



COTSWOLD
DISTRICT COUNCIL

2016 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the
Environment Act 1995
Local Air Quality Management
June 2016

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Executive Summary: Air Quality in Our Area

Cotswold District Council has continued the diffusion tube monitoring survey for nitrogen dioxide across the district. The sites are representative of relevant exposure and relate to emissions from traffic.

Monitoring carried out within the Air Quality Management Area (AQMA) near the junction of Thames Street, Lechlade, shows nitrogen dioxide levels continue to be at risk of exceeding the national air quality standard, which was set to protect the health of residents. Monitoring will continue so that we can keep a check on the situation which is affected by meteorological conditions as well as the number and type of vehicles using the junction. The results from the continuous monitor in Lechlade were found to be unreliable due to problems with the analyser. The results will not be reported here as they are considered to be unrepresentative and the analyser will be decommissioned.

The continuous analyser at the Air Balloon Roundabout in Birdlip was decommissioned during 2015 as it had become obsolete. As expected, the continuing diffusion tube data in the area shows no significant change in the levels of nitrogen dioxide (NO₂), which remain above the national objective level. This is expected as the cause of the exceedance is traffic emissions and there has been no significant change in the usage of the road.

Traffic management within our air quality management areas (AQMA) is outside the direct control of Cotswold District Council. As the exceedance at Lechlade is marginal it is anticipated that improvements in emissions from the national fleet could reduce the pollution to acceptable levels in the future, but in the meantime the Council will work with the County Highways Department regarding the traffic management controls at the junction, and investigate whether there are any options which might reduce nitrogen dioxide levels in the shorter term.

The Council will continue to encourage and support any measures considered by the Highways Agency to improve the situation at the Birdlip AQMA. Central government funding has been made available to alter the strategic trunk route in due course, but there are no details on proposals for improvement. It is not known if a change will address the air quality issue which is principally related to the number of HGVs and the topography; the steep incline on the approach to the roundabout from the Gloucester direction gives rise to the slow moving traffic labouring along this section of the road. The Council will take note of any further developments in the proposed improvement to the roads within the AQMA at the Air Balloon roundabout at Birdlip.

Cotswold District Council will not revoke the AQMA for Thames Street, Lechlade at this time, as the measured nitrogen dioxide annual average concentration exceeds the national objective at one point and is close to the objective level at the other points monitored in Thames Street. Monitoring will continue in the area. The problem, which is thought to be caused by idling traffic queuing at the junction, will be discussed with the County Highways Department.

There are no new areas of concern that have been identified within Cotswold District Council's area. Monitoring will continue at the same sites as previously identified and will be carried out in accordance with Defra guidance TG(09). An updated air quality report will be produced in 2017.

Air Quality in Cotswold District 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 billion³.

Air Quality in the Cotswold Area is generally very good. There are however air pollution hotspots where nitrogen dioxide associated with traffic emissions is higher and where it has been necessary to declare Air Quality Management Areas (AQMA). These areas are typically where houses are very close to a busy road and the pollution from the traffic can be exacerbated by problems with congestion as well as the topography, the presence of street canyons and meteorological conditions such as inversion layers and fog.

There are two air quality AQMA in the district, both declared because nitrogen dioxide levels, related to traffic emissions, exceed national objectives.

The two Air Quality Management Areas (AQMA) are:

- the Air Balloon Roundabout in Birdlip, declared in 2008
- an area of Thames Street Lechlade, declared 2014.

The AQMA at the Air Balloon roundabout is related to the quantity of traffic using the strategic trunk roads and the tailback of traffic on the hill which approaches the roundabout from the Gloucester direction.

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

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In Thames Street, Lechlade, the AQMA relates to the very close proximity of houses to the road which suffers congestion at the traffic controlled junction, during rush hours in particular.

Air quality monitoring is undertaken throughout the district with a greater level of monitoring in the AQMAs. Monitoring is undertaken for nitrogen dioxide (NO₂). Previous review and assessment of air quality has established that this is the only pollutant of concern in the area. The monitoring results give an annual average for nitrogen dioxide which is assessed for compliance with the National Air Quality Objective and compared with the monitoring results from previous years. Current monitoring indicates that levels are broadly similar to levels recorded in recent years. We monitor air quality at 16 locations throughout the district. The survey shows no significant change in the levels of NO₂ since last year. It remains above the national objective within the AQMAs, which is to be expected as there has been no change in the usage of the roads in these areas. The monitoring survey does not indicate any additional areas of concern with regard to air quality, within the District. There are no industrial developments with air pollution implications and any development proposals have been considered with regard to their potential to increase traffic pollution in the AQMAs and other areas.

Defra have an internet site containing Air Quality Reports from all local authorities that have AQMAs. The page for Cotswold District Council reports can be found here: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=68

Actions to Improve Air Quality

Air Quality in the District is mainly very good. In 2012 an Action Plan to address the AQMA at the Air Balloon roundabout was published. The high nitrogen dioxide levels are due to traffic on the major trunk route; management of which is outside the control of Cotswold District Council. The Action Plan concluded that Cotswold District Council would provide support and encouragement for measures that may help to control traffic and encourage alternative transport, through a working group led by the County Highways Department.

The exceedance in the AQMA at Lechlade has continued so monitoring will continue in this location and the AQMA will not be revoked until levels are consistently below the national air quality objective level. Cotswold District Council will work with the County Highways Department to learn whether any changes to the road layout or traffic light controls could be considered, or whether any other measures might be worth consideration to improve air quality in this AQMA.

Local Priorities and Challenges

Over the next year we will continue the diffusion tube monitoring survey. We will continue discussions with the County Council with a view to giving further consideration to the traffic issues in our AQMAs and how these can be best addressed.

The recent and ongoing interconnectivity between the District Councils of Forest of Dean, Cotswold and West Oxfordshire may afford the opportunity for a regional approach. The three rural districts share the same common source of actual and potential pollution arising from vehicular density within congested or high traffic density areas. In addition to any financial consideration, a further constraint upon the progress of any Action Plan has been the political implication (and potential impasse) which might arise as traffic is diverted from one sensitive area towards another area of similar concern within a neighbouring District.

This requires consideration and the forthcoming partnership should facilitate relevant discussions.

How to Get Involved

As the air pollution of concern in the district is related to traffic emissions, we can all do our bit to reduce emissions, by not using a car unless entirely necessary. Walking or cycling, or taking public transport or car sharing rather than driving an otherwise empty car, reduces our individual carbon footprint.

The solution to congestion related pollution lies to a large extent in road traffic management and District authorities do not have the remit to manage this. Local interest groups can however lobby County Councils directly to influence the content of Local Transport Plans (LTP).

Copies of the latest Air Quality Report can be found on Cotswold District Council's Website at:

<http://www.cotswold.gov.uk/residents/environment/environmental-health/air-quality/>

Any queries about Air Quality should be directed to the Environmental Protection team within Cotswold District Council.

