2018 Air Quality Annual Status Report (ASR)

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

December 2018

Local Authority Officer	Matthew Clark
Department	Regulatory Services
Address	Shropshire Council, Abbey Foregate, Shrewsbury, Shropshire, SY2 6ND
Telephone	03456 789000
E-mail	publicprotection@shropshire.gov.uk
Report Reference number	SC_ASR2018
Date	December 2018

Executive Summary: Air Quality in Our Area

Air Quality in Shropshire Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children 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 Since the last report was written 3 AQMAs have been revoked: Oswestry AQMA, Shrewsbury No 1 AQMA and Shrewsbury No 2 AQMA. This has removed 11 dwellings and several businesses from areas considered likely to be exposed to pollutants exceeding the national objective levels.

Bridgnorth Pound Street AQMA is still required as NO_2 levels exceed 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. In 2018 additional diffusion tubes have been included in the area to consider the extent of the exceedance. NO_2 levels in the AQMA have reduced significantly at one monitoring location and risen slightly at another. It is considered likely that the reduction at one monitoring location (DF13) is due to two months recording low levels of NO_2 possible linked to road works in the area.

Shrewsbury No 3 AQMA is still required although there is only an exceedance of the national objective level at one monitoring location where there is relevant exposure. It is anticipated that there are only a few relevant receptors in the AQMA. A reduction at monitoring location (DF438), where there is relevant exposure, was found in 2017. This was the lowest recorded result on record. The downward trend continues in this area.

[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

Actions to Improve Air Quality

Shropshire Council's Highways and Transport department has completed various works on the Shrewsbury Integrated Transport Package including traffic smoothing measures on the English Bridge gyratory, 20mph speed limits increased over English Bridge and cycle land infrastructure on English Bridge. Other measures have been carried out and are detailed on the following link: https://shropshire.gov.uk/roads-and-highways/roadworks-and-road-closures/large-scale-project-works/shrewsbury-integrated-transport-package-sitp/

Shrewsbury Council's policy for Hackney Carriages and Private Hire Vehicles has been reviewed and proposals for the 2019 – 2024 policy are being considered. Consultation and decisions will be made in 2018/19 year.

Shropshire Council put forward a renewed business case for a North-West Relief Road. A decision is to be made by central government in 2018.

Conclusions and Priorities

Two AQMAs were revoked in 2017: Shrewsbury No 1 AQMA and Shrewsbury No 2 AQMA.

Although a downward trend is noted in the Shrewsbury No 3 AQMA further reductions are still required. As Bridgnorth AQMA is was generally stable at one monitoring point (DF13) and reduced at the other (DF28) additional work is still required to work towards meeting national objective levels.

Work to create ta Key Stakeholder air quality group to review the Air Quality Action Plans was not taken forward. It was considered more appropriate to carry out work to gather source apportionment data first with which to engage relevant services. This work is proposed for 2018/2019. The work being considered may allow scenarios to be tested to consider the benefit of any proposed intervention.

Information on air quality has been provided to Public Health staff who update the Council's Joint Strategic Needs Assessment (JSNA). Air Quality will feature in future

renditions. For more information visit: http://www.shropshiretogether.org.uk/wp-content/uploads/2016/06/Shropshire-Air-Quality-and-Health.pdf

Electric charging infrastructure is considered by Planning staff to ensure that electric vehicle charging points are in place in new build developments with on and off-street parking.

Shropshire Council has adopted a new parking strategy which is focussed on a linear parking charge theme. This will make it more expensive to park in town centres (particularly those with AQMAs) and encourage parking on edge of town to stop traffic entering congested areas and parts of AQMAs which exceed national objective levels. This will be implemented in 2018. Further information can be found at: https://shropshire.gov.uk/roads-and-highways/roadworks-and-road-closures/large-scale-project-works/shrewsbury-integrated-transport-package-sitp/

Priorities for the year ahead

In the year ahead the main priorities will be:

1. Provide air quality comment on the Local Plan to help prioritise potential development sites and flag up where there may be concerns.
2. Implement the Parking Strategy throughout 2018/19 financial year
3. Commission work that will allow source apportionment to be carried out and trial impact of interventions.
4. Engage with the Shrewsbury Big Town Plan project being considered which will look at visions and aspirations for the town in future to ensure that air quality is considered.
5. Complete and submit business case for the North West Relief Road.

Challenges to the above will include providing the resources required to carry out works to move forward with source apportionment.

Local Engagement and How to get Involved

To reduce air pollution and contribute to clean air 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.

Table of Contents

List of Tables

1 Local Air Quality Management

This report provides an overview of air quality in Shropshire Council 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 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 compliance with 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. Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides a map of air quality monitoring locations in relation to the AQMA(s).

Two AQMAs were revoked in 2017/18 year. They were Shrewsbury No 1 AQMA centred in Bayston Hill to the south of Shrewsbury and Shrewsbury No 2 AQMA centred on a roundabout north of Shrewsbury Town Centre where Ditherington Road meets Whitchurch Road. Links to detailed assessments can be found at: https://www.shropshire.gov.uk/environmental-health/environmental-protection-and-prevention/air-quality/shropshire-council-air-quality-reports/

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 Published	Link
Shrewsbury AQMA No 3.	Declared 1/5/2003, Amended 1/3/2006	NO2 Annual Mean	Shrewsbury	An area covering the town centre of Shrewsbury mainly contained within the river Severn loop but extending out over English and Welsh bridge.	NO	86 (in 2006)	µg/m^3	54	µg/m^3	Shrewsbury Air Quality Action Plan	2008	https://www.shropshire.gov.uk/media/5218/shrewsbury-aqap-2008.pdf
Bridgnorth AQMA	Declared 1/4/2005	NO2 Annual Mean	Bridgnorth	An area encompassing a number of properties centred over the minim roundabout at the junction of Whitburn Street, Salop Street and Pound Street.	NO	54.1 (in 2010)	µg/m^3	44	µg/m^3	Bridgnorth Air Quality Action Plan	2008	https://www.shropshire.gov.uk/media/5215/bridgnorth-dc-action-plan-pdf.pdf
Shrewsbury No 1 AQMA	Declared 1/5/2003, Amended 1/3/2006 Revoked 15/02/2018	NO2 Annual Mean	Bayston Hill	An area encompassing a number of properties along the A49 corridor running through Bayston Hill, a village to the south of Shrewsbury	YES	43.7 (in 2010)	µg/m^3	33.5	µg/m^3 in 2016	Shrewsbury Air Quality Action Plan	2008	https://www.shropshire.gov.uk/media/5218/shrewsbury-aqap-2008.pdf

Shrewsbury No 2 AQMA	Declared 1/5/2003, Amended 1/3/2006 Revoked 15/02/2018	NO2 Annual Mean	Shrewsbury	An area encompassing a number of properties centred around Heathgates roundabout on the Whitchurch Road, Shrewsbury	No	38.2 (2010)	µg/m^3	30.8	µg/m^3 in 2016	Shrewsbury Air Quality Action Plan	2008	https://new.shropshire.gov.uk/media/5218/shrewsbury-aqap-2008.pdf

☒ **Shropshire 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 Shropshire Council

Defra's appraisal of last year's ASR concluded the AQAP is very limited containing only four measures, some of which are completed and that the Council should ensure that the AQAP is reviewed and updated as a matter of priority. It was noted that the Council does not make any reference to PM2.5 and the Public Health Outcomes Framework. Comments also noted maps were not considered clear and maps of non-continuous monitoring points should be included in the report, that diffusion tube data should be corrected for distance in all circumstances and annualization carried out where necessary. Each of these points has been considered and looked to have been addressed in this year's report.

Shropshire Council 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 below:

- Completion of works at English Bridge gyratory to improve traffic flows, extend 20mph to junction and add cycle lane provision as part of the Shrewsbury Integrated Transport Package (SITP). The core objectives of the SITP include a reduction in the volume of traffic flowing through the town centre, encouraging sustainable modes of transport by adding missing links to current pedestrian and cycle routes, improving road safety, enhancing the built environment and contributing to the economic growth of the town and improving air quality.The whole package is expected to be completed in 2020 at a cost of £12.1 million. To date work has been completed at the Meole Brace roundabout, Sutton roundabout and English Bridge Gyratory. Updates on work can be found at: https://shropshire.gov.uk/roads-and-highways/roadworks-and-road-closures/large-scale-project-works/shrewsbury-integrated-transport-package-sitp/

- Procurement of lower emission vehicles through programmed contract renewals e.g. Civil Enforcement Officer vehicles changed from Euro V diesel to Euro VI diesel.
- Pool cars of Euro VI standard including one hybrid procured to reduce mileage in staff vehicles. Hybrid car brought in to promote low emission vehicles by giving staff the potential to experience driving a hybrid vehicle.
- Parking Strategy was adopted allowing implementation 2018 when car users will be incentivised to use edge of town parking rather than town centre parking where they add to congestion and pollution.

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

- a decision to be given on the Shrewsbury North West Relief Road business case submitted to Central Government which is considered likely to have a significant impact on air quality and the capacity to carry out further actions,
- Review of the Hackney Carriage and Private Hire Vehicle Policy where vehicle emissions will be considered,
- Consider how to move forward with source apportionment work.
- Additional procurement of cleaner vehicles.
- Review of all development sites proposed in the County for the next Local Plan
- Implementation of the new Parking Strategy

Shropshire Council's priorities for the coming year are to research what monitoring work can be carried out through more innovative means which can feed into modelling to present air quality visually. The product will be a useful engagement tool for stakeholders, partners and public. It is expected that this work will provide source apportionment work to allow action planning to progress in the following year 2019-2020. It will include consideration of ANPR traffic counts to provide best available data on traffic splits to feed into source apportionment.

The principal challenges and barriers to implementation that Shropshire Council anticipates facing include finding the resources to carry out works to carry out air quality duties including source apportionment, action planning and in particular implementing interventions.

Progress on updating AQAPs has been slower than expected as consideration on how to carry out source apportionment to get more out of the process is being considered. Methods being considered provide anticipated additional benefits from source apportionment which will provide information for use more widely rather than specified use for future AQAP work alone.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Shropshire Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Shrewsbury No 3 AQMA and Bridgnorth AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure 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
1	Hackney Carriage and Private Hire Vehicle Policy	Promoting Low Emission Transport	Taxi Licensing conditions	Shropshire Council	Planning phase May-17 to May-18 Consultation phase June-18 to Dec-18	Apr-19	A new 5 year policy adopted promoting cleaner vehicles over the next 5 years	Reduced emissions from fleet as a whole/reduced vehicle average emissions	Planning / consultation stage	01/04/19	Due to vehicle improvements through the next 5 years as a result of better regulation of new vehicle emissions (conformity factor phased in approach) it is considered suitable to encourage the fleet to adopt cleaner vehicles. This will take time to allow the trade to adapt.
2	Shrewsbury Integrated Transport Programme (SITP): inclusion of cycle path	Transport Planning and Infrastructure.	Cycle network	Shropshire Council	2015/16	2017	NA	None specified. Part of ongoing work to encourage active transport.	Completed	2017	Cycle lane put in place to encourage active transport.
3	SITP: Improvements to flow around English Bridge gyratory and	Transport Planning and Infrastructure.	Other	Shropshire Council	2015/16	2017	NA	None specified. Improved flows anticipated reducing localised air pollution.	Completed	2017	Rework of lanes, resurfacing, repaving.
4	Shropshire Council Pool Car Scheme	Alternatives to private vehicle use	Car clubs	Shropshire Council	2016	2017/18	Uptake of vehicles	NA but general reductions in Council vehicle pollutants anticipated.	Completed	2017	5 Euro VI pool cars brought in through Enterprise. In addition one hybrid vehicle added to increase awareness of the technology and allow staff to experience them to promote low emission technology going forward.

5	Procuring Vehicles	Promoting Low Emission Transport	Company Vehicle Procurement – prioritising uptake of low emission vehicles.	Shropshire Council	2016	2017		Changes from Euro III and IV vehicles to Euro VI compliant vehicles in Regulatory Services	Completed		5 cars used by CEOs of Regulatory Services changed and Euro VI vehicles procured. Planned changes to 5 pest control vans in 2018.
6	Car Parking Strategy	Policy Guidance and Development Control	Workplace Parking Levy, Parking Enforcement on highway.	Shropshire Council	2016/2017	2018	Increased use of edge of town car parks	NA. A general reduction through looking to stop vehicles entering most polluted and congested areas.	Strategy adopted by Council. Implementation set to be phased in over 2018.	2018	The strategy adopts a linear parking tariff running from the centre of towns towards the periphery with prices starting high and getting progressively lower to encourage edge of town parking. Following adoption of the strategy some detraction from the strategy has been seen through individual TROs being brought into force
7	Inclusion of electric vehicle charging points in new developments	Promoting Low Emission Transport	Promoting Alternative Rfulling infrastructure to promote Low Emission Vehicles, EV recharging, Gas Recharging	Shropshire Council	2016/17	2017	Planning conditions on planning application decisions which include provisions for electric vehicle charging points in new developments	NA. General betterment predicted in future as new development equip for future electric vehicle provision.	Planning case officers directed to include electric vehicle charging provision when considering applications.	2017 onwards	No specific policy in place although NPPF directs consideration to this area. Consideration of specific policy going forward through the Local Plan Review.

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 $PM_{2.5}$:

- 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, less than 10 µg/m3 as an annual mean, 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.
- All actions noted in Table 2.2 that look to reduce congestion will in turn reduce brake pad and tyre ware reducing PM2.5 emissions in the area. Any initiatives that look to calm traffic are likely to have a similar impact.

In considering the need for additional actions relating to PM2.5 it is noted that the Public Health Outcomes Framework (PHOF) Indicator number 3.01 - Fraction of mortality attributable to particulate air pollution for Shropshire Council was noted to be 4% in 2016. This is the lowest for the whole of the West Midlands Region which has an average of 5.5%. The West Midlands region figure is slightly above the national average of 5.3%. As the Shropshire Council PHOF indicator concerned with PM2.5 shows that mortality due to PM2.5 is significantly below the national level and that for the West Midlands as a region it is not considered necessary for any specific

actions to be carried out while there are other interventions taking place which will contribute to reducing anthropogenic PM2.5 such as traffic calming and actions to reduce congestion.

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 at two 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 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 88 sites during 2017. Table A.2 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 and distance correction. Annualisation is strictly considered necessary for two locations where diffusion tubes were positioned where there is relevant exposure however as there is no likelihood of the national objective level being breeched at these locations, backed up by trend data, the resource required to annualise the data was not considered to be appropriate for a publicly funded body such as a Local Authority. 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. It should be noted that 2017 data presented has also been distance calculated however this is generally not the case for previous years as it was not done as a matter of course and instead only historically carried out when there was noted to be potential of an exceedance of the national objective level. This has had the effect of generally showing a reduction in 2017 compared to previous years as receptors are generally set further back from the kerbside than monitoring locations.

