St Edmundsbury
BOROUGH 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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| Local Authority Officer | Matthew Axton |
| Department | Environment Team (Planning & Growth) |
| Address | West Suffolk House<br>Western Way<br>Bury St Edmunds<br>Suffolk<br>IP33 3YU |
| Telephone | 01284 757041 |
| E-mail | matthew.axton@westsuffolk.gov.uk |
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# Executive Summary: Air Quality in Our Area

## Why Air Quality Matters

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].

The most recent indicator for St Edmundsbury suggests that 5.5% percent of mortality in persons in the age range 30+years is attributable to poor air quality. This can be compared to the East of England mortality rate of 5.6% for the same period (www.phoutcomes.info/).

Improving the air quality will help to improve the long term health of our local communities, makes our towns more attractive places to visit and therefore improves the local economy.

Improving air quality in St Edmundsbury will not only help to reduce the impact on human health, but it will also reduce damage to water quality, biodiversity and crops, all of which are important within the borough.

## Air Quality in St Edmundsbury

Air Quality in St Edmundsbury is generally good, with our monitoring focusing on the two major towns of Bury St Edmunds and Haverhill, as well as the village of Great Barton.  We monitor for the pollutant Nitrogen Dioxide, as this is considered to be the major pollutant of concern in the Borough and is considered a reasonable proxy for the other major potential pollutants of $PM_{10}$ and $PM_{2.5}$.

[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

2015 saw a significant increase in the number of individual sites being monitored throughout St Edmundsbury (increasing from 11 to 22) in an effort to ensure that pollution hotspots were being appropriately identified.

There were only two monitored locations in the Borough where the annual mean objective for Nitrogen Dioxide was exceeded in 2015, these being adjacent to the Post Office on The Street at Great Barton and on Sicklesmere Road on the southern side of Bury St Edmunds. However, neither are currently declared as an AQMA, although, this is under consideration. Both of these ‘hotspots’ are very small and only affect a small number of properties.

Generally, levels of pollutants at monitoring points that have had long term (i.e. at least 5 years) monitoring are showing a decrease in pollution. However, this is very gradual and shows yearly fluctuations that do not fit the long term trend, i.e. levels of pollutants can increase in some years despite an overall downward trend.

As most of the pollution within St Edmundsbury originates from road traffic, the Borough Council have to work closely with Suffolk County Council, who is the responsible authority for the maintenance and strategic planning of the local road network. We also work closely with the St Edmundsbury Planning department to ensure new developments are appropriately controlled and mitigation is provided where required.

## Actions to Improve Air Quality

As already noted, for the majority of the Borough, air quality is good. However, our review has concluded that some areas of the major towns warranted further monitoring to confirm that this continues to be the case in respect of the main pollutant of concern, Nitrogen Dioxide. The expansion of our monitoring network during 2015 has provided further confidence in the condition of the local air quality, with the data we have gathered now available to inform long and medium term town planning decisions.

An example is the monitoring along Eastgate Street (which becomes Mustow Street as it approaches the town centre). Monitoring had occurred for a number of years at the façade of a property along Eastgate Street close to where the A14 trunk road crosses via a flyover, but relatively distant to the flow of traffic along Eastgate Street itself. This monitoring location had identified levels of Nitrogen Dioxide relatively close to the annual mean objective for a number of years, but due its location adjacent to the A14 it was unclear what proportion of the pollution was being caused by traffic along Eastgate Street and what was being caused by traffic on the A14 trunk road. Eastgate Street is known to have significant queueing during the morning rush hour and has some areas where properties are much closer to the roadside than the historically monitored location. Three new monitoring locations were therefore positioned along Eastgate Street and Mustow Street and these have confirmed that the traffic along this route to the town centre is not causing an air quality problem. This information can now be used with confidence when assessing planning applications that would affect this route.

Given that there are no Air Quality Management Areas in St Edmundsbury, there have been no specific targeted actions or specifically funded projects. However, broad action continues throughout the Borough using our influence through the planning process. For example, we are now requesting, for larger developments, all new dwellings with off street parking should be provided with an electric vehicle charge point to encourage the uptake of zero emission electric vehicles.

## Local Priorities and Challenges

Air quality in St Edmundsbury is generally good, however, significant growth is expected in the medium term with numerous planning applications for major residential developments either approved or currently being assessed through the planning process. The planning documents ‘Bury St Edmunds Vision 2031’ and ‘Haverhill Vision 2031’ indicates the two towns will grow by at least 6360 and 4260 new homes respectively between 2009 and 2031. This growth will change the shape of both major towns and the surrounding villages and there will be significant challenges in ensuring this growth is managed in such a way to ensure the existing generally good air quality is not adversely affected.

## How to Get Involved

St Edmundsbury Borough Council continuously aims to improve air quality. However, the actions of individuals will also help to improve air quality. Simple actions such as walking or cycling rather than using a car; choosing economic cars with a proven good environmental performance; or moving to electric vehicles will all help to improve the local air quality.

There are no specific air quality campaign groups within St Edmundsbury, however, a number of local community groups have shown an interest in assisting to improve air quality in their areas. We have also had community groups highlight areas where they believe that air quality might be an issue and we are always willing to consider monitoring new areas if we agree that pollution may be a problem.

If you have any specific concerns about air quality in St Edmundsbury, please contact us at environment@westsuffolk.gov.uk or 01284 757400. If you have a more general enquiry, there are a number of websites where you can get information on air quality, including up to date air quality forecasts and results from the national monitoring network, such as the DEFRA website (https://uk-air.defra.gov.uk).

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# 1 Local Air Quality Management

This report provides an overview of air quality in St Edmundsbury 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 St Edmundsbury Borough 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 (AQO). 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.

St Edmundsbury Borough Council currently does not have any AQMAs, however, we did formerly have an AQMA in Great Barton, which was revoked in 2012. The decision to revoke this AQMA is reviewed below. Information related to revoked AQMAs, including maps of AQMA boundaries are available online at [https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=255](https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=255).