This team can be contacted by e mail on: ers@2020partnership.uk

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1 Local Air Quality Management

This report provides an overview of air quality in Cotswold District during 2015. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

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

2 Actions to Improve Air Quality

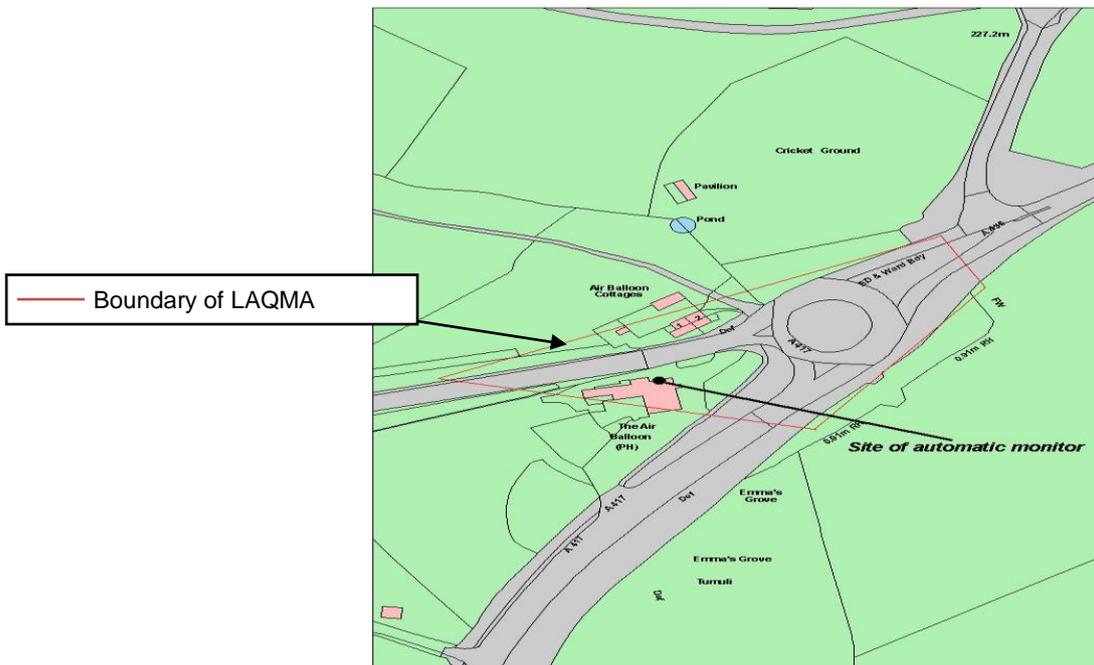
2.1 Air Quality Management Areas

Air Quality Management Areas (AQMA) 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 Cotswold District Council can be found in Table 2.1. Further information related to declared AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=68 and on the Council [air quality webpage](http://www.cotswold.gov.uk/residents/environment/environmental-health/air-quality/) at: <http://www.cotswold.gov.uk/residents/environment/environmental-health/air-quality/>

Figure 2.1 Maps of AQMA Boundaries

Air Balloon Birdlip



Cotswold District Council
Air Quality Management (Thames Street, Lechlade 2014) Area

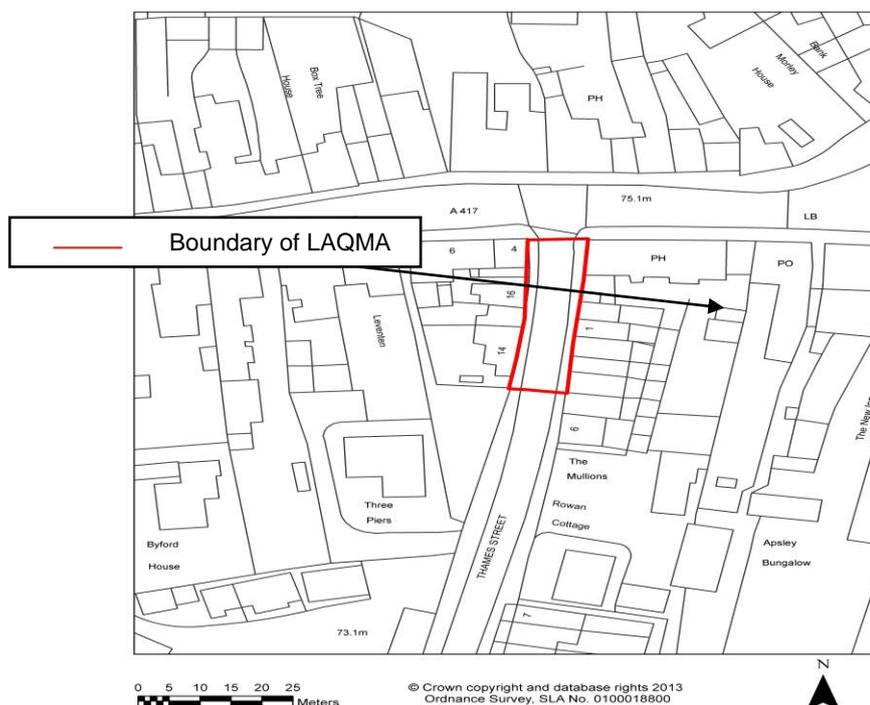


Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	Action Plan
Air Balloon Roundabout	NO ₂ annual mean	Birdlip	An area encompassing properties adjacent to the roundabout on a strategic trunk route	AQ Action Plan pending
Thames Street, Lechlade	NO ₂ annual mean	Lechlade	Residential properties along Thames Street near the junction with the High Street.	AQ Action Plan under consideration

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

Progress on the Air Balloon Action Plan has stopped, due to the lack of options regarding any potential improvements through an alternative road layout.

During the next reporting year, Cotswold District Council expects an action plan for Thames Street AQMA to be considered in liaison with Gloucestershire County Council Highways Department.

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Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Air Balloon Roundabout	Freight and Delivery Management	Trunk route management/ Strategic routing strategy for HGVs	Gloucestershire County Council	LTP	TBC	Reduced NO2 levels recorded	Annual average NO2 to be reduced to meet AQ objective	Awaited	Not known	On hold
2	Thames Street, Lechlade	Freight and Delivery Management	Trunk route management	CDC	1	TBC	Reduced NO2 levels recorded	Annual average NO2 to be reduced to meet AQ objective	Awaited	Not known	To be commenced
3	CDC	Promoting Low Emission Transport	Promote LEVs	CDC	Promote LEV infrastructure	TBC	Increased number of LEVs	Reduced NO2	Awaited	Not known	To be commenced
4	CDC	Promoting Travel Alternatives	Facilitate home-working	CDC			Less journeys	Reduced NO2	Awaited	Not known	

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.

