2017 Air Quality Annual Status Report (ASR)

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

January 2018

Local Authority Officer	Matthew Clark
Department	Regulatory Services
Address	Shirehall, Abbey Foregate, Shrewsbury, SY2 6ND
Telephone	03456 789000
E-mail	public.protection@shropshire.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in the Shropshire Council area

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].

There has been a general downward trend in air pollution across monitoring sites in Shropshire over the past 5 years. Since the last report was published three Air Quality Management Areas (AQMAs) – areas where national air quality targets are exceeded – are being considered for revocation due to air quality improvements. The AQMAs in question are: Oswestry AQMA, Shrewsbury No 1 AQMA and Shrewsbury No 2 AQMA. Eleven dwellings and several businesses are no longer considered at risk of exceeding national objective levels.

Bridgnorth Pound Street AQMA is still required due to NO_2 levels exceeding the national objective level. The AQMA covers 37 dwellings however local knowledge and monitoring suggests that many may no longer be exposed to NO_2 levels above the national objective level due to betterments over time. Further monitoring and potentially modelling is planned to delineate the current extent of the exceedance.

Shrewsbury No 3 AQMA covering the town centre is still required although there is only an exceedance of the national objective level at one monitoring location.

[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

Shropshire Council will give consideration on whether to amend the AQMA in light of this information. It is predicted there are only a few relevant receptors in the area that exceeds ait quality standards in comparison to hundreds within the existing AQMA.

Actions to Improve Air Quality

Shropshire Council's Highways and Transport department has started work on the Shrewsbury Integrated Transport Package which in part aims to reduce vehicles numbers in the town centre and consequently improve air quality.

Shropshire Council's policy for taxis has in the last year seen 330 Euro III vehicles removed from the licensing regime and an increase in Euro V and VI vehicles contributing to reduced emission of pollutants associated with this sector.

Shropshire Council is currently reviewing the business case for a North-West Relief Road. Such a road would be likely to reduce traffic at the air pollution hotspot in Shrewsbury bringing improvements in air quality. The potential impact has not yet been defined.

Local Priorities and Challenges

The priorities for the year ahead include:

1. Creating a Key Stakeholder air quality group to review the Air Quality Action Plans (AQAPs) for Shrewsbury and Bridgnorth.
2. Continue to develop the case for the Shrewsbury North-West Relief Road.
3. Introducing air quality onto the Council's Joint Strategic Needs Assessment to highlight the import health impacts that air quality has.
4. To secure electric charging infrastructure through the planning system for new development to ensure that Shropshire is ready for a predicted increase in electric cars in future as the UK looks to phase out conventionally fuelled vehicles.

5. Consider experimenting/modelling traffic lane and control changes to bring about betterments at air pollution hot spot locations.
6. Reviewing the car parking strategy to encourage sustainable use of town centres.

Challenges include finding resources to carry out detailed source apportionment studies to help move forward in an evidence led way with action plans and interventions.

How to Get Involved

To reduce air pollution and contribute to clean air for all everyone living, working and visiting 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:

Avoid driving into congested areas: it is good for your health and your wealth.

By planning your journey to avoid congested areas you can make a positive difference. Parking on the edge of town is often cheaper than parking in town centres saving you money. Walking into town from edge of town carparks keeps you active and is good for your family's health. By not driving into congested, polluted areas you reduce your family's exposure to harmful air pollutants and stop your own vehicle emissions contributing to the problem. An alternative to walking and cycling is to use a Park and Ride or a bus service to get you the final mile.

To help plan your journey find Shropshire Council car parks here.

For Park and Ride information in Shropshire click here.

Consider your commute

If you regularly drive to work you may be able to save money by adopting the steps above. In addition you could reduce the amount of money you spend on fuel and parking by:

- using the Park and Ride service
- cycling or walking to work. By cycling or walking into work once a week you would reduce your emissions by 20%.
- car share: this can be a very effective way of reducing numbers of vehicles on the road and saving money, the further your journey the more you stand to save. The more you share, the more you save.

Doing the school run - not the school sit

Travel to take children to school contributes to the congestion on our roads at a time of day when there are increased vehicle numbers due to people travelling to work. Where the school is within walking/cycling distance we would encourage this method of transport. Not only would this save money in fuel costs and improve air quality by reducing congestion it would also add active travel to your regular journeys helping to improve your family's health by introducing regular exercise. Getting children into the habit of walking can provide lifelong benefits to them and their families in turn.

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1 Local Air Quality Management

This report provides an overview of air quality in the Shropshire Council area during 2016. 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 if 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 Shropshire 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 the objectives.

A summary of AQMAs declared by Shropshire Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=442

See full list at: http://uk-air.defra.gov.uk/aqma/list.

Oswestry AQMA (nitrogen dioxide) was revoked on 12/04/2017 by Shropshire Council following detailed assessment (see monitoring section). The revocation order will be sent to DEFRA to formally revoke the AQMA in the near future.

It is proposed to revoke Shrewsbury No 1 AQMA and Shrewsbury No 2 AQMA following detailed assessment of monitoring data and wider consultation (see monitoring section).

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	Action Plan
Shrewsbury No 1 AQMA	NO_2 annual mean	Shrewsbury	Residential properties along the A49 through the centre of Bayston Hill – proposed for revocation.	See Shrewsbury action plan at the following link: https://new.shropshire.gov.uk/media/5218/shrewsbury-aqap-2008.pdf
Shrewsbury No 2 AQMA	NO_2 annual mean	Shrewsbury	Residential properties around Heathgates roundabout, Shrewsbury – proposed for revocation.	See Shrewsbury action plan at the following link: https://new.shropshire.gov.uk/media/5218/shrewsbury-aqap-2008.pdf

AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	Action Plan
Shrewsbury No 3 AQMA	NO_2 annual mean	Shrewsbury	The majority of Shrewsbury Town centre within the river loop has been declared.	See Shrewsbury action plan at the following link: https://new.shropshire.gov.uk/media/5218/shrewsbury-aqap-2008.pdf
Bridgnorth Pound Street AQMA	NO_2 annual mean	Bridgnorth	Residential properties around the Whitburn Street/Pound Street junction.	See Bridgnorth action plan at the following link: https://new.shropshire.gov.uk/media/5215/bridgnorth-dc-action-plan-pdf.pdf
Oswestry AQMA	NO_2 annual mean	Oswestry	One residential property close to the A483 between Oswestry and Pant.	Revoked by order on 12/04/2017

2.2 Progress and Impact of Measures to address Air Quality in Shropshire Council

Shropshire Council has taken forward many 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 which are available to view at http://new.shropshire.gov.uk/environmental-health/environmental-protection-and-prevention/air-quality/shropshire-council-air-quality-reports/#. Key completed measures are:

- Shrewsbury Integrated Transport Package (SITP) planning process complete and works commenced. The core objectives of the SITP include; to alleviate congestion, reduce the volume of traffic flows through the town centre, encourage sustainable modes of transport by adding missing links to current pedestrian and cycle routes, improve safety, enhance the built environment,

contribute to economic growth and improve air quality. The whole package is expected to be completed in 2020 at a cost of £12.1 million. To date work has commenced on key junction improvements on the inner ring road with Meole Brace Roundabout and Sutton Roundabout improvements completed. Updates on key work completed will be highlighted in future ASRs. For more details visit: https://www.shropshire.gov.uk/street-works/latest-roadworks-and-road-closures/shrewsbury-integrated-transport-package/

- Taxi policy progressive measures removed all Euro III vehicles from the taxi fleet between 2015 and 2017. The composition of the fleet has changed from 26% Euro III, 40% Euro IV, 30% Euro V and 4% Euro VI in March 2016 to 0% Euro 3, 39% Euro IV, 51% Euro V and 10% Euro VI. Despite this significant shift to newer vehicles when considering real world emissions testing results data provided in the latest DEFRA clean air strategy consultation it is noted that Euro 4 and 5 diesel vehicles still produce significant amounts of NOx, the pollutant of concern in Shropshire. Petrol vehicles however produce much less NO_x. It is recommended that any future taxi policy changes take this into consideration. The current taxi policy can be found at: http://new.shropshire.gov.uk/media1/2685/hcph-licensing-policy-2015-2019.pdf.

Progress on the following measures has been slower than expected due to:

- AQAP review: AQAPs have not been reviewed since 2008/09. Work is currently underway to review the action plans. To date local source contributions have been calculated using guidance in TG(16). This has identified the need for nearly a 40% and 30% reduction in locally produced NOx in Shrewsbury and Bridgnorth AQMAs respectively to achieve the national objective level for annual mean nitrogen dioxide concentration. Work is underway to establish quotes for source apportionment studies.

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

- SITP led improvements to the English Bridge gyratory in Shrewsbury.

- Renewed business case for the Shrewsbury North West Relief Road – a scheme to complete an outer ring road around Shrewsbury

Shropshire Council's priorities for the coming year are:

- Move forward with a review of AQAPs for both Bridgnorth and Shrewsbury
- Take the next steps in plans to develop the North-West Relief Road in step with results of the business case and central government direction
- Consider defining how developments that come through the planning system will provide sustainable development moving forward considering government targets to phase out conventionally powered new registered vehicles in 2040.
- Move air quality onto the Council's Joint Strategic Needs Assessment.
- Consider where experimentation with road layouts and traffic control measures can impact on air quality in hotspot areas
- Review the County's car parking strategy to encourage sustainable transport uses and address town centre congestion and pollution problems.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementa-tion Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completio n Date	Comments
1	Procuring Vehicles	Promoting Low Emission Transport	Company Vehicle Procurement – prioritising uptake of low emission vehicles	Shropshire Council (Regulatory Services)	May - June 2017	July - August	Removal of Euro III and IV vehicles from the fleet Reduction in the average age of vehicles in the fleet	Reduce the societal cost of the vehicles used in terms of pollutants by £600 annually.	Vehicles ordered ready for replacement	September 2017	Procurement of vehicles required and Euro VI vehicles specified to ensure that Regulatory Services is leading by example in how to encourage betterments for air quality.
2	Hackney Carriage and Private Hire Licensing Policy	Promoting Low Emission Transport	Taxi Licensing conditions	Shropshire Council (Regulatory Services)	2015	2015-2019	Removal of Euro III and IV vehicles from the fleet Reduction in the average age of vehicles in the fleet	Not quantifiable.	Euro III vehicles all removed by April 2017	April 2019	330 Euro III vehicles removed (April 2016 and April 2017). Average age of vehicles reduced from 8yrs to 6yrs 10months. The current policy sets out that the required European Emission Standards will be updated in line with current legislation when the policy is reviewed (due to be undertaken in 2018), i.e. to incorporate Euro VI requirements and any other emissions related requirements know at the time the policy is reviewed. Due to real world emissions information now available, the review process for the policy that will be implemented for the period 2019 – 2023 will consider whether to consult on the removal of diesel vehicles to have the greatest impact on NO2 emission reduction.

