Worcestershire
Regulatory Services
Supporting and protecting you

2018 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management

January 2019

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Executive Summary: Air Quality in Our Area

Air Quality in the district of Bromsgrove

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 and older people, and those with heart and lung conditions. There is also often 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 society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

Worcestershire Regulatory Services (WRS) is a shared service formed from the Environmental Health and Licensing departments of the six Worcestershire District Councils. Responsibility for managing (monitoring and reporting of) local air quality transferred from the partnership councils to WRS in April 2011.

Monitoring results within the Bromsgrove District (BDC) area demonstrate no discernible trend in concentrations across the district in 2017 or over the 5 year period 2013 – 2017.

There are currently three Air Quality Management Areas (AQMA's) within the Bromsgrove District declared for exceedances of the annual average mean objective for nitrogen dioxide (NO_2). The Kidderminster Road, Hagley AQMA was revoked in 2018 following a detailed review which identified no significant exceedances of the national objectives for a considerable period of time. The existing AQMAs are as follows:

- Lickey End Bromsgrove AQMA declared 26th July 2001
- Redditch Road Bromsgrove AMQA declared 17th February 2010
- Worcester Road Bromsgrove AQMA declared 24th October 2011

[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

Details of declaration and plans of the AQMAs can be found on the following pages of the WRS website: http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-management-areas.aspx

Monitoring results within the Bromsgrove District Council area demonstrate a significant decrease in concentrations at all monitoring locations in 2017, consistent with trends across Worcestershire. This is attributed to the low bias adjustment factor of 0.77 applied to raw NOx tube data as required by Defra.

Actions to Improve Air Quality

In 2013, WRS produced a countywide Air Quality Action Plan (AQAP) for Worcestershire which was adopted on 13th November 2013. WRS have produced two updates to the countywide AQAP, the latest in September 2016. For details of all measures previously completed, in progress or planned, please refer to the 'Air Quality Action Plan Progress Report for Worcestershire April 2015-2016'. A copy of this, the previous update and the AQAP is available to download via

http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-action-plan.aspx

In 2014, WRS set up the Worcestershire Air Quality Steering Group and subsequent sub-groups to facilitate progressing implementation of prioritised actions identified in the AQAP. The Bromsgrove Urban (Steering) Sub-Group includes the Lickey End, Redditch Road, and Worcester Road AQMAs. A separate sub-group covered the Kidderminster Road, Hagley AQMA. The sub-groups currently comprise representatives of WRS, the Worcestershire County Council Air Quality Liaison Officer, and local County and district Councilors.

Many of the prioritised actions contained within the AQAP concerning the remaining AQMAs relate to specific highways improvements or junction enhancements. Worcestershire County Council (WCC) has previously advised that none of these actions would be implemented in isolation but may be considered as part of a wider scheme. The county council has set out a number of proposals for major highway development packages within Local Transport Plan 4 relating to the Bromsgrove area. It is unclear whether any of the air quality priority measures will be incorporated as part of any of the proposed schemes.

WCC's LTP4 details the following schemes in relation to the Bromsgrove District:-

- **Lickey End (M42 Junction 1). Major Junction Enhancement Scheme and Lickey End AQMA Remediation Major Scheme**

  Lickey End (M42, Junction 1) is widely recognised as operating in excess of built capacity and so is now heavily congested at peak times. The junction is the focus for an Air Quality Management Area and offers a challenging environment for non-motorised users. This major scheme would look at strategic options to tackle this issue, which could include redesign or junction relocation and will be delivered in partnership with Highways England. Through partnership working with the Council and Highways England this scheme is agreed in principle and funding sources identified.

- **Bromsgrove A38 Strategic Corridor (Lydiate Ash to Hanbury Turn) Major Scheme**

  The A38 Bromsgrove Corridor Major Scheme is currently being developed by Worcestershire County Council (WCC). The scheme will support the sustainable growth of Bromsgrove by enhancing the A38 Bromsgrove Eastern Bypass. The scheme includes a series of junction/island enhancements where delay and congestion is currently experienced, and where conditions are predicted to deteriorate further without intervention. These works will be critical in helping to support the objectives of the Bromsgrove District Plan, the Redditch Local Plan, Worcestershire's LTP 4 and both the Worcestershire and Greater Birmingham and Solihull Strategic Economic Plans prepared by the Local Enterprise Partnerships.

- **Bromsgrove Transport Strategy**

  This proposed scheme would involve a package of Public Realm Enhancements in Bromsgrove Town Centre and would be integrated with other schemes in the area. The scheme would also involve a comprehensive multimodal review of network efficiency and infrastructure. This study would identify where to focus investment to improve the operation of the local transport network. This would also include a review of Bromsgrove's highway network to explore options to improve and disperse traffic flow to increase efficiency and AQMA remediation at Worcester Road.

- **Bromsgrove – Strategic Active Travel Network Investment Programme (Including Catshill, Marlbrook and Lickey End)**

  Active Travel Investment Programme is a systemic investment in walking and cycling links across the Bromsgrove area to create a safe, comprehensive, integrated network linking residential areas with key trip attractors, including schools, rail stations, town centres and employment locations. This will include surfacing, signage, lighting and public realm improvements to create an attractive and coherent network.

- **Electric Vehicle Infrastructure Strategy** – In addition to the above actions proposed within LTP4 WCC are also currently considering the introduction of an EV strategy for Worcestershire. This will consider all ULEVs including electric, hydrogen, and Compressed Natural Gas (CNG). It is anticipated that WCC will consult with stakeholders such as WRS and the district councils on requirements and potential policy in 2019.

- **Ultra Low Emission Taxi Infrastructure Scheme – Round 2 Bid** – In 2018 BDC also made a bid for funds to help deliver infrastructure to support existing taxi drivers using electrical vehicles and encourage further uptake. The bid was supported by WRS who are also looking to add funds to the scheme should the bid be successful. The outcome of the bid is currently unknown at the time of writing this report.

Conclusions and Priorities

Currently three AQMAs are in place within the Bromsgrove District area. In 2017 exceedances of the annual mean objective for nitrogen dioxide where recorded in one of these AQMAs at two monitoring locations within Lickey End. Concentrations have been calculated to be below the objective when worked back to relative exposure however it is still likely that the annual mean objective is being exceeded in some areas of the AQMA. One location within the Worcester Road AQMA was also very close to the objective with a concentration of 39.68 at BC.

Concentrations at all other locations were recorded well below the objective. However the significant decrease in concentrations in 2017 compared with other years is largely attributed to the low bias adjustment factor of 0.77 applied to raw NOx tube data as required by Defra.

WRS are aware that the Defra published national bias adjustment factors for 2017 are significantly lower than in previous years. Consequently this significantly reduces the adjusted measurements of local nitrogen dioxide tubes well below local trends. No satisfactory explanation has been provided to WRS as to why this is the case and it does not provide confidence in the adjusted 2017 results. Therefore, in WRS opinion, the adjusted 2017 data should not be relied upon as indicative of local trends.

A detailed screening assessment was undertaken in relation to the Kidderminster Road, Hagley AQMA in 2017/18 due to concentrations generally being recorded well below the objective for a significant period of time. BDC revoked the AQMA in December 2018 following lengthy consideration of the process. During this period of revocation it was agreed that further monitoring locations would be established outside of the AQMA in another area of Hagley identified as a potential air quality concern in the vicinity of Kidderminster Road South and Worcester Road. Additional diffusion tube locations were established in this area as of May 2018.

Monitoring, review and assessment of air quality will continue within the Bromsgrove District area at all existing and former AQMAs and other relevant areas.

Local Engagement and How to get Involved

There are a number of ways members of the public can help to improve local air quality:

- Walk or cycle around the District instead of driving;
- WCC have launched a car sharing website, LiftShare, to help people find others journeying to the same destinations to share journeys and costs, and reduce traffic and emissions. Visit this link for more information: https://liftshare.com/uk/community/worcestershire
- General travel planning advice is available on WCC's website (including walking, cycling and bus maps and timetables) and Government website:
    - http://www.worcestershire.gov.uk/info/20007/travel_and_roads
    - https://www.gov.uk/government/publications/smarter-choices-main-report-about-changing-the-way-we-travel

- **Hold meetings by Conference Call** by phone or Skype rather than driving to meetings. This reduces fuel and other travel costs, vehicle maintenance and hire cost, increases productivity through reduction in hours lost through unnecessary travel;
- Facilitate **Flexible Working Arrangements** for non-front line staff to work remotely from home or nearer home facilities for one or more days a week thus removing or reducing any journey to work. This reduces congestion which has beneficial impacts for delivery times, reduced business costs and thus economic benefits. Additionally, provides social benefits through improved work life balance for employees, reduces local air quality and reduced emergency vehicle response times.
- **Switch Fleet to Low Emission Vehicles**: The government is providing £80m funding to encourage installation of EV charging points. Eligible businesses, charities and public sector organisations with off street parking for staff or vehicles fleets can apply for vouchers to redeem costs of electric vehicle charge-points. There is a limit of 1 voucher per applicant; however, applicants with a 'franchise' may apply for up to 20 franchisees. There is an approved charge points list and a list of authorised installers.

  https://www.gov.uk/government/collections/government-grants-for-low-emission-vehicles#workplace-charging-scheme
- If you have to drive follow fuel efficient driving advice, often known as 'Smarter Driving Tips', to save on fuel and reduce your emissions. A number of websites promote such advice including:
  - http://www.energysavingtrust.org.uk/transport/driving-advice
  - https://www.theaa.com/driving-advice/fuels-environment/drive-smart
  - https://www.vehicle-certification-agency.gov.uk/fcb/smarter-driving-tips.asp

Air pollution can affect all of us over our lifetime however certain groups will be more sensitive to the effects of air pollution. Vulnerable groups include adults and children with lung or heart conditions such as asthma, chronic bronchitis, emphysema and

chronic obstructive lung disease (COPD)[4,5]. Senior citizens are more likely to be affected by respiratory diseases and children are more likely to be affected by air pollution due to relatively higher breathing and metabolic rates as well as a developing lung and immune system.

Vulnerable individuals and groups can keep informed of:

- Current levels and forecasts of air pollution from Defra at https://uk-air.defra.gov.uk/.
- If you are sensitive to the effects of air pollution, it may be appropriate to limit the length of time spent in areas of local poor air quality – see advice from Defra at https://uk-air.defra.gov.uk/air-pollution/daqi.
- If you are on social media, sign up to the WRS Twitter feed @RegServs. WRS tweet when pollution is forecast by Defra to be moderate to very high.

Further information for the general public on reducing your family's exposure to poor air quality in Worcestershire and how individuals, business and schools can assist with reducing their impact on local air quality can currently be found at http://www.worcsregservices.gov.uk/pollution/air-quality/public-advice.aspx .

[4] http://www.breathelondon.org/

[5] https://www.londonair.org.uk/LondonAir/guide/MyActionsForMe.aspx

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1 Local Air Quality Management

This report provides an overview of air quality in Bromsgrove District during 2017. 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 Bromsgrove District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 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 must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Bromsgrove District Council can be found in Table 2.1. Further information relating to declared or revoked AQMAs, including maps of AQMA boundaries are available online at

http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-management-areas.aspx

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan		
						At Declaration	Now	Name	Date of Publication	Link
Lickey End, Bromsgrove AQMA	26th July 2001	NO2 Annual Mean	Bromsgrove	Residential properties along four roads emanating from the Junction 1 M42	YES	45.7µg/m3	30.8µg/m3	Air Quality Action Plan for Worcestershire (2013)		http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-action-plan.aspx
Redditch Road, Bromsgrove AQMA	17th February 2010	NO2 Annual Mean	Bromsgrove	Long stretch of the A38 including a number of residential properties	YES	45.6µg/m3	33.1µg/m3			
Worcester Road, Bromsgrove AQMA	24th October 2011	NO2 Annual Mean	Bromsgrove	Comprises mainly the B4091 Worcester Road single carriageway southwest of the town centre	NO	56µg/m3	39.68µg/m3			

☒ **Bromsgrove District Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

2.2 Progress and Impact of Measures to address Air Quality in Bromsgrove District

Defra's appraisal of last year's ASR concluded that *'the report is well structured, detailed, and provides the information specified in the Guidance. The comments below are designed to assist in the development of future reports:*

1. *It is noted that the District Council are continuing to carry out routine monitoring with the use of passive diffusion tubes for nitrogen dioxide at 35 sites across the District, with results falling below objective levels in the Hagley AQMA with exceedances within the remaining three AQMA's.*
2. *This is a departure for 2016 monitoring results compared to the previous year, where there was only an exceedance at Worcester Road AQMA.*
3. *These results highlight the transitory nature of results from year to year. Over 5 years Kidderminster Road Hagley, Worcester Road, and Redditch Road AQMAs show some small increases, with the Hagley AQMA remaining below objective levels.*
4. *There is some evidence that monitored concentrations at positions of relevant exposure for the Lickey End AQMA, show some reductions over a 5-year period.*
5. *The report makes clear that Lickey End and Redditch Road AQMAs are centred on emissions from the A38 which is recognised within the LTP as a strategic corridor, with proposals for junction enhancements at sites known to be subject to congestion and delays.*
6. *Furthermore a proposed scheme for Bromsgrove Town centre within the Bromsgrove Transport Strategy aims to improve the operation of the local network by increasing traffic flows, including for the Worcester Road AQMA.*
7. *The further monitoring of sites of local traffic congestion and air quality hotspots needs to be a basis for future monitoring and assessment of the proposed traffic management schemes for Bromsgrove. Improved traffic flows and reducing congestion should be considered as key strategies for reducing emissions within AQMAs.*

8. *We note that there are a significant number of proposed action plan measures linked to traffic management schemes within the LTP4 programmes that are reliant upon successful funding bids.*
9. *It will be important to ensure that future ASR reports provide a clear update on the progress of implementing proposed action plan measures. Some of the proposed schemes are expected to be delivered in partnership through Highways England and the County Council, as well as wider Enterprise Partnership initiatives.*
10. *The multimodal review of Bromsgrove's highway network, within the Bromsgrove Transport Strategy should consider the impact of options that can expect to contribute to reducing traffic emissions at key hotspot locations.*
11. *The Kidderminster Road, Hagley AQMA Revocation Screening Assessment has been included within the ASR report. The report lists the progress of prioritised actions that have been identified for the AQMA, reviews monitoring data, summarising exceedances over a 15yr period. It concludes that within the last six years there has been only one occasion where the objective has been exceeded and no other instances within 5% of the NO_2 annual mean objective.*
12. *We concur with the conclusions of the report that the Hagley AQMA may be considered for revocation.*
13. *However we also note that there is some evidence of recent small increases in pollution levels, which should require monitoring to continue in key locations.*
14. *The main report references a rationalisation of monitoring for the Lickey End AQMA, we consider that a full review of monitoring is needed, particularly once the scope of proposed traffic management schemes are clarified.'*

In response to points 11 and 12 above WRS can confirm the revocation of the Kidderminster Road, Hagley AQMA was agreed by BDC following a lengthy consideration process and a revocation order passed dated 21st December 2018.