Other than the potential source from vehicles, no other significant source of PM_{2.5} has been identified within the District. Therefore the control at this stage is aligned with the measures designed to achieve a reduction in vehicular emissions.

Liaison with Gloucester County transport and health committees will be pursued to ensure Air Quality is considered in policy making.

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

3.1 Summary of Monitoring Undertaken

This section sets out the monitoring that has taken place and how it compares with national objectives as well as previous years' results.

Continuous monitoring within AQMA at the Air Balloon Roundabout junction has been undertaken for 8 years. In 2014 there were problems with power outages; consequently the data collection was poor and inconsistent. This analyser was decommissioned in 2015 with an option to re-install in the area if there are major changes to the layout of the road.

Central government has made funds available for major alterations to the Air Balloon Roundabout in due course. At the time of writing no details as to effects and timescales are available. However it is possible that because of the topography of the area, mainly the steep incline, and the high volume of HGVs using this route, proposed changes in upgrading part of the route and changing the road lay out will have minimal effect on the air quality. Cotswold District Council will keep a watching brief on the development of this project.

Continuous monitoring at Thames Street, Lechlade was carried out intermittently. Difficulties accessing the site where the analyser was located and technical problems maintaining the analyser meant that data became unreliable. For this reason the results recorded are not reported here and the analyser will be decommissioned.

3.1.1 Non-Automatic Monitoring Sites

No new areas have been identified that required monitoring; Cotswold District Council has therefore retained its existing diffusion tube survey sites across the district. The sites all relate to traffic emissions. There have been no new roads or major changes that have affected traffic flows. .

Cotswold District Council undertook non- automatic (passive) monitoring of NO₂ at sixteen sites during 2015. All sites related to traffic emissions and were positioned in locations where there is "relevant public exposure", in accordance with guidance in TG (09). (The "car park" tube at Air Balloon was decommissioned as it was not representative of "relevant exposure")

Four tubes were located within each of our air quality management areas (AQMA). Appendix A provides details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D.

3.2 Individual Pollutants

3.2.1 Nitrogen Dioxide (NO₂)

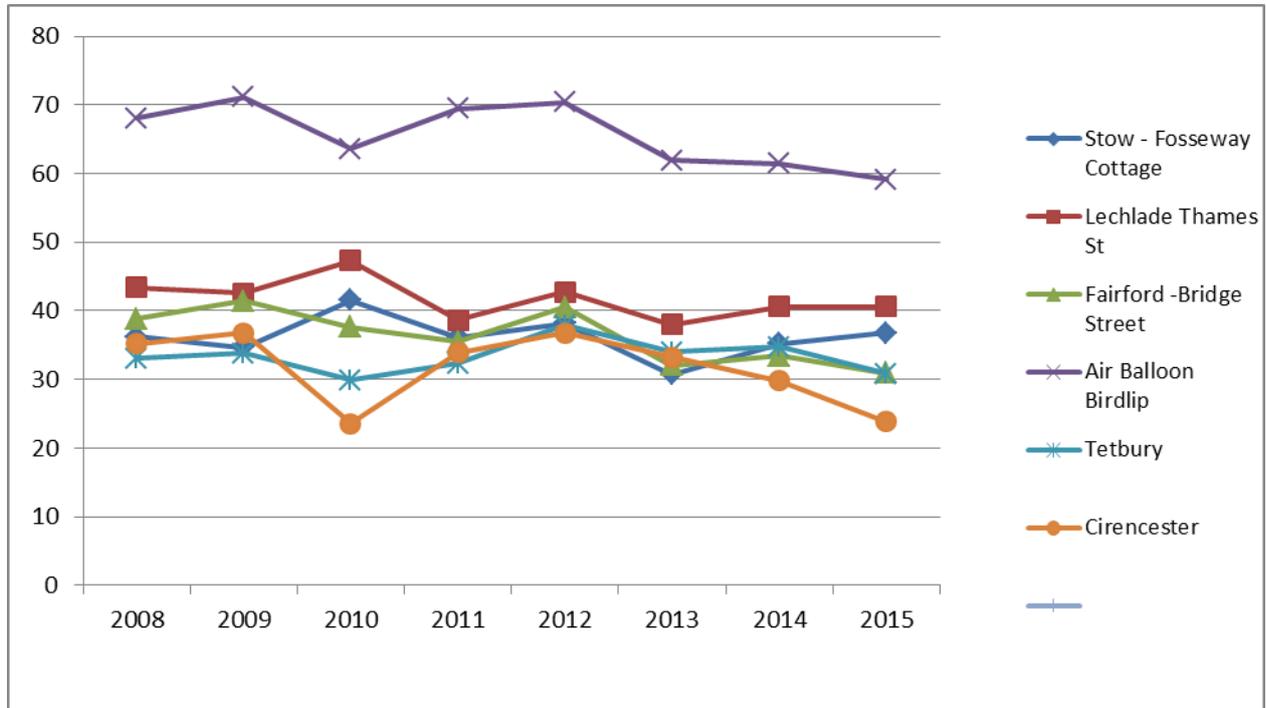
The air quality monitoring results presented in this section are, where relevant, adjusted for “annualisation” and bias. As there were at least 9 months data for each monitoring site, annualisation was not required. Details on the bias adjustment are provided in Appendix C.

A.2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years, for comparison with the air quality objective of 40µg/m³. The full 2015 dataset of monthly mean NO₂ levels from the diffusion tube survey is provided in Appendix B.

Nitrogen dioxide levels remain high within Air Balloon roundabout AQMA, which is as expected given the significant volume of traffic on this strategic trunk route. The monitored concentrations have varied very little over the last few years, as can be seen from the trend graph which shows levels for the last 8 years.

Monitoring results for Thames Street Lechlade show nitrogen dioxide levels continue to be close to the national objective of 40 µg/m³. The Council will continue diffusion tube monitoring in the area. These levels are thought to be caused by exhaust emissions from idling traffic queuing at the T- junction, which is controlled by traffic lights. Cotswold District Council will liaise with the County Highways Department to determine whether there are any safe alternatives to this choice of traffic management technique at this junction with the potential to improve the air quality situation.

Figure 2.4 Graph showing the trends over 8 years at long term diffusion tube monitoring sites



The data points in the graph in Figure 2.4 are the annual average levels of NO₂, bias adjusted and expressed in µg/m³

The graph shows that at the Air Balloon roundabout, Birdlip the level has decreased overall by around 10µg/m³ since 2012 (when there was an annual average of 70 µg/m³) but the rate of decrease has slowed down over the last 3 years.

It can be seen that over the last 3 years, levels at Lechlade, Thames Street, have remained consistently close to the national objective level for nitrogen dioxide, which is 40 µg/m³.