Monitoring along the A143 in Great Barton commenced in 2007 and it was established that the annual mean AQO for Nitrogen Dioxide was being breached along a short section of the road adjacent to the Post Office. An AQMA was subsequently declared in 2009. This was then revoked in 2012 after SEBC took advice from an Environmental Lawyer; however, SEBC continued to monitor the air quality at this location. The advice from the lawyer concluded that members of the public needed to be regularly present (as prescribed in the Regulations) and that these members of the public should be outside the buildings, therefore residents of buildings cannot be classified as being regularly present. Thus meaning the façade of a residential property was not a relevant location if there were no members of the public regular present outside (only inside). The advice goes on to conclude that the Statutory '*Guidance may be declared by a court as containing an error of law in respect of what a relevant location is and thus need not be followed by the local authority in this instance.*'

The decision to revoke this AQMA was not supported by DEFRA or any of the other Local Authorities in Suffolk (including Suffolk County Council).

Levels of Nitrogen Dioxide remain above the annual mean objective and therefore this decision was reassessed during 2015 and early 2016. Advice from DEFRA remains unchanged, i.e. the annual mean objective should apply at the façade of a residential property. This is reiterated in the Technical Guidance published in April

2016 by DEFRA. We have requested further information from DEFRA, and they have provided additional evidence as to why the façade of a residential property is an appropriate location for the measuring of the annual mean objective.

We have also reassessed the advice from the lawyer. In addition to the formal advice to the specific questions posed, informal advice was also given which stated '*that "regularly present" does not mean many people have to be present at the façade; a small number would suffice. "Regularly" also does not mean frequently, but rather that individuals are present at the façade in a repeated pattern (e.g. a child passing that point repeatedly over time to go to school).*' It is clear that this situation does occur in Great Barton, and therefore taking the Environmental Lawyers advice in full, the Council is reconsidering its position that the AQMA should be re-declared.

In summary, the AQMA should be in place either if SEBC follow the DEFRA guidance (which may be considered to accord with the Regulations) or if SEBC take the full advice of the lawyer (which, although we do not agree is an appropriate interpretation of the legislation, still results in the same outcome). Therefore, it is the Council's conclusion that the AQMA should be re-declared, subject to Members approval.

## 2.2 Progress and Impact of Measures to address Air Quality in St Edmundsbury

St Edmundsbury Borough Council has not taken forward any specific measures during the current reporting year of 2015 in pursuit of improving local air quality as we do not have any AQMA's where specific action is required. We do, however, continue to take broad action via planning to ensure that the relatively good air quality is not adversely impacted by development.

Subject to concluding its review, St Edmundsbury Borough Council would develop an action plan for the Great Barton AQMA and will report on any subsequent actions in the 2017 Annual Status Report.

## 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.

St Edmundsbury Borough Council is currently developing measures to address $PM_{2.5}$, and, as part of the Suffolk Air Quality Protection Group are intending to meet with Public Health Suffolk in the near future to ensure the actions are most appropriately targeted. Actions will be developed over the coming year and reported in the 2017 ASR.

# 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.

St Edmundsbury Borough Council has not undertaken any automatic (continuous) monitoring during 2015. National monitoring results are available at https://uk-air.defra.gov.uk/networks/.

### 3.1.2 Non-Automatic Monitoring Sites

St Edmundsbury Borough Council undertook non-automatic (passive) monitoring of $NO_2$ at 22 sites during 2015. Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

## 3.2 Individual Pollutants

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

### 3.2.1 Nitrogen Dioxide ($NO_2$)

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

For diffusion tubes, the full 2015 dataset of monthly mean values is provided in Appendix B.

In general the results of monitoring showed that the annual mean objective for $NO_2$ was being achieved at the majority of sites throughout the borough. However, there are a couple of areas where the annual mean objective was exceeded or was close to being exceeded, as discussed below. None of the monitoring sites in the borough exceeded, or were close to exceeding, a value of 60µg/m$^3$ which is considered to indicate that an exceedance of the 1 hour objective for $NO_2$ is highly unlikely to occur.

<u>Great Barton</u>

The diffusion tube adjacent to the Post Office on The Street (A143), Great Barton, exceeded the annual mean objective, returning an annual mean for $NO_2$ of 40.9µg/m$^3$. This site has been in exceedance for a number of years, but has shown a relatively rapid decline in the concentrations of $NO_2$, with a decrease in concentrations from 48.2µg/m$^3$ in 2011 (15% decrease over 5 years). It is unclear exactly why the levels at this site have decreased so rapidly as there doesn't appear to have been any change in the number of vehicles utilising this section of road and there have been no changes to the immediately surrounding landscape. It is possible that the number of people parking outside the Post Office (which was considered a major contributing factor to the disruption of traffic flow and hence poor air quality) has decreased over the past few years. Observations at this location throughout 2015 suggest that the number of people now parking outside the Post Office is now minimal.

The diffusion tubes at Church Street Junction (also on The Street, Great Barton and previously referred to as 'The Lodge') has shown a significant decrease in concentrations from 2014 (40.1µg/m$^3$) to 2015 (35.1µg/m$^3$). There is no obvious explanation for this decrease in $NO_2$.

Background monitoring in Great Barton was introduced in 2015, the results of which indicated that the elevated concentrations of $NO_2$ do not extend beyond the A143 and background levels of $NO_2$ in Great Barton are lower than background concentrations in both Haverhill and Bury St Edmunds.

Monitoring at these locations will continue throughout 2016.

Bury St Edmunds

The number of diffusion tube locations in Bury St Edmunds was increased from five (including one suburban background location) in 2014 to thirteen in 2015. A number of long running monitoring locations which had showed consistently acceptable levels were moved or removed to allow for monitoring to occur on streets or junctions where there had previously been little or no monitoring.

New monitoring locations were placed on Sicklesmere Road, Eastgate Street, Mustow Street, Horringer Road, Vinery Road, Fornham Road and at the Kings Road/Parkway Roundabout.

The annual mean objective for $NO_2$ was exceeded at one location on Sicklesmere Road (45.3µg/m$^3$). Sicklesmere Road is the main entry route to Bury St Edmunds and access route to the A14 from the villages to the south of Bury St Edmunds and from the town of Sudbury. This road experiences significant congestion during the morning rush hour and is busy at other times of the day, with an AADF of approximately 10,500. A planning application to the south east of Bury St Edmunds for a development of 1,250 dwellings which will comprise a 'relief road' is currently at the consultation stage. This relief road will allow traffic from the south to access the A14 trunk road without travelling along Sicklesmere Road and should help to reduce the concentrations of $NO_2$ in the location of the exceedance. St Edmundsbury Borough Council are awaiting additional modelling data from the consultants connected to this development. An additional monitoring point was introduced on Sicklesmere Road at the beginning of 2016. A decision whether or not to declare an AQMA at this location will be made once the additional modelling is received from the developer's consultants and at least six months data is available from the additional monitoring location.