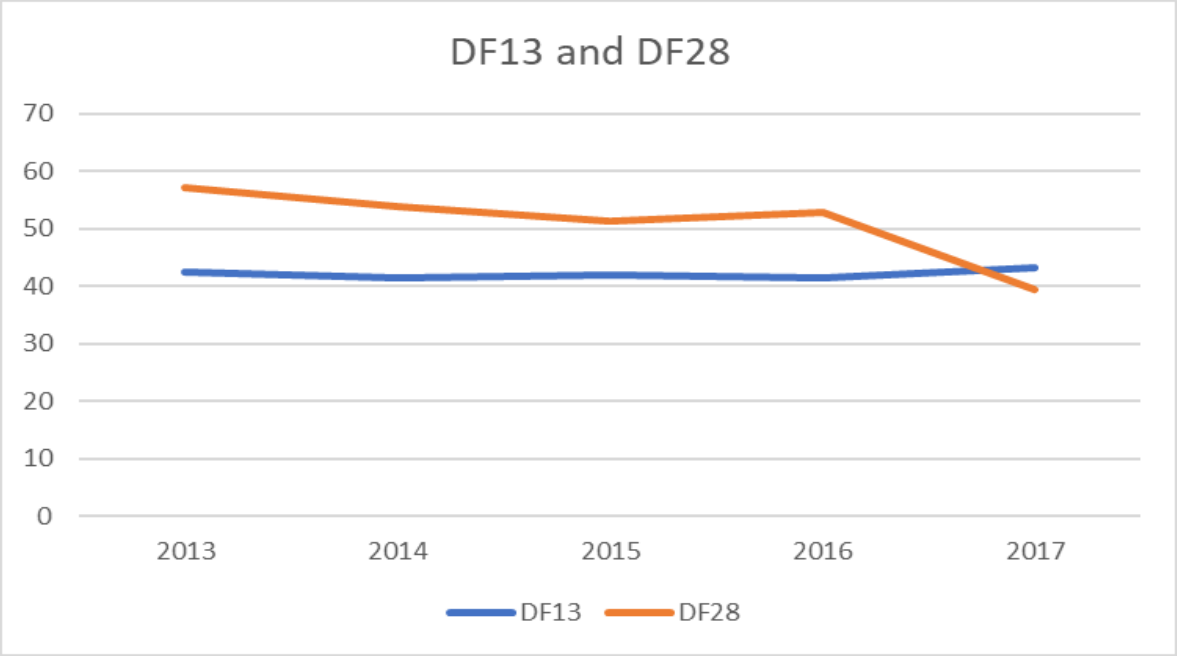
For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B. **Error! Reference source not found.** in Appendix A has remained blank as there has been no continuous monitoring carried out in 2017 for nitrogen dioxide.

No sites recorded an annual mean of above 60µg/m^3 suggesting that there are no exceedances of the 1-hour mean objective level for nitrogen dioxide. No continuous monitors for nitrogen dioxide exist to suggest otherwise and it is concluded that there are no exceedances on the 1-hour mean objective in the Shropshire Council Area.

Diffusion tube data found exceedance of the annual average national objective level of 40µg/m^3 at the following eight monitoring location reference points: DF13, DF28, DF71, DF223, DF438, DF458, DF474 and DF475. However once a fall of with distance calculation had been carried out DF28 fell below the national objective level. Each of the remaining 7 diffusion tube locations shall be discussed below.

<u>DF13 and DF71: Bridgnorth AQMA</u>

DF13 and DF71 are both found within the existing Bridgnorth AQMA. DF13 has been in situ for several years and a trend chart of the last 5 years data is presented below alongside another monitoring location, DF28, which has exceeded in the past.



The chart above suggests that at DF13 there has been a general stable trend over the past 5 years. At DF28 it is noted that there was a significant reduction in 2017. When considering the monthly diffusion tube data for DF28 it is noted this reduction is generally due to lower than normal levels being recorded in the months of September and October and it is not considered likely that this annual result will be replicated in future. Although there is a general downward trend at DF28 since 2013 however it may be seen next year that this downward trend is slowing.

DF71 is a new monitoring location put in place to gather additional information in the area. It highlights that there is an exceedance at this point which is slightly closer to the junction than DF13.

In conclusion the information presented finds the existing AQMA is still necessary due to exceedance of the annual mean nitrogen dioxide concentration.

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 at this point. The receptor has no openings in the brick façade facing the road and the monitoring point, 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 set back from the road and approximately 5m further away from the roundabout junction than the monitoring location. The window is considered the most appropriate place to specify relevant exposure as the rest of the façade has no openings as specified during the planning process. A distance calculation, shown below, has been used to estimate the NO_2 concentration at the window using distance calculation only.

BUREAU VERITAS

Enter data into the pink 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)?	6.01956	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	50.4	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	**41.0**	µg/m^3

The calculation above suggests that an annual average of 41.0 µg/m^3 is found when considering a distance of 3.4m to the relevant receptor. Last year a result of 42.5 µg/m^3 was recorded using the same methodology.

The above fall off with distance calculation uses an initial monitoring location result after bias adjustment using information 03/18 issue of the bias adjustment spreadsheet. This suggests a bias adjustment factor of 0.89 is necessary. However, when considering a more recent bias adjustment factor, 06/18 issue and 09/18 issue of the bias adjustment spreadsheet, the facotor has been revised to 0.87. If we consider this factor and recalculate we find the following:

Enter data into the pink cells

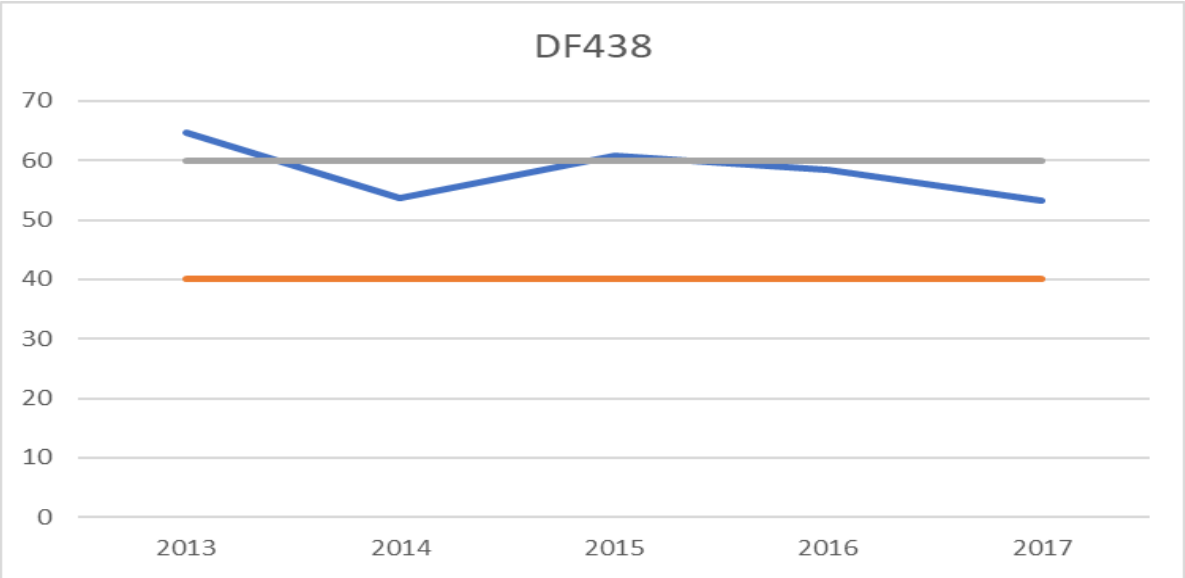
Step 1	How far from the KERB was your measurement made (in metres)?	1.25	metres
Step 2	How far from the KERB is your receptor (in metres)?	3.4	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	6.01956	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	49.329	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	**40.2**	µg/m^3

The calculation above finds there is a 0.2 µg/m^3 exceedance of the national objective level. This result does not take into consideration the fact that the relevant exposure point is 5 metres further away from the junction than the monitoring point. This suggests that in reality the concentration of nitrogen dioxide at the relevant exposure point will be less than expressed above as there will be less standing traffic here and in turn less acceleration at this point which is known to be the time when most emissions are created. In addition the window is found on the end of the property perpendicular to the road. At this point air contaminated with exhaust pollutants can mix with clener air coming in from away from the road source creating additional air movement and dispersion of pollutant in addition to increased dilution of pollutant in comparison to the area close to the monitoring point.

In conclusion it is noted that there is a slight exceedance of the national objective at a position 5m closer to a major junction than the nearest actual exposure. At the actual exposure point there is better air circulation potential. Both of these factors would be expected to reduce pollutant concentration from that monitored. As a result no likely exceedance is expected to occur at the relevant exposure point and no action is considered necessary. General reductions are anticipated over time as emissions in vehicle exhausts become cleaner with tightening standards. This location will be monitored moving forward and additional work carried out should it be considered necessary.

DF438 and DF458 Shrewsbury No 3 AQMA

These monitoring locations are both found within the Shrewsbury No 3 AQMA. Below is a chart showing the trend line for DF438 over the past 5 years against the 1-hour NO_2 national objective level of 60 µg/m^3 and the annual average national objective level for NO_2 which is set at 40 µg/m^3.



The above shows that there is a general downward trend over the past 5 years at DF458. The 1-hour national objective level (grey line) is no longer likely to be exceeded. The annual average national objective level (orange line) is still being exceeded. As a result the AQMA is still considered necessary.

DF458 has no relevant receptor for consideration. It represents a position considered to be the worst case scemnario for NO_2 concentraiton as it is underneath railway bridges close to a traffic light junction. With no relevant receptor present no further discussion is required for this location.

DF474: Bayston Hill

Over the past three years the distance corrected diffusion tube results for DF474 have been 33.6, 38.6 and 42.5 µg/m^3. The other four diffusion tubes in the Bayston Hill area have not exceed the national objective level with DF474 exceeding the objective level for the first time in its three year history suggests that monitoring

needs to continue. The three year trend is an increase in pollutant which goes against the national trend and trend more widely in Shropshire. This may be linked to increased HGV movements from the local quarry. This location will be monitored on an ongoing basis to consider if an AQMA is necessary and if so where its limits should extend. It should be noted that if the more recent bias adjustment spreadsheet is used (09/18 rather than 03/18) a slight reduction would be noted after fall off with distance calculation of 1µg/m^3. This suggests that an exceedance of 1.5 µg/m^3 occurred at this location in 2017 rather than the 2.5µg/m^3 exceedance stated above. This is within 5% of the national objective level.

3.2.2 Particulate Matter (PM_{10})

PM10 was not monitored in the Shropshire Council area in 2017 as no exceedance was considered likely to exist given historic monitoring data available in past reports.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.4 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years.

Only 3 years of monitoring have taken place and therefore trying to establishing a trend is not considered suitable. In 2017 annual average levels of 7.6 µg/m^3 and 7.66 µg/m^3 were found at CM3 and CM4 respectively. This shows that concentrations are well below 10 µg/m^3, the level which the World Health Organisation deem to be unacceptable. As a result it is considered that PM2.5 levels in the County are satisfactory.

3.2.4 Sulphur Dioxide (SO_2)

Shropshire Council does to find it necessary to monitor SO_2 having regard to TG(16).

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)
CM3	Mayfield Close	Urban background	351492	316619	PM2.5	NO	BAM	5	1	1.5
CM4	Chester Street	Roadside	349378	312938	PM2.5	YES	BAM	3	3	1.5

Notes:

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

(2) N/A if not applicable.

Table A.2 – 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)
DF5	Kidderminster Rd	Roadside	372145	292436	NO2	No	21.7m	1.9m	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
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
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
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
DF71	6 Pound Street	Roadside	371346	293086	NO5	Yes	1.4	1.1	No	Approx. 2m
DF127	Old Brick Cottage	Roadside	332314	288566	NO2	No	1m	1m	No	Approx. 2m
DF130	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
DF139	CM - Post Office	Roadside	367322	275713	NO2	No	3.5m	1.0m	No	Approx. 2m

DF141	Opp. Osborne Cottage	Roadside	367056	275715	NO2	No	1.3m	3.7m	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
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
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	363640	332232	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
DF305	74 Castle Street	Roadside	328978	329879	NO2	No	2.0m	1.9m	No	Approx. 2m
DF306	A483 (1)	Roadside	328922	325981	NO2	No	1.4m	1.4m	No	Approx. 2m
DF312	Pant Village Hall	Roadside	327584	322568	NO2	No	2.3m	1.85m	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

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
DF427	82/83 Frankwell	Roadside	348669	312957	NO2	Yes	5.0m	5.0m	No	Approx. 2m
DF429	6a Severn Steps	Roadside	349237	312900	NO2	Yes	1.6m	1.5m	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
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
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
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
DF470	13 Main Street	Roadside	347808	302929	NO2	No	1.7m	1.6m	No	Approx. 2m
DF472	Hem Cottage, Bayston Hill (lamp column)	Roadside	348750	309004	NO2	Yes	2.1m	1.9m	No	Approx. 2m
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	3.8m	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
DF480	Peking Aroma, Castle Foregates	Roadside	349466	313151	NO2	Yes	3.1m	2.6m	No	Approx. 2m
DF482	Royal mail Lamp Column By Traffic Lights	Roadside	349436	313064	NO2	Yes	NA	Approx. 1m	No	Approx. 2m
DF485	Frankwell terrace	Roadside	348815	312854	NO3	Yes	4m	2.6m	No	Approx. 2m

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.3 – 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 (µg/m^3) [3]				
					2013	2014	2015	2016	2017
DF5	Roadside	Diffusion Tube	100	100	30.7	27.5	27.9	26.8	15.7
DF10	Roadside	Diffusion Tube	100	100	27.8	26.4	23.4	24.1	21.2
DF13	Roadside	Diffusion Tube	100	100	**42.5**	**41.4**	**41.9**	**41.5**	**43.2**
DF14	Roadside	Diffusion Tube	100	100	22.6	20.7	17.9	19.6	17.3
DF16	Roadside	Diffusion Tube	100	92	36.9	34.3	34.7	30.5	28
DF18	Roadside	Diffusion Tube	100	100	26.7	27.8	26.1	25.4	18.3
DF19	Roadside	Diffusion Tube	100	100	35.4	31.7	32.3	30.8	26.2
DF20	Roadside	Diffusion Tube	100	100	26.1	24.3	21.3	22.9	31.8
DF25	Roadside	Diffusion Tube	100	100	29.9	29	28	27.8	29.9
DF27	Roadside	Diffusion Tube	100	100	30.4	28.4	26.5	27.8	28.2
DF28	Roadside	Diffusion Tube	100	100	**57.2**	**53.8**	**51.2**	**52.9**	39.5
DF29	Roadside	Diffusion Tube	100	100	29.4	33	29	29.7	27.8
DF50	Roadside	Diffusion Tube	100	75	35.5	33.2	32.1	32.5	27
DF58	Roadside	Diffusion Tube	100	100	**40.5**	38	37.4	35.8	34.2