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementa-tion Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completio n Date	Comments
3	Shrewsbury Integrated Transport Programme – 20mph zone	Traffic Management	Reduction of speed limits, 20mph zones	Shropshire Council (Highways and Transport)	2015-16	2016/17	Signs installed and 20mph zone established	Not quantified	20mph speed limits introduced into areas of Shrewsbury Town Centre	Complete	To improve safety including safety for pedestrians and cyclists a 20mph zone has been established in the Shrewsbury town centre. This aims to reduce vehicle emissions and promote alternative transport use by removing perception of danger of cycling on street.
4	Shrewsbury Integrated Transport Programme	Traffic Management	UTC, Congestion management, traffic reduction	Shropshire Council (Highways and Transport)	2015-16	2016/17	Offset of through traffic from river loop. Highway capacity created for planned growth of Housing and Employment Sites within Shrewsbury.	Not quantified but recognised a general betterment through reduced traffic numbers expected.	Key Junction Improvement Programme in delivery	Dec 2017	Engineering in future fit capacity at key inner ring road junctions, integration of signalling through extension of the SCOOT system.

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.

Shropshire Council is taking the following measures to address $PM_{2.5}$:

- Encouraging greening of Shrewsbury Town Centre through liaison with businesses and Shrewsbury Business Improvement District (Shrewsbury BID). Greening, through introduction of vegetation such as green walls, can remove fine particulates from the air by trapping them on the surface of plants. They are then washed off by rain/irrigation.
- The Shrewsbury Integrated Transport Package (SITP) as a whole is predicted to reduced numbers of vehicles crossing coming through the town centre in turn reducing emissions and PM2.5. Details of SITP can be found at: http://new.shropshire.gov.uk/media/4256/sitp-consultation-boards-progress.pdf
- Monitoring: two PM2.5 monitors have been installed in Shrewsbury. These will allow Shropshire Council to monitor the pollutant concentrations over time and consider if there is a need for further actions.
- Monitoring shows that PM2.5 levels are not considered high and therefore no specific measures are being taken to address PM2.5s. Many actions are however being carried out to reduce air pollutants overall and reduce traffic numbers in congested areas. These measures will assist in reducing PM2.5s.

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.

Shropshire Council undertook automatic (continuous) monitoring with four monitors over three sites during 2016. 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 how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Shropshire Council undertook non-automatic (passive) monitoring of NO_2 at 107 sites during 2016. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of continued monitoring sites are provided at: https://shropshire.maps.arcgis.com/apps/webappviewer/index.html?id=f8902e4f25464067ad22d10d11f81a00

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

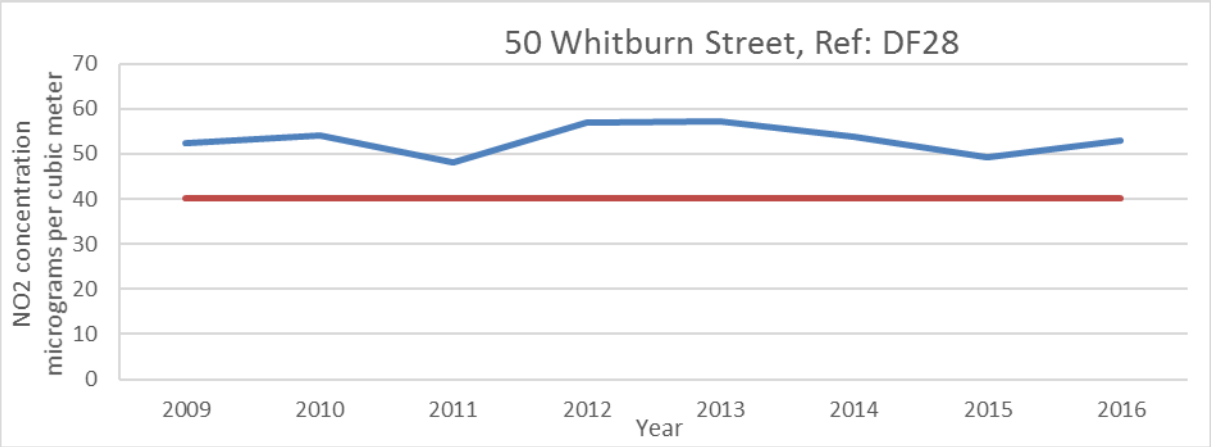
Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

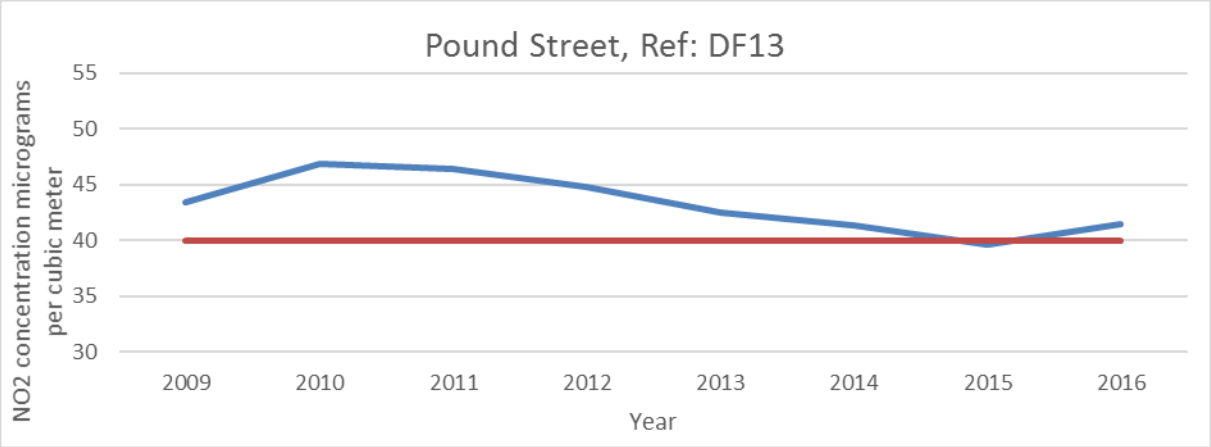
For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B.

Data collected from the continuous monitor did not show any exceedances of the NO_2 annual average. Of the 107 diffusion tubes no annual average results over 60 µg/m^3 were found suggesting that no exceedances of the hourly objective level are likely. **7 diffusion tubes, DF13, DF28, DF223, DF438, DF456, DF458 and DF474, recorded an annual average over 40 µg/m^3** suggesting that there is exceedance of the annual average objective level for NO_2 in these locations. These locations are discussed below.

DF13 and DF28: Bridgnorth Pound Street AQMA

DF13 and DF28 are located within the Bridgnorth Pound Street AQMA. Below shows a trend graph of monitoring since 2009 for both locations (the red line shows the annual mean objective level while the blue line denotes the monitored values.



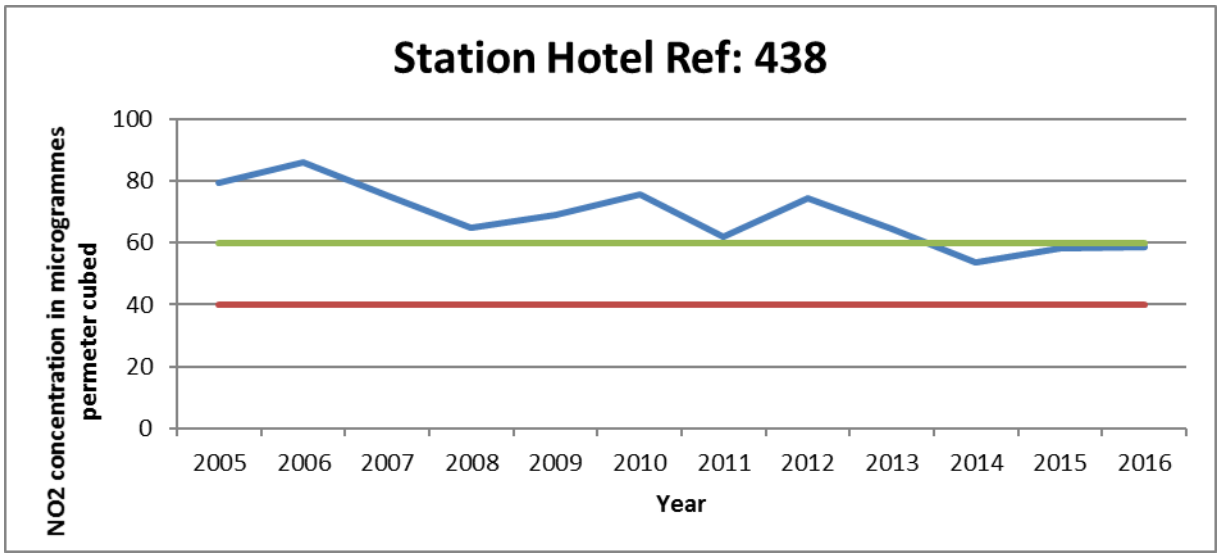


There has been no improvement at DF28 since 2009 however since 2012 a reduction has been noted. Significant improvements have been made at DF13 with legal limits met in 2015. In 2016 there were building works in the direct vicinity which may have caused the increase noted at both locations.

There are currently 37 residential dwellings within the AQMA. Monitoring at DF13 suggests that three or four of these, those further away from the junction than the monitoring location DF13, experience pollutant levels below the national objective. Local knowledge suggests several other properties may also be below the national objective. It is recommended that additional monitoring is carried out in the area to more tightly define the AQMA and amend it in future as necessary. Monitoring will commence in 2018.

DF438: Shrewsbury No 3 AQMA: Shrewsbury Town Centre

Diffusion tube data has recorded exceedances of the annual NO_2 national objective level of 40µg/m^3 at DF438 and DF458 which are located within Shrewsbury No 3 AQMA. There are no relevant receptors at DF458. Below is a trend graph of DF438.



A significant improvement is shown between 2005 and 2016. The downward trend seems to have levelled off in 2015 – 2016 at a level below that which suggests the 1-hour objective level may be exceeded. No other locations within the AQMA exceeded the national objective level making DF438 stand out as a hot spot location. It could be considered suitable to amend the AQMA to reduce it in size to cover the specific area where exceedances are still occurring. There are 14 dwellings within the AQMA that are expected to be exposed to levels above the national objective level.

DF456: Ellesmere Road/ Berwick Road junction, Shrewsbury.