Two other new monitoring locations in Bury St Edmunds recorded concentrations of $NO_2$ close to the annual mean objective. These were at Kings Road (roundabout with Parkway) which recorded a value of 37.5µg/m$^3$ and on Fornham Road at the Tollgate Gyratory (38.0µg/m$^3$). Although these locations are close to the annual mean objective, neither is located directly on the façade of a residential structure and both are considered to represent worst case scenario. We do not, therefore, consider it necessary to undertake any further detailed assessment of these locations, although monitoring will continue.

Haverhill

There were no exceedances of the annual mean objective for $NO_2$ in Haverhill, with the highest recorded concentration (38.3µg/m$^3$) being on Withersfield Road. Recorded concentrations of $NO_2$ at this site show no discernible trend. Monitoring will continue at this location and an additional location added along Withersfield Road (from January 2016) to better establish the levels of $NO_2$ along this road.

The northwest Haverhill growth area has outline planning permission for approximately 1,150 dwellings and a relief road which will, in time, relieve the pressure from Withersfield Road. However, a development of approximately 2,500 dwellings northeast of Haverhill is in the planning consultation period, which could temporarily increase the pressure on Withersfield Road. This situation will require careful management to ensure concentrations along Withersfield do not exceed the annual mean objective. Negotiations, being made through the planning regime, are ongoing.

# Appendix A: Monitoring Results

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

| Site ID / 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) | Tube collocated with a Continuous Analyser? | Height (m) |
|---|---|---|---|---|---|---|---|---|---|
| BSE1 / 2 Sicklesmere Road | Roadside | 586253 | 263147 | $NO_2$ | N | 0 | 1.7 | N | 2.1 |
| BSE2 / 14 Sicklesmere Road | Roadside | 586320 | 263053 | $NO_2$ | N | 0 | 4.0 | N | 2.0 |
| BSE3 / Cullum Road roundabout | Roadside | 585236 | 263746 | $NO_2$ | N | 0 | 3.4 | N | 2.0 |
| BSE4 / Vinery Road | Roadside | 584776 | 263440 | $NO_2$ | N | 1.5 | 2.0 | N | 2.1 |
| BSE5 / Horringer Road lights | Roadside | 584703 | 263483 | $NO_2$ | N | 2.0 | 1.5 | N | 2.2 |
| BSE6 / Kings Road roundabout | Roadside | 584905 | 264171 | $NO_2$ | N | 2.4 | 2.4 | N | 2.1 |
| BSE7 / Northgate Lodge roundabout | Roadside | 585446 | 264956 | $NO_2$ | N | 0(3) | 1.8 | N | 2.0 |
| BSE8 / Fornham Road (Northgate roundabout) | Roadside | 585461 | 265050 | $NO_2$ | N | 6.0 | 1.5 | N | 2.0 |
| BSE9 / Fornham Road (Tollgate) | Roadside | 585085 | 265924 | $NO_2$ | N | 2.8 | 1.5 | N | 2.2 |

| Site ID / 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) | Tube collocated with a Continuous Analyser? | Height (m) |
|---|---|---|---|---|---|---|---|---|---|
| BSE10 / Samson Close | Suburban | 584498 | 266084 | $NO_2$ | N | 9.5 | 1.4 | N | 2.2 |
| BSE11 / Eastgate Street (Vinefields junction) | Roadside | 585940 | 264618 | $NO_2$ | N | 0 | 2.7 | N | 2.1 |
| BSE12 / 8 Mustow Street | Roadside | 585728 | 264371 | $NO_2$ | N | 1.8 | 2.6 | N | 2.2 |
| BSE13 / 21 Mustow Street | Roadside | 585680 | 264352 | $NO_2$ | N | 0.3 | 1.6 | N | 2.2 |
| GB1 / School Road | Roadside | 589147 | 267262 | $NO_2$ | N | 26.2 | 2.2 | N | 2.0 |
| GB2 / Downing Drive | Suburban | 588917 | 267370 | $NO_2$ | N | 16.0 | 1.5 | N | 1.9 |
| GB3 / The Forge Bungalows(2) | Roadside | 589163 | 267013 | $NO_2$ | N | 4.0 | 1.4 | N | 2.2 |
| GB4 / Post Office(2) | Roadside | 589130 | 266969 | $NO_2$ | N | 0 | 1.4 | N | 2.2 |
| GB5 / Church Road junction(2) | Roadside | 588993 | 266838 | $NO_2$ | N | 22.0 | 1.3 | N | 2.2 |
| HH1 / Shetland Road | Suburban | 568609 | 245575 | $NO_2$ | N | 8.7 | 1.7 | N | 2.1 |

| Site ID / 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) | Tube collocated with a Continuous Analyser? | Height (m) |
|---|---|---|---|---|---|---|---|---|---|
| HH2 / Wratting Road | Roadside | 567270 | 245981 | $NO_2$ | N | 3.0 | 1.8 | N | 2.1 |
| HH3 / Withersfield Road | Roadside | 566891 | 245892 | $NO_2$ | N | 2.4 | 1.7 | N | 2.2 |
| HH4 / Hamlet Road | Roadside | 567563 | 245077 | $NO_2$ | N | 1.0 | 1.5 | N | 2.1 |

(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) Three sites in Great Barton are Triplicates

(3) Northgate Lodge Roundabout given as 0m to relevant receptor as it is level with façade 3m away