DF59	Roadside	Diffusion Tube	100	100	32.6	33.8	32.1	33	32.2
DF61	Roadside	Diffusion Tube	100	100	36.5	30.6	31.6	30.4	29.7
DF62	Roadside	Diffusion Tube	100	100	**43.4**	**40.6**	39.7	39.1	37.2
DF63	Roadside	Diffusion Tube	100	67	34.1	31.2	31.6	31.7	34.7
DF65	Roadside	Diffusion Tube	100	100	38.6	35.6	36.2	34.7	34.2
DF66	Roadside	Diffusion Tube	100	100	34.2	33.8	32.8	30.9	25.6
DF67	Roadside	Diffusion Tube	100	100	**40.6**	39.7	38.7	36.2	34.6
DF69	Roadside	Diffusion Tube	100	100	22.9	23	21.9	22.3	16.6
DF71	Roadside	Diffusion Tube	100	75	**-**	**-**	**-**	**-**	**56.0**
DF127	Roadside	Diffusion Tube	100	83	14.5	12.9	13.3	14.4	13.3
DF130	Roadside	Diffusion Tube	100	100	36.5	32.1	30.2	29.4	28.9
DF135	Roadside	Diffusion Tube	100	100	15	12.3	12	13.6	12.1
DF138	Roadside	Diffusion Tube	100	100	25.1	24.1	23	22.4	21.5
DF139	Roadside	Diffusion Tube	100	100	32.5	31.6	29.1	30.5	22.5
DF141	Roadside	Diffusion Tube	100	92	24.9	27.2	20.2	23.5	26.9
DF205	Roadside	Diffusion Tube	100	100	22.7	20.7	17.9	20.2	17.6
DF207	Roadside	Diffusion Tube	100	92	27.3	26.1	24.3	25.8	22.7
DF211	Roadside	Diffusion Tube	100	100	33.1	30.7	33	32.2	19.3

DF216	Roadside	Diffusion Tube	100	100	31.4	26.8	28.9	28.5	27.5
DF217	Roadside	Diffusion Tube	100	100	38.4	34.1	35.7	34.4	21.8
DF218	Roadside	Diffusion Tube	100	83	29.7	26.7	29.3	26.6	27.4
DF219	Roadside	Diffusion Tube	100	100	20.6	19.4	19.9	20.8	18.4
DF220	Roadside	Diffusion Tube	100	100	29.9	26.9	26.2	26.2	24.6
DF223	Roadside	Diffusion Tube	100	100	**-**	**51**	**50.3**	**42.5**	**41**
DF224	Roadside	Diffusion Tube	100	100	-	21.6	21.2	21.5	19.8
DF305	Roadside	Diffusion Tube	100	83	24.7	29.1	27.6	27.8	28
DF306	Roadside	Diffusion Tube	100	100	33.4	33.1	32.3	34.2	31.3
DF312	Roadside	Diffusion Tube	100	83	28.1	27.2	25.4	27.2	22.7
DF400	Roadside	Diffusion Tube	100	92	33.3	33.4	27.4	32	34
DF401	Roadside	Diffusion Tube	100	92	22.8	22.4	18.7	21.4	14.2
DF403	Roadside	Diffusion Tube	100	92	33.9	33.7	31.7	31	29.3
DF404	Roadside	Diffusion Tube	100	83	22.5	18.3	16.9	18.1	15.4
DF405	Roadside	Diffusion Tube	100	92	20.7	20.1	18.1	18.9	21.3
DF407	Roadside	Diffusion Tube	100	92	30.3	28	27.5	27.4	24.8
DF411	Roadside	Diffusion Tube	100	100	30.4	29.4	26.8	27.4	25.3
DF412	Roadside	Diffusion Tube	100	67	34.1	32	30.2	30.8	25.1

DF413	Roadside	Diffusion Tube	100	100	35.1	34.8	31.8	31.7	24.3
DF417	Roadside	Diffusion Tube	100	100	27.5	26.3	25.5	31.1	14.6
DF419	Roadside	Diffusion Tube	100	100	31.5	27.5	28	27.8	23.3
DF420	Roadside	Diffusion Tube	100	92	33.9	30.3	29.1	29.2	26.7
DF423	Roadside	Diffusion Tube	100	100	29	25.9	24.2	26.7	26.2
DF427	Roadside	Diffusion Tube	100	100	27.9	27.2	28	27.4	26.4
DF429	Roadside	Diffusion Tube	100	100	29.6	31.4	27.5	28.2	27.9
DF436	Roadside	Diffusion Tube	100	100	39.1	38.5	36.1	36.4	35.4
DF437	Roadside	Diffusion Tube	100	100	**42.7**	38.4	37.3	37.6	34.8
DF438	Roadside	Diffusion Tube	100	92	**64.6**	**53.6**	**60.8**	**58.5**	**53.3**
DF439	Roadside	Diffusion Tube	100	100	14.8	14.5	11.6	13.2	11.6
DF443	Roadside	Diffusion Tube	100	100	26.2	22.8	23.2	26.1	19.4
DF446	Roadside	Diffusion Tube	100	100	34.3	32.6	30.1	31.7	29.1
DF447	Roadside	Diffusion Tube	100	100	38.2	34.9	35.3	34.7	35.3
DF448	Roadside	Diffusion Tube	100	100	11	11.1	10.4	10.3	9.0
DF449	Roadside	Diffusion Tube	100	100	22.8	20.3	22.5	20.7	14
DF452	Roadside	Diffusion Tube	100	100	34.4	29.5	27.3	25.3	22.8
DF453	Roadside	Diffusion Tube	100	100	23.9	20.3	20.8	22.6	17.1

DF455	Roadside	Diffusion Tube	100	100	22.9	21.5	20.2	21.4	17.4
DF456	Roadside	Diffusion Tube	100	100	**41.2**	37.9	**42.2**	**41**	32.3
DF457	Roadside	Diffusion Tube	100	100	**41.4**	37	37.3	38.5	36.2
DF458	Roadside	Diffusion Tube	100	100	-	**57.4**	**52.4**	**53.9**	**53.6**
DF459	Roadside	Diffusion Tube	100	100	-	34.9	35.9	37.4	38.6
DF460	Roadside	Diffusion Tube	100	100	-	27.2	25.3	26.4	26.4
DF461	Roadside	Diffusion Tube	100	100	-	32.2	32.7	31.7	27.2
DF462	Roadside	Diffusion Tube	100	100	-	21.8	20.5	21.5	20.5
DF463	Roadside	Diffusion Tube	100	100	-	19.7	16.1	15.2	14.2
DF464	Roadside	Diffusion Tube	100	100	-	20.6	18.9	17.3	17.1
DF468	Roadside	Diffusion Tube	100	100	-	-	22	23	20.6
DF470	Roadside	Diffusion Tube	100	100	-	-	37.1	34.9	29.6
DF472	Roadside	Diffusion Tube	100	100	-	-	33.4	23.4	19.2
DF474	Roadside	Diffusion Tube	100	100	-	-	33.6	38.2	**42.5**
DF475	Roadside	Diffusion Tube	100	92	-	-	33.5	33.9	37.0
DF476	Roadside	Diffusion Tube	100	83	-	-	28.7	30.6	30.3
DF477	Roadside	Diffusion Tube	100	100	-	-	31	31.2	31.2
DF480	Roadside	Diffusion Tube	100	92	-	-	33	34.2	31.7

DF482	Roadside	Diffusion Tube	100	92	-	-	-	-	31.6
DF485	Roadside	Diffusion Tube	100	100	-	-	-	-	26.2

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

☐ **Annualisation has been conducted where data capture is <75% No: please see explanation below.**

- **Annualisation is required for reference points DF63 and DF412. Having considered the historic trends for each location it is noted that there is no likelihood of an exceedance at these locations with results in 2016 being 31.7 for DF63 and 30.8 for DF412. It is not considered to be worth the resource annualising this data as it will not result in any action being required as it is not likely that there is any exceedance of the National Objective Levels at these locations. As a result, annualization has not been carried out. This point is reiterated in Appendix C.**

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. Means have not 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.

Table A.4 – $PM_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	$PM_{2.5}$ Annual Mean Concentration ($\mu g/m^3$) (3)				
				2013	2014	2015	2016	2017
CM3	Urban Background	100	91%	-	-	7.68(3)	9.3	7.51
CM4	Roadside	100	91%	-	-	7.19	8.11	7.52

☐ **Annualisation has been conducted where data capture is <75%. This has not been carried out. See Appendix C for details.**

Notes:

(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 Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details

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 ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.89 and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DF5	37.08	33.04	28.68	29.51	23.57	24.16	23.38	24.83	27.99	25.53	31.56	24.62	27.8	24.7	15.7
DF10	38.99	31.6	28.72	21.59	22.61	20.48	19.31	17.21	23.21	23.05	30.59	23.14	25.0	22.2	21.2
DF13	49.58	58.66	56.89	50.8	40.81	40.29	45.23	42.84	51.22	53.28	58.3	46.2	49.5	**44.0**	**43.2**
DF14	32.6	23.82	21.63	16.78	19.65	14.73	15.23	14.24	18.4	19.01	24.69	21.35	20.1	17.9	17.3
DF16	40.13	39.75	36.99	34.51	31.57	29.4	27.15	26.58	34.49	33.84	39.96		34.0	30.2	28.0
DF18	37.73	30.71	30.17	27.43	22.89	22.42	21.26	22.58	26.86	25.01	32.05	27.05	27.1	24.1	18.3
DF19	49.7	35.64	40.46	33.17	25.32	34.23	27.96	29.04	35.5	34	41.52	31.83	34.8	31.0	26.2
DF20	35.04	31.83	26.86	19.01	20.98	18.55	18.47	17.44	54.85	54.41	69.13	62.53	35.7	31.8	N/A
DF25	47.25	43.05	33.94	31.56	31.5	28.7	28.57	26.8	33.29	33.9	41.19	27.74	33.9	30.2	29.9
DF27	46.35	38.04	35.05	25.65	29.48	26.41	25.66	23.04	28.08	31.76	36.49	32.25	31.5	28.0	28.2
DF28	67.29	69.35	60.94	57.24	52.16	42.51	48.3	42.25	19.28	21.74	30.05	32.67	45.3	**40.3**	39.5
DF29	47.45	38.23	33.14	31.01	32.47	28.09	26.64	26.88	32.44	33.91	37.84	29.13	33.1	29.4	27.8
DF50	47	43.25	39.12	34.02	32.36	34.33	30.46	25.88	34.62				35.6	31.7	27.0
DF58	45.57	41.51	42.14	37.2	37.52	34.55	36.06	32.96	39.38	39.77	42.32	32.49	38.4	34.2	34.2
DF59	47.24	44.49	40.83	29.84	31.07	30.74	31.39	28.76	35.96	36.25	43.64	34.87	36.2	32.2	32.2
DF61	46.79	35.45	35.15	33.94	26.56	30.52	26.22	28.04	31.26	31.32	40.72	35.2	33.4	29.7	29.7

DF62	55.16	44.14	44.64	40.55	32.65	42.21	34.66	34.01	42.07	42	49.51	40.11	41.8	37.2	37.2
DF63	47.31	40.91	39.27	30.05					34.47	37.84	40.41	41.88	39.0	34.7	34.7
DF65	47.7	37.95	40.59	44.06	30.73	39.44	35.36	31.7	37.13	35.61	45.37	35.7	38.4	34.2	34.2
DF66	40.77	40.62	35.8	28.77	29.13	34.88	32.07	29.34	34.27	36.37	41.65	29.48	34.4	30.6	25.6
DF67	49.76	43	38.84	42.42	33.9	30.11	32.77	30.7	34.25	33.85	46.12	37.13	37.7	33.5	34.6
DF69	36.72	30.38	26.19	22.63	20.47	22.32	21.67	19.14	24.97	25.31	32.13	23.78	25.4	22.6	16.6
DF71	88.39	75.41	66.35	71.84	60.19	56.59	56.87	60.34	55.64				65.7	**58.5**	**56.0**
DF127	20.5		15.88	15.39	11.55	15.49	11.61	11.82	13.35	13.07	21.04		14.9	13.3	13.3
DF130	45.23	37.41	35.34	34.44	33.35	31.45	27.09	24.45	29.6	31.5	40.12	30.16	33.3	29.6	28.9
DF135	21.85	14.06	14.85	13.85	13.93	13.86	9.96	8.5	10.58	10.78	15.54	15.44	13.6	12.1	12.1
DF138	37.58	31.94	29.42	20.48	19.59	23.93	20.9	19.99	24.85	24.53	31.48	26.2	25.9	23.0	21.5
DF139	42.23	36.7	35.73	31.02	29.26	23.82	26.04	25.43	27.31	33.58	34.51	31.34	31.4	27.9	22.5
DF141	36.95	29.47	28.68	21.72	20.89	22.76	20.56	20.16	23.63	23.25	28.95		25.1	22.4	26.9
DF205	34.28	24.46	21.26	20.94	16.09	20.19	17.98	17.19	20.36	17.93	27.41	23.15	21.7	19.3	17.6
DF207	43	30.62	30.71	27.94		29.64	24.6	23.43	25.46	27.06	29.38	30.83	29.3	26.1	22.7
DF211	46.96	29.86	34.46	46	29.17	30.92	29.89	40.63	33.41	26.89	38.92	32.97	35.0	31.1	19.3
DF216	41.3	31.48	31.15	34.67	25.09	29.79	29.34	23.03	27.14	28.31	37.84	34.61	31.1	27.7	27.5
DF217	36.53	32.01	26.89	19.08	21.4	19.69	20.42	18.67	25.3	22.05	28.99	31.17	25.1	22.4	21.8
DF218	42.46	31.89	35.25	37.17	26.74	27.99	27.29	23.32	31.8		38.78		32.2	28.7	27.4
DF219	34.09	23.46	20.67	23.48	17.86	19.8	17.74	16.1	21.11	19.77	28.76	29.01	22.6	20.1	18.4
DF220	42.79	29.62	30.23	29.76	25.24	24.57	24	20.45	28.23	24.78	33.29	23.89	28.0	24.9	24.6
DF223	75.58	69.61	59.02	54.63	48.12	57.87	48.05	44.72	52.19	48.96	59.65	62.42	56.7	**50.4**	**41.0**
DF224	29.91	23.62	25.22	20.49	22.05	22.16	20.05	21.3	19.84	20.28	18.8	23.99	22.3	19.8	19.8
DF305	36.58	33.9	32.94	31.52	26.19		24.09			31.69	40.57	29.17	31.8	28.3	28.0
DF306	38.75	35.08	35.24	41.03	33.67	30.11	31.61	29.41	26.3	47.55	41.5	32.03	35.1	31.3	31.3
DF312	34	26.34	23.71	25.9	25.01	21.35	29.49	25.89	24.53	29.3			26.5	23.6	22.7
DF400	39.62	38.76	45.57		35.52	34.93	30.78	29.7	61.56	36.72	39.31	28.79	38.2	34.0	34.0