Over the last 3 years there has been only a relatively small variation in NO₂ levels at most of the sites and there is no significant change in levels other than at the Wagon and Horses in Cirencester where the level has been dropping year on year leading to quite a substantial drop in NO₂ levels at this site, since 2012.

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Appendix A: Monitoring Results

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

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Stow-in-the Wold - Fosseway Cottage	Roadside	419079	226054	NO ₂	N	N	y (1m)	3m	N
Lechlade -Thames St	Kerbside	421378	199506	NO ₂	Y	N	y(<1m)	0.5m	Y
Lechlade No 2 Thames St	Kerbside	421359	199404	NO ₂	Y	N	Y(1m)	<1m	Y
Lechlade - Thames St cottage 4	Kerbside	421364	199477	NO ₂	Y	N	y(<1m)	1.5m	Y
Lechlade – High St	Kerbside	421367	199532	NO ₂	N	N	y (<1m)	<1m	Y
Fairford - London Rd	Kerbside	415378	200949	NO ₂	N	N	y (1m)	1m	Y
Fairford Bridge St	Kerbside	415167	201004	NO ₂	N	N	y (1m)	1m	Y
Cirencester -Castle St	Kerbside	402222	202010	NO ₂	N	N	y(1m)	1m	Y
Cirencester – London Rd (Wagon/Horses)	Kerbside	402735	201962	NO ₂	N	N	y (<1m)	<1m	Y
Tetbury - Long St	Kerbside	389007	193197	NO ₂	N	N	y(1m)	1m	Y
Tetbury - Church St	Kerbside	389034	193110	NO ₂	N	N	y(1m)	1m	Y
Birdlip Air Balloon	Kerbside	393446	216118	NO ₂	Y	N	y(1m)	1m	Y
Birdlip - Air Balloon 1	Kerbside	393459	216124	NO ₂	Y	N	y(1m)	4m	Y
Birdlip - Air Balloon 2	Kerbside	393459	216124	NO ₂	Y	N	y(1m)	4m	Y
Birdlip - Air Balloon, beer garden B	Kerbside	393459	216091	NO ₂	Y	N	Y(<1M)	1m	Y
Stow Lodge	Kerbside	403943	202961	NO ₂	N	N	y(5m)	0.5m	Y

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Table A.2 – Annual Mean Nitrogen Dioxide (NO₂) Diffusion Tubes Monitoring Results (2011 to 2015)

Notes: Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**. The highest result is highlighted in **red**

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) µg/m ³				
			2011* (Bias Adjustment Factor = 83)	2012* (Bias Adjustment Factor = 94)	2013* (Bias Adjustment Factor = 95)	2014* (Bias Adjustment Factor = 0.79)	2015 (Bias Adjustment Factor = 0.81)
T1	Stow-in-the -Wold Fosseway Cottage	N	36.2	36.8	30.71	35.18	36.8
T2	Lechlade - Thames Street *	Y	38.7	41.4	38.92	38.19	34.2 (average of 2 co-located tubes)
T3	Lechlade –Cottage no 4	Y	41.7	43.4	42.96	40.63	40.6
T4	Lechlade -Cottage No 2 Thames St	Y	na	39.23	39.89	36.07	38.7
T5	Lechlade High St	N	34.6	35.9	32.65	33.26	32.9
T6	Fairford - London Rd	N	32.3	33.2	28.11	27.89	25.8
T7	Fairford - Bridge St	N	35.5	39.2	33.97	33.45	30.9
T8	Cirencester - London Rd (Waggon/Horses)	N	33.9	35.7	33.28	29.78	23.8
T9	Tetbury - Church St	N	35.7	36.8	32.04	34.78	30.8
T10	Tetbury - Long Street	N	28.6	29.3	26.67	27.01	28.8
T11	Birdlip - Air Balloon	Y	69.4	68.3	61.93	61.46	59.1
T12	Birdlip - Air Balloon 2	Y	43.5	46.1	42.18	40.30	40.5
T13	Birdlip - Air Balloon 3	Y	45.3	47.2	41.60	41.38	39.4
T14	Birdlip - Air Balloon, beer garden A	Y	28.3	44.6	42.93	43.26	40.5
T15	Birdlip - Air Balloon, beer car park C	Y	29.7	27.1	27.44	23.01	-
T16	Stow Lodge	N	35.3	35.3	33.74	32.22	31.7

*Optional

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Table A3 Further information about nitrogen dioxide diffusion tube monitoring in 2015

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Number of Months Data Capture 2015	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.81)
								2015 ($\mu\text{g}/\text{m}^3$)
T1	Stow - Fosse Cottage	Roadside	N		11	N	N	36.8
T2	Lechlade Thames St 1	Kerbside	Y	Co-located	10	N	N	34.7
T2	Lechlade Thames St 2	Kerbside	Y	Co-located	10	N	N	33.7
T3	Lechlade Thames St Cott No4	Kerbside	Y		11	N	N	40.6
T5	Lechlade Thames St No2	Kerbside	Y		9	N	N	38.7
T6	Lechlade High Street	Kerbside	N		11	N	N	32.9
T8	Fairford London Road	Kerbside	N		9	N	N	25.8
T7	Fairford Bridge St	Kerbside	N		11	N	N	30.9
T8	Cirencester Wagon + Horses	Kerbside	N		11	N	N	23.8
T19	Tetbury Church St	Kerbside	N		11	N	N	30.8
T10	Tetbury Long St	Kerbside	N		10	N	N	28.8
T12	Birdlip - Air Balloon 2	Kerbside	Y	Co-located	11	N	N	40.5
T13	Birdlip - Air Balloon 3	Kerbside	Y	Co-located	11	N	N	39.4
T13	Birdlip Air Balloon Beer Garden	Kerbside	Y		11	N	N	40.5
T11	Birdlip Cottages	Kerbside	Y		11	N	N	59.1
T16	Stow Lodge	Kerbside	N		11	N	N	31.7

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Appendix B: Full Monthly Diffusion Tube Results for 2015