Diffusion tube data has recorded an exceedance of the annual NO_2 national objective level of 40µg/m^3 at DF456. This monitoring location is a significant distance away from the nearest receptor. A drop off with distance calculation shows the annual mean NO_2 concentration at the nearest receptor is 33.3 µg/m^3, well below the national objective level. Therefore no likely exceedance of the national objective level is likely and no AQMA is required in this location. The following data inputs were used to generate this information in the online DEFRA tool available at: https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

BUREAU VERITAS

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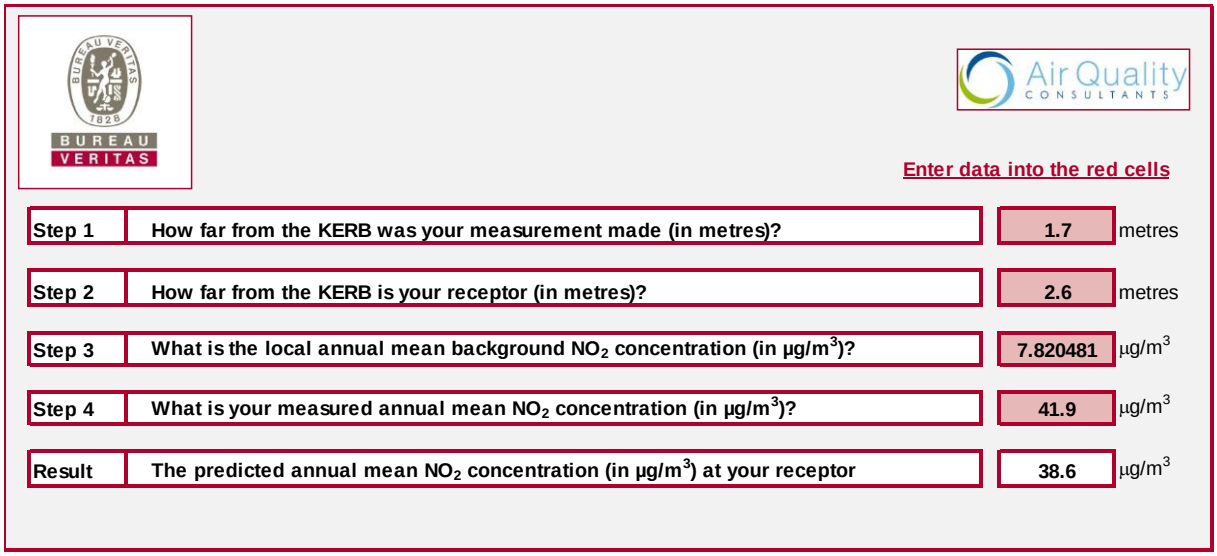
Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.25	metres
Step 2	How far from the KERB is your receptor (in metres)?	4.15	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	10.538366	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	41	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	33.3	µg/m^3

DF474: Shrewsbury No 1 AQMA, Bayston Hill.

Diffusion tube data has recorded exceedance of the annual NO_2 national objective level of 40µg/m^3 at DF474. However, this monitoring location is a significant distance away from the nearest receptor. A drop off with distance calculation shows the annual mean NO_2 concentration at the nearest receptor is 38.6µg/m^3 which is below the national objective level therefore no AQMA is required in this location. The following data inputs were used to generate this information in the online DEFRA tool available at: https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html



Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.7	metres
Step 2	How far from the KERB is your receptor (in metres)?	2.6	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	7.820481	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	41.9	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	38.6	µg/m^3

It is proposed that this AQMA is revoked. This would reduce the number of dwellings in AQMAs in Shropshire by 10 dwellings.

DF223: Tern Hill roundabout.

Diffusion tube data has recorded exceedance of the annual NO_2 national objective level of 40µg/m^3 at DF223. The diffusion tube is located on the roadside close to the roundabout junction where the A41 meets the A53. The monitoring location is close to the one residential receptor in the area.

The monitoring location is 1.25m from the kerb and the façade of the receptor is 1.8m away from the kerb. The barn conversion has no openings in the brick façade facing the road, specified through planning condition for the barn conversion in 2012/13. The nearest exposure point is a window on the end of the property. The window is 3.4m from the road and approximately 5m further away from the roundabout than the monitoring location. The window is considered the most appropriate place to specify relevant exposure. A distance calculation, shown below, has been used to estimate the NO_2 concentration at the window.

BUREAU VERITAS

Air Quality CONSULTANTS

Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.25	metres
Step 2	How far from the KERB is your receptor (in metres)?	3.4	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	8.563129	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	51.6	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	42.5	µg/m^3

This calculation suggests that at 3.4m from the kerb in line with DF223 at the monitoring location the annual mean NO_2 concentration is 42.5 µg/m^3. Moving 5m back from the junction is likely to reduce NO_2 levels as would the fact there is more air circulation at the window than at the monitoring location due to an opening between buildings where the window is located. It is not considered likely that the annual mean NO2 concentration will exceed 40 µg/m^3 at the nearest relevant exposure point to residential receptors and no AQMA is considered necessary.

Due to road works creating congestion around DF223 it is expected that 2017 will result in an increase in NO_2 levels at this location however future betterments are expected in 2018. Monitoring will be retained in this location to monitor future NO_2 concentrations.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year. On no occassion in the past three years has there been any hourly averages exceeding 200µg/m^3. There is no likely breech of this objection level.

3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. A significant improvement is noted between 2013 and 2015/16. This coincides with a sprinkler system being installed along the access track to the nearby quarry. PM10 concentrations in this location have been less than half of the annual objective level for the last two years. It can therefore be stated with confidence that there is no likely exceedance of the annual average PM10 national objective level in this location.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

The information in Table A.6 shows that there have been significant reductions in the numbers of days which exceed the 50µg/m^3 daily average. In 2015 and 2016 respectiveley 4 and 2 days were recorded to exceed this standard compared to 29 days in 2013. The betterment coincides with a sprinkler system being installed along the access track to the nearby quarry. As a result there is no likely exceedance of the daily PM10 objective at this location.

As monitored emissions of PM10s have been significantly below relevant objective levels for two consecutive years it is not considered necessary for monitoring to continue at this location. In early 2017 monitoring at this location ceased following a review of the data and available resources. Operations at the nearby quarry will continue to be monitored through the Environmental Permitting regime for whom Shropshire Council are the issuers and regulators of the permit for the quarry.

In line with TG(16) and following on from work on poultry farms carried out and reported in Shropshire Council's USA 2015, further consideration has been given to poultry installations in relation to PM10 exposure of properties in close proximity. Details of work carried out can be found in Apendix C.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.7 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations.

Two years of monitoring data have been recorded to date at two locations in Shrewsbury. Each result is below the national objective level set in Scotland of 10µg/m^3.

Although the data for 2016 shows a slight increase in $PM_{2.5}$ concentrations at both locations there is not enough data to infer any trends. TG(16) suggests 5 years of data are required before any trends in data can be ascertained with reliability.

PM_{10} concentration in the areas monitored for $PM_{2.5}$ are expected to be significantly below national objective levels (should a ratio scaling factor be applied as explained in paragraph 7.109 of TG(16)).

The monitoring data suggests that there are no significantly elevated concentrations of $PM_{2.5}$ in the areas monitored. Monitoring will continue at both locations in 2017.

3.2.4 Sulphur Dioxide (SO_2)

Shropshire Council do not monitor for this pollutant as it is not considered likely to be found at concentrations above the objective level.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CM1	Chester Street	Roadside	349378	312938	NO_2	Y	Chemiluminescent	3	3	1.5
CM2	Bayston Hill	Roadside	348782	309018	PM_{10}	Y (for NO_2)	BAM	N/A	5	1.5
CM3	Mayfield Close	Urban background	351492	316619	$PM_{2.5}$	N	BAM	5	1	1.5
CM4	Chester Street	Roadside	349378	312938	$PM_{2.5}$	Y (for NO_2)	BAM	3	3	1.5

(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.

NB: Since the last report was submitted in 2016 The following Automatic Monitoring Sites have been removed

- Bridgnorth Roadside Chemiluminescent NOx analyser: Removed in 2015 as no relevant receptor.
- Betton Strange to the east of fugitive source quarry PM_{10} BAM. Removed in 2015 as no likely exceedance of National Objective Level and planned quarry development set back.
- Ludlow Roadside Chemiluminescent NOx analyser. Removed in 2015 as no likely exceedance of National Objective Level.

Table A.2 – 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 from kerb to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DF5	Kidderminster Rd	Roadside	372145	292436	NO2	No	21.7m	1.9m	No	Approx. 2m
DF7	Admirals Park	Roadside	375061	308813	NO2	No	12.6m	3.0m	No	Approx. 2m
DF10	Moat St.-10	Roadside	371569	293344	NO2	No	1.9m	1.4m	No	Approx. 2m
DF13	Pound St	Kerbside	371345	293081	NO2	Yes	0.9m	0.8m	No	Approx. 2m
DF14	Ebenezer Rd	Roadside	371636	292933	NO2	No	1.7m	1.3m	No	Approx. 2m
DF16	Lavington Court	Roadside	371790	292817	NO2	No	2.9m	1.95m	No	Approx. 2m
DF18	Charles Fox	Roadside	372155	292961	NO2	No	Over 10m	2.0m	No	Approx. 2m
DF19	Mill St	Roadside	372060	293129	NO2	No	5.4m	2.4m	No	Approx. 2m
DF20	Bryan & Knott	Roadside	371580	293257	NO2	No	NA	3.75m	No	Approx. 2m
DF25	Citizens Advice	Roadside	371365	293145	NO2	Yes	1.7m	1.6m	No	Approx. 2m

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance from kerb to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DF27	Smithfield	Roadside	371397	293179	NO2	Yes	3.2m	3.3m	No	Approx. 2m
DF28	50 Whitburn St	Roadside	371321	293131	NO2	Yes	1.9m	1.7m	No	Approx. 2m
DF29	Adj. Rutters	Roadside	371297	293108	NO2	Yes	4.3m	3.3m	No	Approx. 2m
DF50	30A Salop St	Roadside	371220	293124	NO2	Yes	3.0m	1.2m	No	Approx. 2m
DF54	Analyser	Roadside	371763	292774	NO2	No	NA	2.4m	No	Approx. 2m
DF58	8 Underhill St	Roadside	371795	292947	NO2	No	1.85m	1.85m	No	Approx. 2m
DF59	2A Underhill	Roadside	371799	293011	NO2	No	1.6m	1.6m	No	Approx. 2m
DF61	2 Bridge St	Roadside	371951	292992	NO2	No	2.0m	2.0m	No	Approx. 2m
DF62	2 Mill St	Roadside	372031	292993	NO2	No	1.0m	1.0m	No	Approx. 2m
DF63	Post Office - St Johns	Roadside	372072	292976	NO2	No	2.0m	2.0m	No	Approx. 2m
DF64	Cartway, Low Town	Roadside	371795	293115	NO2	No	1.5m	1.5m	No	Approx. 2m