DF401	30.23	24.08	21.65		19.48	17.62	17.87	16.47	17.67	17.39	27.78	18.88	20.8	18.5	14.2
DF403	41.82	34.29	33.02	31.84	26.7	31.65	31.58	29.05	33.51	31.78	37.92		33.0	29.3	29.3
DF404	28.23	20.57	17.41	16.59	14.45	13.87		13.85	16.93	16	20.09		17.7	15.8	15.4
DF405	35.57	23.88	22.9	19.23	15.87	18.67	15.55		19.16	22.03	27.64	23.48	22.1	19.7	21.3
DF407	39.28	32.06	30.51	29.77	25.03		22.68	22.39	22.91	24.14	35.39	23.56	27.9	24.8	24.8
DF411	34.95	28.88	27.72	30.07	24.54	28.41	25.91	26.01	31.3	26.96	34.33	22.78	28.4	25.3	25.3
DF412	45.25					34.95	28.81	26.65	31.16	33.29	38.99	32.07	33.8	30.1	25.1
DF413	43.28	37.77	38.53	32.98	28.17	33.92	26.71	28.14	21.4	30.62	36.14	28.12	32.1	28.6	24.3
DF417	36.83	33.46	33.78	22.13	33.22	25.19	23.62	21.92	23.27	28.22	29.49	22.96	27.8	24.7	14.6
DF419	39.18	30.95	32.68	28.6	31.18	31.68	29.24	20.83	25.5	24.07	33.73	29.38	29.7	26.4	23.3
DF420	41.53	33.27	33.91	32.74	27.93	31.28	25.86	22.83	27.35		39.86	30.65	31.5	28.0	26.7
DF423	41	35.83	27.91	26.23	23.65	30.62	26.23	24.23	27.61	25.14	37.46	27.31	29.4	26.1	26.2
DF427	36.42	29.67	32.15	34.79	23.73	27.87	28.3	25.22	30.11	25.57	37.59	25.05	29.7	26.4	26.4
DF429	45.93	39.14	36.78	23.77	26.89	29.49	22.4	22.59	25.31	31.94	39.5	37.3	31.7	28.2	27.9
DF436	49.79	45.35	42.08	40.45	35.87	43.44	34.29	29.72	38.32	37.71	41.67	39.56	39.8	35.4	35.4
DF437	45.85	44.4	34.02	37.95	35.03	40.85	34.91	32.73	38	40.97	47.74	37.99	39.2	34.8	34.8
DF438	63.24	68.59	51.02	60.5		74.82	51	54.38	49.67	53.29	72.8	68.49	60.7	**54.0**	**53.3**
DF439	25.45	14.51	13.55	11.37	10.16	11.18	9.82	8.9	11.59	11.3	15.78	13.28	13.0	11.6	11.6
DF443	39.29	28.6	25.02	23.63	17.83	23.29	15.93	17.23	21.86	22.24	35.07	31.85	25.1	22.3	19.4
DF446	43.56	39.9	36.66	33.63	28.95	33.02	28.06	27.92	32.09	34.22	44.2	36.14	34.8	31.0	29.1
DF447	44.13	47.77	41.33	41.55	36.41	42.89	35.23	34.99	34.66	36.3	45.05	36.63	39.7	35.3	N/A
DF448	18.74	13.02	11.03	7.33	7.67	6.71	6.92	7.29	7.77	10.81	13	11.26	10.1	9.0	9.0
DF449	30.26	22.62	22.72	23.49	20.62	18.59	15.95	15.68	17.4	20.31	36.88	30.93	22.9	20.4	12.7
DF452	28.04	26.1	26.08	23.82	23.25	24.97	23.01	21.77	25.25	27.56	32.92	24.96	25.6	22.8	N/A
DF453	32.92	25.78	24.89	22.07	19.43	18.77	18.97	19.27	23.14	23.09	32.25	28.08	24.0	21.4	17.1
DF455	36.88	25.78	24.36	16.72	20.2	19.51	16.21	16.43	22.01	19.6	24.06	19.48	21.7	19.3	17.4
DF456	48.8	54.67	46.29	49.47	38.88	41.26	37.31	39.76	42.37	42.56	56.73	45.08	45.2	**40.2**	32.3

DF457	44.71	41.55	37.54	40.1	34.42	41.6	39.98	34.41	38.8	41.14	63.78	41.36	41.6	37.0	36.2
DF458	77.44	67.57	55.04	54.81	56.28	55.31	56.32	55.85	56.58	58.97	70.66	59.21	60.3	**53.6**	N/A
DF459	52.13	51.62	42.32	43.34	41.43	37.06	36.98	34.89	39.02	39.84	55.43	47.34	43.4	38.6	N/A
DF460	43.26	31.64	31.45	29.97	23.17	27.41	24.57	25.51	27.54	26.79	37.55	30.2	29.9	26.6	26.4
DF461	38.81	38.97	34.18	38.55	33.2	35.94	30.68	26.6	28.72	29.17	39.51	37.87	34.3	30.5	27.2
DF462	31.7	25.34	21.96	22.91	19.36	21.17	20.26	19.91	21.15	23.34	30.28	20.15	23.1	20.5	N/A
DF463	23.29	17.25	15.05	13.35	13.26	13.51	12.02	12.18	14.8	16.44	22.2	18.38	15.9	14.2	N/A
DF464	29.19	25.45	20.9	14	18.42	16.17	15.93	15.19	16.98	18.9	20.42	20.17	19.3	17.1	N/A
DF468	36.67	25.78	26.01	17.99	20.86	20.35	18.6	18.65	21.99	21.86	28.08	22.05	23.2	20.6	20.6
DF470	48.15	30.17	36.72	42.87	32.92	35.2	26.39	27.85	28.05	26.22	41.68	27.83	33.6	29.9	29.6
DF472	25.05	28.2	24.42	15.42	22.85	19.78	16.32	17.05	32.65	20.51	19.88	21.94	22.0	19.5	19.2
DF474	88.94	53.56	56.65	44.68	35.66	50.36	42.12	44.88	46.01	51.67	57.29	53.22	52.0	**46.3**	**42.5**
DF475	54.01	44.12	34.08	37.61	43.92		59.28	42.62	15.26	56.09	82.99	71.76	49.2	**43.8**	37.0
DF476	43.54		34.82	33.34	27.84	34.55	32.31	32.17	32.51	35.51	44.9		35.1	31.2	30.3
DF477	46.75	38.34	35.74	32.16	30.35	37.97	32.08	37.25	33.82	40.83	50.67	36.28	37.6	33.5	31.2
DF480	52.01	34.4	42.36	30.13		33.36	35.76	30.49	34.99	35.54	41.47	34.78	36.8	32.7	31.7
DF482	34.75	29.11	55.79	43.17	46.14	44.15	18.61	19.59	21.58	22.31	56.56		35.6	31.6	N/A
DF485	41.08	34.34	33.15	38.91	30.22	27.54	27	27.47	28.75	26.97	40.03	27.7	31.9	28.4	26.2

☐ **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

Poultry Farm PM10 discussion.
As noted in Appendix C of Shropshire Council's 2017 ASR two poultry farms required detailed assessment of PM10 due to these farms being found not to screen out using the TG16 Box 7.2 criteria. A detailed modelling exercise was commissioned and produced by Bureau Veritas. The report, Wytherford House and New House Poultry Farms PM10 Dispersion Modelling Report dated 2017 and the subsequent Update to Shropshire Poultry Farm Modelling, concluded that the annual mean PM10 national objective is not likely to be exceeded at either farm. However, the 24-hour mean national objective of 50µg/m^3 may be exceeded at both sites. At Wytherford House Farm it was modelled that the 90.41 percentile 24-hour mean could be as high as 81.2µg/m^3 while at New House Farm it could be 51.92µg/m^3.

Discussions were held with the poultry farm operator and monitoring was carried out for a period of 2 months by the poultry operator with Shropshire Council scrutinising the detail and discussing the data collection as it went along. The monitoring was carried out at Wytherford House Farm only due to cost implications of monitoring. Bureau Veritas were provided with the data to verify the model previously carried out. A subsequent report was provided by Bureau Veritas providing an updated view on PM10 levels based on modelling with the addition of monitored data making the model more robust than previous models. The report, named Wytherford Farm PM10 Monitoring dated May 2018, concluded that despite the uncertainty with the data, the study can provide general conclusions with regards to the modelled concentrations in comparison to the monitored values. The monitored data indicates that the modelled results are over estimating the impact derived from the poultry sheds as concentrations were significantly higher despite Building 3 housing 20,500 more pullets than estimated in the modelling assessment. With regards to the 90.41 percentile of the 24-hour mean, assuming all monitoring data is included; the PM_{10} concentration is below the AQS objective.

The uncertainties mentioned were namely the short-term monitoring period, low data capture rate and a non-industry recognised consultant carrying out the monitoring. In relation to the monitoring period resources prohibited additional monitoring work being carried out. The low data capture was unfortunate but may have been in part due to the extremely cold weather conditions that were noted with snowfall over at least a week of the data capture period. Although it could be argued that snow cover would reduce PM10 levels by dampening down natural sources it should be noted that there was considerable burning of solid fuel at the residential property at which the monitor was located at and peaks coincided with the solid fuel appliance being used. In addition, there was vegetation cut back and burning in the vicinity increasing PM10 levels. In respect to the point of a non-industry recognised consultant carrying out the monitoring the device was set up by the company who rented out the equipment. The monitor used was a recognised piece of equipment clarified as suitable by Bureau Veritas through dialogue and the location it was installed and results recorded were considered by Shropshire Council prior to sending on to Bureau Veritas for consideration. The report discusses the equipment used in more detail but states that the DustTrak monitor used has achieved Environment Agency MCERTS performance standard for indicative ambient particulate monitoring.

The May 2018 Bureau Veritas report noted that the 90.41 percentile of 24-hour mean results for the year, when taking into account the monitored data collected, was likely to be in the region of 46.5 µg/m^3 using all of the data available. This result is significantly reduced to 29.1 µg/m3 if the data set has some specific events considered to be linked to solid fuel burning in the area removed from the data.

As noted above the information from this detailed assessment suggests that there is no exceedance of any PM10 national objective at Wytherford House Farm. The initial model for this site predicted a 90.41 percentile 24-hour mean of 81.2 µg/m^3. Once adjusting for monitored data this fell to a predicted 46.5 µg/m^3. This is a reduction of PM10 levels of 46% from the initial modelled result to the adjusted modelled result.

Taking this into consideration and applying this to New House Farm this would suggest that the 90.41 percentile 24-hour mean at New House Farm is well below the national objective level of 50 µg/m^3. When applying the same reduction noted at Wytherford House Farm the 90.41 percentile 24-hour

mean would be in the region of 28 µg/m^3 at New House Farm. It should be noted that the same operator runs both sites and operates them in a very similar way. It is therefore considered reasonable to assume that a reduction between the initial modelled results for New House Farm would be reduced considerably based on the findings above. As only a 4% reduction would be required at New House Farm to bring levels under the national objective level and it was found at Wytherford House Farm that more than a 40% reduction was likely based on the monitoring data gathered it can be safely assumed that the national objective levels at New House Farm is not likely to be exceeded.

It is therefore concluded that at both poultry sites assessed there is no exceedance of any PM10 national objective level. Both Bureau Veritas reports will be submitted separately to DEFRA for consideration. And for added clarity and detail.

Diffusion Tubes QA/QC and bias adjustment choice.
As there are no locally running NO_2 continuous monitors in Shropshire the option to provide a locally derived bias adjustment for diffusion tubes is not available. As the diffusion tubes are spread over a wide range of settings it was considered inappropriate to try and use data from any other individual continuous monitor to produce a bias adjustment factor. No adjustment for tube chemistry has taken place.

Shropshire Council uses diffusion tubes from Gradko International Ltd. They are analysed with a 20% TEA in water method. The bias adjustment factor used was that found in the Diffusion Tube Bias Adjustment Factors 03/18 Issue of the Spreadsheet. The factor used was 0.89. It is noted that further renditions of the bias adjustment for Gradko 20%TEA in water method refined the bias adjustment factor from 0.89 to 0.87. As the data has had many additional calculations carried out (distance calculations) it has not been considered appropriate to recalculate 88 results for a minor, 2%, additional reduction.

The Gradko 20% TEA in water precision results for 2017 found that there was good precision on 100% of occasions. For confirmation visit:
https://laqm.defra.gov.uk/assets/tubeprecision2017version0918finalreduced.pdf.
As a result it is considered that the QA/QC element for these monitors is satisfied.

Diffusion tube fall off with distance calculation discussion.
Fall off with distance calculations have been carried out, where applicable, for every diffusion tube location with results reported in tables of this report. The calculations were carried out using the NO_2 Fall-Off with Distance Calculator (Version 4.2) available on the LAQM webpages. The following diffusion tube location results exceeded the NO_2 annual average national objective level of 40µg/m^3: DF13, DF28, DF71, DF223, DF438, DF456, DF458, and DF474. The specific fall off with distance calculations for these tubes is given below for reference with a discussion of the locations found in the main body of the report:

DF13 drop off with distance calculation

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	0.8	metres
Step 2	How far from the KERB is your receptor (in metres)?	0.9	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	7.101839	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	44	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	**43.2**	µg/m^3

DF28 drop off with distance calculation

Enter data into the pink 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)?	1.9	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	7.101839	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	40.3	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	*39.5*	µg/m^3

DF71 drop off with distance calculation

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.1	metres
Step 2	How far from the KERB is your receptor (in metres)?	1.4	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	7.101839	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	58.5	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	**56.0**	µg/m^3

DF223 drop off with distance calculation

Enter data into the pink 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)?	6.01956	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	50.4	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	**41.0**	µg/m^3

DF438 drop off with distance calculation

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.2	metres
Step 2	How far from the KERB is your receptor (in metres)?	1.3	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	9.904545	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	54	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	**53.3**	µg/m^3

DF456 drop off with distance calculation

Enter data into the pink 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)?	8.964738	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	40.2	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	32.3	µg/m^3

DF458 drop off with distance calculation

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	2	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	8.964738	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	53.6	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	**53.6**	µg/m^3

DF474 drop off with distance calculation

Enter data into the pink 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)?	6.413502	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	46.3	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	**42.5**	µg/m^3

Diffusion tube annualisation discussion.
Annualisation has not been carried out on the two diffusion tubes with less than 75% data capture. Section 7.124 of TG(16) states, DF63 and DF412 were the only locations with less than 75% data capture. It was considered unnecessary to annualise the data from these points as it is not considered likely that there will be any exceedance of the national objective levels. This view is substantiated giving note to the monthly results captured at these locations and past annual mean results recorded. It is not considered appropriate to spend resources on annualisation when there is no likelihood of any national objective level exceedance despite direction to do so in TG(16).

PM2.5 BAM
Serviced every 6 months by Environtechnology Ltd who supplied and commissioned the monitors. Checks are carried out to ISO17025:2005 standard and include any maintenance of equipment and replacement of consumables. Shropshire Council attended the sites periodically, at least monthly, to check on the equipment and enclosure to ensure proper working order. Shropshire Council staff carried out tape changes when necessary and ensured after each site visit that a self-test was carried out and the parameters found were satisfactory. No major faults/equipment overhaul was necessary during the monitoring period.

As noted in TG16 The Met One PM2.5 Smart Heated BAM 1020, those employed by Shropshire Council, can be used by local authorities without the need for correction for slope and/or intercept and therefore no alterations to the results have been made in line with this statement.

24-hour averages were generated in line with section 7.161 of TG16. A daily average was only considered valid should at least 75% of the data points be considered to be reliable. Shropshire Council staff reviewed all data points and removed any that were duplicates or had negative values. Negative values were likely to be a result of values close to zero being present in reality but due to equipment read out being recorded as negative. As a result of this practice it is likely that the results given are conservative and actual levels are likely to be less than those reported.

The data capture for the year was calculated in line with TG16section 7.162 and found to be 91% in the case of both CM3 and CM4 although the data capture varied slightly with 33 days found not to contain 75% or more data in the case of CM4 and 34 days in the case of CM3.

The annual average was the mean average of the valid 24-hour average data for the calendar year in line with TG16 section 7.163. This consisted of a mean average of 331 24-hours periods for CM3 and 332 24-hour periods for CM4.

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

Figure 1: Map of Shrewsbury AQMA No 3.