Table B.1 – NO₂ Monthly Diffusion Tube Results – 2015

	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean unadjusted	Annual mean bias adjusted	Data collection %
	January	February	March	April	May	June	July	August	September	October	November	December			
AIR QUALITY DIFFUSION TUBE RESULTS -2015														0.81	
Stow - Fosse Cottage	54.8	48.4	50.2	36.5	43.7	47.8	49.6	42.4	50.3	No results	37.4	38.7	45.4	36.8	91.7
Lechlade Thames St 1	35.7	50.8	46.5	46.5	missing	38.6	40.8	41.2	47.5	No results	42.6	38.5	42.9	34.7	83.3
Lechlade Thames St 2	27.2	47.8	53.3	46.5	36.6	31.9	43.7	missing	45.2	No results	41.1	42.7	41.6	33.7	83.3
Lechlade Thames St Cott No4	49.4	59.4	55.4	49.2	48.2	46.4	57.4	46.1	54.8	No results	43.6	41.5	50.1	40.6	91.7
Lechlade High Street	55.6	49.5	49.7	42.9	29.9	31.3	31.7	31.2	42.0	No results	44.5	37.9	40.6	32.9	91.7
Lechlade Thames St No 2	62.7	55.6	50.3	45.1	38.6	44.3	48.8	missing	50.4	No results	33.8	*rejected	47.7	38.7	75.0
Fairford London Road	40.2	38.8	missing	missing	30.3	25.5	30.7	27.0	28.8	No results	32.1	33.8	31.9	25.8	75.0
Fairford Bridge St	46.0	44.4	43.7	25.2	34.3	33.9	38.5	34.2	40.7	No results	37.8	41.0	38.2	30.9	91.7
Cirencester Wagon + horses	44.2	39.1	41.1	30.6	28.8	36.7	0.0	0.0	35.5	No results	33.9	33.6	29.4	23.8	75.0
Tetbury Church St	48.7	47.5	44.5	33.6	39.8	38.7	34.8	32.0	43.0	No results	27.1	28.6	38.0	30.8	91.7

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Tetbury Long St	45.5	35.5	34.8	24.4	missing	31.3	37.3	30.9	46.1	No results	34.9	34.9	35.6	28.8	83.3
Birdlip - Air Balloon 2	74.6	50.7	49.2	54.3	44.4	51.0	54.5	47.0	52.4	No results	35.6	36.0	50.0	40.5	91.7
Birdlip - Air Balloon 3	57.6	47.2	54.1	54.1	41.8	50.4	55.5	46.5	52.1	No results	37.0	39.1	48.7	39.4	91.7
Birdlip Air Balloon Beer Garden	42.1	56.9	56.5	44.3	48.0	52.0	55.5	46.3	53.1	No results	48.6	46.1	49.9	40.5	91.7
Birdlip Cottages	40.6	90.9	79.5	75.0	76.4	66.5	83.3	69.5	69.3	No results	81.9	69.8	73.0	59.1	91.7
Stow Lodge	41.9	38.4	45.2	40.2	40.1	38.0	31.9	35.4	35.8	No results	38.9	44.4	39.1	31.7	91.7

*Rejected for quality purposes (black cap split)

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

Diffusion Tube Bias Adjustment Factors

The diffusion tubes (50% TEA in acetone) were supplied and analysed by ESG Didcot laboratories. The tubes at all locations have a monthly exposure period.

National bias adjustment factors have been used from 03/15 database, available at: <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

(see below) The factor used is 0.81 based on 22 studies and this was applied to all diffusion tubes.

National Diffusion Tube Bias Adjustment Factor Spreadsheet Spreadsheet Version Number: 03/15

Follow the steps below in the correct order to show the results of relevant co-location studies

Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods

Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet

This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.

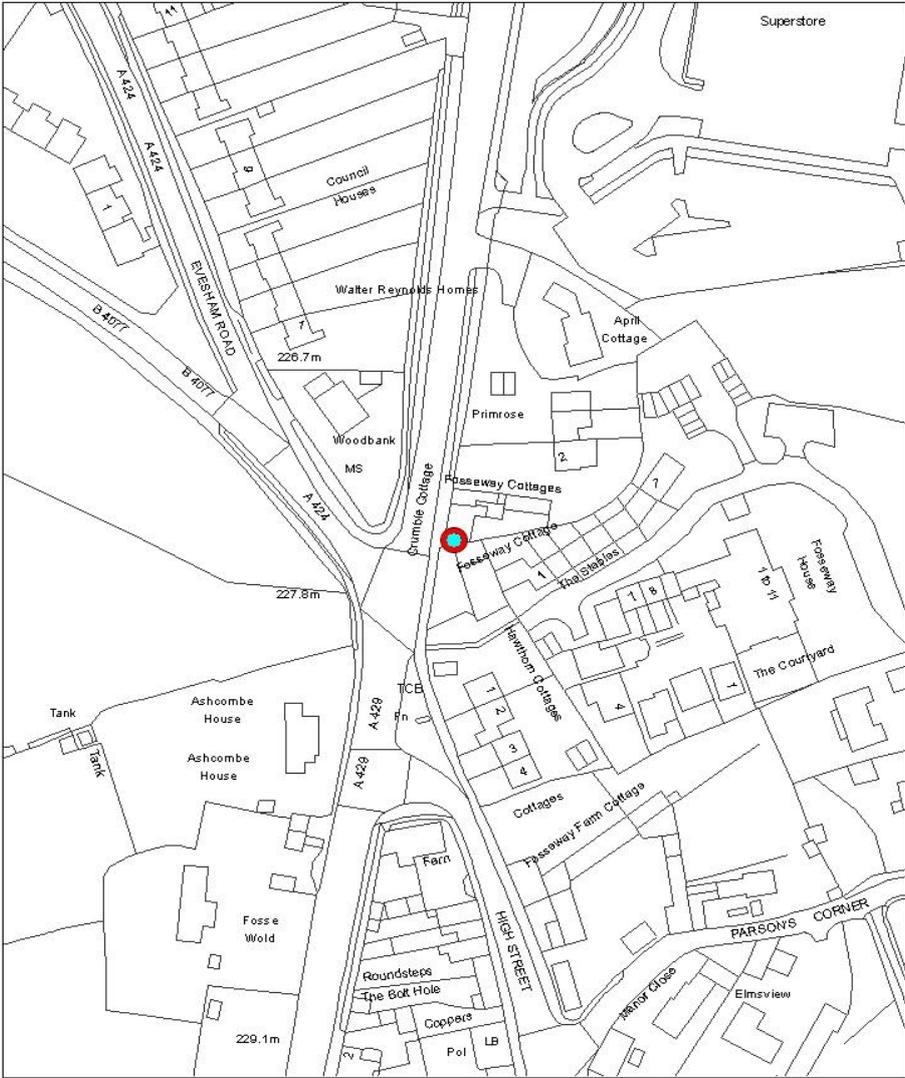
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory. Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Analysed By	Method	Year	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) ($\mu\text{g}/\text{m}^3$)	Automatic Monitor Mean Conc. (Cm) ($\mu\text{g}/\text{m}^3$)	Bias (B)	Tube Precision	Bias Adjustment Factor (A) (Cm/Dm)
ESG Didcot	20% TEA in water	2014	Overall Factor ¹ (5 studies)				Use	0.79	
ESG Didcot	50% TEA in acetone	2014	Overall Factor ¹ (22 studies)				Use	0.81	