In reference to point 14 a rationalisation of monitoring locations within the Lickey End AQMA was undertaken at the end of 2018 with new locations established for the 2019 calendar year. More details of this process will be provided in future reports.

BDC has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned, are set out in Table 2.2.

More detail on these measures can be found in their respective Action Plans. Key measures that have been progressed since the previous 2017 ASR are:

- **Bromsgrove A38 Strategic Corridor (Lydiate Ash to Hanbury Turn) Major Scheme**

  Proposals for the A38 Bromsgrove Corridor Major Scheme have been developed by Worcestershire County Council (WCC). The scheme aims to support the sustainable growth of Bromsgrove by enhancing the A38 Bromsgrove Eastern Bypass. The scheme includes a series of junction/island enhancements where delay and congestion is currently experienced, and where conditions are predicted to deteriorate further without intervention.

  In February 2018 WRS were approached by Jacobs (the consultants for WCC) to discuss requirements for air quality in relation to the proposed scheme. The scheme was referred to as A38 Bromsgrove Major Scheme - Package 1. WCC in conjunction with Jacobs had designed the A38 improvement scheme which consists of 5 packages to be delivered in stages subject to funding. It is understood that the majority of funding had already been secured for Package 1. Neither WRS nor BDC were consulted or involved with the development process of the scheme. Package 1 consists of three separate aspects:

  • A38/M42 Junction 1 Improvements to junction and southbound approach;

  • M5 Junction 4 to Lydiate Ash Road Improvements; and

  • A38/Barley Mow Lane Improvements.

  WRS provided advice to Jacobs as to what would be required in terms of an air quality assessment in order to understand the potential impacts of the

scheme. Some concerns were raised as the enhancements included the widening of the southbound approach to the A38/M42 Junction (Lickey End AQMA) thus moving traffic flow closer to residential properties. This was included in the assessment. The other junction improvements fell outside areas of concern and were generally considered to represent minor changes to the network.

WRS were disappointed not to be consulted on the development of the scheme. The scope of the improvement scheme was also expected to be more comprehensive.

In June 2018 WRS were formally consulted on a 'Request for Scoping Opinion' in relation to Package 1. The information presented showed that the impacts of the scheme were marginal across the study area and the development was not considered to have significant environmental impacts.

It is considered that Package 1 of the scheme will have marginal benefits on air quality within the Lickey End AQMA should it be delivered. Other parts of the scheme (packages 2 to 5) will be assessed as and when they are rolled out and are subject to the relevant funding being obtained.

- **Lickey End (M42 Junction 1). Major Junction Enhancement Scheme and Lickey End AQMA Remediation Major Scheme**

  Lickey End (M42, Junction 1) is widely recognised as operating in excess of built capacity and so is now heavily congested at peak times. The junction is the focus for an Air Quality Management Area and offers a challenging environment for non-motorised users. This major scheme would look at strategic options to tackle this issue, which could include redesign or junction relocation and will be delivered in partnership with Highways England. Through partnership working with the Council and Highways England this scheme is agreed in principle and funding sources identified.

  This proposal is currently still in the design stage and various options are being considered. It is understood that as of the time of writing the County Council are awaiting completion of the Bromsgrove Transport Model so that

the different design scenarios can be run and impacts on the strategic highway network properly understood.

- **Bromsgrove Transport Strategy**

  This proposed scheme involves a package of Public Realm Enhancements in Bromsgrove Town Centre and would be integrated with other schemes in the area. The scheme would also involve a comprehensive multimodal review of network efficiency and infrastructure. This study would identify where to focus investment to improve the operation of the local transport network. This would also include a review of Bromsgrove's highway network to explore options to improve and disperse traffic flow to increase efficiency and AQMA remediation at Worcester Road.

  WCC has commissioned Jacobs to undertake a Strategic Transport Assessment (STA) to support the BDC local plan process and ultimately identify infrastructure schemes to support local plan growth.

- **Bromsgrove – Strategic Active Travel Network Investment Programme (Including Catshill, Marlbrook and Lickey End)**

  Active Travel Investment Programme is a systemic investment in walking and cycling links across the Bromsgrove area to create a safe, comprehensive, integrated network linking residential areas with key trip attractors, including schools, rail stations, the town centre and employment locations. This will include surfacing, signage, lighting and public realm improvements to create an attractive and coherent network.

  It is understood that £3.4 million of funding has been secured for the scheme which is due to be rolled out in 2020. This scheme is currently in development to provide 9 new active travel routes linking residential areas, employment sites, schools, the hospital, the town centre and the railway station.

Electric Vehicle Infrastructure Strategy – WCC are also currently considering the introduction of an EV strategy for Worcestershire. This will

consider all ULEVs including electric, hydrogen, and Compressed Natural Gas (CNG). It is anticipated that WCC will consult with stakeholders such as WRS and the district councils on requirements and potential policy in 2019.

- **Ultra Low Emission Taxi Infrastructure Scheme – Round 2 Bid** – In 2018 BDC made a bid for funds following demand from local taxi businesses. The funding would be used to help deliver infrastructure to support existing taxi drivers using electrical vehicles and encourage further uptake. The bid was supported by WRS who are also looking to add funds to the scheme should the bid be successful. The outcome of the bid is currently unknown at the time of writing this report.

Other actions that have either been completed or are ongoing are as follows:-

- **Freight Quality Partnership** - On-going work with satellite navigation companies to route HGVs around AQMAs.

- **Installing electric vehicle charging points** - Recommendations for the installation of EV Charging Points are routinely recommended by WRS on relevant planning consultations.

- **Greening Council and Business Fleets** - Worcestershire County Council Local Transport Plan (LTP4) was formally adopted in November 2017 and incorporates policy on alterative fuels and associated infrastructure: http://www.worcestershire.gov.uk/downloads/file/9024/worcestershire_s_local_transport_plan_ltp_2018_-_2030

- **Travel Planning** - Personalised travel planning program planned as part of wider health improvement drives from the County Council who have developed a “one-stop-shop” online travel portal: http://www.worcestershire.gov.uk/info/20007/travel_and_roads

- **Car Sharing** - A Liftshare scheme is currently in operation for Worcestershire https://liftshare.com/uk/community/worcestershire

Bromsgrove District Council expects the following measures to be completed over the course of the next reporting year:

- **Produce Air Quality Supplementary Planning Document (SPD)** - WRS officers drafted the SPD in 2017 and updated it in 2018. The document includes guidance on requirements of air quality assessments, standard recommendations for air quality mitigation measures, and advice relating to good practice for new development. The document has been sent to the relevant planning authorities for consideration. WRS are hopeful of formal adoption by the District Councils by 2019.

The principal challenges and barriers to implementation that BDC face are numerous. Some of these challenges relate to the specific site conditions at each AQMA. The Lickey End AQMA is located around the A38 where it meets Junction 1 of the M42. There are numerous properties within the vicinity of this major junction and arterial route. The Redditch Road AQMA is also a stretch of the A38. The main measured exceedances of the objective have been recorded where properties are located very close to the carriageway. The area of the Worcester Road AQMA where regular exceedances of the objectives occur is best described as a ‘street canyon’, consisting of narrow streets with continuous buildings on either side and is a major route for traffic in and out of Bromsgrove. On average approximately 16000 vehicles use this route every day. Although the Kidderminster Road, Hagley AQMA has been revoked the area remains a major arterial route where congestion is still a significant issue. Approximately 36000 vehicles travel daily along this route on average. Securing funding for improvement schemes is a key factor. Ensuring uptake of greener methods of transport and changes in behaviour are also difficult to achieve without incentives or a lack of alternative options being in place.

Large scale residential development is also proposed within the Bromsgrove District and wider area in future years. As a consequence solving the problem of poor air quality at problem locations within the district is proving to be difficult. Even without

further development, and increasing numbers of vehicles, the current road network is already stretched with significant congestion experienced on a daily basis.

A number of priority actions relevant to the three Bromsgrove AQMAs highlighted within the original action plan relate to specific highway actions. Historically WCC have stated that these actions would not be considered for progression in isolation but may be considered as part of one of the larger schemes set out in LTP4. Now that more detail of the LTP4 scheme is known it seems unlikely that some of these actions will be considered further. As such progress on the following priority actions has not yet been made due to these constraints:

AQMA	AQAP Action Ref Number	Action Description
Lickey End AQMA	5.1.1	Alteration to the phasing of traffic lights
	LE4	Junction review – narrowing of two lanes into one causes bottleneck at the top of A38 southbound
	LE6	Traffic exiting Barnsley Hall Road causes congestion – introduce no right turn restriction
	LE7	Traffic turning right into Harvester public house causes congestion – introduce no right turn restriction
Redditch Road AQMA	5.1.1	Alteration to phasing of traffic light systems
	RR7	Two in-road bus stops on carriageway either side of central street canyon
Worcester Road AQMA	WR3	Zebra crossing at Hanover Street / Worcester Road junction causes congestion.
	WR9	Local school traffic causes congestion exiting Shrubbery Road – requires junction review

The original action plan for Worcestershire was drafted in 2013 and since this time a number of changes have occurred locally and nationally. It is anticipated that the Action Plan for the Bromsgrove District area will need to be updated in the future to reflect these changes and to consider other viable options.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Bromsgrove District Council anticipates that further additional measures, not yet prescribed, will be required in subsequent years to achieve compliance and enable the revocation of the Lickey End, Redditch Road, and Worcester Road AQMAs.

Table 2.2 – Progress on Measures to Improve Air Quality

No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
LICKEY END BROMSGROVE AQMA											
5.1.1	Alteration to phasing of traffic light systems	Traffic Management	UTC, Congestion management, traffic reduction	WCC	LTP4 was formally adopted in Nov 2017 and includes scheme for A38 enhancements. A business case and funding applications have been submitted. Phase 1 of the scheme ready for roll out.	Currently unknown	Improved traffic flow in the area	Unknown at this stage	WCC have included A38 major enhancement scheme as part of LTP4. Funding bids made and some sources of funding secured. Phase 1 of scheme includes A38/M42 J1 improvements. .	2019-2021	Cost of scheme reliant on funding bids. WCC will not progress in isolation.
5.3.4	Promote Flexible Working arrangements	Promoting Travel Alternatives	Encourage / Facilitate home-working	WCC BDC	n/a	Ongoing	Increase in number of people able to work from home	Unknown at this stage	County Council have pushed for maximum coverage of fibre optic broadband	Ongoing (96% coverage by Dec 2019)	Reliant on uptake from private sector companies
LE4	Narrowing of two lanes into one causes bottleneck at top of A38 south	Traffic Management	UTC, Congestion management, traffic reduction	WCC	LTP4 was formally adopted in Nov 2017 and includes scheme for A38 enhancements. A business case and funding applications have been submitted. Phase 1 of the scheme ready for roll out.	Currently unknown	Improved traffic flow in the area	Unknown at this stage	WCC have included A38 major enhancement scheme as part of LTP4. Funding bids made and some sources of funding secured. Phase 1 of scheme includes A38/M42 J1 improvements. .	Within lifetime of LTP4 (2018 - 2030)	Cost of scheme reliant on funding bids. WCC will not progress in isolation. Has not been included in A38 package of improvements.
LE6	Traffic exiting Barnsley Hall Road right - no right turn restriction.	Traffic Management	UTC, Congestion management, traffic reduction	WCC	LTP4 was formally adopted in Nov 2017 and includes scheme for A38 enhancements. A business case and funding applications have been submitted. Phase 1 of the scheme ready for roll out.	Currently unknown	Improved traffic flow in the area	Unknown at this stage	WCC have included A38 major enhancement scheme as part of LTP4. Funding bids made and some sources of funding secured. Phase 1 of scheme includes A38/M42 J1 improvements. .	Within lifetime of LTP4 (2018 - 2030)	Cost of scheme reliant on funding bids. WCC will not progress in isolation. Has not been included in A38 package of improvements.

