

2010 Air Quality Progress Report for South Cambridgeshire District Council

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

April 2010

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Executive Summary

This Report constitutes the 2010 Air Quality Review and Assessment Progress Report for South Cambridgeshire District Council. The Report includes air quality monitoring data from 2009 and makes predictions for the future for relevant air pollutants. It also covers other issues and developments that have occurred in the last twelve months, since the Updating and Screening Assessment of 2009, that may have a bearing on local air quality.

During 2009, the objectives for nitrogen dioxide were met at all monitoring locations. However, the daily mean PM₁₀ objective was exceeded at the Bar Hill and Impington continuous monitoring stations and the annual mean PM₁₀ objective was exceeded at Impington.

South Cambridgeshire District Council has recently completed an Air Quality Action Plan (AQAP) in response to the 2008 designation of an Air Quality Management Area for annual mean nitrogen dioxide and daily mean PM₁₀ along the A14 corridor. The AQAP was completed jointly with Cambridge City Council and Huntingdonshire District Council and each Authority has identified 5 priority actions that are thought will have the greatest benefit to local air quality. In addition to the 5 priority actions, a series of other actions have been identified and studied for feasibility and cost effectiveness. .

In addition to the AQAP, South Cambridgeshire Council has also developed Supplementary Planning Guidance on Low Emissions Strategies, which will target primarily the larger scale developments that are proposed for the area.

South Cambridgeshire expected to experience almost 40% increase in housing development between 1999 and 2016. In the past much of the housing development in the Cambridge area has been directed to the villages and towns beyond the city. Most of the new development in the district will take place on the edge of Cambridge and in a new town near to Longstanton and Oakington, named Northstowe. The economic downturn means that the construction of some developments may be delayed and take longer than planned, though house-building is likely to go ahead on other sites. Housing completions are expected to pick up again in a few years' time.

The major growth sites include:

- Cambridge East
- Cambridge Southern Fringe (Trumpington Meadows)
- Cambourne
- Northstowe
- Orchard Park (formerly Arbury Park)
- North West Cambridge

The most significant of these developments is Northstowe. The existing Local Development Framework, Core Strategy and Area Action Plan all put Northstowe at the centre of the development strategy for the area, and all confirm that the new development will have enhanced environmental standards

Within the Administrative area of Cambridgeshire County there are proposed large-scale traffic schemes, which are likely to have an affect on air quality in the future. Although still at formative stages the schemes are discussed further.

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1 Introduction

1.1 Description of Local Authority Area

South Cambridgeshire is a rural district in East Anglia, which entirely surrounds but does not include the city of Cambridge. It is the southernmost district of the county of Cambridgeshire and borders Bedfordshire to the west, Hertfordshire to the south, Essex to the southeast and Suffolk to the east. The district is comprised of 102 parishes with all settlements classified as villages. The landscape and villages are equally varied.

The area has good road and rail links with London and the South-East. The M11/A11 and A14 corridors pass through the District to the west/south and north of Cambridge respectively. To date, air quality issues within the District of South Cambridgeshire have been linked directly to the volume of traffic that runs through the District, specifically along the A14. The A14 is congested on a regular basis between Bar Hill (to the West of Cambridge) and Milton (to the North North-East of Cambridge). This has resulted in the declaration of an Air Quality Management Area for nitrogen dioxide (NO₂) and PM₁₀ along a stretch of the A14 between Bar Hill and Milton. Traffic levels have continued to grow along the A14 through the District so that the road is now almost at its maximum capacity.

The government has identified South Cambridgeshire as one of four growth areas. Substantial development is proposed over the next 10-12 years with plans to increase the population of the District to 162,000 by 2016. Future traffic and development proposals have the potential to cause the air quality management areas to increase in size.

South Cambridgeshire District Council is within the eastern region growth area and is therefore subject to a significant amount of new mixed-use development. All applications received are screened to ensure that any impacts on air quality are identified and mitigated as far as possible. Whilst applications are awaited for most of the growth area schemes, work is continuing in supplying information for the production of environmental statements and assessments.

The most significant proposed development within the District is the new town of Northstowe, which is described as an “exemplar for sustainability” and is still under consideration for ecotown status. Northstowe will ultimately be a new town comprising 9,500 new homes (and a wide range of facilities), which will become a community of up to 24,000 people. The site covers 427 hectares, and is located near Longstanton and Oakington, on the route of the Cambridgeshire Guided Busway and approximately 3km North of the AQMA at Bar Hill. This development has been identified within the Local Development Framework which has led to the development of a Northstowe Area Action Plan (AAP). The AAP sets out the vision for Northstowe covering all aspects of development and design (from visual impact to sustainability issues).