¹ For Casella Seal/GMSS/Casella CRE/Bureau Veritas Labs/Eurofins use Environmental Scientific Groups.
 From 2011 for Environmental Scientific Groups use ESG Glasgow.
 From 2011 for Hanwell Scientific Services use ESG Didcot.
 For Staffordshire CC SSG/Staffordshire County Analyst use Staffordshire Scientific Services.
 For Bodpote Health Sciences and Clyde Analytical Laboratories use Envova.
 For Rotherham MBC use South Yorkshire Labs.
 For Dundee CC use Tayside SS.
 For Leicester Scientific Services use Staffordshire Scientific Services.
 For South Yorkshire Air Quality Samplers use South Yorkshire Labs. As of January 2010 sampler body changed. As of April 2010 sampler cap changed.
 Lancashire County Analysts withdrew from the Field Intercomparison at the end of 2010. No

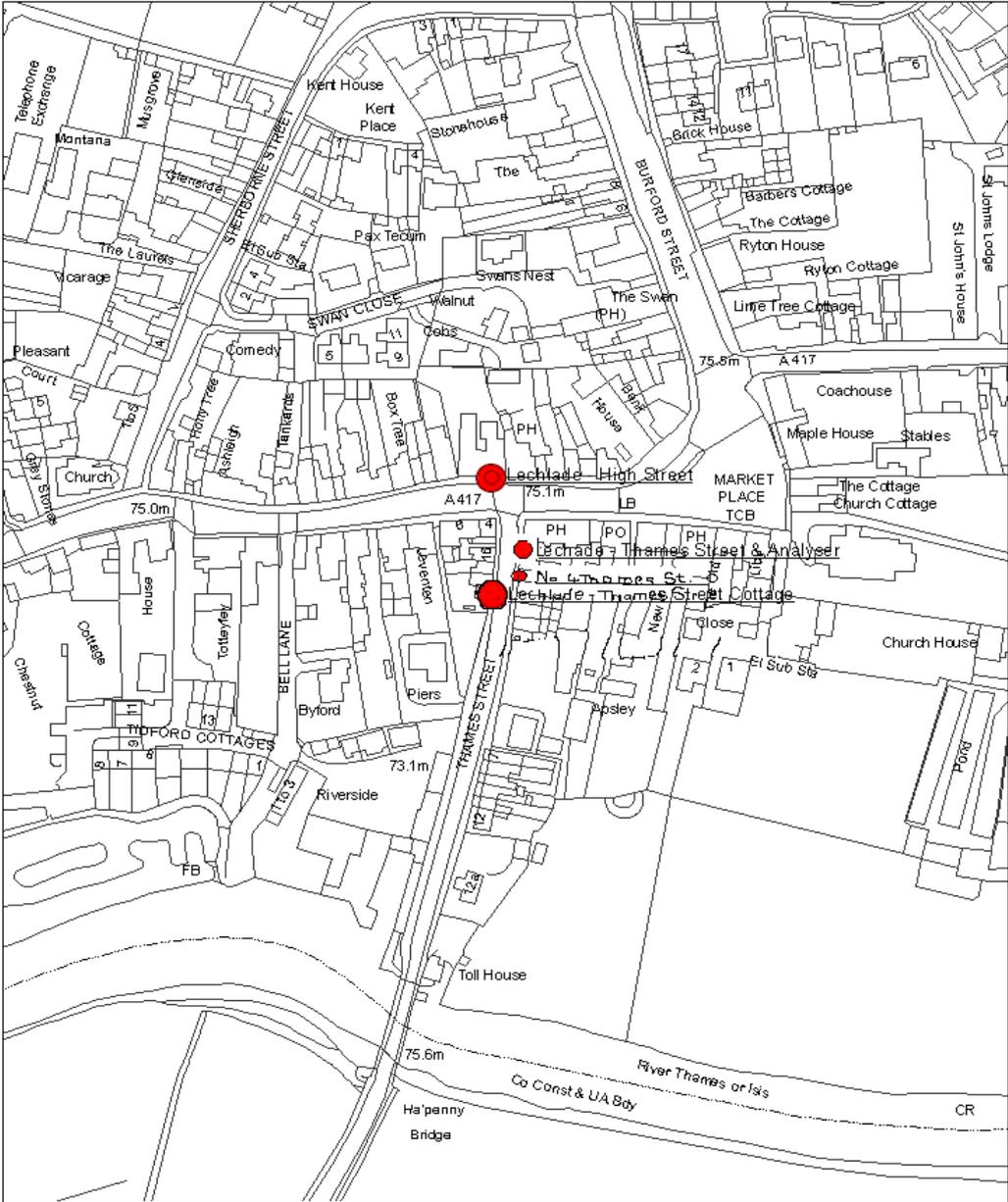
Appendix D: Map(s) of Monitoring Locations