LE7	Turn right into Harvester PH from A38 south. Action no right turn restriction.	Traffic Management	UTC, Congestion management, traffic reduction	WCC	LTP4 was formally adopted in Nov 2017 and includes scheme for A38 enhancements. A business case and funding applications have been submitted. Phase 1 of the scheme ready for roll out.	Currently unknown	Improved traffic flow in the area	Unknown at this stage	WCC have included A38 major enhancement scheme as part of LTP4. Funding bids made and some sources of funding secured. Phase 1 of scheme includes A38/M42 J1 improvements. .	Within lifetime of LTP4 (2018 - 2030)	Cost of scheme reliant on funding bids. WCC will not progress in isolation. Has not been included in A38 package of improvements.
REDDITCH ROAD BROMSGROVE AQMA											
5.1.1	Alteration to phasing of traffic light systems	Traffic Management	UTC, Congestion management, traffic reduction	WCC	LTP4 was formally adopted in Nov 2017 and includes scheme for A38 enhancements. A business case and funding applications have been submitted. Redditch Road AQMA not included within Phase 1 of the scheme.	Currently unknown	Improved traffic flow in the area	Unknown at this stage	County Council have included A38 major enhancement scheme as part of LTP4. Funding bids made and some sources of funding secured for Phase 1.	Within lifetime of LTP4 (2018 - 2030)	Cost of scheme reliant on successful funding bids. WCC will not progress in isolation. Not included in Phase 1 of scheme.
5.2.2	Freight Quality Partnership	Traffic Management	UTC, Congestion management, traffic reduction	WCC	COMPLETED 2014 - 15	On-going.	Fewer HGVs travelling through AQMA	up to 10%	Ongoing	On-going duty under Traffic Management	Can take time for information to filter down to users. HGVs may still need to travel through AQMAs on major arterial routes.
5.3.4	Promote flexible working arrangements	Promoting Travel Alternatives	Encourage/facilitate home-working	WCC BDC	N/A	On-going	Increase in number of people able to work from home	Reduce emissions	County Council have pushed for maximum coverage of fibre optic broadband	Ongoing (96% coverage by Dec 2019)	Reliant on uptake from private sector companies
RR7	Two in road bus stops on carriageway either side of central street canyon	Traffic Management	UTC, Congestion management, traffic reduction	WCC	LTP4 was formally adopted in Nov 2017 and includes scheme for A38 enhancements. A business case and funding applications have been submitted. Redditch Road AQMA not included within Phase 1 of the scheme.	Currently unknown	Improved traffic flow in the area	Unknown at this stage	County Council have included A38 major enhancement scheme as part of LTP4. Funding bids made and some sources of funding secured for Phase 1.	Within lifetime of LTP4 (2018 - 2030)	Cost of scheme reliant on successful funding bids. WCC will not progress in isolation. Not included in Phase 1 of scheme.
WORCESTER ROAD BROMSGROVE AQMA											

5.3.8	Promote and support walking and cycling initiatives in Worcs	Transport Planning and Infrastructure	Cycle network	WCC BDC	NPIF funding for development of an active travel network in Bromsgrove – early stages of feasibility with programme of improvements to be delivered April 2018-March 2020.	2019-2021	Increased uptake of alternative modes of transport	Unknown at this stage	LTP was formally adopted in Nov 2017. A business case and funding applications have been submitted. This scheme is currently in development to provide 9 new active travel routes linking residential areas, employment sites, schools, the hospital, the town centre and the railway station.	Unknown at this stage	Cost of scheme reliant on successful funding bids
5.3.1	Travel Planning	Promoting Travel Alternatives	Personalised travel planning	WCC	2016	On-going	Increased uptake of alternative modes of transport	Reduced emissions	WCC is delivering PTP services on behalf of developers. Building on best practice developed by the Council this proven tool encourages modal shift in new developments towards more sustainable and space efficient forms of transport.	On-going	
WR3	Zebra crossing at Hanover Street/Worcester Road junction causes congestion	Traffic Management	UTC, Congestion management, traffic reduction	WCC	LTP was formally adopted in Nov 2017.	Currently unknown	Improved traffic flow in the area	Unknown at this stage	County Council have included package of improvements within LTP4. WCC has commissioned a Strategic Transport Assessment (STA) to support the BDC local plan process and ultimately identify infrastructure schemes to support local plan growth.	Within lifetime of LTP4 (2018 - 2030)	Cost of scheme reliant on successful funding bids. WCC will not progress action in isolation.
WR9	Local school traffic causes congestion exiting Shrubbery Road – requires junction review	Traffic Management	UTC, Congestion management, traffic reduction	WCC	LTP was formally adopted in Nov 2017. Includes Bromsgrove Transport Strategy.	Currently unknown	Improved traffic flow in the area	Unknown at this stage	County Council have included package of improvements within LTP4. WCC has commissioned a Strategic Transport Assessment (STA) to support the BDC local plan process and ultimately identify infrastructure schemes to support local plan growth.	Within lifetime of LTP4 (2018 - 2030)	Cost of scheme reliant on successful funding bids. WCC will not progress action in isolation.
GENERIC ACTIONS APPLICABLE TO ALL AQMAS											
5.2.2	Freight Quality Partnership	Traffic Management	UTC, Congestion management, traffic reduction	WCC	COMPLETED 2014 - 15	On-going.	Fewer HGVs travelling through AQMA	up to 10%	Ongoing	On-going duty under Traffic Management	Can take time for information to filter down to users. HGVs may still need to travel through AQMAs on major arterial routes.

5.2.5	Greening Council and Business Fleets	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	BDC WCC	2018-19	2019 Onwards	Increase in number of Council fleet and contractors vehicles of higher Euro Standard and/or utilising alternative fuels	Reduced emissions	Ongoing	Unknown	Reliant on uptake from private sector companies
5.2.10	Installing electric vehicle charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	BDC WCC WRS	2013 - 2019	2014 onwards	Increase in availability of EV charging points and correspondi ng increase in use of electric vehicles	up to 20%	Recommendations for installation of EV Charging Points on relevant planning consents formalised in draft SPD. Awaiting adoption by BDC planning authority for consideration.	Estimate SPD adoption 2019.	Lack of prioritisation for funding opportunities for EV charging infrastructure for authorities unnamed in Govt AQAP
5.3.2	Car Sharing	Alternatives to private car use	Car and lift sharing schemes	WCC	2014 – 2015 COMPLETED	Liftshare Scheme launched Autumn 2015	Increase in number of people car sharing	<1%	Liftshare Scheme launched in Autumn 2015	Liftshare website scheme launched Autumn 2015. Currently in operation	Following an initial surge in interest from public, use of service has slowed down
5.3.4	Promote flexible working arrangements	Promoting Travel Alternatives	Encourage/facilitat e home-working	WCC BDC	N/A	On-going	Increase in number of people able to work from home	Reduce emissions	County Council have pushed for maximum coverage of fibre optic broadband	Ongoing (96% coverage by Dec 2019)	Reliant on uptake from private sector companies
5.5.1	Produce Air Quality Supplementar y Planning Document	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	WRS BDC	2016-2017	2019	Formally adoption and utilised by Bromsgrove District Council planning authority	Reduced emissions from new Developm ents	SPD drafted by WRS and provided to City Council late 2017. Not yet formally adopted by planning authority. Updated in 2018 to reflect new NPPF.	Estimate SPD adoption 2019.	Conflicting views on SPD from 6 different local authorities could hamper adoption of single SPD.

5.5.4	Encourage developers to provide sustainable transport facilities and links serving new developments	Promoting Travel Alternatives	Personalised travel planning	BDC WCC WRS	n/a	On-going	Increased uptake of alternative modes of transport	Reduced emissions	WRS is delivering PTP services on behalf of developers. Building on best practice developed by the Council this proven tool encourages modal shift in new developments towards more sustainable and space efficient forms of transport. WRS make standard AQ mitigation measures on all relevant planning apps.	On-going	
5.6.3	Air Quality Networks	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	WRS CEEPG DEFRA BDC	2017	2017 onwards	Improved cross boundary working between local authorities in West Midlands	Reduce emissions	WRS are member of regional environmental protection managers group (CEEPG) and member of Defra LAQM Team Local Authority Advisory Group both formed in 2017.	On-going.	Differing AQ issues, priorities and resources in regional authorities
5.6.8	Forge closer links with local health agencies	Other	Other	WRS WCC PHE	N/A	On-going	Increase participation of Public Health in Worcestershire Air Quality issues and action groups	0	WRS officers have met with the Director of Public Health to highlight the air quality agenda in relation to NO2 and PM2.5. Other meetings and discussions have taken place.	On-going	Slow or limited engagement in air quality matters from Worcestershire DoPH, increased participation.
5.3.1	Travel Planning	Promoting Travel Alternatives	Personalised travel planning	WCC	2016	2017	Increased uptake of alternative modes of transport	Reduced emissions	WCC is delivering PTP services on behalf of developers. Building on best practice developed by the Council this proven tool encourages modal shift in new developments towards more sustainable and space efficient forms of transport.	On-going	
5.3.6 (5.3.8 and 5.3.9)	Improve cycling and walking routes in local areas	Promoting Travel Alternatives	Promotion of cycling	WCC BDC NPIF	2017	2019-2021	Uptake in commuter journeys undertaken by cycle or walking	Reduce emissions	LTP was formally adopted in Nov 2017. A business case and funding applications have been submitted. This scheme is currently in development to provide 9 new active travel routes linking residential areas, employment sites, schools, the hospital, the town centre and the railway station.	Unknown at this stage	Cost of scheme reliant on successful funding bids

5.4.4	Make air quality information more available and accessible	Public Information	Via the Internet	WRS	2012	2012-2016	Website hits and enquiries for information	0	All existing LAQM reports and details of AQMAs are available to public on WRS website. WRS use Twitter account to release information.	On-going	
5.4.2	Provide link to real time air quality information	Public Information	Via the Internet	WRS WCC PHE	2017	2017	Increase in WRS Twitter subscribers	0	System put in place at WRS to tweet alerts when Air pollution > 3 (Low) in any given 5 day forecast on Defra Daily Air Quality Index and shared with County Public Health representative	On-going	Limited to Twitter users
5.45	Raise the profile and increase awareness of air quality within the region	Other	Other	WRS CEEPG MJAC DEFRA	2014	2014 onwards	Improved cross boundary knowledge sharing between local authorities in West Midlands	Reduce emissions	WRS hold position of Air Quality technical coordinator for MJAC, member of CEEPG and member of Defra LAQM Team Local Authority Advisory Group both formed in 2017.	WRS was MJAC AQ Technical Coordinator 2014-17. MJAC/CEEPG Knowledge Hub group set up in 2017 delivered by joint working between WRS and Cannock Chase DC.	Reduced AQ officers in regional authorities and resource
5.4.1	Smarter Driving Tips	Public Information	Via the Internet	WRS and WCC	2017	2017	Increase in website hits	Reduce emissions	New advice page created for all groups affected by and impacting air quality and shared with County Public Health. Activation on WRS webpages held up by website platform changes and security issues caused by outside links requiring significant additional work to web design.	2018-19	Effectiveness depends on behavioural change
FORMER KIDDERMINSTER ROAD HAGLEY AQMA											
5.1.1/KR5	Alteration to phasing of traffic light systems/Junction review	Traffic Management	UTC, Congestion management, traffic reduction	WCC	Completed	Completed	Improved traffic flow in the area	5%	Signals have been upgraded to latest MOVA technology.	Completed	n/a

5.1.4	Variable Message Systems	Traffic Management	UTC, Congestion management, traffic reduction	WCC	2018 onwards	Unknown	Raise awareness of AQMAs	1%	North East Worcestershire Transport Telematics Investment Package outlined within LTP4 - VMS included as part of this	Within lifetime of LTP4 (2018 - 2030)	Scheme reliant on successful funding bids
5.1.8	Introduction of signals at roundabout	Public Information	Other	WCC	Completed	Completed	Improved traffic flow in the area	5%	Signals installed and various revisions made to junction marking	Complete d	n/a
5.2.2	Freight Quality Partnership – work with satellite navigation companies to route HGVs around AQMAs	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	WCC	Completed	Ongoing	Fewer HGVs travelling through AQMA	5%	Information provided to SatNat technology providers on ongoing basis	Ongoing	n/a

2.3 $PM_{2.5}$ – 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.

WRS has reviewed the DEFRA national background maps to determine projected $PM_{2.5}$ concentrations within the Bromsgrove District area for the 2017 calendar year. The average total $PM_{2.5}$ at 218 locations (centre points of 1km x 1km grids) across the Bromsgrove District is 8.98µg/m^3, with a minimum concentration of 8.07µg/m^3 and a maximum concentration of 10.87µg/m^3. This indicates that $PM_{2.5}$ concentrations within the Bromsgrove District are well below the annual average EU limit value for $PM_{2.5}$ of 25µg/m^3.

As outlined in Policy Guidance LAQM.PG16 WRS have discussed the role of the DoPH and the details of $PM_{2.5}$ levels across the County with the Director of Public Health for Worcestershire County Council. The DoPH has not confirmed to WRS that they are advocating or supporting any specific actions to reduce $PM_{2.5}$ concentrations across the County at this time.

In light of the above no additional actions are currently planned by Bromsgrove District Council in relation to the reduction of $PM_{2.5}$ levels. However it is anticipated that any actions taken to improve NO_2 levels across the District will likely result in a linked improvement in $PM_{2.5}$ levels.

Measures to Improve $PM_{2.5}$

Measure No.	Measure
5.2.10	Installing electric vehicle charging points
5.2.1	Promote and support walking and cycling initiatives
5.2.2	Freight Quality Partnership – work with satellite navigation companies to route HGVs around AQMAs
5.3.4	Promote flexible working arrangements
5.3.1	Travel Planning
5.1.4	Variable Message Systems
5.2.5	Greening Council Fleets
5.3.6	Improving cycling and walking routes in local areas
5.4.1	Smarter Driving Tips
5.3.2	Car Sharing Initiatives

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Bromsgrove District Council did not undertake any automatic (continuous) monitoring during 2017.