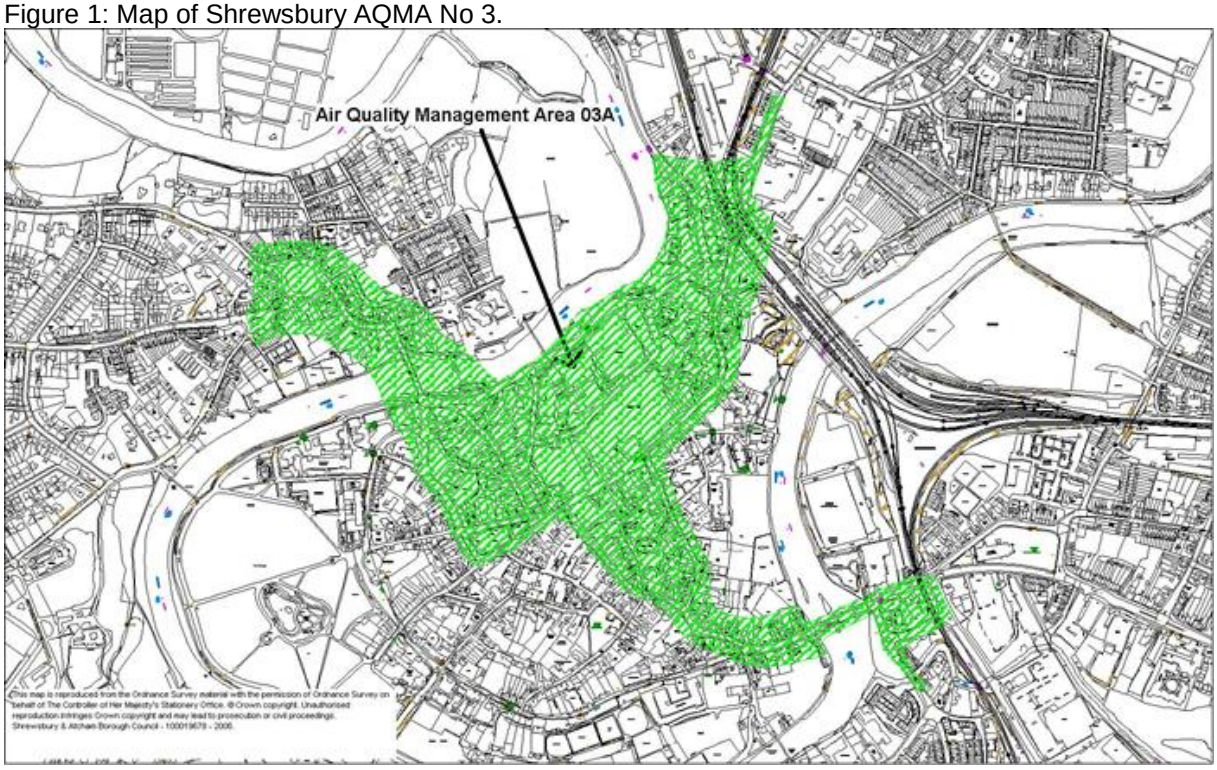


Figure 2: Map of Bridgnorth AQMA.