Site T1 Stow in the Wold

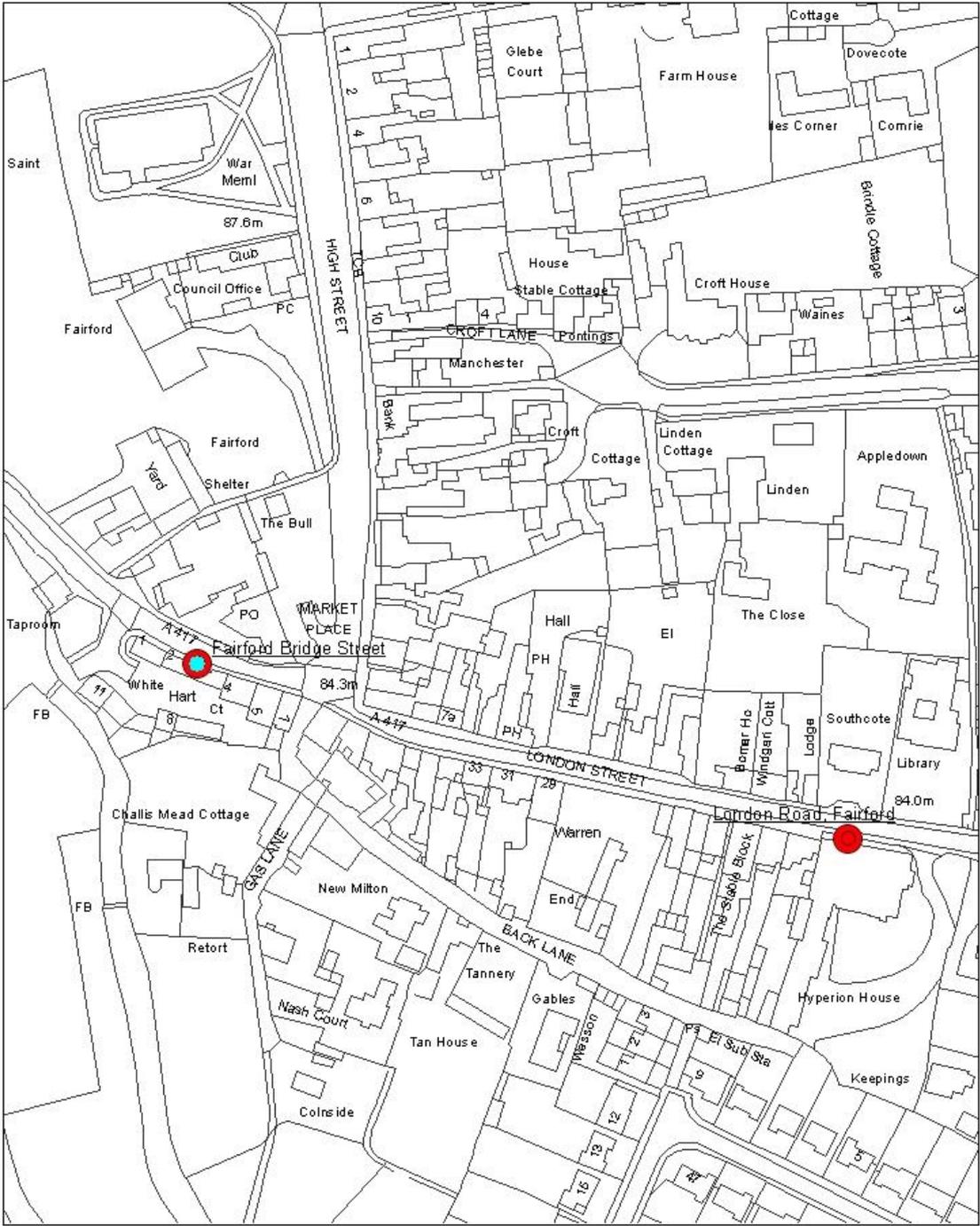


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Site T2, T3, T4, T5 Thames Street, High Street Lechlade