3.1.2 Non-Automatic Monitoring Sites

BDC undertook non- automatic (passive) monitoring of NO_2 at 35 sites during 2017. Table A.1 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.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Exceedances of the annual mean objective of 40µg/m^3 for nitrogen dioxide were measured at two monitoring locations during 2017. These two exceedances ocurred

within the Lickey End, Bromsgrove AQMA. However the two locations within Lickey End AQMA fall below the objective when calculated back to relevant exposure.

No concentrations exceed 60µg/m^3 which indicates the one-hour objective for nitrogen dioxide is not being breached. The highest concentration within the district was recorded as 47.39µg/m^3 at location LE4 within the Lickey End AQMA, although as mentioned previously this location does not represent releative exposure. The highest concentration at relevant exposure was recorded as 39.68µg/m^3 at location BC within the Worcester Road AQMA.

No exceedances of the NO_2 objective were recorded outside any of the AQMAs with the highest concentration of 27.92µg/m^3 at location RES4.

Kidderminster Road, Hagely

No exceedances of the annual mean objective were recorded within or in the vicinity of the former AQMA in 2017. The monitored concentrations ranged between 17.26µg/m^3 at location 8 and 27.92µg/m^3 at RES4 in the Hagely area.

In 2018 the Kidderminster Road, Hagley AQMA was revoked by Bromsgrove District Council as concentrations of nitrogen dioxide had fallen well below the objective for a number of years within the boundary of the AQMA. The report entitled '*Kidderminster Road, Hagley AQMA Revocation Screening Assessment – November 2017'* was submitted to Defra as an annex to the 2017 ASR.

The monitoring network will remain in the area for 2018 with additional locations established in May 2018..

Lickey End, Bromsgrove AQMA

Two exceedences of the objective were recorded within the Lickey End AQMA in 2016 with a value of 47.39µg/m^3 at LE4 and 46.36µg/m3 at F1/2/3. It should however be noted that neither of these locations represents relative exposure and are located some distance away from the nearest receptor. LE4 is located on the pavement outside of the Harvester Public House on the A38. F1/2/3 is a triplicate location formerly colocated with the automatic monitor which has since been removed. It is cited on the roundabout off the B4096 junction, near to a former residential property

that is now part of a commercial car business. When these locations are worked back to the nearest relevant exposure the values fall well below the annual mean objective.

Below is a table comparing the concentration at the monitoring location with that at relevant exposure in the last 5 years. In order to undertake the fall-off with distance calculations distances have been taken from the relevant years air quality report. There are some minor variation distances recorded year on year. The background concentration has been taken from the relevant report for each year.

Concentration at Monitoring Location and Worked Back to Nearest Receptor

	LE4		F1/2/3	
Site ID	Monitoring Location	Nearest Receptor	Monitoring Location	Nearest Receptor
2013	67	**44.5**	50.3	34.3
2014	51.26	36.6	59.5	**41.3**
2015	52.67	36	54.45	37.1
2016	56.51	35.7	57.99	33.1
2017	47.39	30.8	46.36	27.7

When calculated back to relevant exposure the values fall below the annual mean concentration with exceedances in only 2014 for F1/2/3 and 2013 for LE4. The next highest value within the AQMA in 2017 is 31.36µg/m^3 at LE5. The worked back figures have been used within the relevant tables of this report as per the guidance provided.

It is considered that the AQMA needs to remain in place at this time with monitoring to continue. Exploration of alternative monitoring locations should be carried out in future years to more accurately represent concentrations of nitrogen dioxide at relevant exposure.

It should be noted that at the time of writing this report a rationialisation of tube locations was undertaken at the end of 2018 and two new monitoring locations established within the AQMA for 2019. The AQMA is to remain in place and monitoring will continue.

Redditch Road, Bromsgrove AQMA

No exceedances of the annual mean objective have been recorded within the Redditch Road AQMA in 2017. The highest value of 33.1µg/m^3 was recorded at location 19/a/b. Two minor exceedances of 40.5 µg/m^3 were recorded in the AQMA in 2016. Prior to this the last exceedance in the AQMA was recorded in 2013. It is considered that the AQMA should remain in place and monitoring should continue.

Worcester Road, Bromsgrove AQMA

No exceedance was recorded within the Worcester Road AQMA in 2017 although a value of 39.68µg/m^3.was monitored at location BC which is less than 1% below the objective. The next highest concentration was at BCX (16 Worcester Road) and measured 34.54µg/m^3. The AQMA is to remain in place and monitoring to continue.

The monitored concentrations within 2017 are such that there is unlikely to be a breach of the hourly mean objective for NO_2.

3.2.2 Particulate Matter (PM_{10})

Bromsgrove District Council did not monitor PM10 in 2017.

3.2.3 Particulate Matter ($PM_{2.5}$)

Bromsgrove District Council did not monitor PM2.5 in 2017

3.2.4 Sulphur Dioxide (SO_2)

Bromsgrove District Council did not monitor Sulphur Dioxide in 2017.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
FL1	2C Fox Lane behind Greyhound Pub (second house past pub)	Roadside	395079	269797	NO2	No	0m	6.96m	No	2.13m
FL2	Lamppost next to new houses close to road on Fox Lane near to Rock Hill junction	Roadside	395118	269721	NO2	No	4.66m	1.36m	No	2.13m
RH1	8 Rockhill, Bromsgrove	Roadside	359243	269844	NO2	No	0m	6.25m	No	2.15m
WR4	188 Worcester Road, B'grove	Roadside	395312	269938	NO2	Yes	0m	7.50m	No	2.20m
WR2	159 Worcester Road, Bromsgrove	Roadside	395511	270180	NO2	Yes	0m	2.2m	No	2.21m
WR3	138 Worcester Road, Bromsgrove	Roadside	395501	270190	NO2	Yes	0m	4.42m	No	2.49m
BC	Ye Olde Black Cross, Worcester Road,	Roadside	395685	270424	NO2	Yes	0m	2.1m	No	2.29m

	Bromsgrove									
BCX	16 Worcester Road, Bromsgrove	Roadside	395807	270549	NO2	Yes	0m	2.7m	No	5.31m
WR/a/b	10 Hanover Street, B61 7JH	Roadside	395702	270423	NO2	Yes	0m	6.4m	No	1.37m
BG1	Davenall House, Birmingham Road, Bromsgrove	Roadside	396238	27118	NO2	No	N	2.59m	No	2.57m
BR	35 Birmingham Road, Bromsgrove	Roadside	396292	271210	NO2	No	0m	3.40m	No	2.17m
1	3A Alcester Road, Lickey End.	Roadside	396999	272979	NO2	Yes	0m	11.70m	No	1.84m
LE4	outside Harvester (Forest inn) PH Birmingham Road, Lickey End	Roadside	396935	272949	NO2	Yes	11m	1.35m	No	2.13m
LE7	371 Birmingham Road, Lickey End	Urban Background	396916	273014	NO2	Yes	0m	15.9m	No	2.10m
F1/2/3	Lickey End / Forrest Inn Island Lamppost 4957	Roadside	397010	273112	NO2	Yes	20m	2.31m	No	1.96m
LE5	5 Old Birmingham	Roadside	396999	273143	NO2	Yes	0m	6.53m	No	1.94m

	Road, Lickey End									
LE6	308 Birmingham Road, Lickey End	Urban Background	396958	273157	NO2	Yes	0m	18.30m	No	2.13m
TS	Smallholdings, Wildmoor Lane, Catshill	Rural	396613	275085	NO2	No	0m	51m	No	1.8m
10	77a Park Road, Hagley	Urban Background	391137	280638	NO2	Yes	0m	17m	No	1.93m
11	74 Worcester Lane, Hagley	Roadside	390295	280043	NO2	No	N	2.75m	No	1.88m
HL	20 Birmingham Road Road sign	Roadside	391551	280999	NO2	Yes	13m	2m	No	1.88m
8	9 Market Way, Hagley	roadside	391452	280947	NO2	Yes	0m	13.8m	No	1.88m
9/a/b	78 Kidderminster Road, Hagley	Roadside	391210	280668	NO2	Yes	0m	8.3m	No	1.98m
KR62	62 Kidderminster Road	Roadside	391182	280631	NO2	Yes	0m	7m	No	1.98m
RES 1	26 Stourbridge Road, Hagley Downpipe Front of Property	Roadside	391445	281179	NO2	Yes	0m	15m	No	2.10m
RES 2	21 Birmingham Road, Hagley, DY9 9JZ	Roadside	391556	281042	NO2	Yes	0m	15m	No	2.20m
RES 3	104 Kidderminster	Roadside	389827	279590	NO2	No	0m	14.3m	No	2.00m

	Road South, Hagley Downpipe Front of Property									
RES 4	23 Worcester Road, Hagley DY9 0LF Downpipe Front of Property	Roadside	390025	27965	NO2	No	0m	14.5m	No	2.10m
BG3	Finstall Primary School, Carnforth Road, Bromsgrove	Urban Background	396755	270400	NO2	No	1.42	n/a	No	1.96m
SR	2 Stoke Road, Aston Fields, Bromsgrove	Roadside	396780	269450	NO2	No	0m	4.9m	No	1.88m
18	84 Redditch Road, Bunsford Hill	Roadside	395180	268549	NO2	Yes	0m	1.6m	No	2.01m
19/a/b	93 Redditch Road, Bunsford Hill	Roadside	395188	268564	NO2	Yes	0m	2.7m	No	1.93m
HR	52 Hanbury Road, Stoke Heath	Roadside	394772	268441	NO2	No	0m	5m	No	2.20m
16	58 Redditch Road, Bromsgrove	Roadside	394701	268444	NO2	Yes	0m	2.3m	No	2.16m
255	255 Worcester Road (A38 Roundabout)	Roadside	394408	268417	NO2	No	0m	12m	No	2.31m
DT2	Name2	Select	332395	433175	NO_2	YES/NO	3	1	YES/NO	2.0

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2013	2014	2015	2016	2017
FL1	Roadside	Diffusion Tube	92	92			19.81	22.11	17.69
FL2*	Roadside	Diffusion Tube	100	100			33.86	33.20	30.51
RH1	Roadside	Diffusion Tube	100	100		33.3	33.30	34.81	27.43
WR4	Roadside	Diffusion Tube	100	100		31.83	30.81	32.17	26.92
WR2	Roadside	Diffusion Tube	100	100	**42**	**40.69**	36.31	38.65	29.25
WR3	Roadside	Diffusion Tube	100	100	38	32.71	32.72	33.19	28.61
BC	Roadside	Diffusion Tube	92	92	**56**	**45.62**	**47.59**	**47.31**	39.68
BCX	Roadside	Diffusion Tube	100	100	**58**	**46.81**	**43.03**	**45.09**	34.54
WR/a/b	Roadside	Diffusion Tube	97	97	**46.6**	39.41	37.06	38.75	32.21
BG1	Roadside	Diffusion Tube	92	92	36	31.81	31.98	33.71	27.30
BR	Roadside	Diffusion Tube	100	100	33	28.66	28.63	30.15	22.84
1	Roadside	Diffusion Tube	75	75	31	30.37	25.51	29.39	22.28
LE4*	Roadside	Diffusion Tube	92	92	**67**	**51.26**	**52.67**	**56.51**	**47.39**

LE7	Urban Background	Diffusion Tube	100	100		32.99	30.58	34.76	25.76
F1/2/3*	Roadside	Diffusion Tube	100	100	**50.3**	**59.5**	**54.45**	**57.99**	**46.36**
LE5	Roadside	Diffusion Tube	100	100	**43**	34.51	35.15	36.07	31.36
LE6	Urban Background	Diffusion Tube	100	100		31.22	30.54	31.77	27.38
TS	Rural	Diffusion Tube	100	100	32	28.13	25.47	26.76	19.93
10	Urban Background	Diffusion Tube	100	100	37	32.01	30.22	33.52	25.02
11	Roadside	Diffusion Tube	100	100	33	29.87	27.68	31.28	23.22
HL	Roadside	Diffusion Tube	100	100	34	25.48	25.92	28.65	21.07
8	roadside	Diffusion Tube	100	100	27	20.42	20.01	21.88	17.26
9/a/b	Roadside	Diffusion Tube	100	100	**40.2**	33.65	32.44	34.49	27.36
KR62	Roadside	Diffusion Tube	100	100	33	31.76	32.17	33.86	27.70
RES 1	Roadside	Diffusion Tube	100	100		20.93	20.54	22.29	17.88
RES 2	Roadside	Diffusion Tube	100	100		31.31	32.26	34.72	27.81
RES 3	Roadside	Diffusion Tube	100	100		16.56	19.35	21.71	16.99
RES 4	Roadside	Diffusion Tube	100	100		31.43	32.70	35.67	27.92
BG3	Urban Background	Diffusion Tube	50	50	26	18.37	20.18	24.73	19.02
SR	Roadside	Diffusion Tube	100	100	31	26.46	26.80	29.90	19.64
18	Roadside	Diffusion Tube	100	100	**41**	35.47	35.03	**40.50**	30.65

19/a/b	Roadside	Diffusion Tube	100	100	**43.2**	37.05	35.40	**40.49**	33.10
HR	Roadside	Diffusion Tube	100	100	37	32.09	30.62	34.38	26.54
16	Roadside	Diffusion Tube	100	100	35	34.56	32.24	35.18	28.23
255	Roadside	Diffusion Tube	100	100	30	25.37	24.84	28.09	21.28

☒ **Diffusion tube data has been bias corrected**

☒ **Annualisation has been conducted where data capture is <75%**

Notes:

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

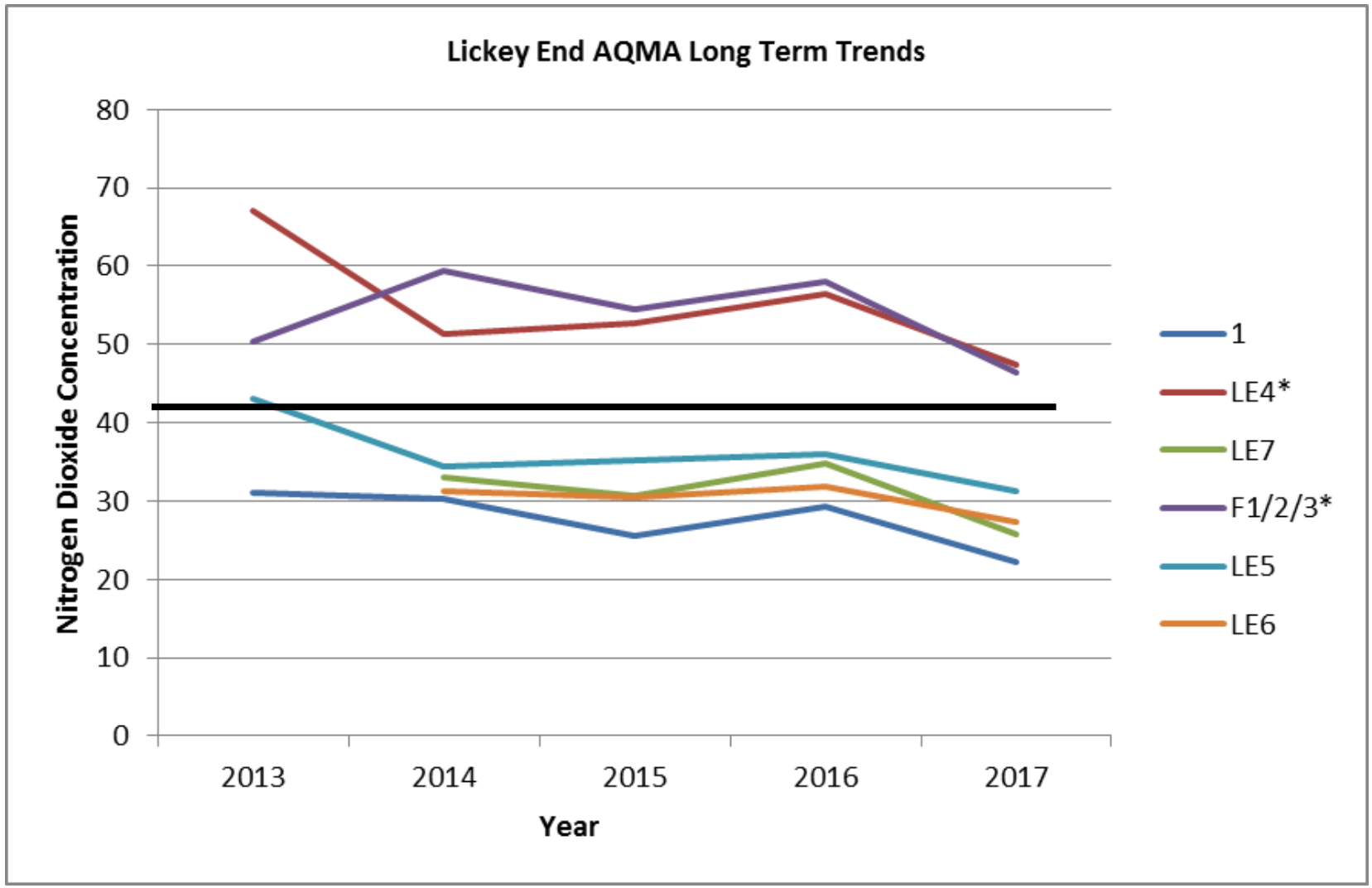
NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

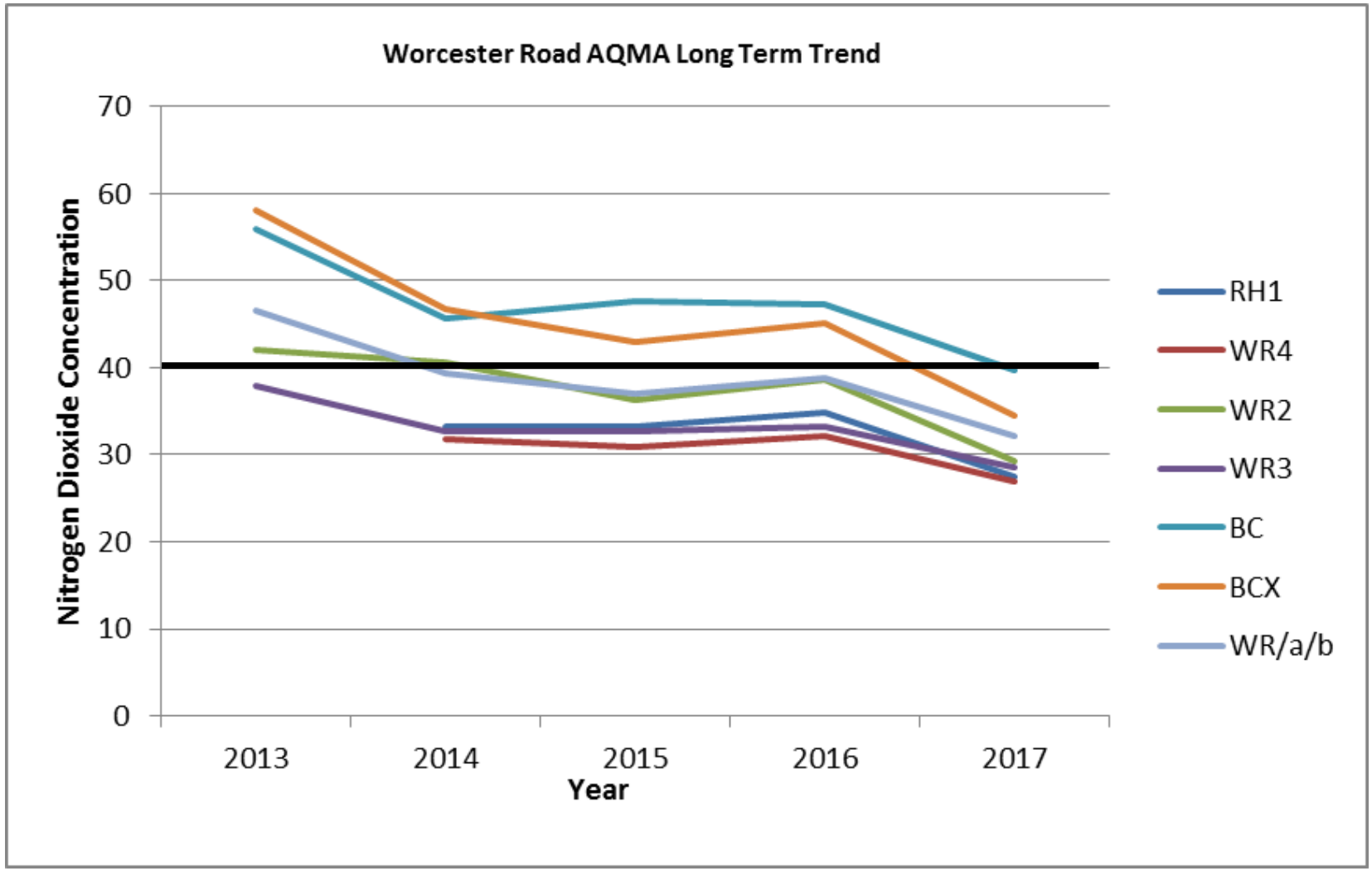
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

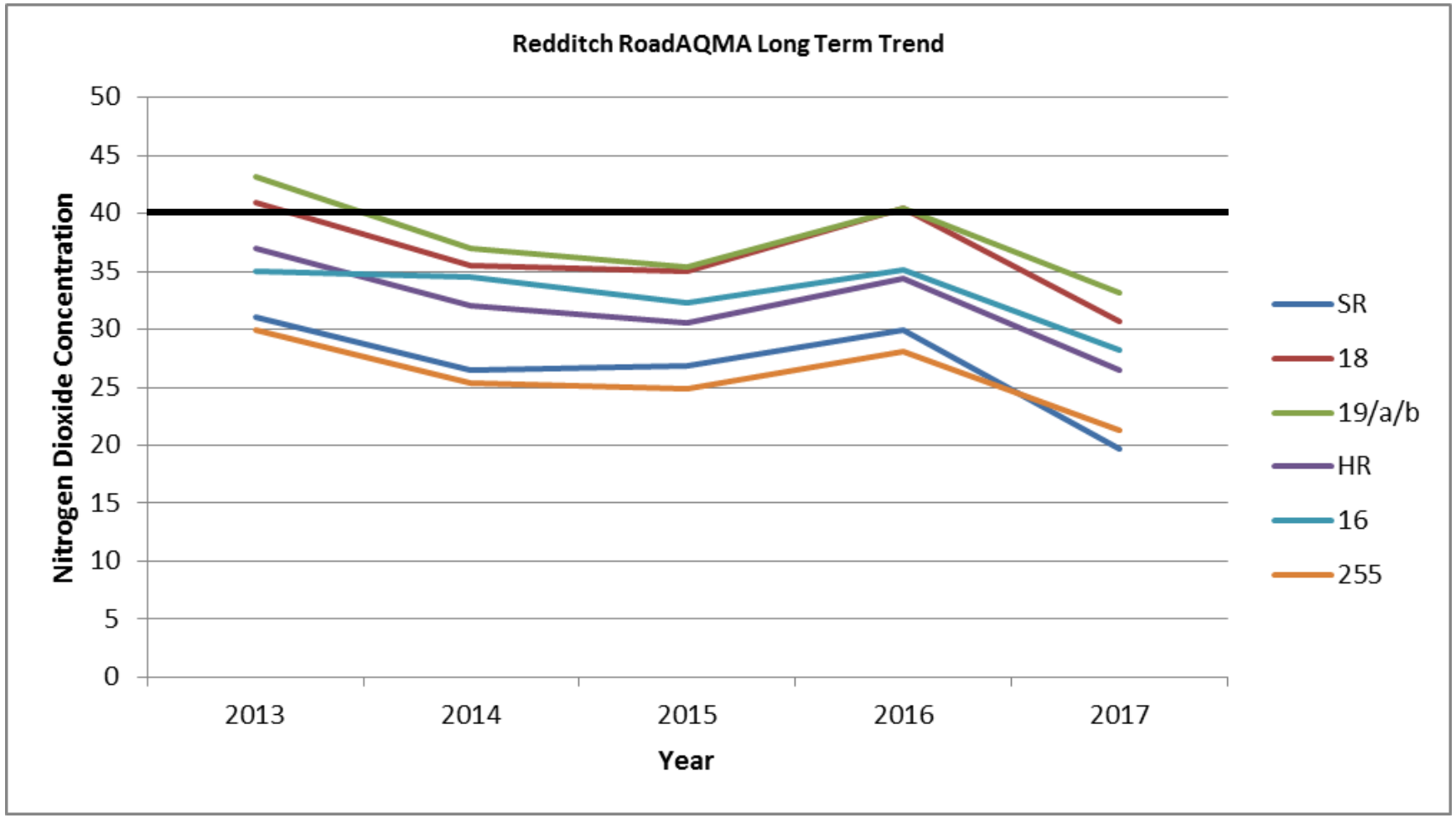
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

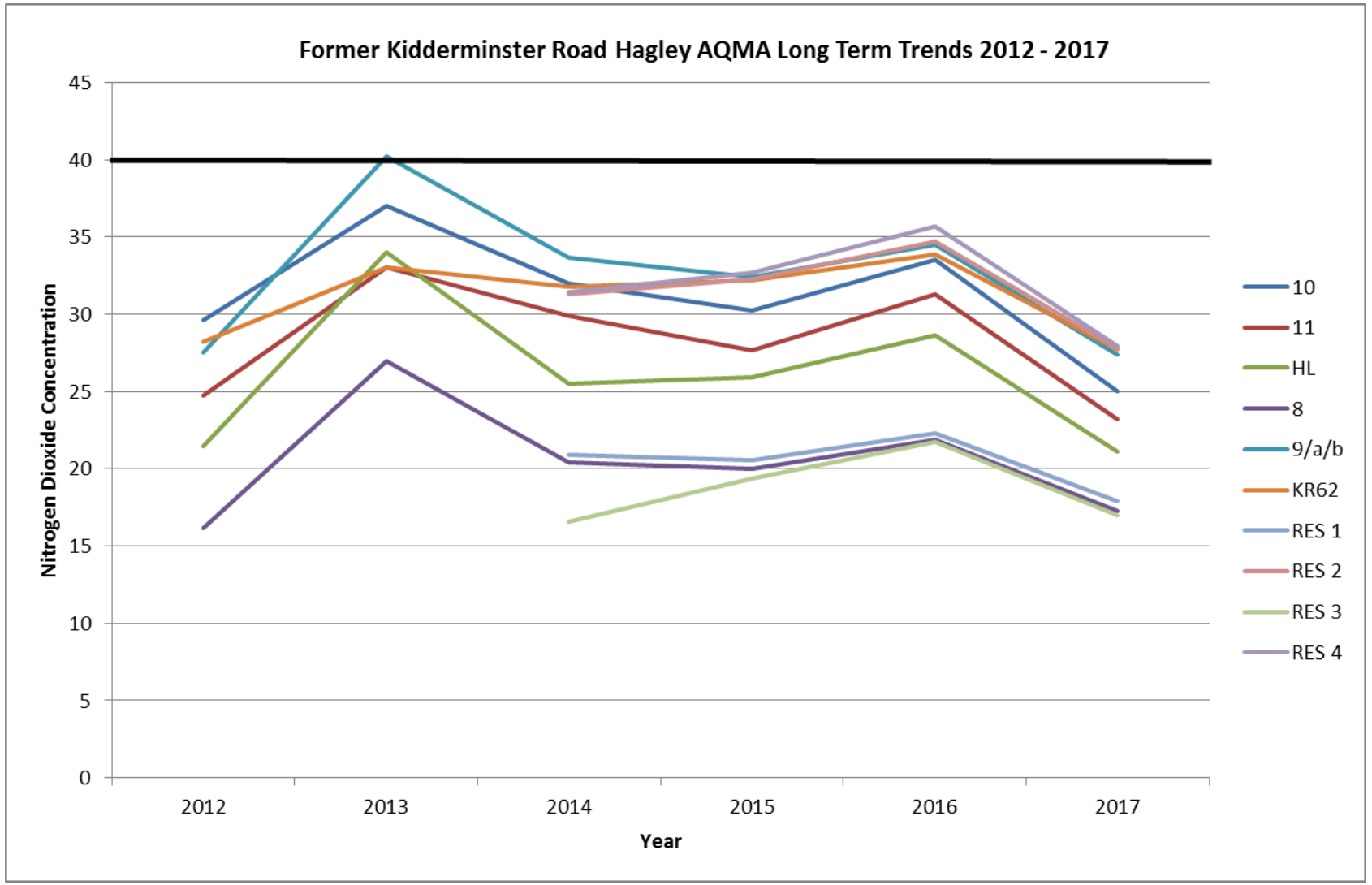
(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