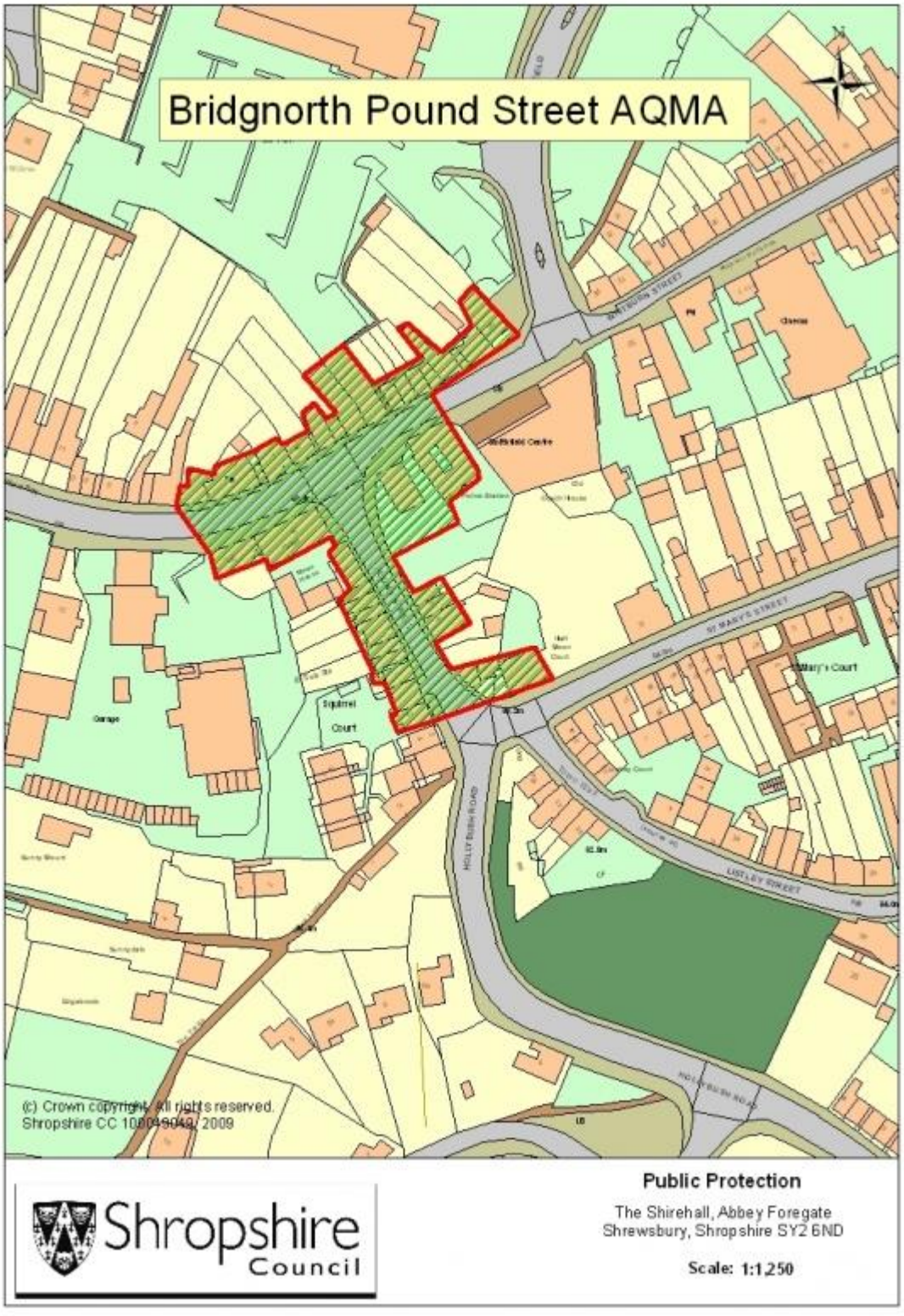


Figure 3: CM3: Mayfield Close automatic PM2.5 monitor

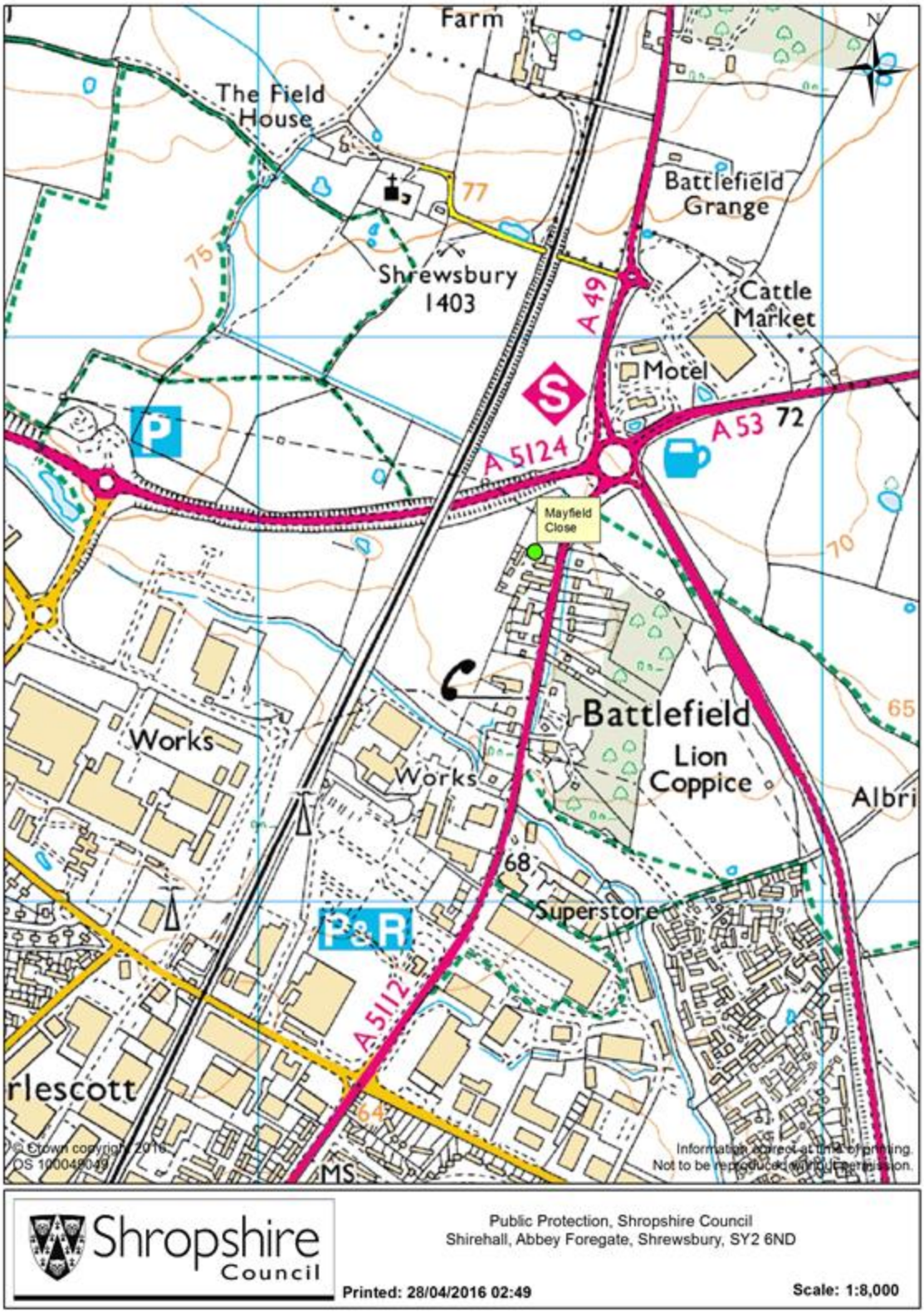


Figure 4: CM4: Chester Street Automatic NOx and PM2.5 monitor

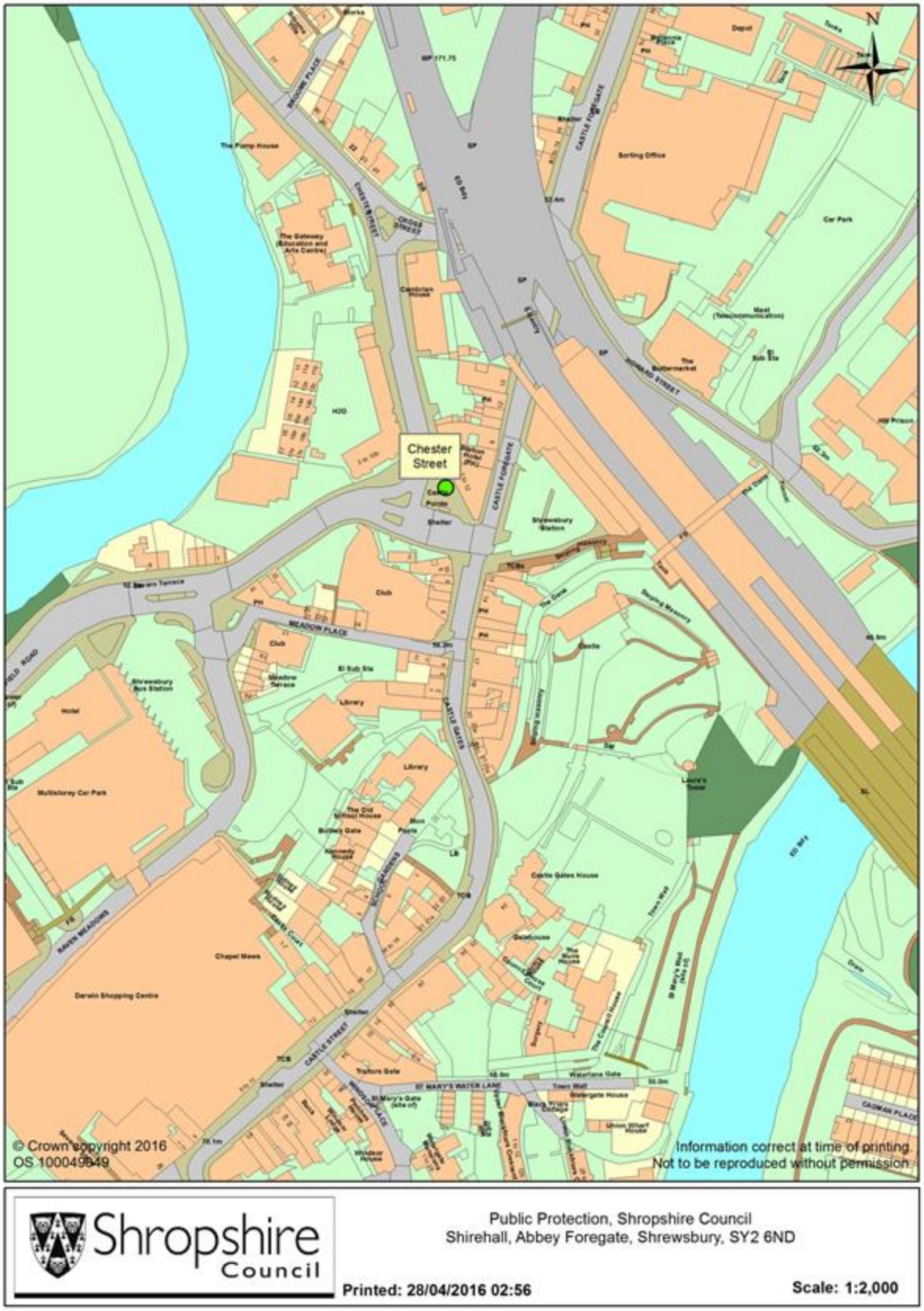
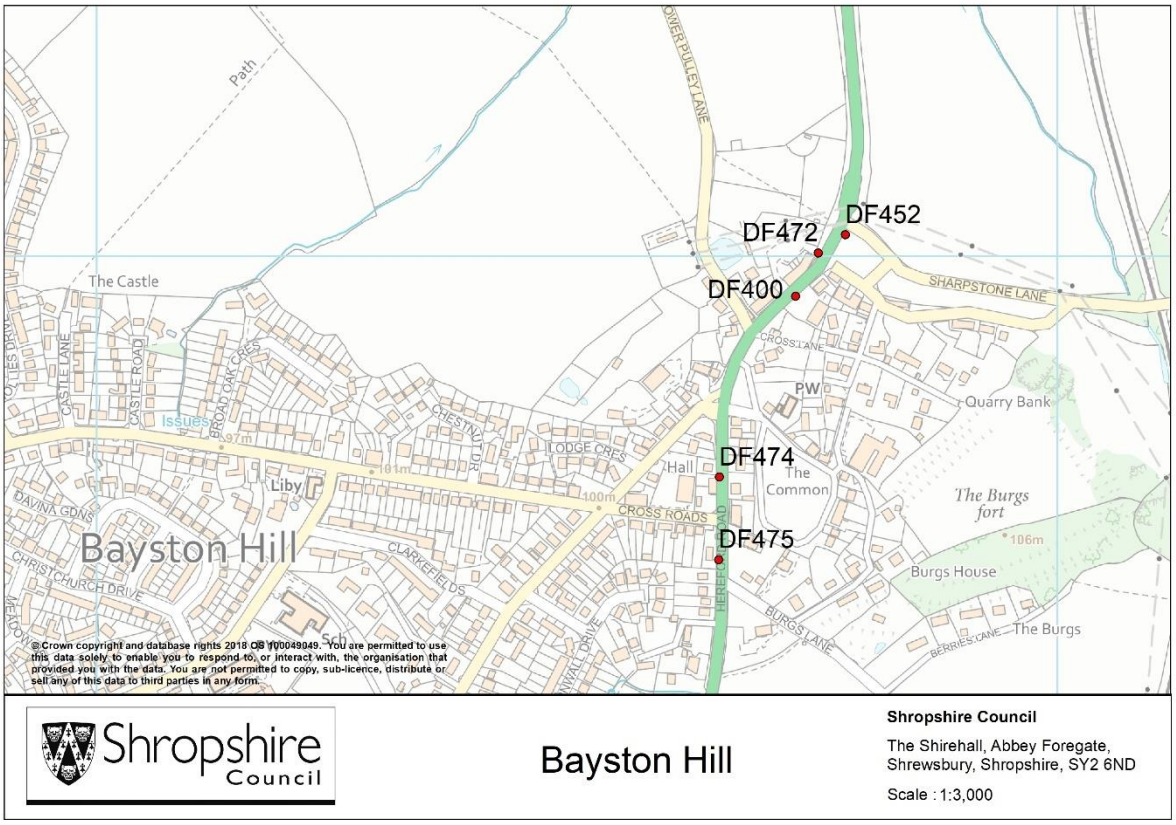
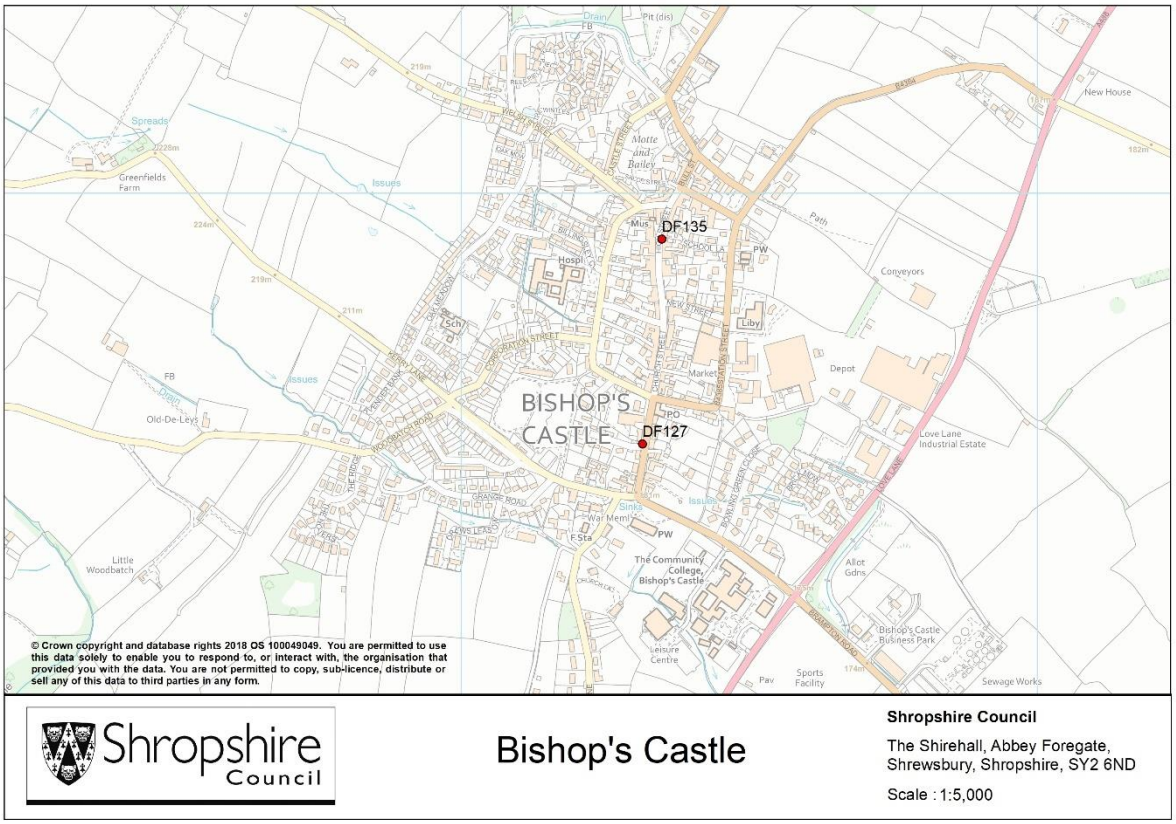
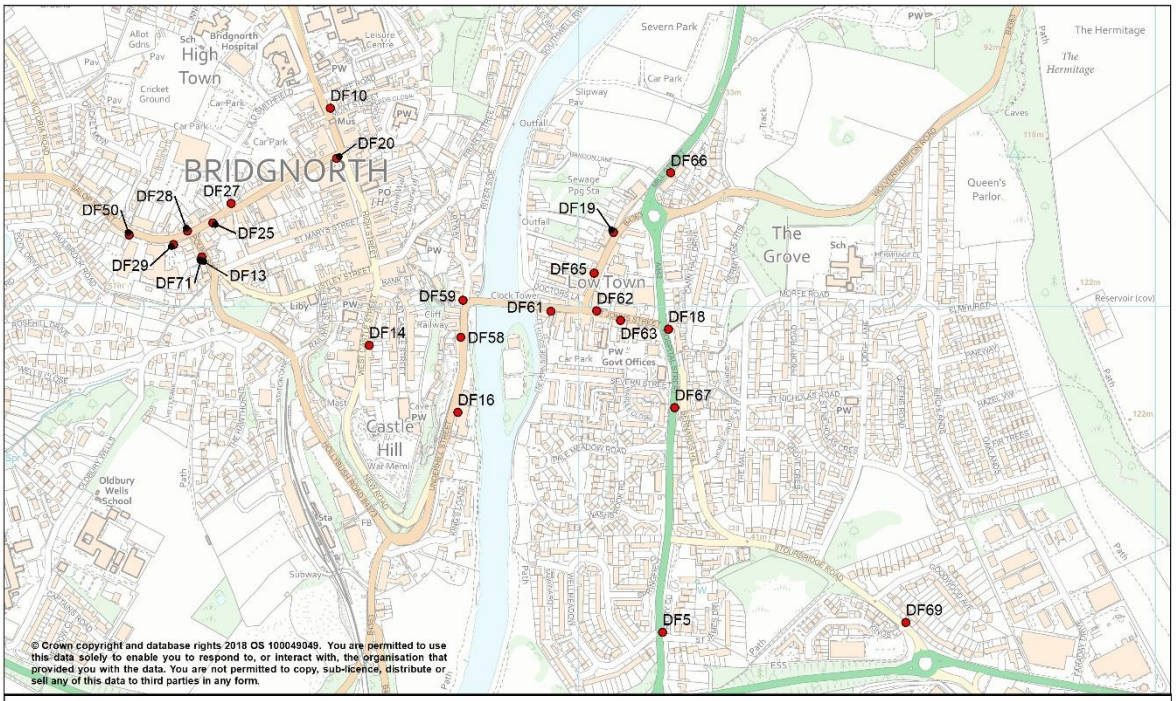
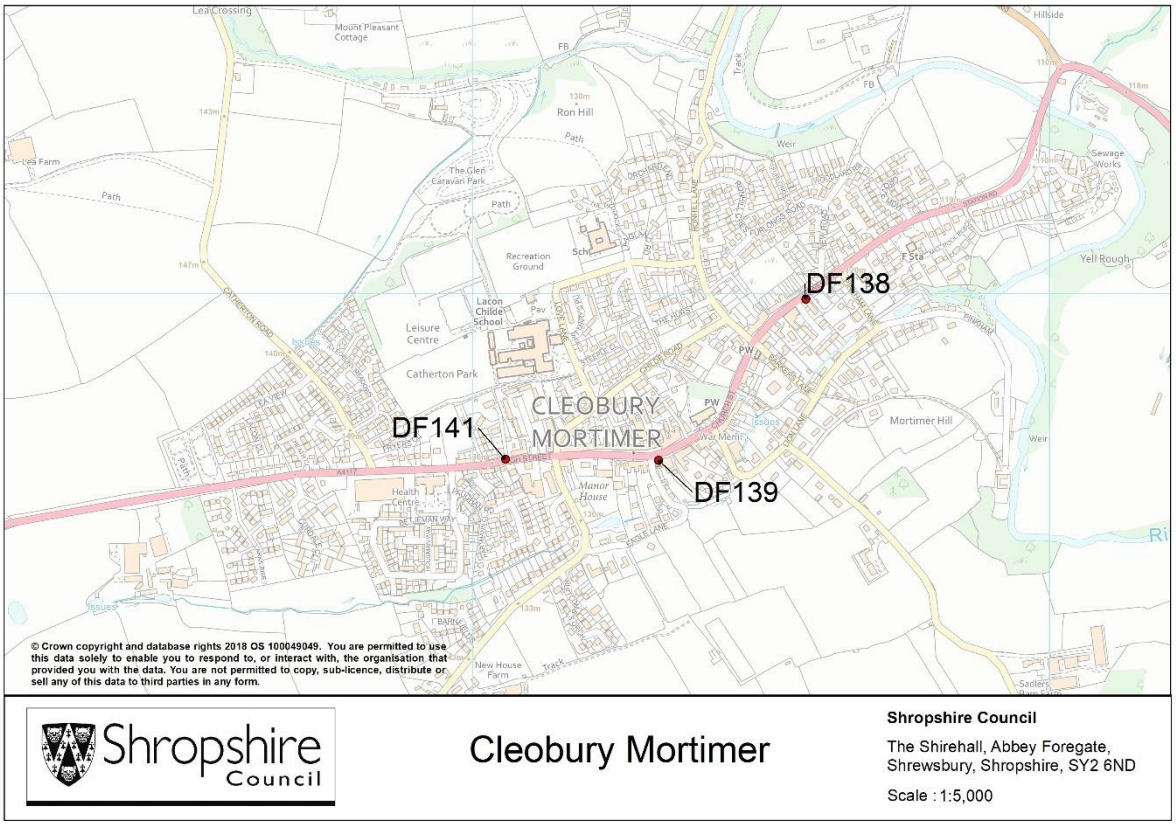


