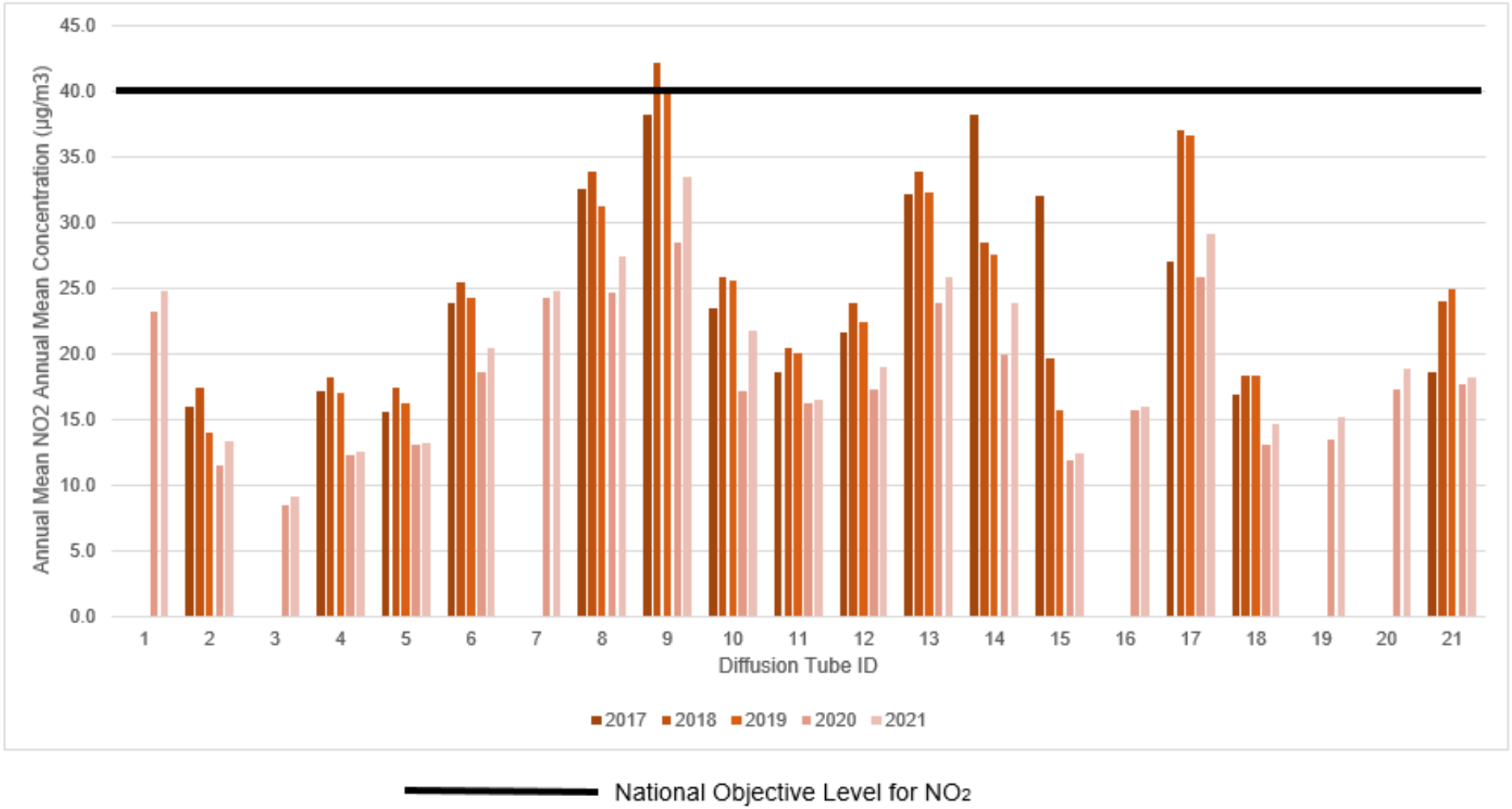
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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



Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO_2 2021 Diffusion Tube Results (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m^3)												Simple Annual Mean (µg/m3)			Comment
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.84)	Distance Corrected to Nearest Exposure	
1	369706	311063	35.1	33.2	26.9	29.0	28.1	24.8	26.0	25.9	33.7	29.0	31.6	31.2	29.5	24.8	-	
2	370013	312166	19.4	18.7	16.3	20.2	13.6	15.3	14.2	12.3	15.5	12.2	17.2	15.9	15.9	13.3	-	
3	374214	318134	16.6	14.4	10.3	11.6	8.3	8.0	8.4	7.3	12.0	10.3	11.7	12.0	10.9	9.2	-	
4	373202	316555	19.7	14.5	15.6	17.6	11.9	14.4	15.2	11.4	15.8	13.8	15.3	14.1	15.0	12.6	-	
5	368742	312775	22.5	19.0	17.0	16.6	11.5	10.1		10.4	16.1	14.4	19.0	16.8	15.8	13.2	-	
6	365095	312402	25.4	30.0	20.5	25.4	24.4	20.8	20.3	22.1	30.9	25.4	23.8	23.3	24.3	20.4	-	
7	366626	311627	35.5	29.1	31.1	36.4	27.8	19.7			31.2	24.9	33.6	25.6	29.5	24.8	-	
8	365918	311056	35.7	35.7	30.7	32.3	32.8	29.9	31.6	26.6	36.5	27.7	41.5	31.1	32.7	27.4	-	
9	365911	311061	44.3	41.5	37.8	43.9	35.6	37.4	36.9	36.0	46.4	37.0	45.9	35.8	39.9	33.5	-	
10	366092	311083	28.7	34.8	24.3	26.6	34.9	22.0	22.6	21.1	27.1	21.2		22.4	26.0	21.8	-	
11	365895	311024	23.9	23.9	18.3	22.1	18.3	16.5	17.2	14.6	21.6	17.3	23.3	19.2	19.7	16.5	-	
12	365939	311013	25.7	17.5	22.3	27.6	23.8	22.8	22.9	19.4	24.7	18.8	25.4	20.9	22.6	19.0	-	
13	366065	311068	35.2	24.0	29.4	35.4	24.0	30.3	30.4		38.5	31.4	29.2	30.8	30.8	25.8	-	
14	368727	310040	30.6	33.1	24.1	32.0	26.2	23.6	26.4	23.2	33.7	27.5	32.7	27.8	28.4	23.9	-	
15	367560	308854	17.8	17.3	14.8	15.9	12.9	12.7	13.7	12.4	14.1	12.0	18.3	14.9	14.7	12.4	-	
16	367513	303444	25.3	14.7	10.4	19.4	18.1	17.6	19.1		20.7	18.8	24.3	20.2	19.0	15.9	-	
17	369893	308650	35.3	31.3	28.1	27.3	35.6	32.9	34.7	29.9	39.8	38.8	42.6	39.5	34.6	29.1	-	

18	370990	308497	22.0	21.0	15.6	22.4	16.3	15.0	14.8	14.4	18.7	13.0	18.7		17.4	14.7	-	
19	372232	309922	23.7	20.8	15.7	21.9	15.5	12.9	17.1	13.4	17.9	16.9	22.4	18.2	18.0	15.2	-	
20	370415	309918	26.2	25.9	20.1	22.7	22.7	16.8	19.1	17.4	24.7	23.0	28.0	22.2	22.4	18.8	-	
21	371117	309458	29.1	25.8	21.1	18.3	19.0	15.6	16.1	16.8	25.6	23.2	26.7	22.6	21.7	18.2	-	

☒ **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 >25% 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.**

☒ **Telford & Wrekin Council confirm that all 2021 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 **bold and underlined**.

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 Telford & Wrekin Council During 2021

Telford and Wrekin Council has not identified any new sources relating to air quality within the reporting year of 2021.

Additional Air Quality Works Undertaken by Telford & Wrekin Council During 2021

Telford and Wrekin Council has not completed any additional works within the reporting year of 2021.

QA/QC of Diffusion Tube Monitoring

Details in relation to the aspects of non-automatic (i.e. passive) monitoring using diffusion tubes are as follows:

- Supplier – Gradko
- Preparation method - 20% TEA in water;
- Monitoring has been completed in adherence with the 2021 Diffusion Tube Calendar

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Telford & Wrekin Council recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 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.

Telford & Wrekin Council have applied a national bias adjustment factor of 0.84 to the 2021 monitoring data. A summary of bias adjustment factors used by Telford & Wrekin Council over the past five years is presented in Telford and Wrekin Council do not have any co-location studies, neither are triplicated diffusion tube locations utilised. Therefore, the nationally derived factor is used for bias adjustment for Gradko 20%TEA in Water method in 2021. 32 studies have been used to determine the bias adjustment factor of 0.84.

Table C.1.