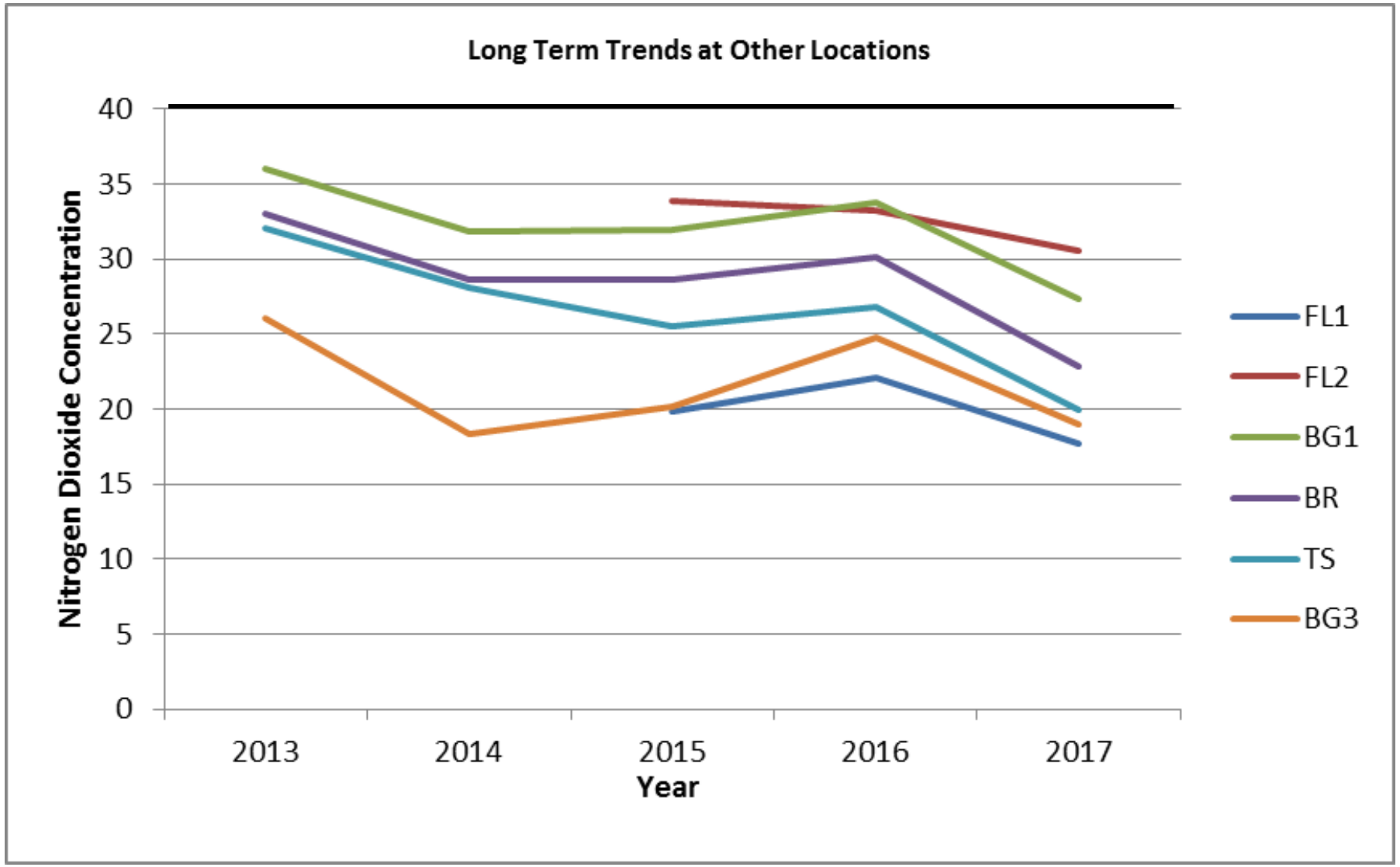
Figure A.1 – Trends in Annual Mean NO_2 Concentrations




Worcester Road AQMA Long Term Trend
Nitrogen Dioxide Concentration
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
Year
RH1
WR4
WR2
WR3
BC
BCX
WR/a/b


Redditch RoadAQMA Long Term Trend
Nitrogen Dioxide Concentration
50
45
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Year
SR
18
19/a/b
HR
16
255


Former Kidderminster Road Hagley AQMA Long Term Trends 2012 - 2017
Nitrogen Dioxide Concentration
45
40
35
30
25
20
15
10
5
0
2012
2013
2014
2015
2016
2017
Year
10
11
HL
8
9/a/b
KR62
RES 1
RES 2
RES 3
RES 4


Long Term Trends at Other Locations
Nitrogen Dioxide Concentration
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
Year
FL1
FL2
BG1
BR
TS
BG3

Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2017

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
FL1	34.37	23.54	23.38	18.73	20.58	14.20	15.64	16.39	25.06	24.75	36.06		22.97	17.69	
FL2	47.66	41.02	47.39	39.12	34.89	38.24	25.69	36.81	40.15	40.75		44.15	39.62	30.51	25.7(2)
RH1	46.85	40.25	37.53	32.71	31.26	29.74	26.77	30.06	29.95	38.90	41.43	42.02	35.62	27.43	
WR4	43.65	36.66	37.23	34.89	29.52	26.25	25.61	27.66	35.62	35.11	45.15	42.19	34.96	26.92	
WR2		46.07	43.31	31.73	36.58	33.50	27.50	30.61	34.07	43.85	45.27	45.41	37.99	29.25	
WR3	39.83	36.39	35.72	35.43	27.06	30.67	26.81	28.59	34.13	42.44	66.22	42.59	37.16	28.61	
BC	36.25	58.30	55.61	55.16		44.69	41.91		50.95	57.88	53.53	61.01	51.53	39.68	
BCX	62.83	57.21	55.67	16.56	45.00	40.61	33.30	38.67	44.51	47.16	42.91	53.87	44.86	34.54	
WR	52.74	50.01	46.06	37.19	36.92	37.45	31.44	35.88	37.88	44.86	44.56	49.33	42.03	32.36	
WRa	51.30	50.61	45.33	39.55	39.63	36.00	31.56	35.80	38.84	44.70	47.45	48.52	42.44	32.68	
WRb	47.91	46.80	43.27	40.27	39.82	36.79	30.28	33.24	38.90	41.32	46.16	47.37	41.01	31.58	
WR/a/b														32.21	
BG1	47.16	40.91	39.52	32.47	33.49	27.70	24.61	29.29	31.38	36.76	38.84	43.40	35.46	27.30	
BR	39.89	34.21	34.26	31.26	25.41	20.92	20.36	22.94	26.55	25.96	36.12	38.10	29.66	22.84	
1	36.57	31.42	29.42	33.37	23.91	20.72	21.05	22.24	28.40	30.56	36.36	33.25	28.94	22.28	

LE4	66.28	63.20	68.57	68.45	47.02	49.18	47.24	55.71	60.52	62.96	82.52	66.88	61.54	**47.39**	30.8[(2)]
LE7	43.59	37.04	37.41	35.43	35.23	22.56	24.64	26.73	32.23	33.74	37.00	35.86	33.45	25.76	
F1	76.37	73.67		56.49	52.34	55.90	47.28	38.51	46.36	71.06	64.57	65.82	58.94	**45.38**	
F2	77.12	54.70		60.21	55.15	33.17	51.37	52.82	60.55	72.22	74.61	66.52	59.86	**46.09**	
F3	83.07			56.25	52.97	59.19	50.02	56.92	57.57	67.87	65.81	68.59	61.83	**47.61**	
F1/2/3														**46.36**	27.7[(2)]
LE5	50.42	43.42	43.21	37.25	27.64	35.54	31.91	36.96	39.85	42.60	50.23	49.74	40.73	31.36	
LE6	41.90	39.66	39.65	33.68	25.36	32.51	27.04	30.86	32.34	40.59	39.54	43.57	35.56	27.38	
TS	38.07	30.35	29.44	16.88	34.59	16.64	17.07	18.60	21.48	28.03	28.19	31.25	25.88	19.93	
10	42.84	38.62	42.42	29.85	24.35	24.54	24.22	26.35	30.54	31.77	35.94	38.44	32.49	25.02	
11	37.01	37.64	34.69	24.64	25.32	24.67	22.02	18.91	26.65	35.08	37.35	37.98	30.16	23.22	
HL	36.07	28.33	30.29	32.03	16.03	22.30	23.83	21.85	25.49	27.50	35.46	29.22	27.37	21.07	17.0[(2)]
8	26.35	26.32	22.47	22.94	30.63	13.34	15.80	15.96	20.32	20.82	27.31	26.80	22.42	17.26	
9	36.82	41.07	39.71	36.40	31.84	29.35	28.31	31.15	32.11	33.53	42.32	40.40	35.25	27.14	
9a	42.65	37.80	41.76	38.33	30.83	30.34	27.50	31.30	33.15	35.74	43.27	37.00	35.81	27.57	
9b	40.89	36.88	40.85	36.27	31.02	28.95	29.09	33.16	34.08	37.54	39.36	38.39	35.54	27.37	
9/a/b														27.36	
KR62	39.01	38.18	39.10	41.00	29.61	27.97	29.32	34.71	32.74	38.03	45.39	36.66	35.98	27.70	
RES 1	32.68	23.49	24.65	18.22	20.00	14.92	18.15	20.22	20.90	26.52	29.91	28.93	23.22	17.88	
RES 2	45.15	38.18	39.28	43.49	30.83	30.34	27.62	30.45	29.96	34.02	43.21	40.86	36.12	27.81	
RES 3	29.55	26.75	25.13	21.06	20.36	16.50	14.83	16.50	18.87	23.69	25.47	26.05	22.07	16.99	
RES 4	46.22	40.75	40.01	45.42	28.99	26.98	28.24	29.60	26.65	36.72	43.56	42.02	36.26	27.92	
FFS	38.32	28.36	22.39				14.70	18.02	18.84		32.25		24.7	19.02	
SR	34.15	28.47	26.70	30.00	21.66	18.81	22.53	21.74	25.45	25.49			25.5	19.64	
18	59.64	54.85	49.12	44.16	34.41	28.81	17.06	30.10	33.22	39.91	46.56		39.8	30.65	
19	59.45	49.53	46.21	43.47	32.43	32.49	35.08	35.12	37.45	41.07	49.93		42.02	32.36	
19a	61.02	52.14	49.24	43.41	35.09	32.18	33.12	34.53	41.85	43.41	54.63		43.69	33.64	

19b	61.40	49.26	49.35	43.28	37.84	31.88	34.17	35.39	37.62	42.90	52.77		43.26	33.31	
19/a/b														33.10	
HR	44.48	36.29	35.96	39.06	31.95	28.38	29.20	17.97	36.75	32.49	46.66		34.47	26.54	
16	47.56	44.86	42.60	35.10	31.95	27.46	30.49	26.92	32.23	38.74	45.33		36.66	28.23	
255	33.73	30.81	31.66	27.71	19.39	19.55	20.07	21.42	42.96	25.64	31.05		27.64	21.28	

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

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

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QA/QC Data

Factor from Local Co-location Studies (if available)

No local co-location studies for nitrogen dioxide have been undertaken in 2017.

Diffusion Tube Bias Adjustment Factors

The following UKAS accredited company provides Bromsgrove District Council with Nitrogen dioxide diffusion tubes and analysis:

Somerset Scientific Services,
Unit 2A,
Westpark 26
Chelston
Wellington
Somerset
TA21 9AD

01823 355906

sssmailbox@somerset.gov.uk

The 20% Triethanolamine (TEA) / De-ionised Water preparation method is used. The bias adjustment factor applied to the results in 2017 was 0.77 (Spreadsheet Version No. 09/18) which were derived from the national studies.