BSE = Bury St Edmunds

GB = Great Barton

HH = Haverhill

## Table A.2 – Annual Mean $NO_2$ Monitoring Results

| Site ID | Site Type | Monitoring Type | Valid Data Capture for Monitoring Period (%) [1] | Valid Data Capture 2015 (%) [2] | $NO_2$ Annual Mean Concentration ($\mu g/m^3$) [3] | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2011 | 2012 | 2013 | 2014 | 2015 |
| BSE1 | Roadside | Diffusion Tube | 100 | 100 | - | - | - | - | **45.3** |
| BSE2 | Roadside | Diffusion Tube | 100 | 58 | - | - | - | - | 31.2 |
| BSE3 | Roadside | Diffusion Tube | 92 | 92 | 34.1 | 33.7 | 32.9 | 31.7 | 32.5 |
| BSE4 | Roadside | Diffusion Tube | 100 | 100 | - | - | - | - | 25.8 |
| BSE5 | Roadside | Diffusion Tube | 92 | 92 | - | - | - | - | 26.4 |
| BSE6 | Roadside | Diffusion Tube | 100 | 100 | - | - | - | - | 37.5 |
| BSE7 | Roadside | Diffusion Tube | 75 | 75 | 29.8 | 28.3 | 28.3 | 26.5 | 29.4 [4] |
| BSE8 | Roadside | Diffusion Tube | 100 | 100 | - | - | - | - | 29.1 |
| BSE9 | Roadside | Diffusion Tube | 92 | 92 | - | - | - | - | 38.0 |
| BSE10 | Suburban | Diffusion Tube | 92 | 92 | 15.2 | 14 | 14.6 | 14.1 | 13.4 |
| BSE11 | Roadside | Diffusion Tube | 100 | 100 | - | - | - | - | 24.2 |
| BSE12 | Roadside | Diffusion Tube | 75 | 75 | - | - | - | - | 24.2 |
| BSE13 | Roadside | Diffusion Tube | 83 | 83 | - | - | - | - | 32.9 |
| GB1 | Roadside | Diffusion Tube | 100 | 42 | - | - | - | - | 10.8 |
| GB2 | Suburban | Diffusion Tube | 92 | 92 | - | - | - | - | 10.1 |
| GB3 | Roadside | Diffusion Tube (Triplicate) | 97 | 97 | 39.6 | 37.5 | 37.9 | 36.5 | 36.0 |
| GB4 | Roadside | Diffusion Tube (Triplicate) | 100 | 100 | **48.2** | **46.1** | **46.7** | **43.7** | **40.9** |
| GB5 | Roadside | Diffusion Tube (Triplicate) | 100 | 100 | - | - | 39.7 | **40.1** | 35.1 |
| HH1 | Suburban | Diffusion Tube | 100 | 100 | 15.1 | 13.7 | 14.5 | 13.7 | 13.3 |
| HH2 | Roadside | Diffusion Tube | 92 | 92 | - | - | - | - | 32.0 |
| HH3 | Roadside | Diffusion Tube | 100 | 100 | **41.1** | 38.9 | 36.9 | 38.3 | 38.3 |

| Site ID | Site Type | Monitoring Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2015 (%) (2) | $NO_2$ Annual Mean Concentration ($\mu g/m^3$) (3) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2011 | 2012 | 2013 | 2014 | 2015 |
| HH4 | Roadside | Diffusion Tube | 75 | 75 | - | - | - | - | 22.0 |

Notes: Exceedances of the $NO_2$ annual mean objective of $40\mu g/m^3$ are shown in **bold**.

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

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

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

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

(4) BSE7 / Northgate Lodge was moved marginally at the beginning of 2015 as the previous location was not deemed representative as it was within a corner – not free flowing air.

# Appendix B: Full Monthly Diffusion Tube Results for 2015

### Table B.1 – $NO_2$ Monthly Diffusion Tube Results - 2015

| Site ID / Name | $NO_2$ Mean Concentrations (µg/m$^3$) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean | |
| | | | | | | | | | | | | | Raw Data | Bias Adjusted (1) |
| BSE1 / 2 Sicklesmere Road | 65 | 68.5 | 53.3 | 53 | 46.4 | 41.7 | 47.2 | 47.3 | 62.7 | 66.8 | 64 | 55.5 | 56.0 | 45.3 |
| BSE2 / 14 Sicklesmere Road | - | - | - | - | - | 31.1 | 34.7 | 33.5 | 38 | 39.2 | 40.3 | 37.3 | 38.5 (2) | 31.2 |
| BSE3 / Cullum Road roundabout | 55.2 | 43.9 | 39 | 39.4 | 34.3 | 30.8 | - | 30.3 | 43 | 41.5 | 46.2 | 37.8 | 40.1 | 32.5 |
| BSE4 / Vinery Road | 42.7 | 40.3 | 28.9 | 30 | 23.3 | 20.6 | 29 | 24.2 | 33.9 | 34.2 | 37.3 | 37.2 | 31.8 | 25.8 |
| BSE5 / Horringer Road lights | 39.8 | - | 36.8 | 33.5 | 26.1 | 25.1 | 27.8 | 24.7 | 39.4 | 41.3 | 35.3 | 28.7 | 32.6 | 26.4 |
| BSE6 / Kings Road roundabout | 41.9 | 51.6 | 50 | 41.6 | 30.6 | 34.1 | 39.2 | 45.7 | 48.2 | 58.7 | 52.2 | 62.2 | 46.3 | 37.5 |
| BSE7 / Northgate Lodge roundabout | 43.1 | 43.2 | 37.3 | 37 | - | - | 26.3 | 29.7 | - | 43.8 | 34.9 | 31.5 | 36.3 | 29.4 |
| BSE8 / Fornham Road (Northgate roundabout) | 42.6 | 35.5 | 35.5 | 34.6 | 23.9 | 26.4 | 28.8 | 32.3 | 39.5 | 49.4 | 42.6 | 39.6 | 35.9 | 29.1 |
| BSE9 / Fornham Road (Tollgate) | 57.4 | - | 45.6 | 47 | 46 | 36.3 | 38 | 46.9 | 47.9 | 50.6 | 52.3 | 47.9 | 46.9 | 38.0 |
| BSE10 / Samson Close | 20.2 | 23.6 | 18.7 | 14.3 | 11.2 | - | 9.3 | 12.5 | 14.9 | 18.2 | 18.4 | 21 | 16.6 | 13.4 |