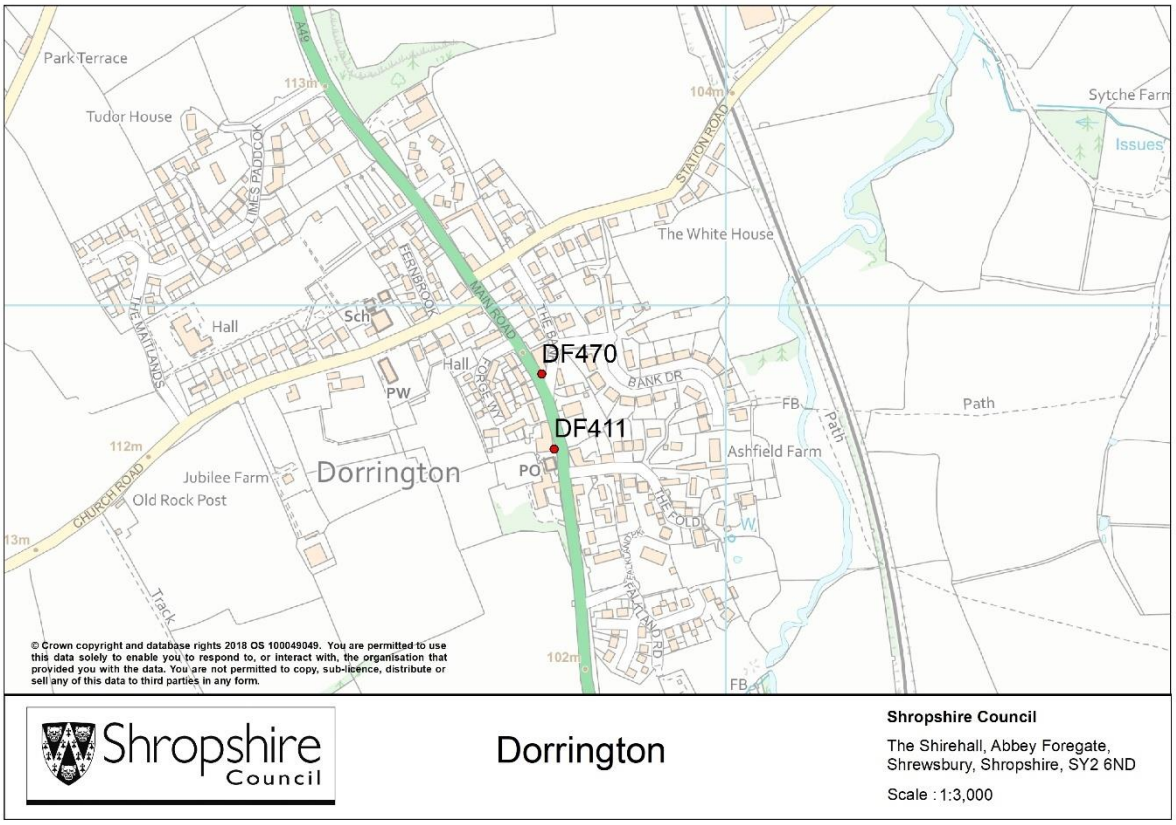
Figure 5: Diffusion tube location maps

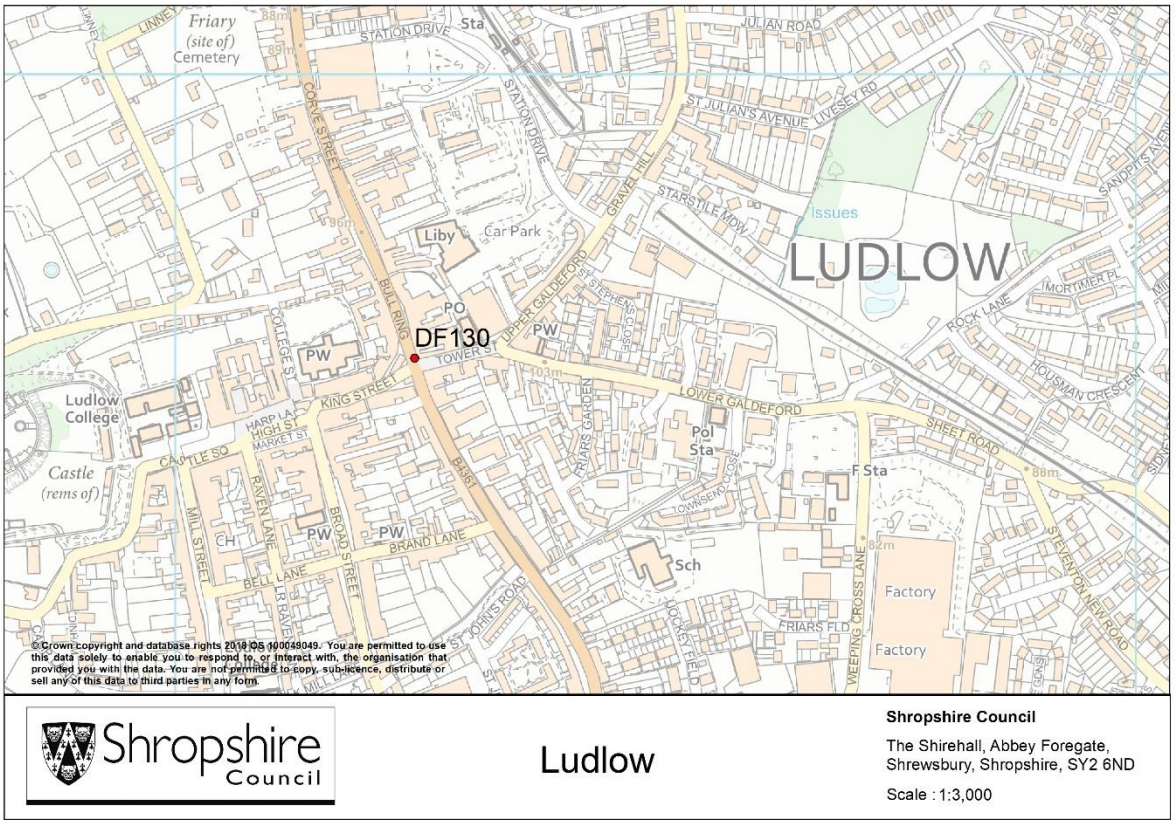




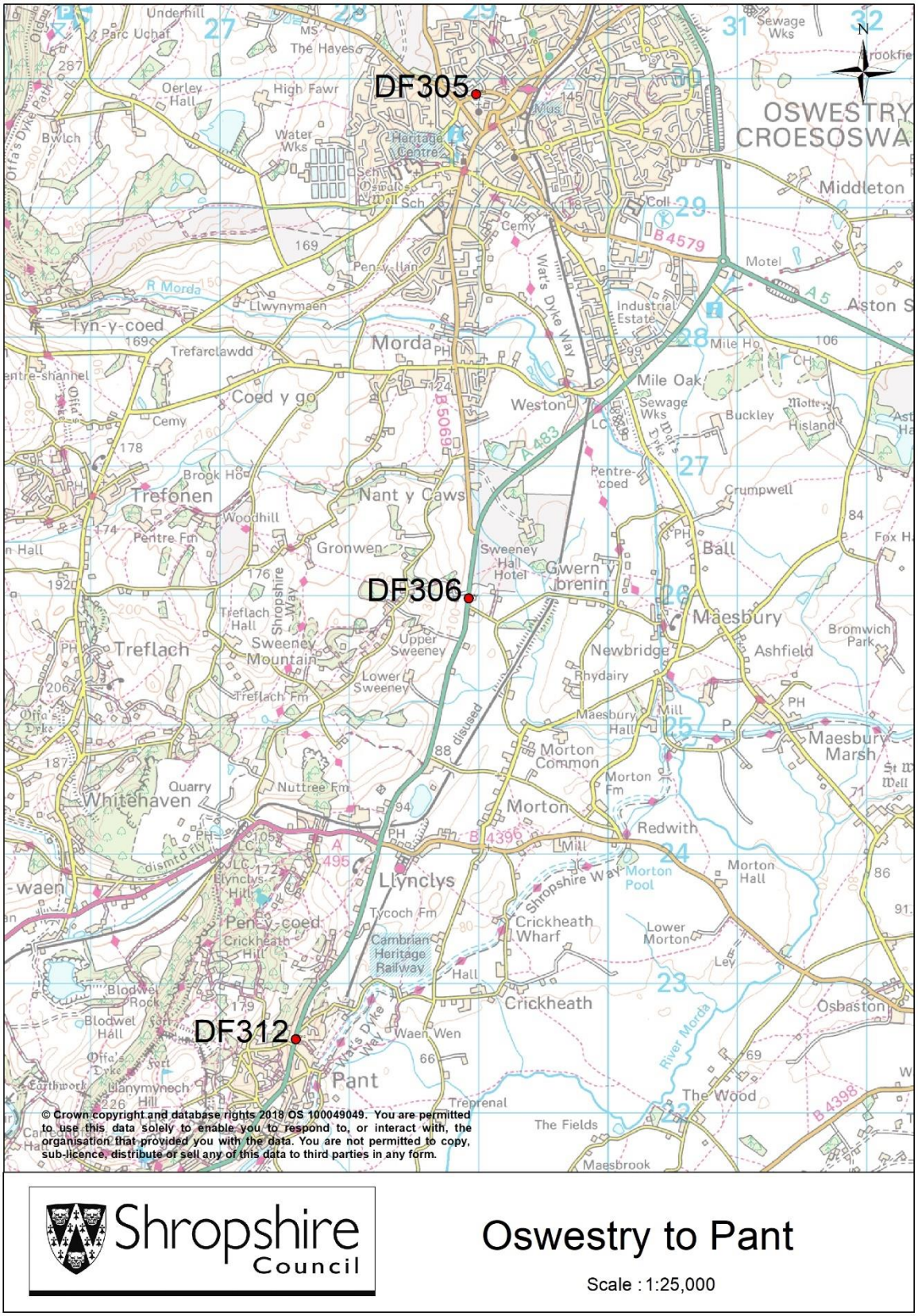

DF10
DF20
DF66
DF28
DF27
DF50
DF25
DF19
DF29
DF71
DF13
DF65
DF59
DF61
DF62
DF18
DF14
DF58
DF63
DF16
DF67
DF5
DF69
BRIDGNORTH
High Town
Low Town
Castle Hill
The Grove
Severn Park
The Hermitage
Queen's Parlor
© Crown copyright and database rights 2018 OS 100049049. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Shropshire Council
Bridgnorth
Shropshire Council
The Shirehall, Abbey Foregate,
Shrewsbury, Shropshire, SY2 6ND
Scale : 1:5,000

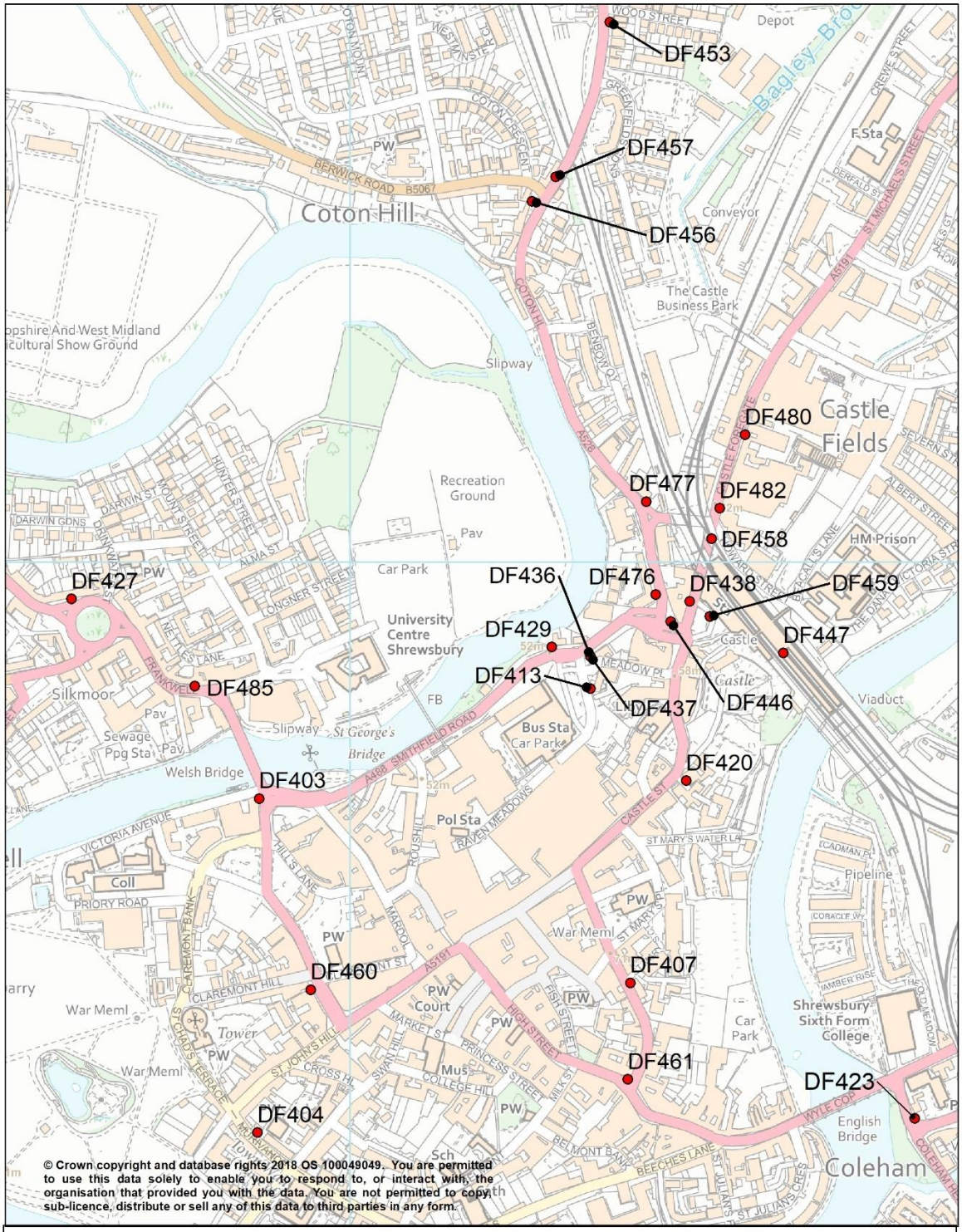

DF138
DF141
DF139
CLEOBURY MORTIMER
Catherton Park
Leisure Centre
Recreation Ground
Ron Hill
© Crown copyright and database rights 2018 OS 100049049. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Shropshire Council
Cleobury Mortimer
Shropshire Council
The Shirehall, Abbey Foregate,
Shrewsbury, Shropshire, SY2 6ND
Scale : 1:5,000


Park Terrace
Tudor House
113m
104m
Sytche Farm
Issues
The White House
STATION ROAD
MAIN ROAD
FERNBROOK
Hall
Sch
DF470
DF411
PW
Hall
BANK DR
FB
Path
Ashfield Farm
112m
Jubilee Farm
Dorrington
Old Rock Post
PO
CHURCH ROAD
13m
Track
102m
© Crown copyright and database rights 2018 OS 100049949. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Shropshire Council
Dorrington
Shropshire Council
The Shirehall, Abbey Foregate, Shrewsbury, Shropshire, SY2 6ND
Scale : 1:3,000


Friary (site of) Cemetery
STATION DRIVE
Sta
JULIAN ROAD
ST JULIAN'S AVENUE
LIVESEY RD
GRAVEL HILL
STARSTILE MDW
Issues
LUDLOW
Liby
Car Park
PO
DF130
PW
BULL RING
TOWER
UPPER GALDEFORD
ST STEPHENS CLOSE
MORTIMER PL
ROCK LANE
HOUSMAN CRESCENT
LOWER GALDEFORD
SHEET ROAD
Ludlow College
KING STREET
HARP LA
HIGH ST
MARKET ST
Pol Sta
F Sta
Castle (rems of)
CASTLE SQ
RAVEN LANE
MILL STREET
CH
PW
BROAD STREET
BRAND LANE
BELL LANE
A4361
FRIARS GARDEN
TOWNSEND CLOSE
Sch
Factory
Factory
FRIARS FLD
WEEPING CROSS LANE
STEVENTON NEW ROAD
ST JOHNS ROAD
© Crown copyright and database rights 2018 OS 100049949. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Shropshire Council
Ludlow
Shropshire Council
The Shirehall, Abbey Foregate, Shrewsbury, Shropshire, SY2 6ND
Scale : 1:3,000


DF205
DF207
MARKET DRAYTON
Cemetery
Market Drayton Infant School
Liby
Govt Offices
Cross (remains of)
Gas Governor
Market Drayton
© Crown copyright and database rights 2018 OS 100049049. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Shropshire Council
Market Drayton
Shropshire Council
The Shirehall, Abbey Foregate, Shrewsbury, Shropshire, SY2 6ND
Scale : 1:3,000