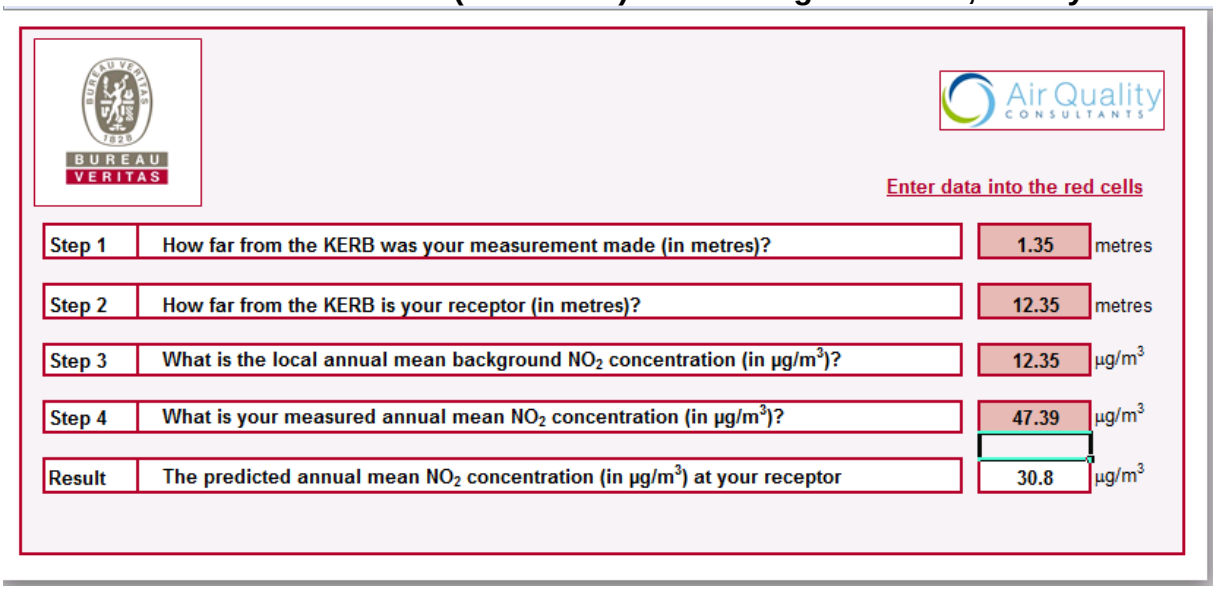
QA/QC of Automatic Monitoring

No Automatic Monitoring Data is available for 2017.

QA/QC of Diffusion Tube Monitoring

Under the AIR NO_2 PT (formerly WASP) Scheme Somerset Scientific Services performed 100% satisfactory for the period January to August 2017 and 75% for the period September to October 2017 (no data for the period November to December 2017). Tube precision was ‘Good’ throughout 2017.

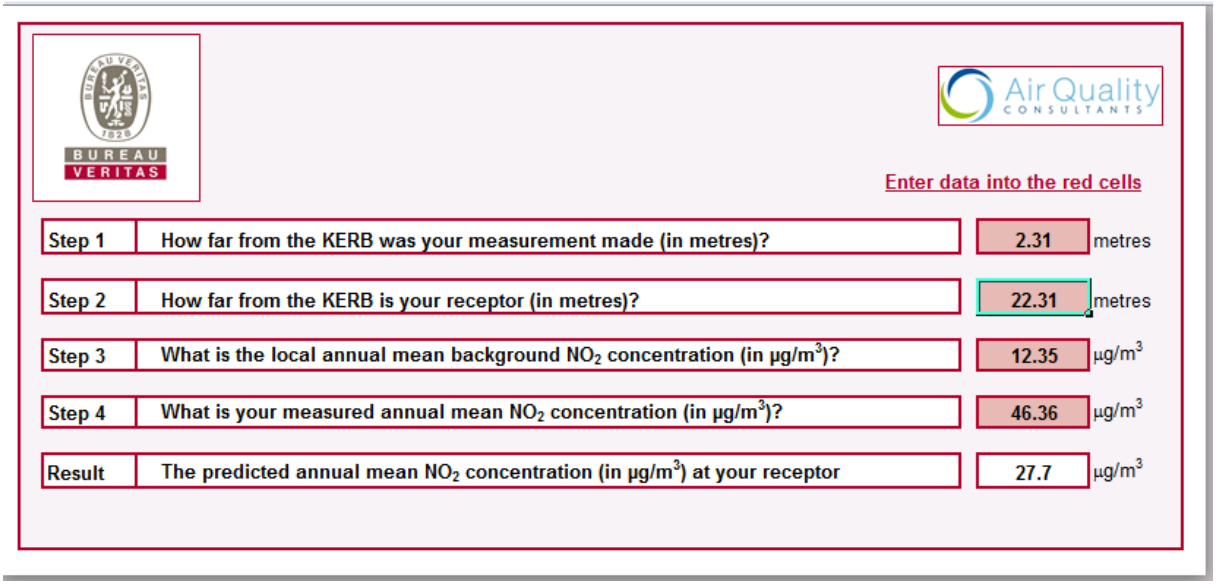
C.1 - LE4 - Outside Harvester (Forest inn) PH Birmingham Road, Lickey End



Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.35	metres
Step 2	How far from the KERB is your receptor (in metres)?	12.35	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	12.35	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	47.39	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	30.8	$\mu g/m^3$

C.2 - F1/2/3 - Lickey End / Forrest Inn Island Lamppost 4957



Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	2.31	metres
Step 2	How far from the KERB is your receptor (in metres)?	22.31	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	12.35	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	46.36	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	27.7	$\mu g/m^3$

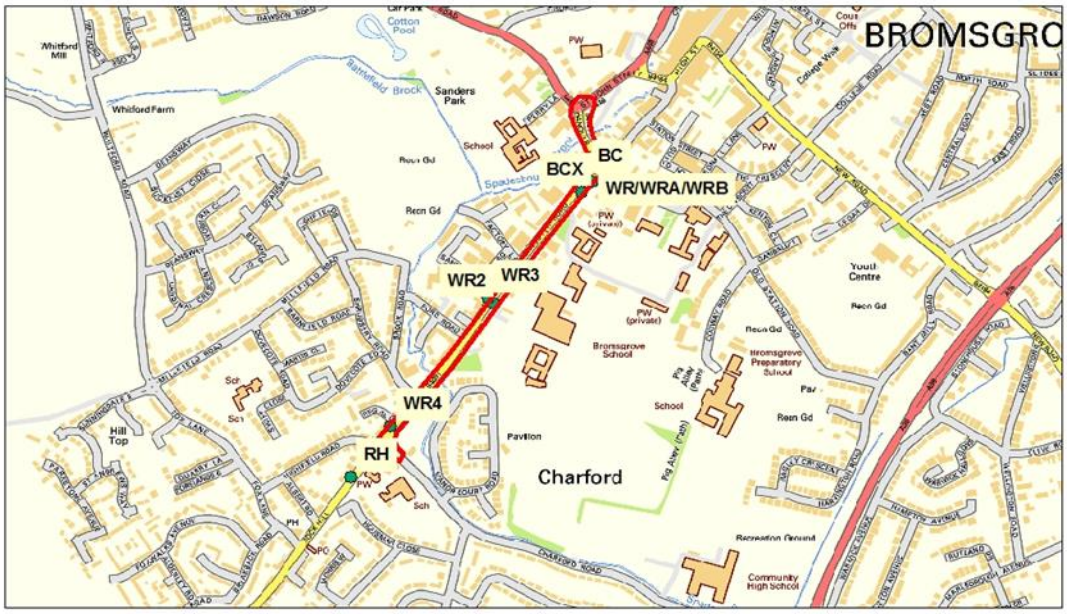
C.3 - FL2 - Lamppost next to new houses close to road on Fox Lane near to Rock Hill junction

Enter data into the red cells

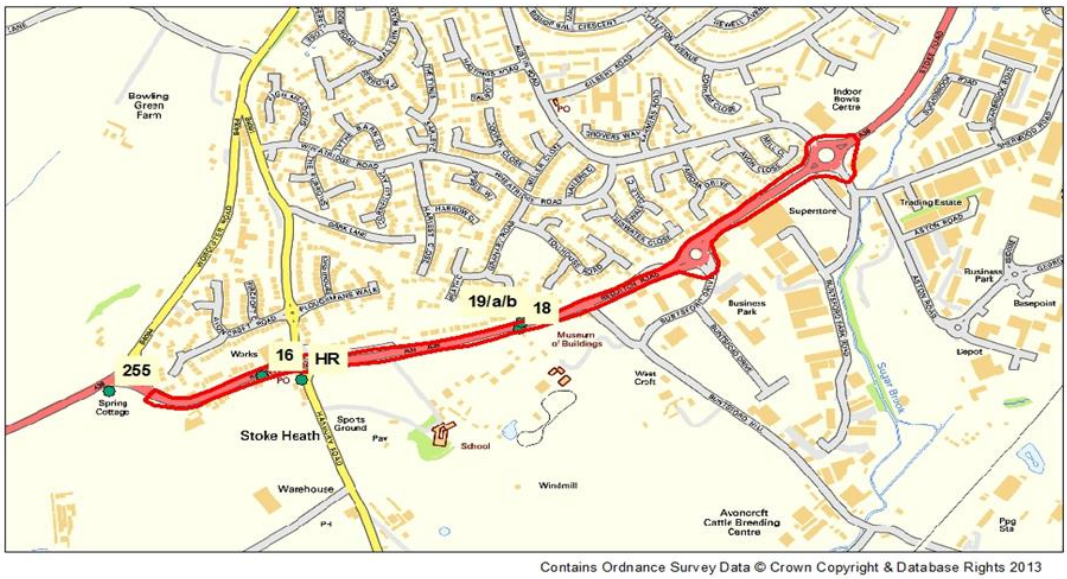
Step 1	How far from the KERB was your measurement made (in metres)?	1.36	metres
Step 2	How far from the KERB is your receptor (in metres)?	4.66	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	12.35	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	30.51	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	25.7	µg/m^3

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

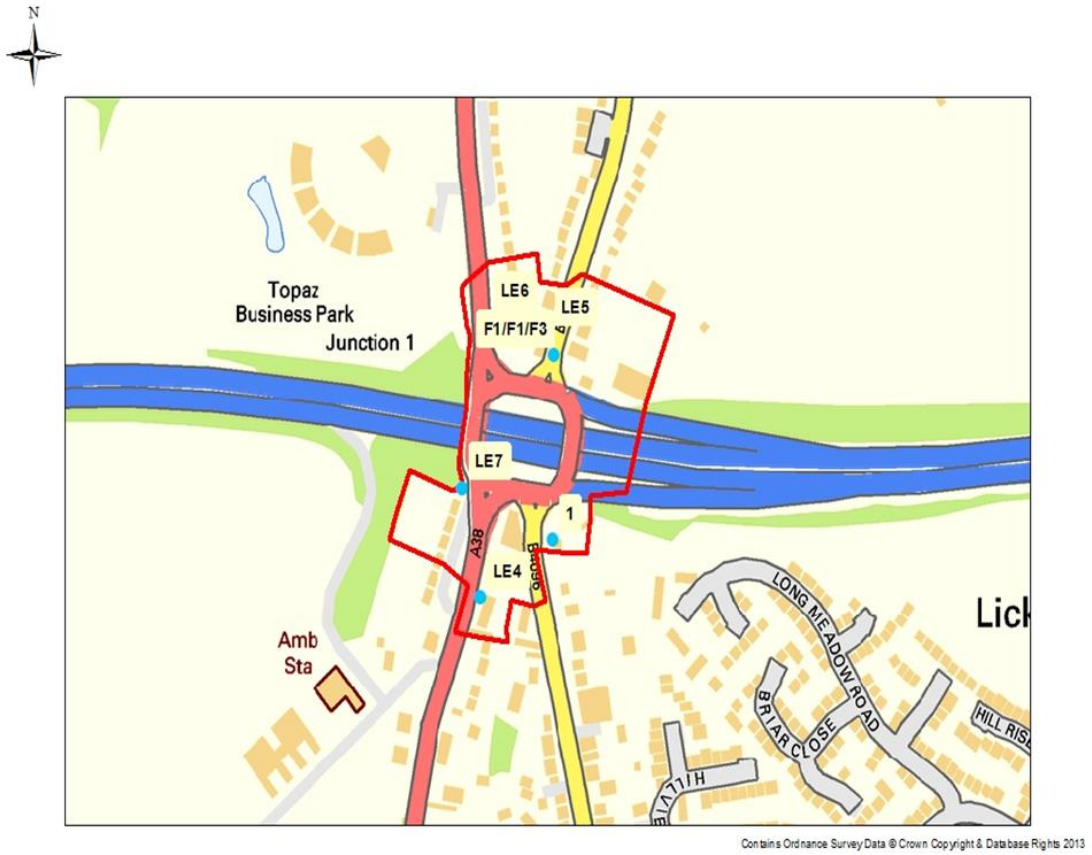
D.1 - Worcester Road AQMA and monitoring locations