| Site ID / Name | $NO_2$ Mean Concentrations (µg/m$^3$) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean | |
| | | | | | | | | | | | | | Raw Data | Bias Adjusted (1) |
| BSE11 / Eastgate Street (Vinefields junction) | 34.6 | 36.9 | 35.8 | 32.4 | 23.2 | 21.4 | 20.9 | 24.2 | 33.3 | 40.5 | 30.8 | 24.8 | 29.9 | 24.2 |
| BSE12 / 8 Mustow Street | - | 39.9 | 33.2 | 33.7 | - | 16 | 25.9 | 27.3 | 34.7 | - | 32.4 | 25.9 | 29.9 | 24.2 |
| BSE13 / 21 Mustow Street | - | 48.5 | 42.1 | 39.3 | 39.5 | 36.8 | 39.5 | 34.8 | 34.1 | - | 46.1 | 45.6 | 40.6 | 32.9 |
| GB1 / School Road | 17.4 | 20.1 | 13.4 | 10.8 | 10 | - | - | - | - | - | - | - | 13.3 (2) | 10.8 |
| GB2 / Downing Drive | 18.4 | 16.2 | 13.4 | 11.4 | 9.1 | 8.2 | 9.8 | 9.3 | 11.1 | 13.1 | - | 17.2 | 12.5 | 10.1 |
| GB3 / The Forge Bungalows | 63.3 | 54 | 47.1 | 38.8 | 39 | 32 | 41.3 | 37.5 | 40.1 | 42.9 | 54.9 | 52.1 | 45.3 | 36.0 |
| | 58.7 | 53.8 | 40.3 | 38 | 38.5 | 38.4 | 39.6 | 36.7 | 37.2 | 42 | 63.9 | 50.1 | 44.8 | |
| | 57.4 | 56.8 | - (3) | 35.4 | 39.6 | 30.7 | 38 | 37.9 | 39 | 39.9 | 55.5 | 45.4 | 43.2 | |
| GB4 / Post Office | 66.2 | 54.2 | 53.7 | 48 | 42.1 | 42.6 | 43.9 | 41.9 | 53 | 65.2 | 53.2 | 41.6 | 50.5 | 40.9 |
| | 65.4 | 62.8 | 45 | 48.2 | 45.2 | 49.6 | 44.2 | 43.9 | 57 | 60 | 45.7 | 41.4 | 50.7 | |
| | 66.9 | 62.1 | 55 | 48.1 | 45.6 | 39.3 | 43.3 | 44.7 | 55.2 | 57 | 52 | 36.3 | 50.5 | |
| GB5 / Church Road junction | 48.1 | 54.9 | 42.9 | 39.1 | 35.4 | 33.3 | 41.1 | 40.7 | 45.4 | 47.5 | 51.9 | 46.5 | 43.9 | 35.1 |
| | 40 | 52 | 38.1 | 34.9 | 34.1 | 36.8 | 37.1 | 41.1 | 45 | 47.3 | 49.8 | 43.6 | 41.7 | |
| | 51 | 50.7 | 41.9 | 40.5 | 38.1 | 37.5 | 38.8 | 43.6 | 47.5 | 42.8 | 51.2 | 49.9 | 44.5 | |
| HH1 / Shetland Road | 23.4 | 23.9 | 19.1 | 13.7 | 11.3 | 9.1 | 9.2 | 11.8 | 13.5 | 17.9 | 21.7 | 22.6 | 16.4 | 13.3 |
| HH2 / Wratting Road | 48.1 | 41 | 37.2 | 40.2 | 31.4 | 32.2 | 33.3 | 37 | - | 42.8 | 43.6 | 48.1 | 39.5 | 32.0 |
| HH3 / Withersfield Road | 47.5 | 66.9 | 46.6 | 45.5 | 39.6 | 36 | 43.7 | 44.8 | 44.6 | 40.5 | 53.3 | 58.5 | 47.3 | 38.3 |

| Site ID / Name | $NO_2$ Mean Concentrations (µg/m$^3$) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean | |
| | | | | | | | | | | | | | Raw Data | Bias Adjusted (1) |
| HH4 / Hamlet Road | 30.9 | 32 | 29.2 | 25.3 | 21.2 | 17.2 | - | 22.2 | - | - | 32.9 | 33.5 | 27.2 | 22.0 |

(1) See Appendix C for details on bias adjustment

(2) Raw data values for 14 Sicklesmere Road and School Road have been annualised in line with TG(16) using values of 1.06 and 0.93 respectively. Local sites have been used in the absence of a sufficient number of local continuous background sites.

(3) Triplicate results did not correlate (CV >20) – Determined as outlier and deleted

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

## National Diffusion Tube Bias Adjustment Factor Spreadsheet

Spreadsheet Version Number: 03/16

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

This spreadsheet will be updated at the end of June 2016
LAQM Helpdesk Website

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.