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance from kerb to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DF65	Mill Street, Low Town	Roadside	372026	293058	NO2	No	2.1m	2.1m	No	Approx. 2m
DF66	Mill Street, Low Town	Roadside	372159	293232	NO2	No	5.1m	2.1m	No	Approx. 2m
DF67	Hospital Street	Roadside	372166	292825	NO2	No	1.3m	1.6m	No	Approx. 2m
DF69	Stourbridge Road	Roadside	372567	292453	NO2	No	9.0m	1.1m	No	Approx. 2m
DF104	Old Street	Roadside	351250	274683	NO2	No	8.7m	2.2m	No	Approx. 2m
DF127	Old Brick Cottage	Roadside	332314	288566	NO2	No	1m	1m	No	Approx. 2m
DF128	Cleobury	Roadside	367184	275715	NO2	No	2.3m	1.8m	No	Approx. 2m
DF130	Corve Street Coral	Roadside	351249	274706	NO2	No	2.00m	1.75m	No	Approx. 2m
DF131	Corve Street Coral	Roadside	351249	274706	NO2	No	2.00m	1.75m	No	Approx. 2m
DF135	BC - Barclays Bank	Roadside	332348	288921	NO2	No	1m	1m	No	Approx. 2m
DF138	CM - Lower Street	Roadside	367577	275992	NO2	No	3.0m	2.0m	No	Approx. 2m

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance from kerb to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DF139	CM - Post Office	Roadside	367322	275713	NO2	No	3.5m	1.0m	No	Approx. 2m
DF140	CM - Bus Shelter	Roadside	367266	275727	NO2	No	6.0m	0.8m	No	Approx. 2m
DF141	Opp. Osborne Cottage	Roadside	367056	275715	NO2	No	1.3m	3.7m	No	Approx. 2m
DF203	Prees Heath	Roadside	355720	337966	NO2	No	17.0m	2.0m	No	Approx. 2m
DF205	Market Drayton	Roadside	367373	334404	NO2	No	4.9m	2.5m	No	Approx. 2m
DF207	Shropshire St MD	Roadside	367462	334095	NO2	No	5.4m	2.4m	No	Approx. 2m
DF208	High Street	Roadside	354158	341550	NO2	No	2.1m	2.0m	No	Approx. 2m
DF211	Tilstock Roundabout	Roadside	354377	340069	NO2	No	19.10m	3.0m	No	Approx. 2m
DF216	Wem High St	Roadside	351415	328965	NO2	No	2.6m	2.5m	No	Approx. 2m
DF217	Mill Street, Wem	Roadside	351235	328802	NO2	No	1.9m	1.6m	No	Approx. 2m
DF218	Mill Street, Wem	Kerbside	351221	328735	NO2	No	1.2m	0.9m	No	Approx. 2m

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance from kerb to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DF219	Aston Street, Wem	Roadside	351658	329027	NO2	No	1.8m	1.0m	No	Approx. 2m
DF220	High Street, Wem	Roadside	351150	328891	NO2	No	1.6m	1.5m	No	Approx. 2m
DF223	Tern Hill Barn	Roadside	363648	332337	NO2	No	1.8m	1.25m	No	Approx. 2m
DF224	Tern Hill Willow Barn	Roadside	363534	332165	NO2	No	7.0m	7.0m	No	Approx. 2m
DF301	Willowgate	Roadside	328895	329818	NO2	No	3.3m	3.2m	No	Approx. 2m
DF305	74 Castle Street	Roadside	328978	329879	NO2	No	2.0m	1.9m	No	Approx. 2m
DF306	A483 (1)	Roadside	328922	325981	NO2	Yes*	1.4m	1.4m	No	Approx. 2m
DF312	Pant Village Hall	Roadside	327584	322568	NO2	No	2.3m	1.85m	No	Approx. 2m
DF313	Pant Village Hall duplicate	Roadside	327600	322661	NO2	No	4m	2m	No	Approx. 2m
DF400	A49 Bayston Hill	Roadside	348726	308959	NO2	Yes	1.4m	1.4m	No	Approx. 2m
DF401	Mytton Oak Road	Roadside	346481	312421	NO2	No	8.9m	1.5m	No	Approx. 2m

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance from kerb to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DF403	Smithfield Rd/ Victoria Av	Roadside	348891	312721	NO2	Yes	2.4m	2.4m	No	Approx. 2m
DF404	Town Walls, opp. Murivance	Roadside	348889	312326	NO2	Yes	2.2m	1.8m	No	Approx. 2m
DF405	Shillington Dr/ Battlefield Rd	Roadside	351500	316218	NO2	No	13.4m	18m	No	Approx. 2m
DF407	Dogpole Car Entrance	Roadside	349330	312503	NO2	Yes	1.9m	1.9m	No	Approx. 2m
DF411	Horseshoes Inn	Roadside	347821	302851	NO2	No	3.0m	3.0m	No	Approx. 2m
DF412	Whitchurch Rd, adj. to Morrison	Roadside	350533	314786	NO2	Yes	7.4m	2.8m	No	Approx. 2m
DF413	Raven Meadows / 23 Meadow Pl	Roadside	349283	312851	NO2	Yes	2.4m	0.7m	No	Approx. 2m
DF417	Meole brace	Roadside	348929	310108	NO2	No	20.3m	1.5m	No	Approx. 2m
DF419	51 Abbey Foregate	Roadside	349983	312430	NO2	No	5.9m	2.8m	No	Approx. 2m
DF420	25 Castle Street	Roadside	349396	312742	NO2	Yes	4.0m	3.0m	No	Approx. 2m
DF423	Duplicate of Samaritans	Roadside	349667	312347	NO2	Yes	3.3m	3.4m	No	Approx. 2m

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance from kerb to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DF427	82/83 Frankwell	Roadside	348669	312957	NO2	Yes	5.0m	5.0m	No	Approx. 2m
DF428	Brittania Inn	Roadside	349461	313132	NO2	Yes	3.0m	3.0m	No	Approx. 2m
DF429	6a Severn Steps	Roadside	349237	312900	NO2	Yes	1.6m	1.5m	No	Approx. 2m
DF433	Heathgates Pub	Roadside	350436	314607	NO2	Yes	6.7m	6.7m	No	Approx. 2m
DF436	The Albert	Roadside	349283	312889	NO2	Yes	2.8m	2.8m	No	Approx. 2m
DF437	The Albert Duplicate	Roadside	349283	312889	NO2	Yes	2.8m	2.8m	No	Approx. 2m
DF438	Station Hotel	Roadside	349400	312954	NO2	Yes	1.3m	1.2m	No	Approx. 2m
DF439	135 Harlescott Lane	Roadside	350477	316167	NO2	No	12.6m	12.6m	No	Approx. 2m
DF443	36 London Rd	Roadside	350821	311812	NO2	No	2.9m	1.3m	No	Approx. 2m
DF446	AQMS Chester Street	Roadside	349378	312930	NO2	Yes	8.0m	6.0m	Yes	Approx. 2m
DF447	Train Platform 4/5	Other*	349511	312893	NO2	Yes	NA	2.0m from line	No	Approx. 2m

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance from kerb to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DF448	Welshpool Road	Roadside	345769	313223	NO2	No	2.9m	2.8m	No	Approx. 2m
DF449	Darwens Wood	Roadside	346796	313509	NO2	No	5.5m	0.2m	No	Approx. 2m
DF452	AQ station, Bayston Hill	Roadside	348778	309023	NO2	Yes	NA	7.0m	No	Approx. 2m
DF453	Ellesmere Rd	Roadside	349306	313639	NO2	No	6.3m	1.2m	No	Approx. 2m
DF454	York Road	Roadside	350327	315686	NO2	No	7.5m	1.9m	No	Approx. 2m
DF455	Whitchurch Road	Roadside	351523	316578	NO2	No	6.4m	3.3m	No	Approx. 2m
DF456	Coton Hill /Berwick Rd	Roadside	349214	313427	NO2	No	4.15	1.25m	No	Approx. 2m
DF457	Ellesmere Rd/ Berwick Rd	Roadside	349242	313456	NO2	No	1.15m	1.0m	No	Approx. 2m
DF458	Under railway bridge	Roadside	349426	313028	NO2	Yes	NA	2m	No	Approx. 2m
DF459	Rail car park	Roadside	349424	312936	NO2	Yes	NA	18m	No	Approx. 2m
DF460	Bellstone	Roadside	348952	312495	NO2	Yes	3.1m	3m	No	Approx. 2m

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance from kerb to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DF461	High St, Wyle Cop	Roadside	349327	312389	NO2	Yes	4m	2m	No	Approx. 2m
DF462	Welshpool Rd	Roadside	345203	313427	NO2	No	NA	1.7m	No	Approx. 2m
DF463	Otley Rd Stadium	Roadside	349765	310451	NO2	No	NA	4.0m	No	Approx. 2m
DF464	Otley Rd cycle path	Roadside	351138	310402	NO2	No	NA	7.0m	No	Approx. 2m
DF468	3 Whitchurch Road (downpipe)	Roadside	350376	314599	NO2	Yes	7.3m	7.3m	No	Approx. 2m
DF469	23 Main Street	Roadside	347642	303165	NO2	No	3.4m	3.3m	No	Approx. 2m
DF470	13 Main Street	Roadside	347808	302929	NO2	No	1.7m	1.6m	No	Approx. 2m
DF471	Butchers	Roadside	347839	302795	NO2	No	1.1m	1.0m	No	Approx. 2m
DF472	Hem Cottage, Bayston Hill (lamp column)	Roadside	348750	309004	NO2	Yes	2.1m	1.9m	No	Approx. 2m
DF473	Denehurst, Bayston Hill (sign post)	Roadside	348663	308837	NO2	Yes	3.0m	0.5m	No	Approx. 2m

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance from kerb to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DF474	2 Whiterock Cottage, Bayston Hill	Roadside	348647	308771	NO2	Yes	2.6m	1.7m	No	Approx. 2m
DF475	Windyridge, Bayston Hill	Roadside	348646	308685	NO2	Yes	2.2m	1.7m	No	Approx. 2m
DF476	Chester Street parking bay	Roadside	349360	312962	NO2	Yes	1.7m	1.4m	No	Approx. 2m
DF477	25 Chester Street	Roadside	349349	313072	NO2	Yes	3.1m	2.1m	No	Approx. 2m
DF479	Opp Broome Street duplicate	Roadside	349299	313106	NO2	Yes	3.2m	2.9m	No	Approx. 2m
DF480	Peking Aroma, Castle Foregates	Roadside	349466	313151	NO2	Yes	3.1m	2.6m	No	Approx. 2m
DF481	Chester Street car park	Roadside	349348	313019	NO2	Yes	3.1m	2.6m	No	Approx. 2m