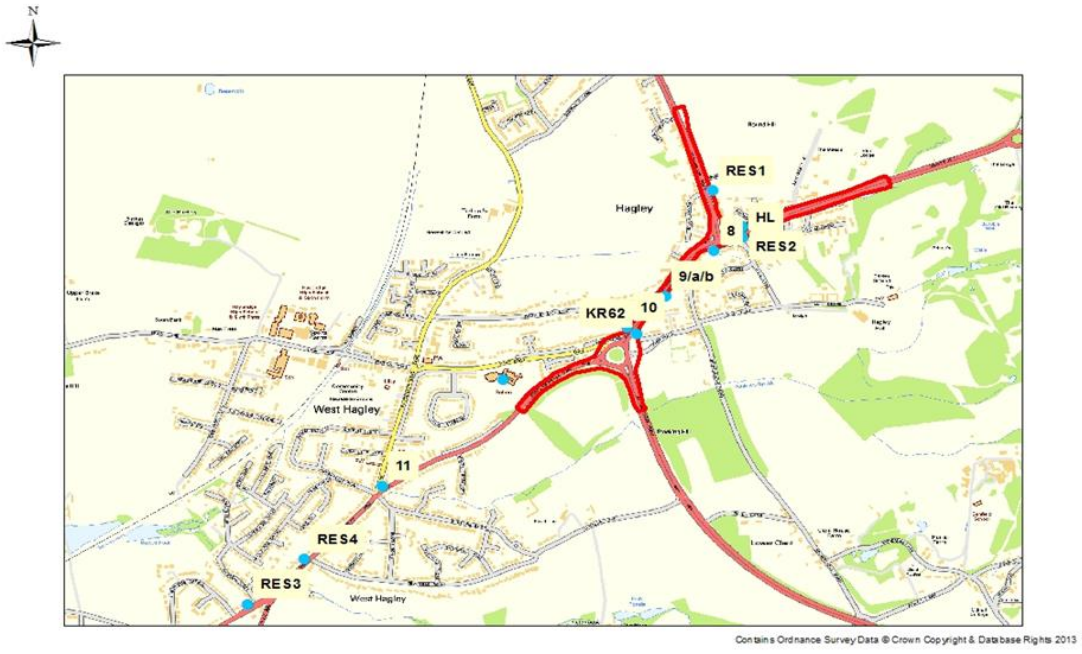
D.2 - Redditch Road AQMA and monitoring locations



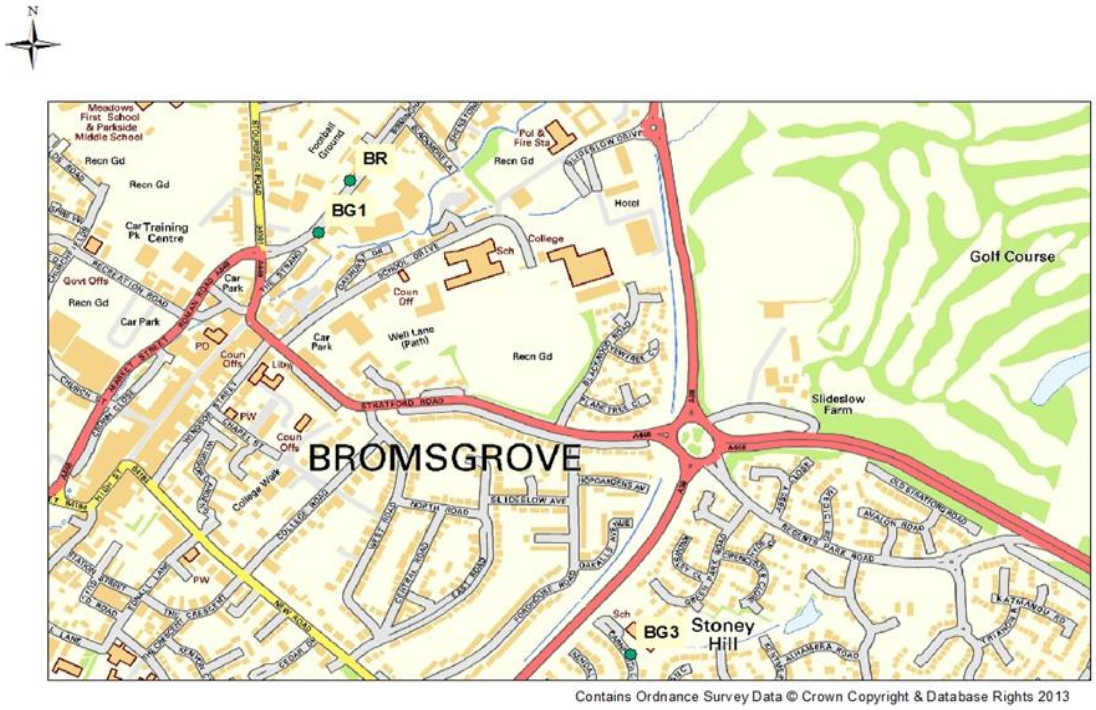
D.3 - Lickey End AQMA and monitoring locations

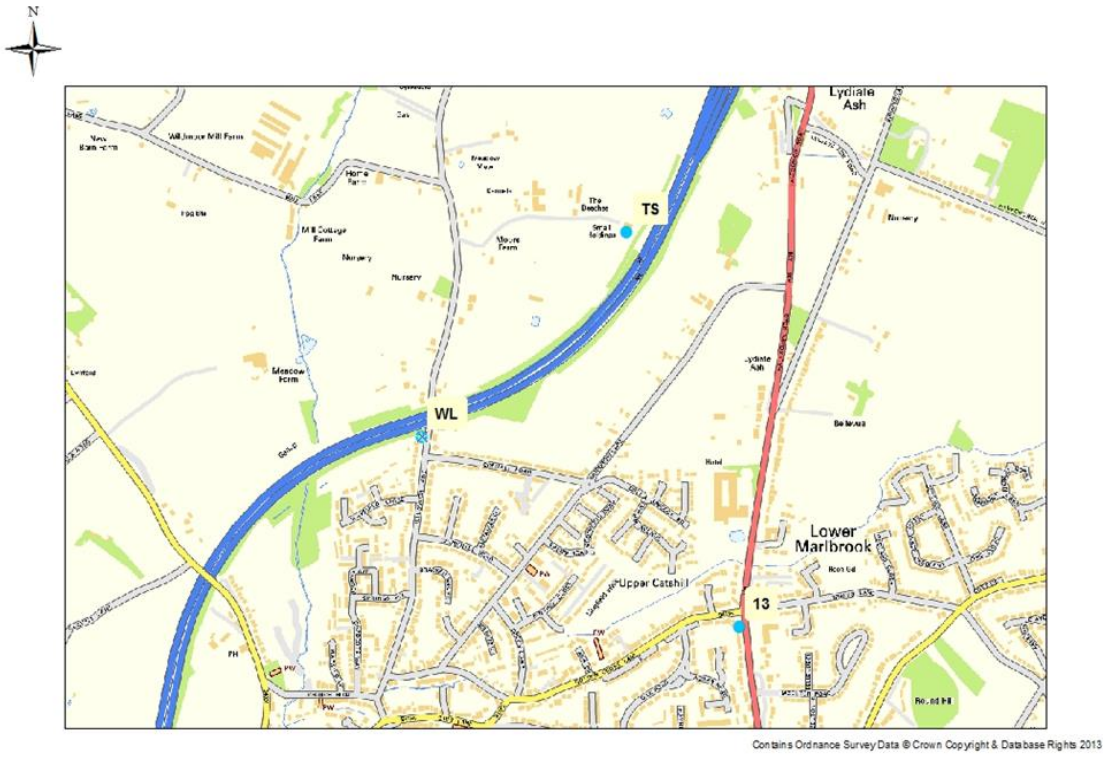


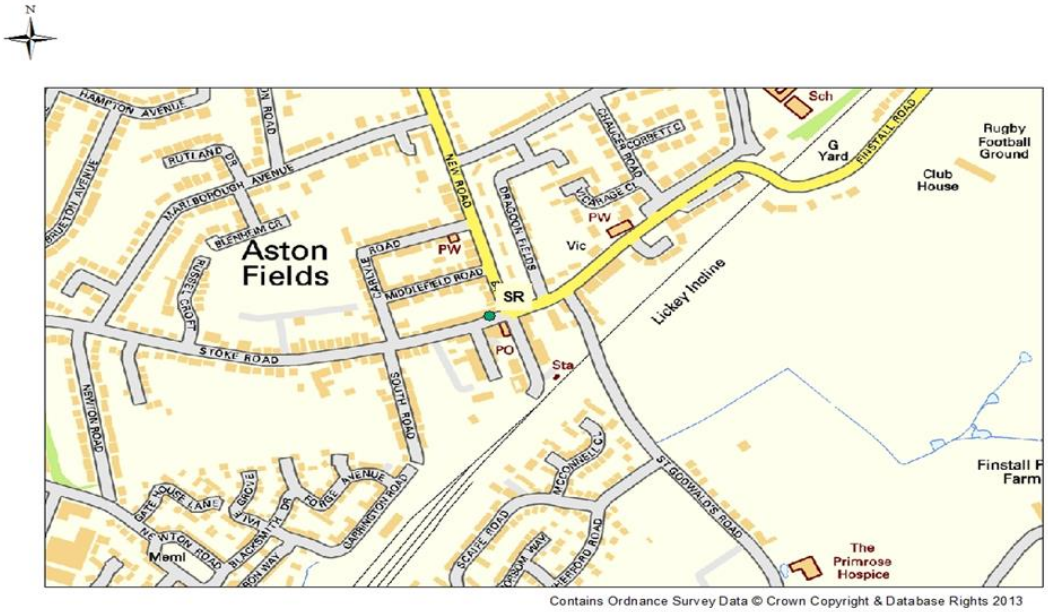
D.4- Former Kidderminster Road, Hagley AQMA and monitoring locations

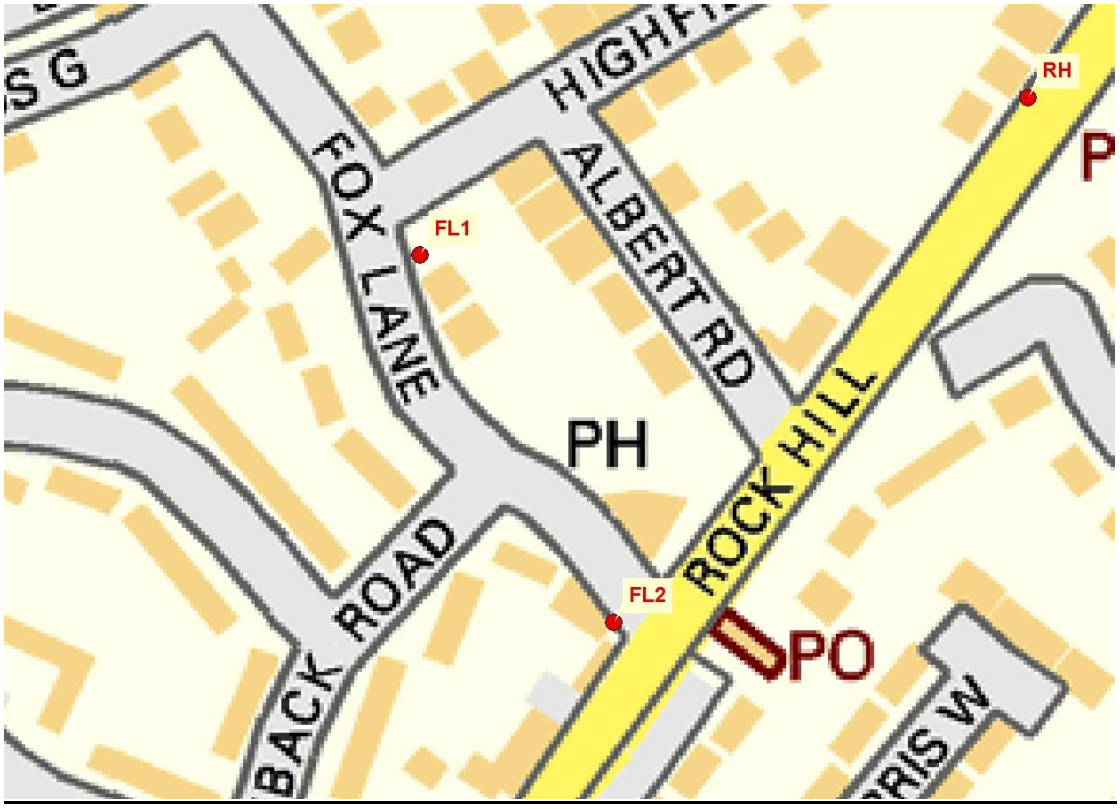


D.5 - Monitoring Locations outside of AQMAs






Aston Fields
Rugby Football Ground
Club House
G Yard
Sch
PW
Vic
SR
PO
Sta
Lickey Incline
Finstall F Farm
The Primrose Hospice
STOKE ROAD
SOUTH ROAD
NEW ROAD
Contains Ordnance Survey Data © Crown Copyright & Database Rights 2013


FOX LANE
ALBERT RD
ROCK HILL
BACK ROAD
FL1
FL2
RH
PH
PO

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[6]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/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).

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	Air quality 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 (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

1. DEFRA (2016) 'Local Air Quality Management Policy Guidance LAQM PG.(16)'

2. DEFRA (2016) 'Local Air Quality Management Technical Guidance LAQM TG.(16)'

3. DEFRA (2017) 'National Diffusion Tube Bias Adjustment Factor Spreadsheet v.03/17 V2

4. Worcestershire Regulatory Services (2013) 'Air Quality Action Plan for Worcestershire'

5. Worcestershire Regulatory Services (2015) 'Air Quality Action Plan Progress Report for Worcestershire April 2013-April 2015'

6. Worcestershire Regulatory Services (2016) 'Air Quality Action Plan Progress Report for Worcestershire April 2015 – March 2016'

7. Worcestershire Regulatory Services (2017) 'Kidderminster Road, Hagley AQMA
8. Revocation Screening Assessment'

9. Worcestershire Regulatory Services (2017) 'Annual Status Report – Bromsgrove District Council'

10. Worcestershire Regulatory Services Website
    http://www.worcsregservices.gov.uk/pollution/air-quality/