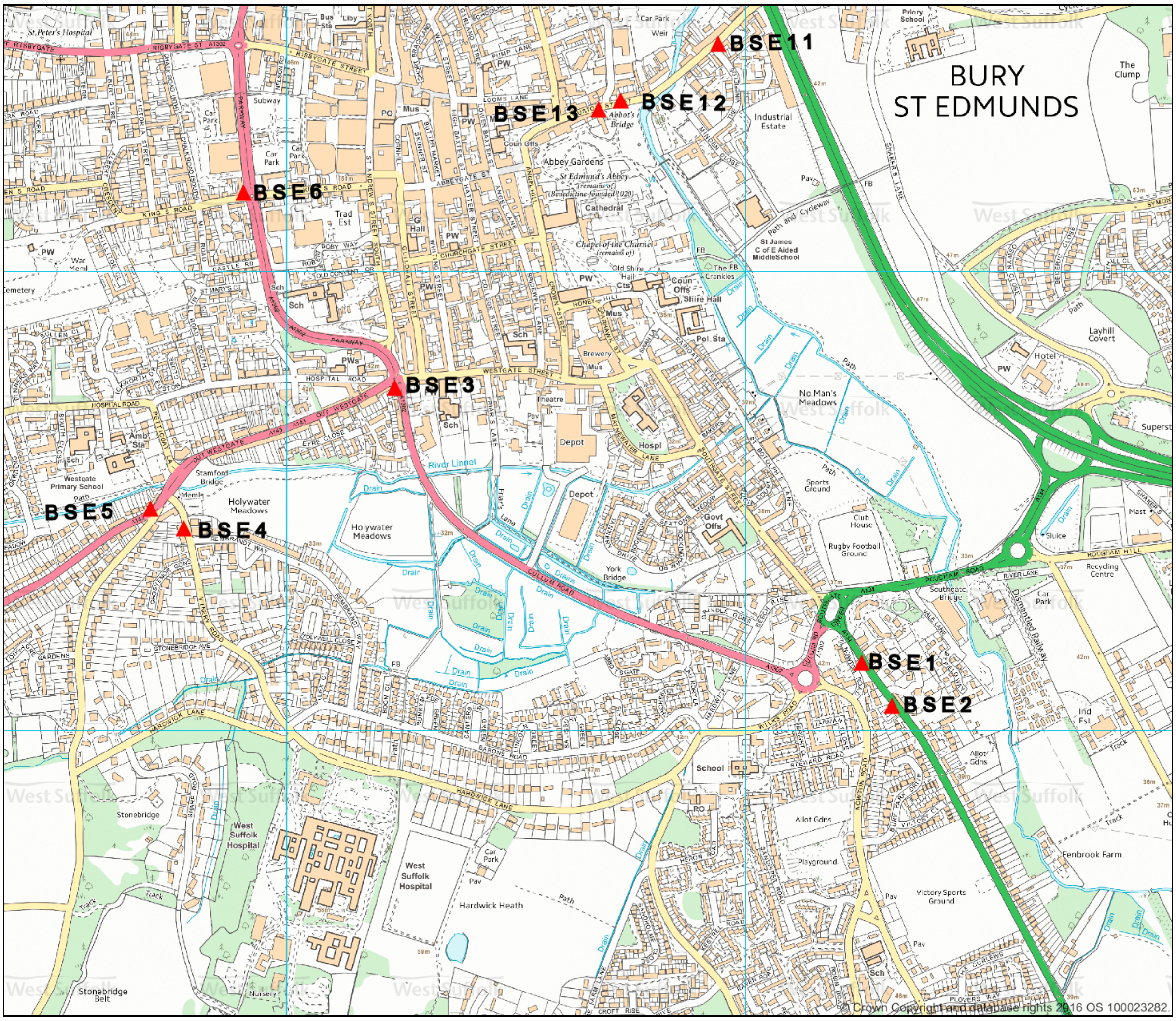
Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

| Step 1: | Step 2: | Step 3: | Step 4: |
|---|---|---|---|
| Select the Laboratory that Analyses Your Tubes from the Drop-Down List | Select a Preparation Method from the Drop-Down List | Select a Year from the Drop-Down List | **Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.** |
| If a laboratory is not shown, we have no data for this laboratory. | If a preparation method is not shown, we have no data for this method at this laboratory. | If a year is not shown, we have no data[2] | If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953 |