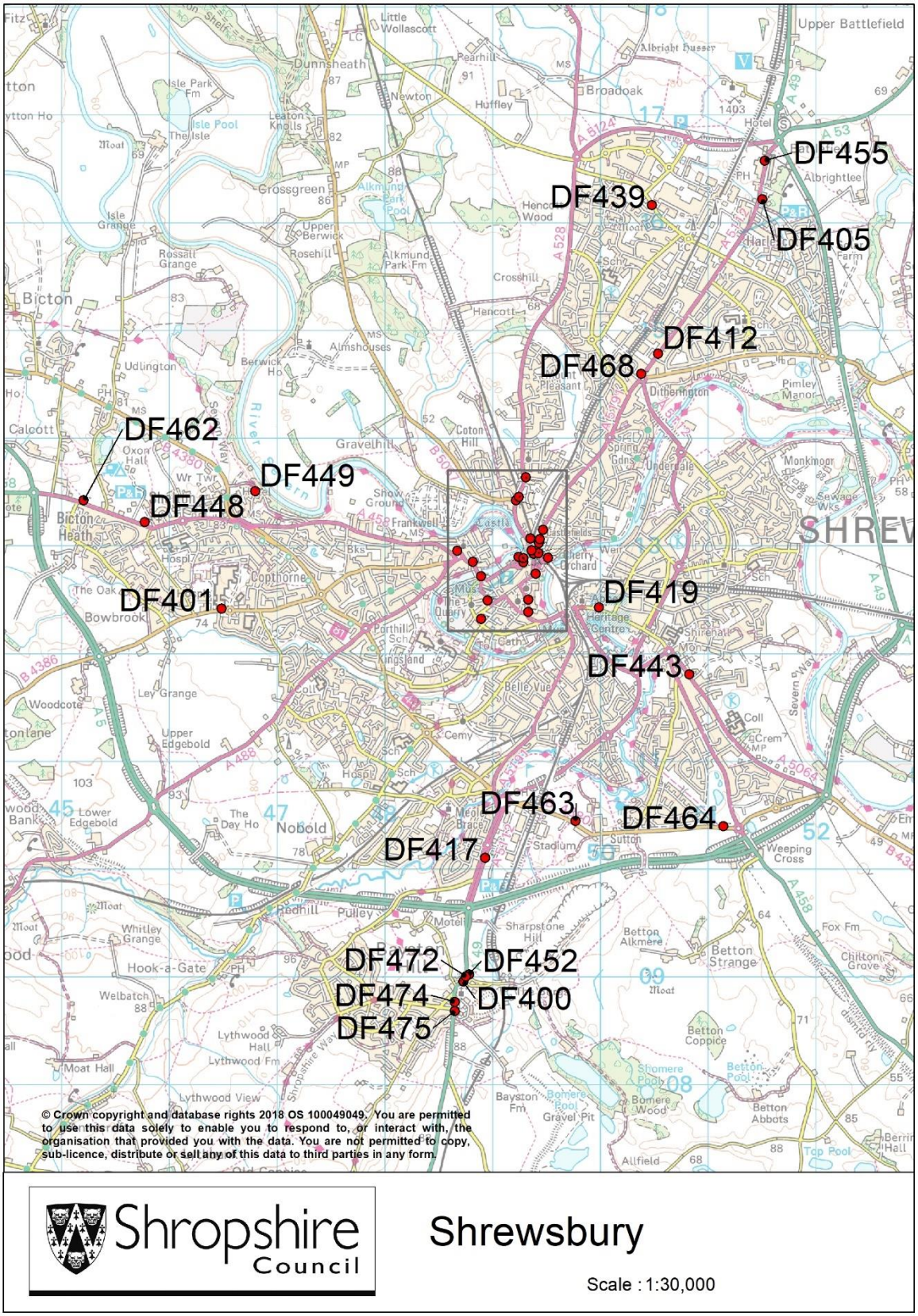

DF305
DF306
DF312
OSWESTRY
CROESOSWA
Middleton
Aston S
Morda
Weston
Mile Oak
Buckley
Crumpwell
Maesbury
Ball
Gwern y brenin
Sweeney Hall Hotel
Trefonen
Nant y Caws
Gronwen
Treflach
Sweeney Mountain
Upper Sweeney
Lower Sweeney
Newbridge
Ashfield
Bromwich Park
Maesbury Marsh
Morton
Morton Common
Redwith
Morton Hall
Morton Pool
Whitehaven
Llynclys
Crickheath Wharf
Crickheath
Lower Morton
Osbaston
Pant
The Wood
The Fields
Maesbrook
Coed y go
Tyn-y-coed
Trefarclawdd
Llwynymaen
Pen-y-llan
Cemy
Oerley Hall
High Fawr
The Hayes
Heritage Centre
Industrial Estate
Sewage Wks
Water Wks
Motel
Mile Ho
Pentre-coed
Rhydairy
Maesbury Hall
Mill
Quarry
Nuttree Fm
Tycoch Fm
Cambrian Heritage Railway
Treprenal
Waen Wen
Blodwel Rock
Blodwel Hall
Llanymynech Hill
Pentre Fm
Woodhill
Brook Ho
Treflach Hall
Treflach Fm
Shropshire Way
Watts Dyke Way
River Morda
R Morda
B5069
A483
A5
A495
B4579
B4396
disused
© Crown copyright and database rights 2018 OS 100049049. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Shropshire Council
Oswestry to Pant
Scale : 1:25,000

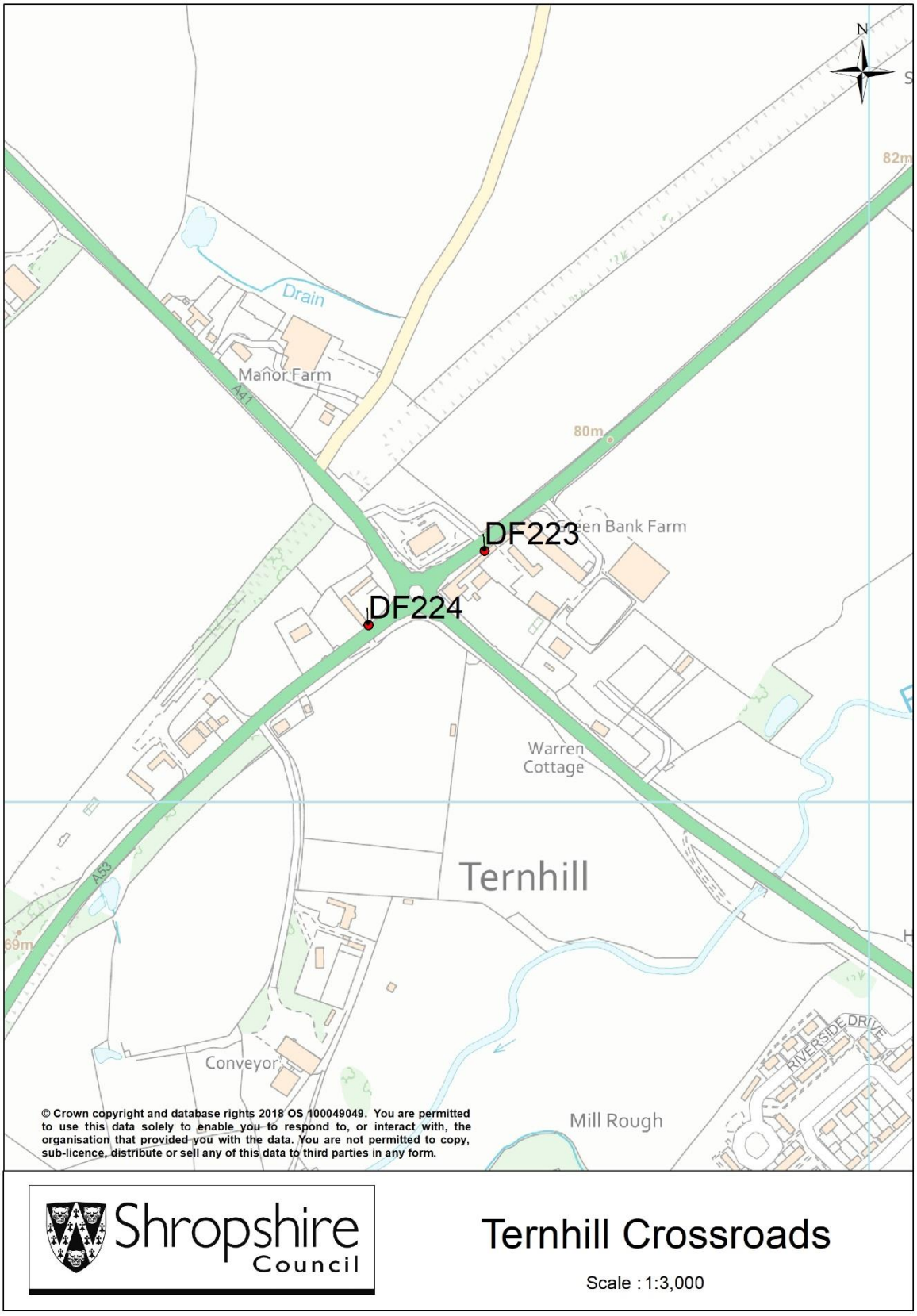


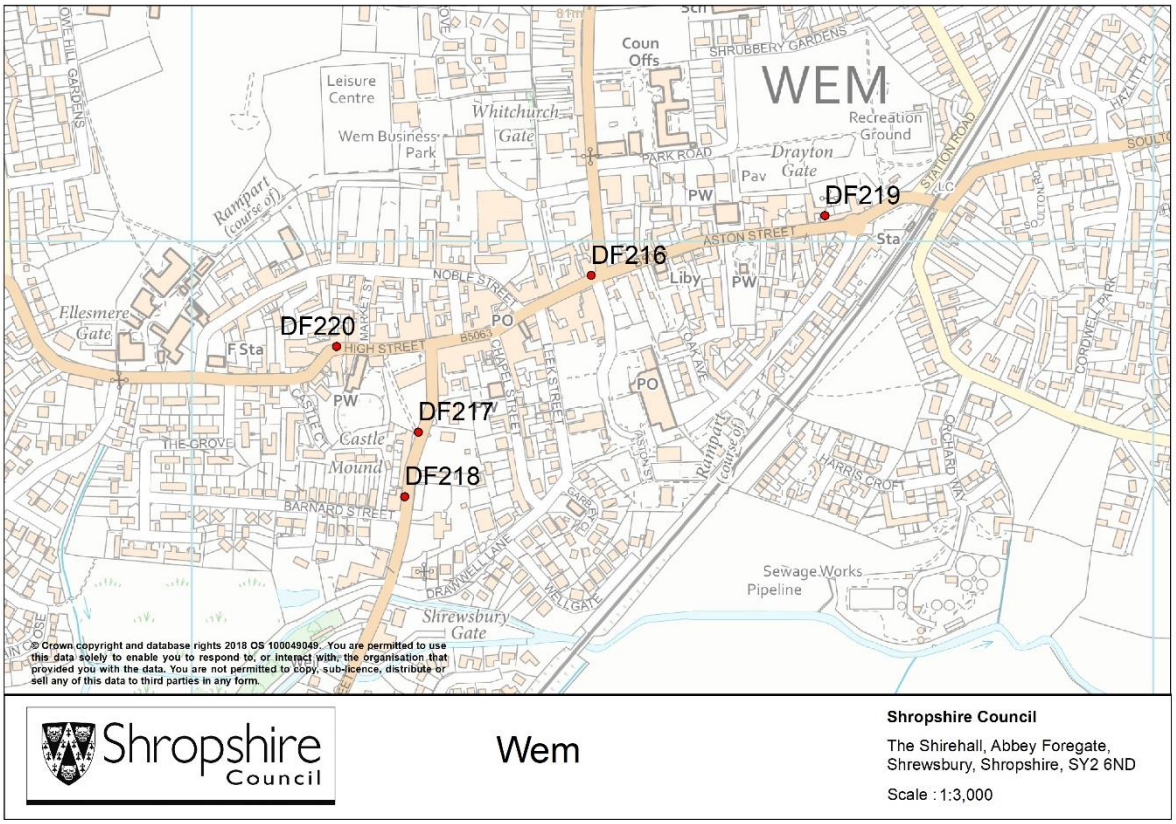
Shropshire Council

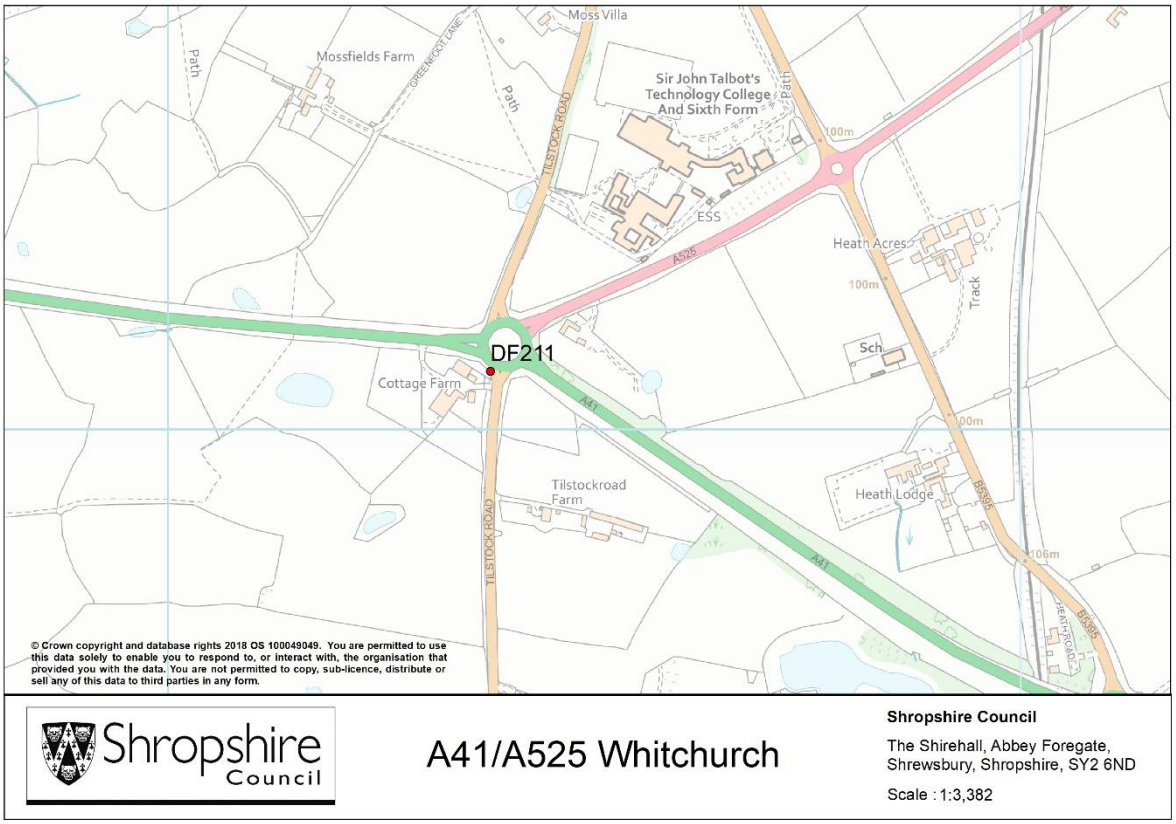
Shrewsbury (Centre)

Scale : 1:4,000


DF455
DF439
DF405
DF412
DF468
DF462
DF449
DF448
DF401
DF419
DF443
DF463
DF464
DF417
DF472
DF452
DF474
DF400
DF475
Shrewsbury
Scale : 1:30,000
© Crown copyright and database rights 2018 OS 100049049. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.


N
82m
Drain
Manor Farm
A41
80m
DF223
DF224
Bank Farm
Warren
Cottage
Ternhill
A53
69m
Conveyor
Mill Rough
RIVERSIDE DRIVE
© Crown copyright and database rights 2018 OS 100049049. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Shropshire Council
Ternhill Crossroads
Scale : 1:3,000


WEM
Leisure Centre
Wem Business Park
Whitchurch Gate
Coun Offs
Recreation Ground
Drayton Gate
Rampart (course of)
Ellesmere Gate
Castle Mound
Shrewsbury Gate
Sewage Works
Pipeline
DF216
DF217
DF218
DF219
DF220
HIGH STREET
NOBLE STREET
CHAPEL STREET
ASTON STREET
PARK ROAD
BARNARD STREET
THE GROVE
SHRUBBERY GARDENS
STATION ROAD
HARRIS CROFT
ORCHARD WAY
CORDWEL PARK
PW
PO
Liby
Sta
F Sta
Pav
LC
© Crown copyright and database rights 2018 OS 100049049. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Shropshire Council
Wem
Shropshire Council
The Shirehall, Abbey Foregate, Shrewsbury, Shropshire, SY2 6ND
Scale : 1:3,000


Moss Villa
Mossfields Farm
Sir John Talbot's Technology College And Sixth Form
TILSTOCK ROAD
A525
A41
Heath Acres
Heath Lodge
Cottage Farm
Tilstockroad Farm
DF211
Track
Sch
ESS
100m
106m
© Crown copyright and database rights 2018 OS 100049049. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
Shropshire Council
A41/A525 Whitchurch
Shropshire Council
The Shirehall, Abbey Foregate, Shrewsbury, Shropshire, SY2 6ND
Scale : 1:3,382

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
EU	European Union
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

Defra, 2018. Local Air Quality Management Technical Guidance (TG16).[Online].

Available at: https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf

Accessed on: 12/12/2018