(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.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2016 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2012	2013	2014	2015	2016
CM1	Roadside	Automatic	100	>95	NA	NA	31.45	26.8	27.65
DF5	Roadside	Diffusion Tube	100	100	26.7	30.7	27.5	27.9	26.8
DF7	Roadside	Diffusion Tube	100	100	16.2	16.3	15.5	13.6	14.7
DF10	Roadside	Diffusion Tube	100	100	29.4	27.8	26.4	23.4	24.1
DF13	Roadside	Diffusion Tube	100	100	**44.8**	**42.5**	**41.4**	**41.9**	**41.5**
DF14	Roadside	Diffusion Tube	100	100	20.5	22.6	20.7	17.9	19.6
DF16	Roadside	Diffusion Tube	100	100	35.9	36.9	34.3	34.7	30.5
DF18	Roadside	Diffusion Tube	100	100	25.8	26.7	27.8	26.1	25.4
DF19	Roadside	Diffusion Tube	100	100	35.0	35.4	31.7	32.3	30.8
DF20	Roadside	Diffusion Tube	100	100	24.5	26.1	24.3	21.3	22.9
DF25	Roadside	Diffusion Tube	100	100	29.5	29.9	29.0	28.0	27.8
DF27	Roadside	Diffusion Tube	100	100	29.4	30.4	28.4	26.5	27.8
DF28	Roadside	Diffusion Tube	100	100	**56.7**	**57.2**	**53.8**	**51.2**	**52.9**
DF29	Roadside	Diffusion Tube	100	100	29.1	29.4	33.0	29.0	29.7
DF50	Roadside	Diffusion Tube	100	100	36.4	35.5	33.2	32.1	32.5
DF54	Roadside	Diffusion Tube	100	92	**40.3**	36.5	36.0	36.8	35.9
DF58	Roadside	Diffusion Tube	100	100	38.3	**40.5**	38.0	37.4	35.8
DF59	Roadside	Diffusion Tube	100	100	31.4	32.6	33.8	32.1	33.0
DF61	Roadside	Diffusion Tube	100	100	37.5	36.5	30.6	31.6	30.4
DF62	Roadside	Diffusion Tube	100	100	**41.7**	**43.4**	**40.6**	39.7	39.1
DF63	Roadside	Diffusion Tube	100	100	33.6	34.1	31.2	31.6	31.7
DF64	Roadside	Diffusion Tube	100	100	15.7	14.9	13.2	13.2	14.2
DF65	Roadside	Diffusion Tube	100	100	**40.5**	38.6	35.6	36.2	34.7
DF66	Roadside	Diffusion Tube	100	100	31.9	34.2	33.8	32.8	30.9
DF67	Roadside	Diffusion Tube	100	100	37.0	**40.6**	39.7	38.7	36.2

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2016 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2012	2013	2014	2015	2016
DF69	Roadside	Diffusion Tube	100	100	20.1	22.9	23.0	21.9	22.3
DF104	Roadside	Diffusion Tube	100	75	33.0	33.4	30.1	29.1	29.0
DF127	Roadside	Diffusion Tube	100	92	14.4	14.5	12.9	13.3	14.4
DF128	Roadside	Diffusion Tube	100	75	35.3	36.2	33.0	31.6	35.4
DF130	Roadside	Diffusion Tube	100	100	38.1	36.5	32.1	30.2	29.4
DF131	Roadside	Diffusion Tube	100	92	38.5	34.3	34.7	30.7	30.2
DF135	Roadside	Diffusion Tube	100	92	13.8	15.0	12.3	12.0	13.6
DF138	Roadside	Diffusion Tube	100	100	24.0	25.1	24.1	23.0	22.4
DF139	Roadside	Diffusion Tube	100	100	33.9	32.5	31.6	29.1	30.5
DF140	Roadside	Diffusion Tube	100	100	26.8	28.8	25.3	24.9	26.0
DF141	Roadside	Diffusion Tube	100	92	23.7	24.9	27.2	20.2	23.5
DF203	Roadside	Diffusion Tube	100	100	30.1	32.6	30.9	29.5	32.4
DF205	Roadside	Diffusion Tube	100	100	24.4	22.7	20.7	17.9	20.2
DF207	Roadside	Diffusion Tube	100	100	29.4	27.3	26.1	24.3	25.8
DF208	Roadside	Diffusion Tube	100	67	19.6	17.7	17.9	16.9	20.7
DF211	Roadside	Diffusion Tube	100	100	31.5	33.1	30.7	33.0	32.2
DF216	Roadside	Diffusion Tube	100	100	32.1	31.4	26.8	28.9	28.5
DF217	Roadside	Diffusion Tube	100	92	38.5	38.4	34.1	35.7	34.4
DF218	Roadside	Diffusion Tube	100	59	32.8	29.7	26.7	29.3	26.6
DF219	Roadside	Diffusion Tube	100	100	20.5	20.6	19.4	19.9	20.8
DF220	Roadside	Diffusion Tube	100	100	29.7	29.9	26.9	26.2	26.2
DF223	Roadside	Diffusion Tube	100	100	-	-	**51.0**	**50.3**	**51.6**
DF224	Roadside	Diffusion Tube	100	100	-	-	21.6	21.2	21.5
DF301	Roadside	Diffusion Tube	100	92	25.9	30.0	26.6	25.1	23.3
DF305	Roadside	Diffusion Tube	100	92	28.7	24.7	29.1	27.6	27.8
DF306	Roadside	Diffusion Tube	100	75	32.5	33.4	33.1	32.3	34.2

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2016 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2012	2013	2014	2015	2016
DF312	Roadside	Diffusion Tube	100	100	29.3	28.1	27.2	25.4	27.2
DF313	Roadside	Diffusion Tube	100	100	-	25.9	25.4	23.3	23.1
DF400	Roadside	Diffusion Tube	100	100	32.2	33.3	33.4	27.4	32.0
DF401	Roadside	Diffusion Tube	100	100	20.9	22.8	22.4	18.7	21.4
DF403	Roadside	Diffusion Tube	100	100	34.1	33.9	33.7	31.7	31.0
DF404	Roadside	Diffusion Tube	100	100	18.7	22.5	18.3	16.9	18.1
DF405	Roadside	Diffusion Tube	100	100	19.9	20.7	20.1	18.1	18.9
DF407	Roadside	Diffusion Tube	100	100	30.1	30.3	28.0	27.5	27.4
DF411	Roadside	Diffusion Tube	100	100	30.0	30.4	29.4	26.8	27.4
DF412	Roadside	Diffusion Tube	100	92	33.2	34.1	32.0	30.2	30.8
DF413	Roadside	Diffusion Tube	100	100	33.0	35.1	34.8	31.8	31.7
DF417	Roadside	Diffusion Tube	100	92	32.6	27.5	26.3	25.5	31.1
DF419	Roadside	Diffusion Tube	100	92	26.5	31.5	27.5	28.0	27.8
DF420	Roadside	Diffusion Tube	100	100	32.0	33.9	30.3	29.1	29.2
DF423	Roadside	Diffusion Tube	100	92	26.4	29.0	25.9	24.2	26.7
DF427	Roadside	Diffusion Tube	100	100	28.0	27.9	27.2	28.0	27.4
DF428	Roadside	Diffusion Tube	100	92	34.3	36.4	-	-	-
DF429	Roadside	Diffusion Tube	100	100	32.1	29.6	31.4	27.5	28.2
DF433	Roadside	Diffusion Tube	100	92	27.1	26.1	25.0	24.0	24.4
DF436	Roadside	Diffusion Tube	100	100	36.9	39.1	38.5	36.1	36.4
DF437	Roadside	Diffusion Tube	100	100	39.8	**42.7**	38.4	37.3	37.6
DF438	Roadside	Diffusion Tube	100	100	**74.2**	**64.6**	**53.6**	**60.8**	**58.5**
DF439	Roadside	Diffusion Tube	100	100	15.0	14.8	14.5	11.6	13.2
DF443	Roadside	Diffusion Tube	100	75	25.6	26.2	22.8	23.2	26.1
DF446	Roadside	Diffusion Tube	100	100	33.0	34.3	32.6	30.1	31.7
DF447	Roadside	Diffusion Tube	100	100	36.6	38.2	34.9	35.3	34.7

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2016 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2012	2013	2014	2015	2016
DF448	Roadside	Diffusion Tube	100	100	10.4	11.0	11.1	10.4	10.3
DF449	Roadside	Diffusion Tube	100	100	22.5	22.8	20.3	22.5	20.7
DF452	Roadside	Diffusion Tube	100	100	34.0	34.4	29.5	27.3	25.3
DF453	Roadside	Diffusion Tube	100	92	24.0	23.9	20.3	20.8	22.6
DF454	Roadside	Diffusion Tube	100	100	16.8	17.5	16.0	15.0	15.6
DF455	Roadside	Diffusion Tube	100	92	19.8	22.9	21.5	20.2	21.4
DF456	Roadside	Diffusion Tube	100	100	**42.3**	**41.2**	37.9	**42.2**	**41.0**
DF457	Roadside	Diffusion Tube	100	100	39.6	**41.4**	37.0	37.3	38.5
DF458	Roadside	Diffusion Tube	100	100	-	-	**57.4**	**52.4**	**53.9**
DF459	Roadside	Diffusion Tube	100	100	-	-	34.9	35.9	37.4
DF460	Roadside	Diffusion Tube	100	100	-	-	27.2	25.3	26.4
DF461	Roadside	Diffusion Tube	100	100	-	-	32.2	32.7	31.7
DF462	Roadside	Diffusion Tube	100	83	-	-	21.8	20.5	21.5
DF463	Roadside	Diffusion Tube	100	100	-	-	19.7	16.1	15.2
DF464	Roadside	Diffusion Tube	100	100	-	-	20.6	18.9	17.3
DF468	Roadside	Diffusion Tube	100	100	-	-	-	22.0	23.0
DF469	Roadside	Diffusion Tube	100	100	-	-	-	28.5	28.6
DF470	Roadside	Diffusion Tube	100	92	-	-	-	37.1	34.9
DF471	Roadside	Diffusion Tube	100	100	-	-	-	34.1	32.5
DF472	Roadside	Diffusion Tube	100	92	-	-	-	33.4	23.4
DF473	Roadside	Diffusion Tube	100	92	-	-	-	29.2	30.6
DF474	Roadside	Diffusion Tube	100	92	-	-	-	36.4	**41.5**
DF475	Roadside	Diffusion Tube	100	59	-	-	-	**40.9**	39.9
DF476	Roadside	Diffusion Tube	100	92	-	-	-	28.7	30.6
DF477	Roadside	Diffusion Tube	100	100	-	-	-	31.0	31.2
DF479	Roadside	Diffusion Tube	100	100	-	-	-	32.9	35.9

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2016 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2012	2013	2014	2015	2016
DF480	Roadside	Diffusion Tube	100	100	-	-	-	33.0	34.2
DF481	Roadside	Diffusion Tube	100	100	-	-	-	26.6	27.3

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 Technical Guidance LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2011	2012	2013	2014	2015
CM1	Roadside	Automatic	100	>95	-	-	0	0	0

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

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

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

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

Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2016 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
				2012	2013	2014	2015	2016
CM2	Roadside	100	89	24.0	26.1	-	18.4	19.2

Notes: Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ are shown in **bold.**

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

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

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

Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2012	2013	2014	2015	2016
CM2	Roadside	100	92	17	29	-	4	2

Notes: Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold.**

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

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

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

Table A.7 – $PM_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	$PM_{2.5}$ Annual Mean Concentration (µg/m^3)				
				2012	2013	2014	2015	2016
CM3	Urban Background	100	84	-	-	-	7.68(3)	9.3
CM4	Roadside	100	84	-	-	-	7.19	8.11

(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) The data for this result was for a monitoring period from May to December 2015. The data has not been annualised as there is no objective level for PM2.5.

Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2016

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
DF5	27.41	33.95	30.24	23	28.81	24.98	23.95	24.22	29.18	33.91	38.29	32.87	29.2	26.8
DF7	15.97	21.59	16.44	15.82	13.69	12.02	9.16	11.17	10.05	18.65	22.96	26.63	16.1	14.8
DF10	31.71	30.71	29.27	23.83	21.61	20.55	19.58	19.07	22.58	25.56	36.97	32.91	26.1	24.1
DF13	39.87	52.38	43.42	37.61	38.43	36.82	42.7	39.3	37.8	47.95	68.48	57.67	45.2	41.5
DF14	23.39	24.92	21.62	20.33	19.48	17.48	13.52	14.54	16.52	25.44	28.31	31.31	21.4	19.6
DF16	34.64	41.8	32.38	33.2	28.81	27.44	26.88	30	27.9	31.89	44.17	39.86	33.2	30.5
DF18	30.42	34.13	29.61	24.28	27.27	22.11	21.18	19.79	22.45	29.09	38.68	32.48	27.6	25.4
DF19	32.77	37.39	40.31	33.41	30.67	26.77	29.28	29.39	27.23	36.1	41.36	37.13	33.4	30.8
DF20	29.38	33.33	24.07	20.19	20.17	17.7	17.96	17.45	20.23	26.42	34.83	38.02	24.9	22.9
DF25	27.47	35.24	29.16	26.94	27.87	23.59	24.51	26.47	25.29	32.55	40.87	43.78	30.3	27.8
DF27	34.86	35.4	31.66	24.17	27.62	24.65	21.19	24.36	25.77	32.57	41.05	39.8	30.2	27.8
DF28	60.4	67.13	61.99	48.05	52.58	51.48	40.91	42.56	49	56.4	83.44	76.62	57.5	52.9
DF29	31.48	36.82	32.79	28.49	34.95	26.51	25.5	26.86	26.36	33.82	44.36	40.13	32.3	29.7
DF50	32.72	40.28	30.48	30.36	34.92	28.45	30.26	33.12	30.32	39.96	49.86	44.2	35.4	32.5
DF54	39.14	42.4	37.72	35.44		33.45	35.96	34.98	38.28	38.58	51.05	42.68	39	35.9
DF58	38.14	45.35	39.1	37.25	35.18	35.02	33.3	31.69	32.46	41.83	50.24	43.93	38.6	35.5
DF59	44.11	43.68	37.84	29.48	27.98	27.6	27.87	34.84	33.49	33.6	47.54	42.91	35.9	33
DF61	26.43	40.92	39.82	31.8	33.41	26.93	26.47	27.78	26.31	34.78	45.63	36.48	33	30.4
DF62	33.3	49.47	51.34	37.56	41.37	35.91	33.6	33.21	35.35	48.96	61.96	48.02	42.5	39.1
DF63	36.62	41.1	35.71	29.89	30.37	28.71	31.35	29.84	29.81	34.65	43.64	41.88	34.4	31.7
DF64	17.34	19.12	17.63	13.55	12.44	10.81	9.48	10.45	12.73	17.99	20.85	23.05	15.4	14.2

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 (1)
DF65	32.02	44.2	44.43	39.12	35.66	32.8	32.35	33.7	30.11	39.05	47.85	41.88	37.7	34.7
DF66	39.44	37.15	36.41	24.42	35.24	28.73	28.96	28.26	30.19	34.53	38.93	41.06	33.6	30.9
DF67	33.43	49.65	41.76	35.12	42.85	34.23	30.77	30.68	31.1	47.88	49.8	45.95	39.4	36.2
DF69	23.57	30.52	26.6	19.57	20.25	19.25	18.21	17.34	21.1	27.38	35.74	32.36	24.3	22.3
DF104	28.36	37.19	31.14	26.11			22.62		30.16	32.97	42.25	33.47	31.5	29
DF127	12.88	18.46	17.06	16.32	14.05	13.9	9.72		9.65	17.51	22.29	20.81	15.6	14.4
DF128		42.06	43.72	32.39			27.24	29.17	37.95	38.62	51.69	43.9	38.5	35.4
DF130	29.84	37.63	34.49	26.84	32.97	28.14	23.03	23.49	29	34.09	43.15	41.89	32	29.4
DF131	29.26	36.78	36.05	25.53	35.16		19.51	25.39	29.89	39.86	43.7	40.32	32.8	30.2
DF135	12.26	16.23	18.46	14.62	13.92	13.67	6.82		7.79	18.53	19.38	21.26	14.8	13.6
DF138	26.18	31.4	25.29	21.51	22.06	19.82	20.97	18.68	15.29	25.65	35.77	30.67	24.4	22.4
DF139	32.37	41.44	31.67	27.74	33.89	26.72	27.76	27.89	28.29	34.62	45.21	41.13	33.2	30.5
DF140	18.37	33.23	34.59	27.79	29.87	23.43	19.33	20.97	23.27	37.1	38.22	33.05	28.2	26
DF141	25.38	27.2	25.9	23.24	21.69	17.13	19.19		25.89	32	32.61	31.19	25.5	23.5
DF203	27.82	37.04	36.65	32.3	34.73	37.03	27.64	30.31	34.81	37.69	46.51	40.84	35.2	32.4
DF205	22.44	23.66	25.14	20.17	18.6	19.84	14.12	16.13	19.67	25.05	31.34	27.54	21.9	20.2
DF207	26.11	32.46	29.76	26.55	24.07	27.07	22.75	19.73	24.91	30.56	38.53	35.14	28.1	25.8
DF208		20.9	20.21	15.22	14.18	15.32	10.6				61.81	22.23	22.5	20.7
DF211	18.96	31.5	34.85	40.74	38.84	41.59	27.44	27.22	30.98	42.2	55.45	31.13	35	32.2
DF216	24.72	31.55	32.87	32.83	32.69	32.17	25.48	25.58	25.38	32.93	40.43	35.25	30.9	28.5
DF217	33.65	42.58	38.66	33.5	33.65	38	36.23	31.17	35.15	38.42	50.33		37.3	34.4
DF218	27.09	34.57	34.08			30.98	25.54	25.13	25.49				28.9	26.6
DF219	27.31	26.56	24.56	24.2	18.18	20.24	15.53	16.2	17.81	21.75	32.46	27.38	22.6	20.8
DF220	21.48	32.11	34.42	28.82	26.73	27.17	21.32	21.39	22.7	32.46	40.34	32.9	28.4	26.2
DF223	56.52	53.43	53.61	51.86	61.82	58.28	49.53	50.75	46.5	62.11	64.52	64.9	56.1	51.6

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 (1)
DF224	20.53	22.54	25.18	20.85	24.77	23.89	20.32	19.14	19.75	27.81	30.49	26.18	23.4	21.5
DF301	34.46	27.81	24.61	25.36	0.05	42.05	23.1	21.32	24.7	23.6	32.62		25.4	23.3
DF305		40.12	30.92	27.98	30.47	20.59	18.64	23.86	21.23	32.22	45.9	41.53	30.3	27.8
DF306	35.94	42.73	36.82		39.43	31.58		24.86	26.03		53.59	44.04	37.2	34.2
DF312	34.43	29.04	0.34	54.24	32.55	24.54	22.29	24.22	23.54	30.44	43.13	36.28	29.5	27.2
DF313	28.22	37.57	26.78	22.48	24.74	18.87	16.65	17.51	18.88	27.15	32.75	30.07	25.1	23.1
DF400	34.31	45.11	27.19	43.35	46.37	31.03		36	22.77	50.41	38.17	42.23	34.8	32
DF401	21.9	29.77	23.53	21.83	25.04	17.17	13.9	16.77	19.14	25.25	35.04	29.93	23.2	21.4
DF403	32.45	36.45	33.42	36.56	29.89	32.02	26.2	29.91	28.48	36.23	41.31	42.3	33.7	31
DF404	16.29	22.96	22.2	18.58	17.8	17.43	10.78	12.05	14.43	27.09	29.52	27.34	19.7	18.1
DF405	19.69	25.8	22.02	19.28	17.88	17.13	13.73	14.52	16.11	21.91	29.04	30.35	20.6	18.9
DF407	27.12	33.34	31.23	32.27	28.63	27.74	20.12	24.26	22.34	35.22	39.54	36.65	29.8	27.4
DF411	27.99	30.13	29.22	30.68	26.85	30.74	26.5	25.74	29.01	31.64	35.76	33.19	29.7	27.4
DF412	32.36	40.57	33.58	31.85	30.2	31.47	26.12	27.99	26.03		44.14	44.85	33.5	30.8
DF413	34.31	37.95	36.21	36.1	33.37	33.13	27.38	27.91	26.04	38.91	42.86	40.07	34.5	31.7
DF417	31.48	37.89	29.49		59.66	27.93	19.43	23.01	24.63	38.54	40.25	40.65	33.9	31.1
DF419	28.58	33.67	33.8	34.47	29.77	26.8	17.99	24	23.64		40.35	40.14	30.2	27.8
DF420	27.94	37.01	32.6	25.16	34.64	34.85	24.5	22.13	24.26	37.6	42.26	38.13	31.7	29.2
DF423		32.16	29.84	29.51	22.96	28.45	20.64	21.89	23.74	32.83	39.19	38.03	29	26.7
DF427	28.28	28.86	32.15	30.49	26.68	32.07	20.33	22.3	24.72	34.34	38.2	39.78	29.8	27.4
DF428	56.51	45.71	45.87	42.16	43.23	46.12	30.35		45.49	49.31	47.71	56.64	46.2	42.5
DF429	34.57	35.38	32.24	30.26	29.61	26.35	22.19	20.61	24.14	34.15	37.92	41.07	30.7	28.2
DF433		31.87	27.1	24.71	25.74	25.54	18.73	18.11	22.68	26.25	32.97	38.58	26.5	24.4
DF436	24.54	42.06	40.29	41.6	38.33	42.47	30.06	31.5	33.94	46.25	54.81	49.33	39.5	36.4
DF437	39.88	44.95	38.06	37.21	36.87	43.61	32.3	34.97	29.38	46.92	55.35	51.6	40.9	37.6