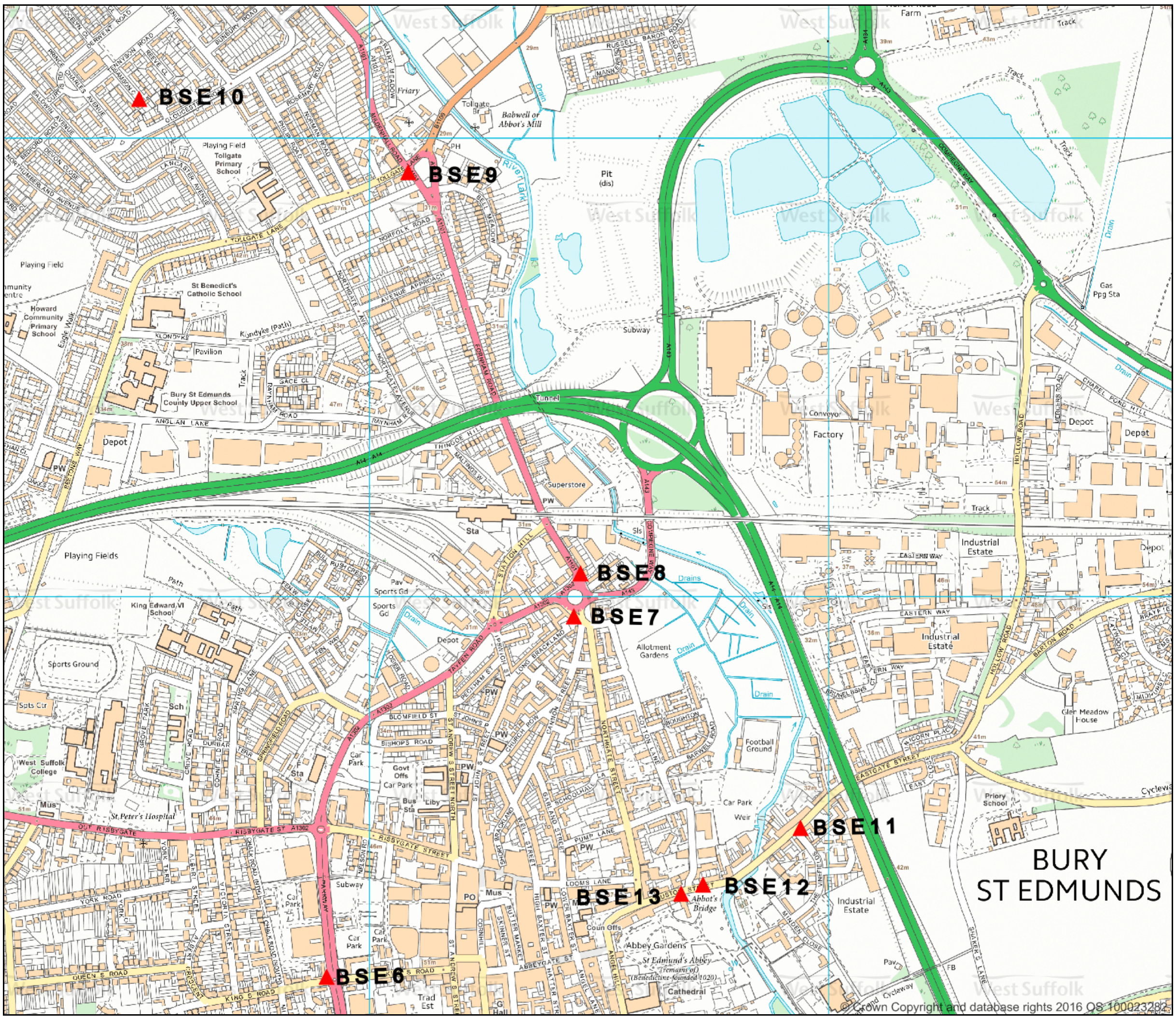
| Analysed By[1] | Method<br>To undo your selection, choose (All) from the pop-up list | Year[5]<br>To undo your selection, choose (All) | Site Type | Local Authority | Length of Study (months) | Diffusion Tube Mean Conc. (Dm) (μg/m³) | Automatic Monitor Mean Conc. (Cm) (μg/m³) | Bias (B) | Tube Precision[6] | Bias Adjustment Factor (A) (Cm/Dm) |
|---|---|---|---|---|---|---|---|---|---|---|
| ESG Didcot | 50% TEA in acetone | 2015 | R | Dumfries and Galloway Council | 12 | 35 | 30 | 14.6% | G | **0.87** |
| ESG Didcot | 50% TEA in acetone | 2015 | B | Gravesham Borough Council | 12 | 40 | 30 | 34.1% | G | **0.75** |
| ESG Didcot | 50% TEA in acetone | 2015 | B | Gravesham Borough Council | 12 | 30 | 23 | 29.8% | P | **0.77** |
| ESG Didcot | 50% TEA in acetone | 2015 | UI | North Lincolnshire | 11 | 24 | 18 | 36.5% | P | **0.73** |
| ESG Didcot | 50% TEA in acetone | 2015 | R | Swale BC | 11 | 38 | 32 | 19.3% | P | **0.84** |
| ESG Didcot | 50% TEA in acetone | 2015 | R | Swale BC | 10 | 48 | 39 | 21.0% | G | **0.83** |
| ESG Didcot | 50% TEA in acetone | 2015 | R | Swale Borough Council | 11 | 40 | 34 | 19.7% | P | **0.84** |
| ESG Didcot | 50% TEA in acetone | 2015 | R | Wrexham County Borough Council | 12 | 19 | 19 | 0.6% | G | **0.99** |
| ESG Didcot | 50% TEA in acetone | 2015 | UC | Cardiff Council | 10 | 26 | 26 | 1.6% | G | **0.98** |
| ESG Didcot | 50% TEA in acetone | 2015 | KS | Marylebone Road Intercomparison | 12 | 104 | 81 | 27.9% | G | **0.78** |
| ESG Didcot | 50% TEA in acetone | 2015 | R | Vale of White Horse District Council | 11 | 34 | 29 | 15.7% | G | **0.86** |
| ESG Didcot | 50% TEA in acetone | 2015 | UI | Stockton on Tees | 12 | 24 | 18 | 29.4% | G | **0.77** |
| ESG Didcot | 50% TEA in acetone | 2015 | R | Stockton on Tees | 12 | 17 | 14 | 21.5% | G | **0.82** |
| ESG Didcot | 50% TEA in acetone | 2015 | KS | Suffolk Coastal DC | 12 | 44 | 35 | 26.0% | P | **0.79** |
| ESG Didcot | 50% TEA in acetone | 2015 | SU | Thanet District Council | 9 | 17 | 15 | 10.6% | G | **0.90** |
| ESG Didcot | 50% TEA in acetone | 2015 | R | Thanet District Council | 12 | 27 | 23 | 17.8% | G | **0.85** |
| ESG Didcot | 50% TEA in acetone | 2015 | B | Medway Council | 12 | 21 | 12 | 77.3% | G | **0.56** |
| ESG Didcot | 50% TEA in acetone | 2015 | R | Medway Council | 11 | 32 | 23 | 42.6% | G | **0.70** |
| ESG Didcot | 50% TEA in acetone | 2015 | R | North East Lincolnshire Council | 10 | 34 | 28 | 21.2% | P | **0.83** |
| ESG Didcot | 50% TEA in acetone | 2015 | R | North East Lincolnshire Council | 11 | 39 | 28 | 38.6% | G | **0.72** |
| ESG Didcot | 50% TEA in acetone | 2015 | R | North East Lincolnshire Council | 11 | 55 | 47 | 16.2% | G | **0.86** |
| ESG Didcot | 50% TEA in acetone | 2015 | | **Overall Factor[3] (21 studies)** | | | | **Use** | | **0.81** |

# Appendix D: Map(s) of Monitoring Locations

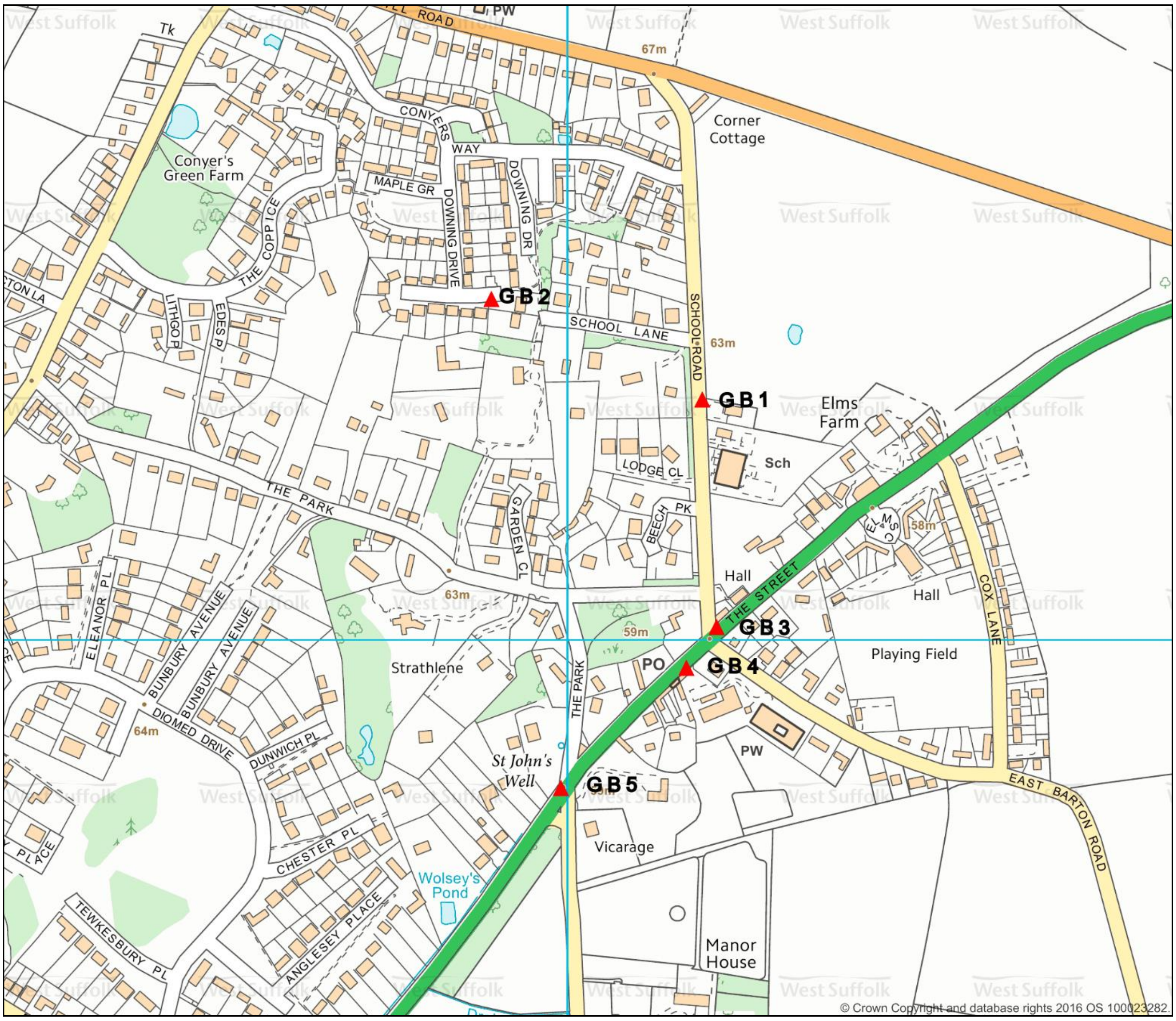
## Figure D.2 – Monitoring Locations – Bury St Edmunds (South)