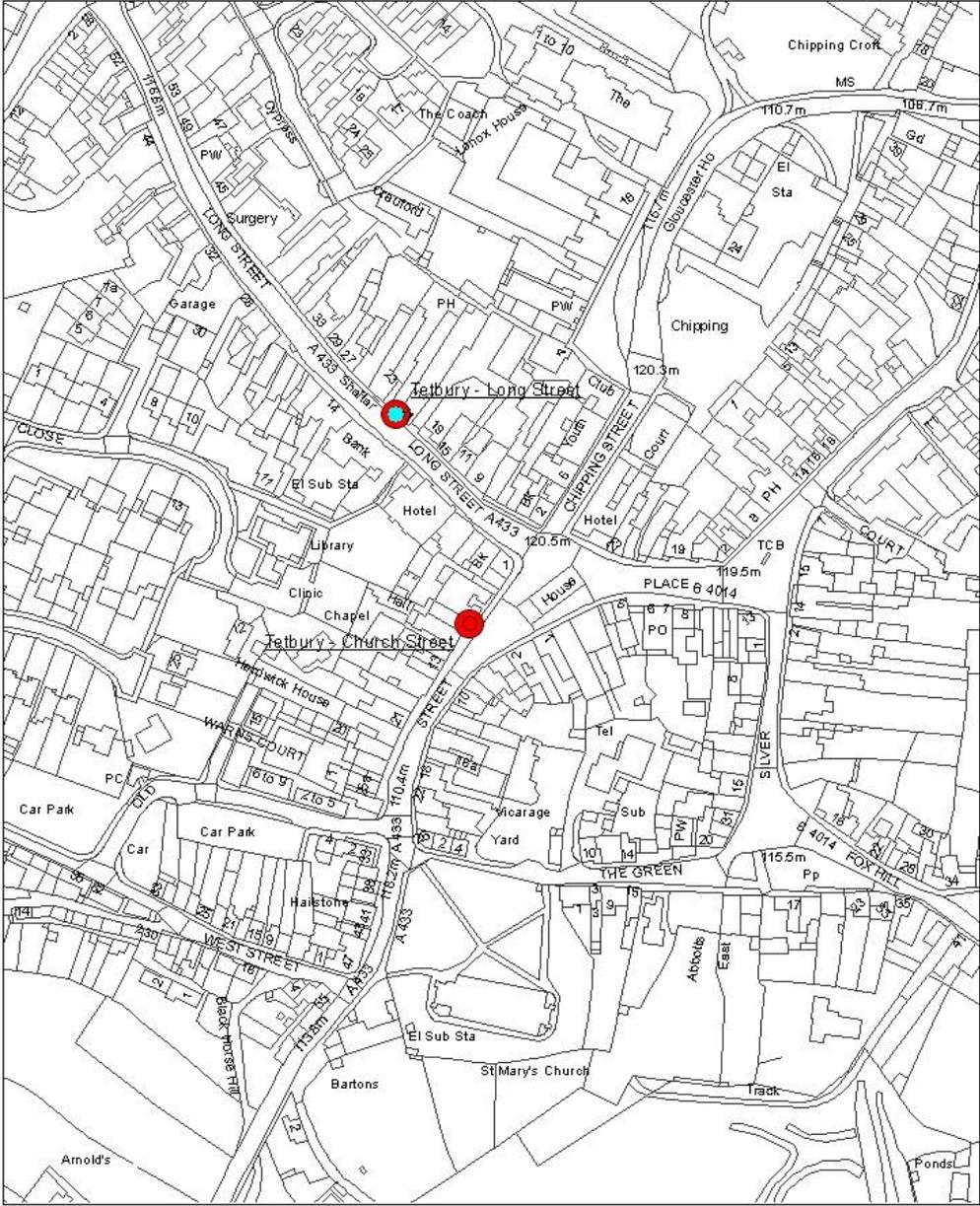


Site T6, London Road, T7 Bridge Street Fairford



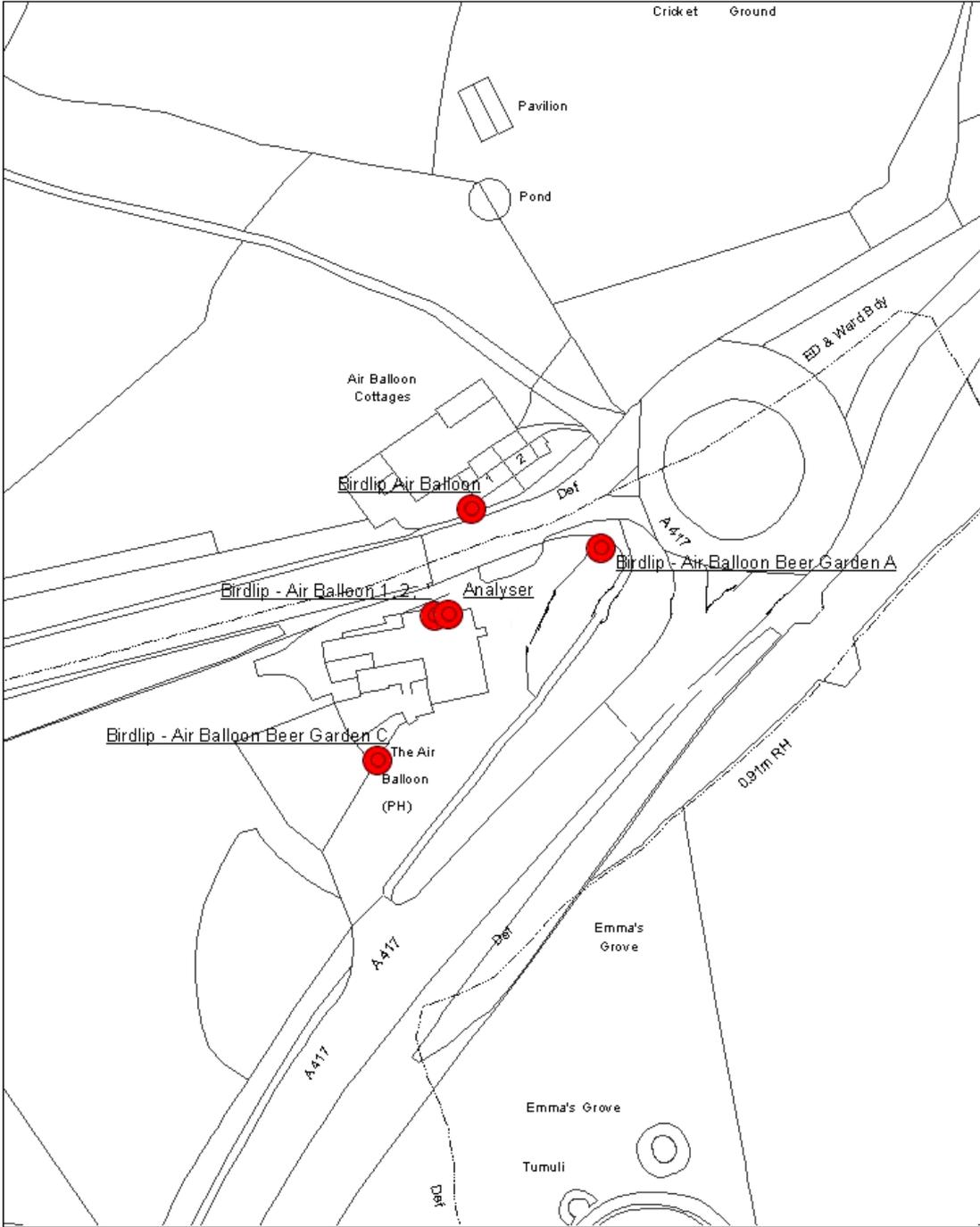
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Site T9 Church Street T10 Long Street Tetbury



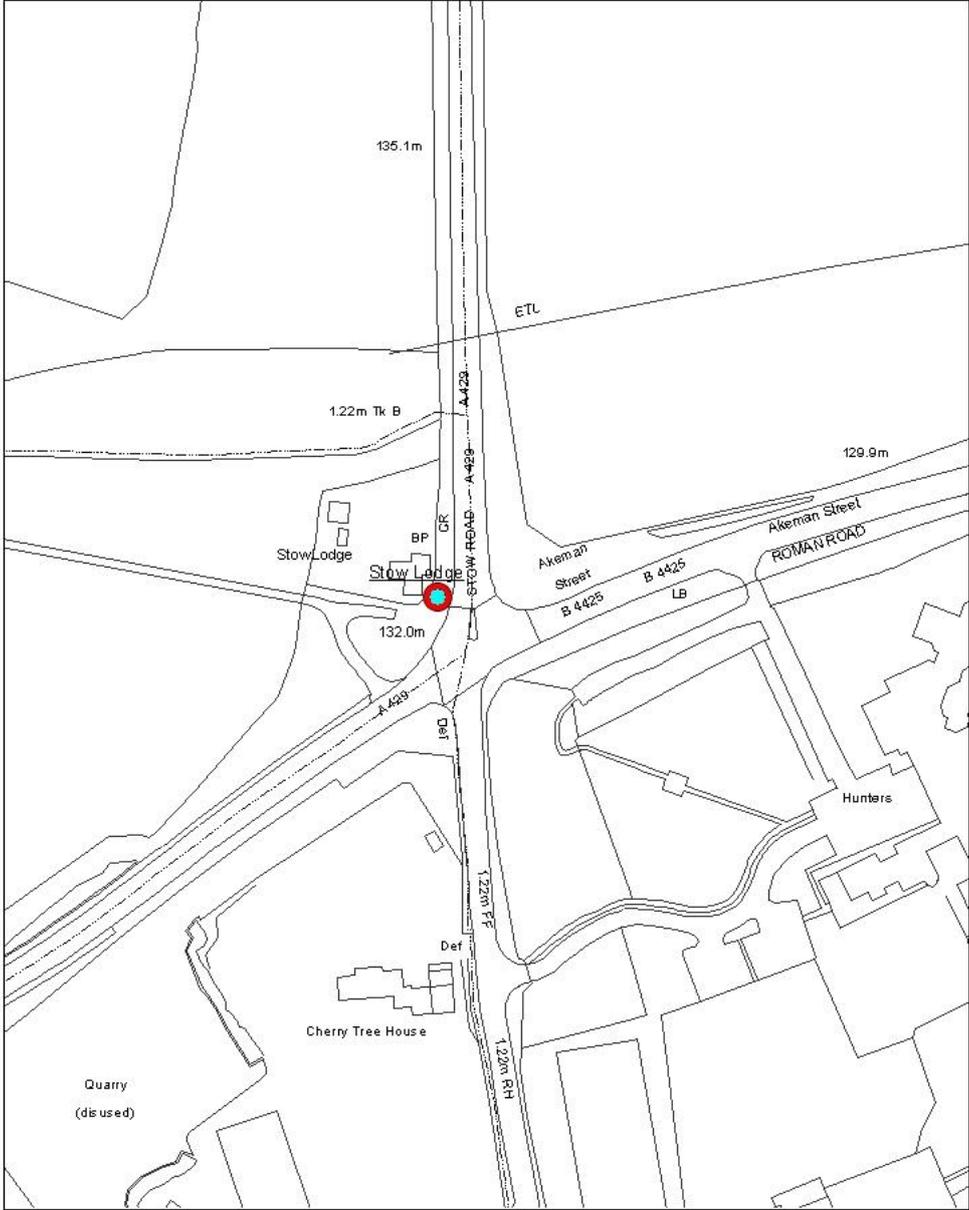
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Sites at Air Balloon Roundabout T11 T12 T13 T14
T15



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Site T16 Stow Lodge



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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 microgrammes of pollutant per cubic metre of air (µg/m³).

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
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