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 (1)
DF438	64.44	72.77	68.44	71.01	49.64	67.93	56.39	52.93	54.43	64.38	76.65	65.09	63.6	58.5
DF439	16.59	16.27	17.05	13.25	13.67	11.1	5.61	8.22	10.32	17.34	21.16	22.75	14.4	13.2
DF443	22.74		27.78	25.2	22.12	21.6			30.86	28.71	38.59	38.08	28.4	26.1
DF446	34.93	38.54	35.06	32.74	32.75	34.93	23.29	24.29	26.33	38.45	46.95	45.29	34.4	31.7
DF447	37.55	38.97	36.18	41.77	36.48	37.63	36.02	35.07	32.84	37.79	44.16	39.21	37.8	34.7
DF448	14.92	14.85	12.22	7.8	9.16	6.07	5.72	6.64	8.84	11.13	18.61	19.54	11.2	10.3
DF449	19.42	24.63	24.98	19.21	25.42	18.89	13.36	17.71	18	24.08	36.87	27.9	22.5	20.7
DF452	25.3	32.71	35.22	25.31	28.07	25.68	0.8	20.52	22.59	31.46	50.02	32.78	27.5	25.3
DF453	22.67	28.76	27.73		19.92	22.98	17.53	18.22	20.93	24.4	33.03	34.57	24.6	22.6
DF454	17.34	20.41	16.95	15.57	13.99	13.16	8.11	10.55	13.33	21.4	26.02	26.65	16.9	15.6
DF455	23.79	25.53		38.01	20.13	17.76	13.11	16.28	18.93	26.12	29.19	27.74	23.3	21.4
DF456	37.37	49.31	38.98	46.95	40.73	45.97	38.03	36.52	43.7	46.78	55.73	55.98	44.6	41
DF457	34.75	41.75	40.27	43.11	37.47	46.84	36.19	36.31	36.06	43.79	53.97	52.49	41.9	38.5
DF458	62.49	56.65	58.27	61.62	55.56	70.21	41.64	49.16	54.44	68.93	59.84	64.54	58.6	53.9
DF459	44.06	46.5	40.66	33.05	36.36	40.76	31	35.21	33.06	47.86	50.1	49.64	40.6	37.4
DF460	26.8	32.62	30.97	28.92	22.55	26.14	22.06	25.61	23.02	30.63	40.61	34.43	28.6	26.4
DF461	29.94	37.45	35.22	37.29	33.43	36.51	24.52	30.1	27.42	38.65	44.97	38.41	34.4	31.7
DF462	19.88	25.47	26.7	19.47	19.25	15.51		20.24		21.81	32.81	32.95	23.4	21.5
DF463	16.37	21.31	18.78	15.48	15.19	11.24	9.43	14.15	13.13	15.94	21.96	25.78	16.5	15.2
DF464	23.14	24.69	20.46	16.47	15.76	11.31	9.54	15.72	16.46	15.59	29.09	28.35	18.8	17.3
DF468	28.3	26.5	25.33	22.29	24.21	23.89	13.13	17.01	20.56	27.11	32.16	39.51	25	23
DF469	21.43	35.9	33.45	28.74	30.32	34.44	23.74	25.96	26.28	32.29	48.61	33.17	31.1	28.6
DF470	30.02	46.27	42.69	36.2	39.18	48.04	27.57	30.01	32.85	45.03	40.33		38	34.9
DF471	28.95	40.25	37.45	29.39	34.1	39.11	24.25	28.5	33.79	39.05	48.27	41.87	35.4	32.5
DF472	25.6	24.91	24.52	15.48	24.25	16.74		16.71	47.15	28.7	27.48	28.97	25.5	23.4

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 (1)
DF473	23.08	30.95	49.86	43.71	49.71	20.17		20.55	29.79	34.82	31.83	31.84	33.3	30.6
DF474	50.87	54.84	53.92	25.01	29.52	41.54		35.87	42.01	48.86	50.39	64.25	45.1	41.5
DF475		54.57	49.96	39.52	46.52	37.12			16.44	51.47	52.05		43.4	39.9
DF476	33.3	35.87	31.15	31.36	29.74	30.19	28.55	29.56		31.31	42.9	42.33	33.2	30.6
DF477	35.64	37.07	32.99	31.28	30.66	31.22	29.88	32.75	28.23	30.61	38.54	48.61	33.9	31.2
DF479	37.34	42.35	37.01	33.91	38.92	37.86	29.76	34.83	30.59	43.58	49.06	53.62	39	35.9
DF480	43.51	36.55	36.83	34.76	38.09	33.7	29.35	30.41	30.37	39.11	47.6	46.86	37.2	34.2
DF481	34.98	33.11	32.27	21.5	28.43	26.56	24.58	27.88	25.56	29.87	34.39	37	29.6	27.3

(1) See Appendix C for details on bias adjustment

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

Diffusion Tubes QA/QC.

Diffusion tubes were analysed by Gradko International 20% TAE method. The bias adjustment factor used was that provided on the National Diffusion Tube Bias Adjustment Factor Spreadsheet: spreadsheet version 06/17. The bias adjustment factor used is 0.92.

AIR NO_2 PT rounds AR012, AR013, AR015, AR016 and AR018 cover the full 2016 period. This data shows that 100% of Gradko International diffusion tubes were deemed to be satisfactory. As a result the diffusion tube data in this report is deemed to be suitable for use.

Continuous monitors QA/QC.

All continuous monitors were serviced every 6 months throughout the monitoring periods reported. Servicing was carried out by the supplier and installer of the equipment, Enviro Technology Services Plc. Between servicing Shropshire Council staff carried out regular span and zero checks on the chemiluminescence monitor. Data was used to carry out drift corrections on raw data by Shropshire Council staff. Shropshire Council maintained the BAMs between servicing periods and carried out relevant data corrections on raw data as specified by manufacturer instruction in line with guidance from Enviro Technology Services plc.

Poultry unit assessment

Shropshire Council's last air quality report, USA 2015 which included monitoring data for 2015, noted that six poultry installations had been identified that met the criteria in Box 7.2 of Technical Guidance document (TG16) for further screening. Of these installations five had been found not to screen out of a need for detailed assessment. As a result, it was concluded that, "*Shropshire Council has identified seven poultry farms meeting the specified criteria and will proceed to a Detailed Assessment following further advice and guidance from Defra*".

Following the conclusion above further details of poultry operations were discussed with the Environment Agency, who issue and regulate Environmental permits which the poultry installations must operate under, and poultry farm operators. It was apparent that although many of the poultry units had permits for the numbers of birds stated in Shropshire Council's USA 2015, many did not operate to these numbers due to updated welfare standards for birds and not implementing planned expansions which would increase the number of birds on site. In addition, some of the distances originally used in calculations were revisited to ensure that precise measurements were taken for inputs into the screening tool.

Of the five farms it was noted that Comberton Farm only stocked 350,000 birds due to welfare standards and other site constraints and the poultry unit no longer fulfils the criteria for screening found in Box 7.2 of TG(16). Alderley Lane Farm also fell into this category only stocking 325,000 birds. Manor Farm had not developed two new sheds and therefore its capacity was limited to 320,000 again falling short of the screening criteria.

As a result the screening tool provided in TG(16) was re-run with the up to date and accurate data for those poultry units that are still found to screen in. Data can be found in the table below:

Address	Easting	Northing	Distance to receptor	Number of birds	90.4 percentile contribution	Annual mean PM10 background	Percentile contribution plus background	Objective level (24 hour mean)
Wytherford House Farm	357500	319500	48	520000	54.7	15.6	70.3	50
New House Farm	337500	304500	41	850000	102.8	12.9	115.8	50
The Oaklands	351500	332500	118	1814000	28.0	17.8	45.8	50

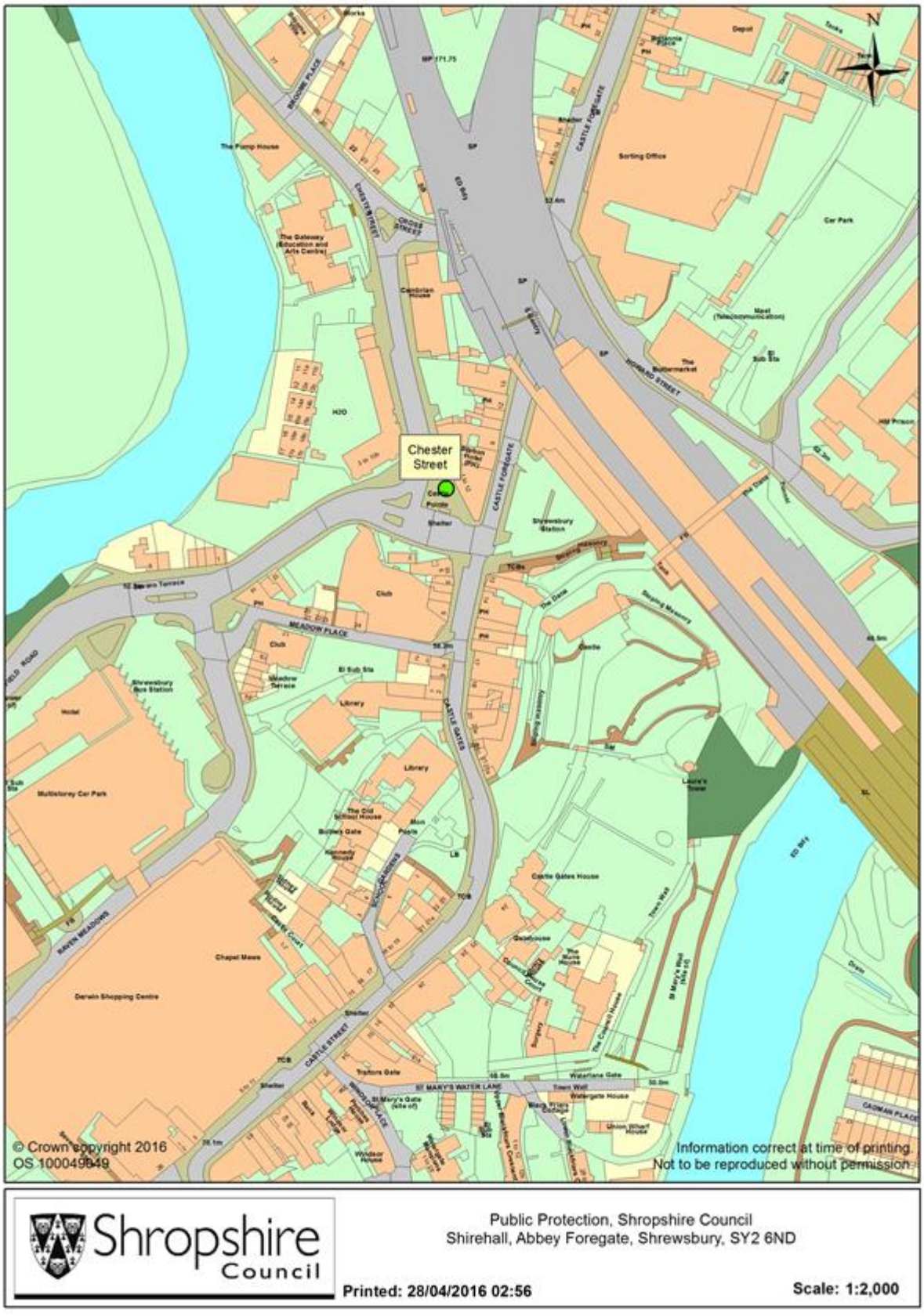
The new screening tool shows that The Oaklands, although not strictly required for screening as the nearest property is over 100m away however due to the significant number of birds on site it was kept in, does not require detailed assessment as it screens under the objective level. In addition, it is noted that Oaklands poultry units