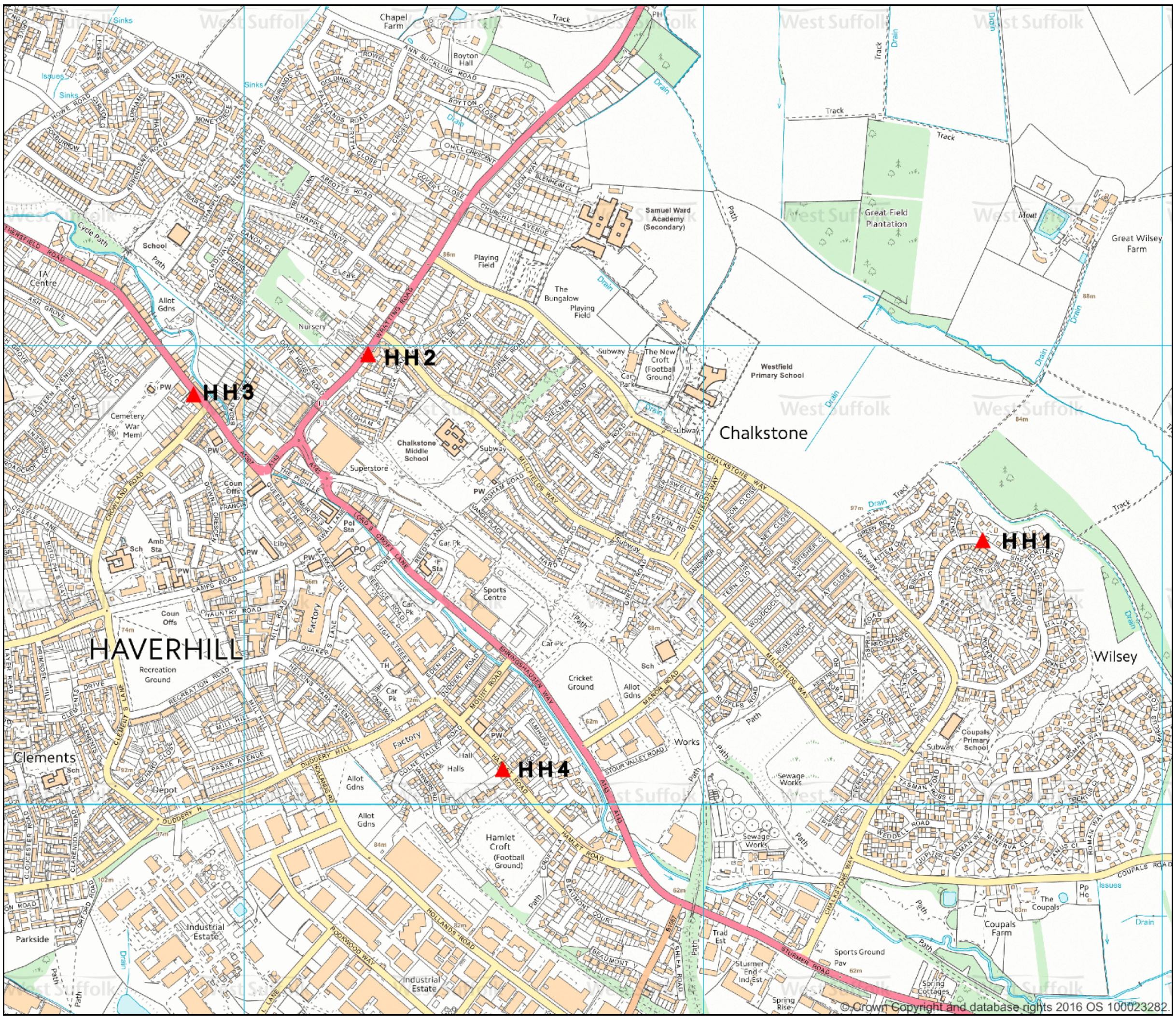
## Figure D.2 – Monitoring Locations – Bury St Edmunds (North)



## Figure D.3 – Monitoring Locations – Great Barton



## Figure D.4 – Monitoring Locations – Haverhill



# 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/m$^3$).

# Glossary of Terms

| Abbreviation | Description |
| --- | --- |
| AADF | Annual Average Daily Flow – The number of vehicles estimated to pass a given point on the road in a 24 hour period on an average day in the year. |
| 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 |
| 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 |
| SEBC | St Edmundsbury Borough Council |
| $SO_2$ | Sulphur Dioxide |
| … | … |