Telford and Wrekin Council do not have any co-location studies, neither are triplicated diffusion tube locations utilised. Therefore, the nationally derived factor is used for bias adjustment for Gradko 20%TEA in Water method in 2021. 32 studies have been used to determine the bias adjustment factor of 0.84.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	06/20	0.92
2018	National	06/19	0.92
2017	National	06/18	0.87

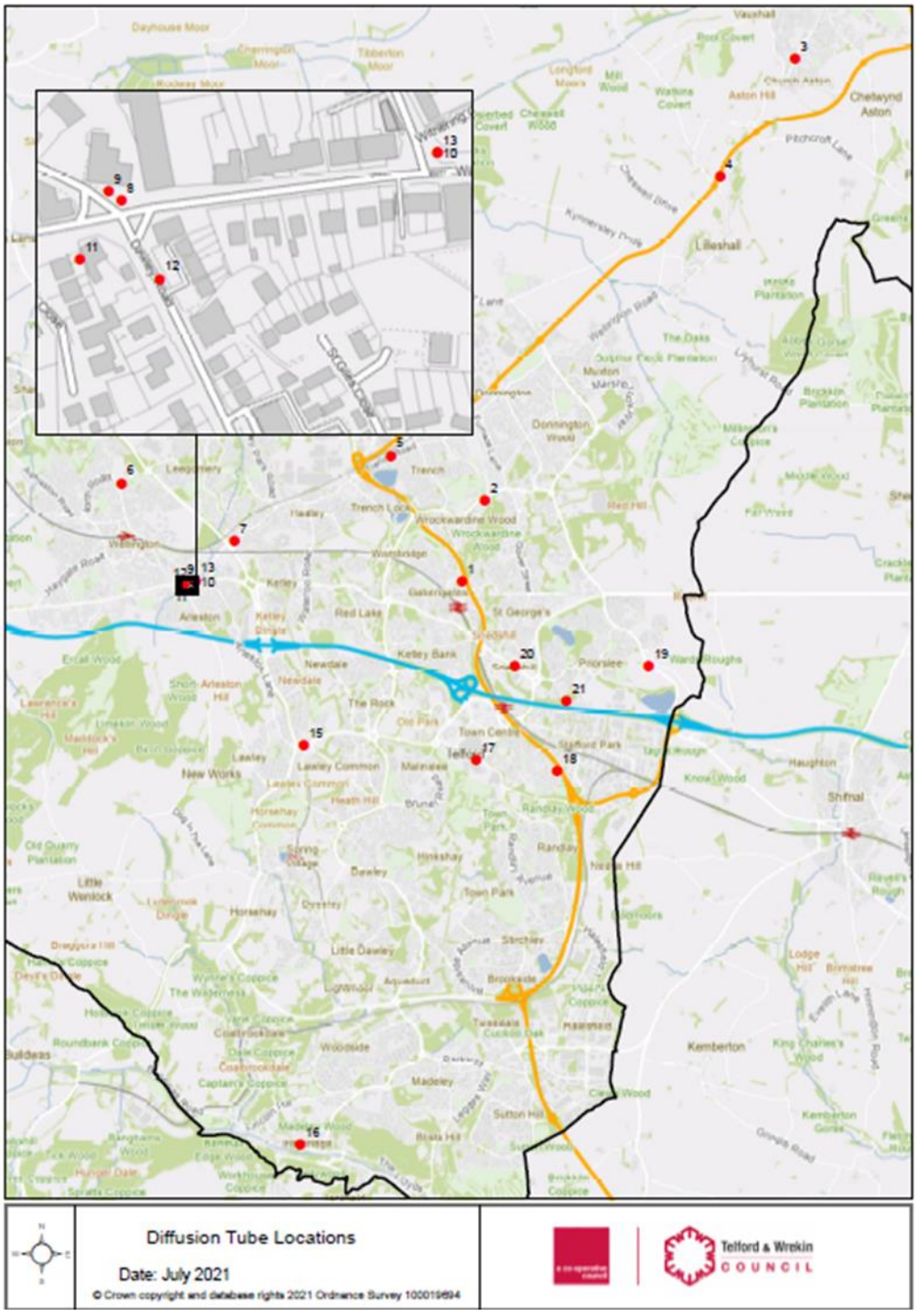
NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been 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 Telford & Wrekin Council required distance correction during 2021.

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

Figure D.1 – Map of Non-Automatic Monitoring Site



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

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

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

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 National Highways
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.