are spread out in a near linear fashion resulting in most units being several hundred metres away from receptors.

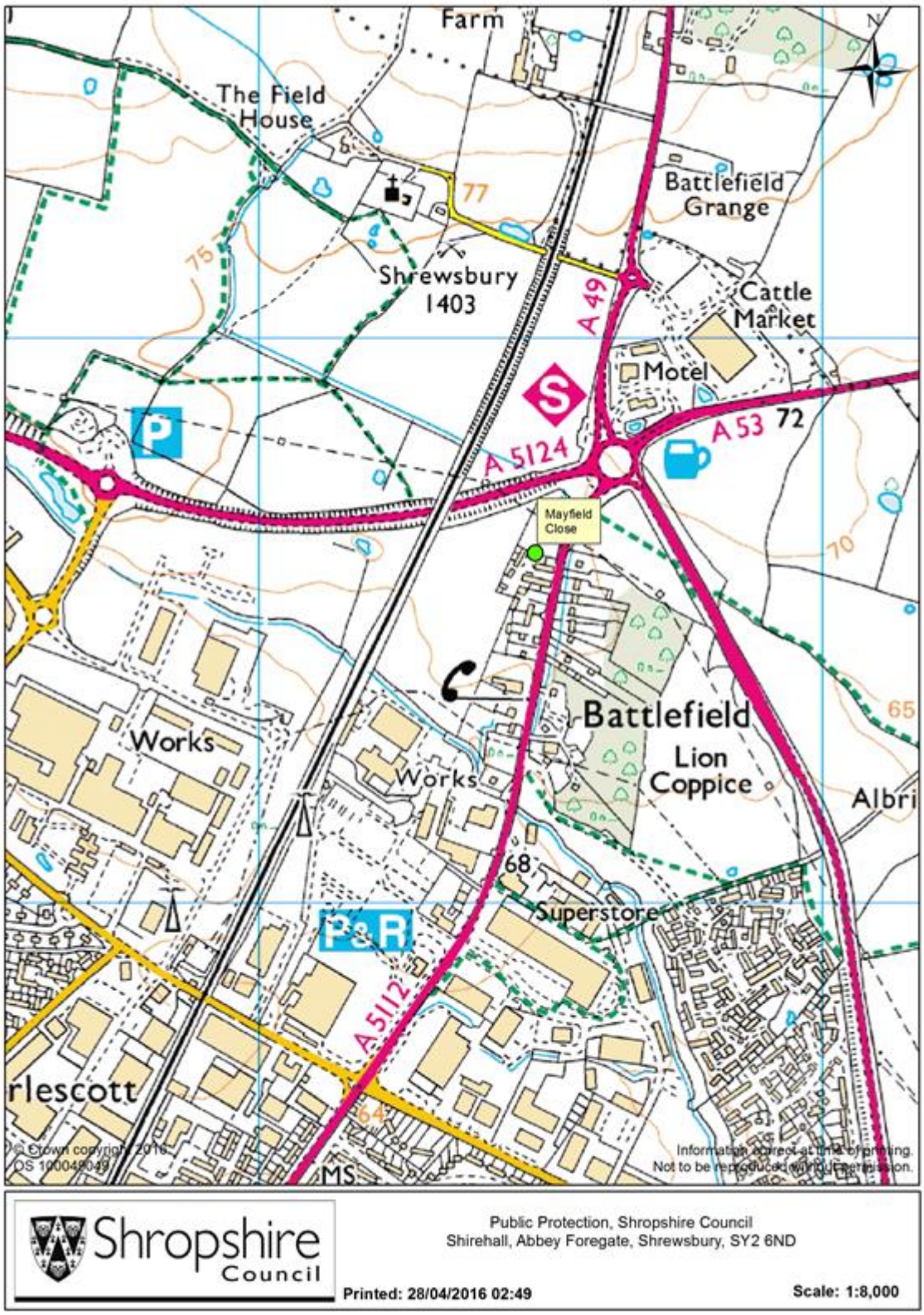
The two remaining poultry units at Wytherford House Farm and New House Farm require detailed assessment. Detailed assessment through a modelling exercise has been completed. To verify the model monitoring is proposed when funds can be identified. An update will be provided in the next ASR.

Appendix D: Maps of Monitoring Locations

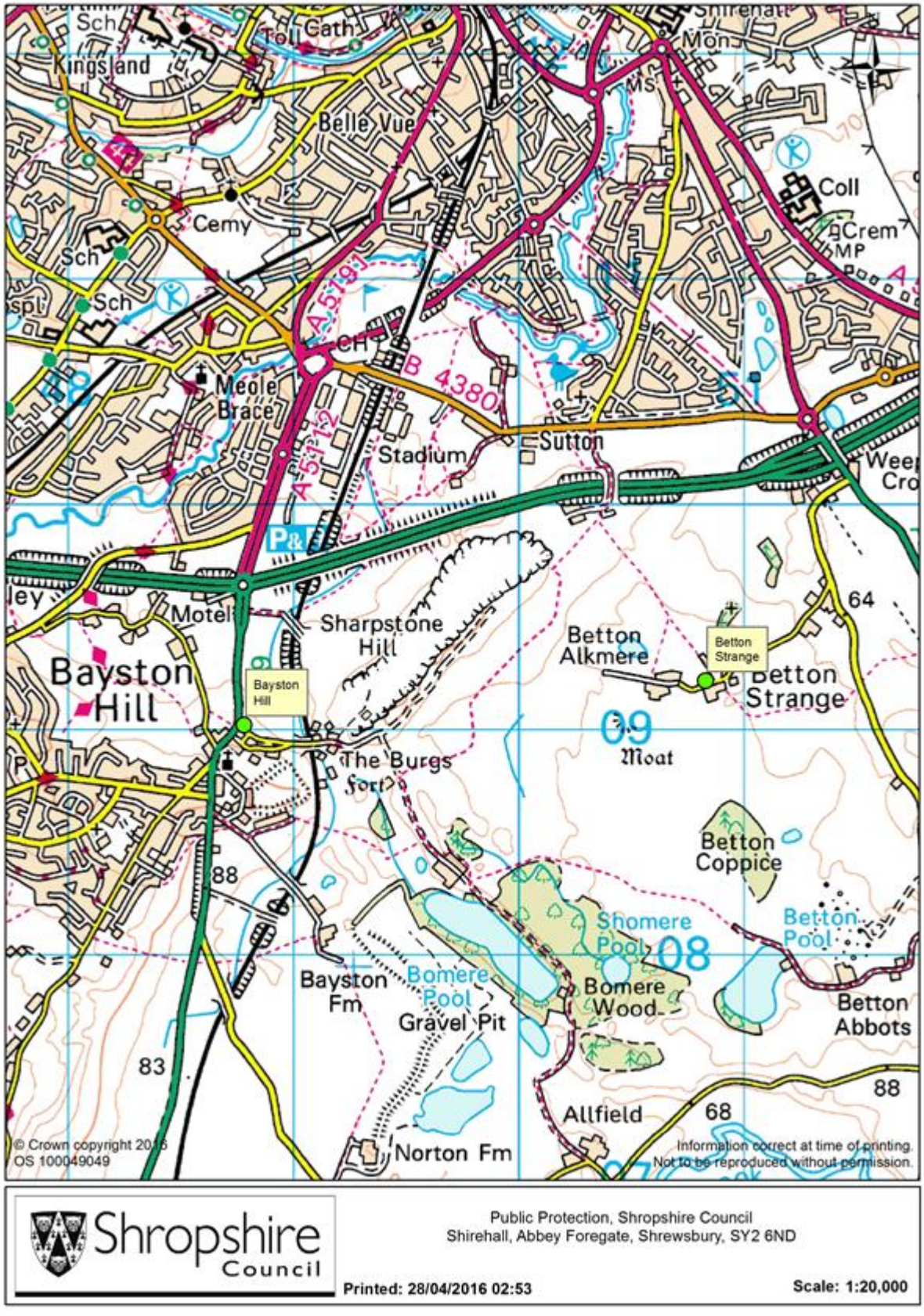
CM1 and CM4: Chester Street Automatic NOx and PM2.5 monitor



CM3: Mayfield Close automatic PM2.5 monitor



CM2: Bayston Hill continuous automatic PM10 monitor



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[4]	
	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

[4] The units are in micrograms 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
SITP	Shrewsbury Integrated Transport Package
SO_2	Sulphur Dioxide
…	…

References

DEFRA (2016). Local Air Quality Management: Technical Guidance 2016 (TG(16)). Department for the Environment, Food and Rural Affairs. [Online]. Available at: https://laqm.defra.gov.uk/documents/LAQM-TG16-April-16-v1.pdf

NO_2 fall off with distance calculator (Version 4.1) available at: https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html was used for all relevant calculations carried out in this report.