In addition, an outline planning application was submitted in 2007 for the development of Upper Cambourne. This is to include up to 950 dwellings, a community centre, open space and play areas. Owing to the recent improvements on the local network A428, it is thought that traffic movements will not cause a significant impact to air quality.

1.2 Purpose of Progress Report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) in England are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (for carbon monoxide the units used are milligrammes per cubic metre, mg/m^3). Table 1.1. includes the number of permitted exceedences in any given year (where applicable).

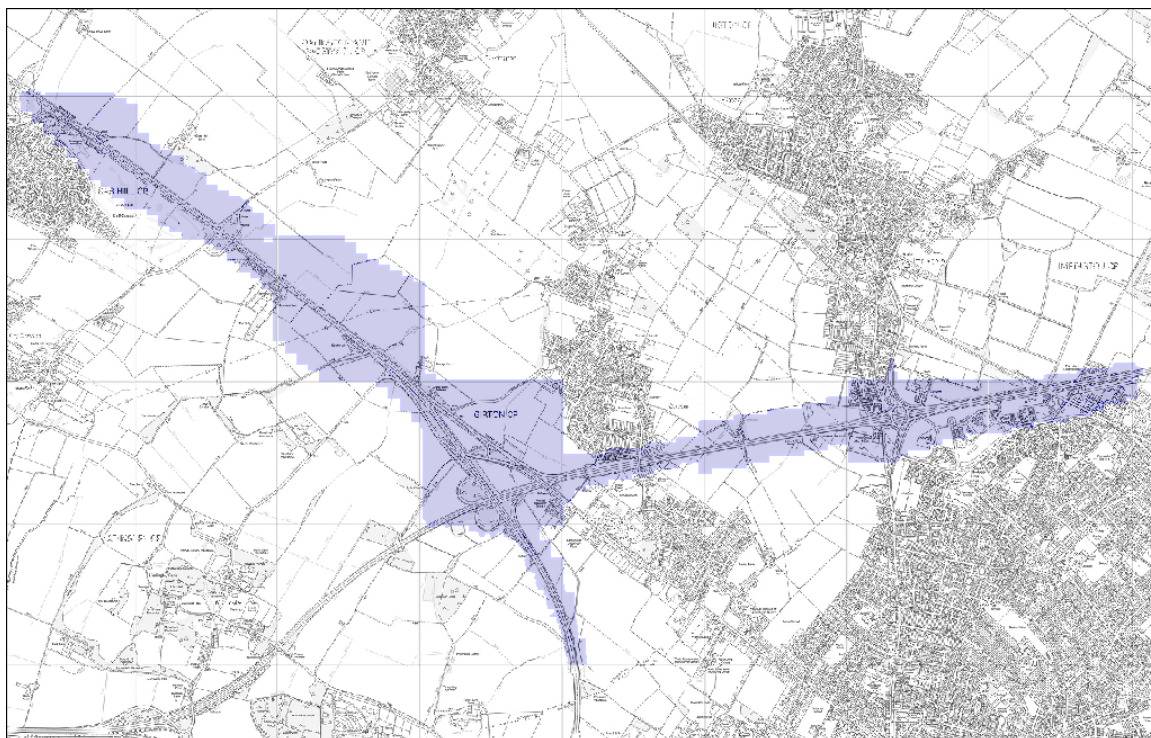
Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

| Pollutant | Concentration | | Date to be achieved by |
|---|---|---------------------|------------------------|
| | Concentration | Measured as | |
| Benzene | 16.25 $\mu\text{g}/\text{m}^3$ | Running annual mean | 31.12.2003 |
| | 5.00 $\mu\text{g}/\text{m}^3$ | Running annual mean | 31.12.2010 |
| 1,3-Butadiene | 2.25 $\mu\text{g}/\text{m}^3$ | Running annual mean | 31.12.2003 |
| Carbon monoxide | 10.0 mg/m^3 | Running 8-hour mean | 31.12.2003 |
| Lead | 0.5 $\mu\text{g}/\text{m}^3$ | Annual mean | 31.12.2004 |
| | 0.25 $\mu\text{g}/\text{m}^3$ | Annual mean | 31.12.2008 |
| Nitrogen dioxide | 200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year | 1-hour mean | 31.12.2005 |
| | 40 $\mu\text{g}/\text{m}^3$ | Annual mean | 31.12.2005 |
| Particles (PM ₁₀) (gravimetric) | 50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year | 24-hour mean | 31.12.2004 |
| | 40 $\mu\text{g}/\text{m}^3$ | Annual mean | 31.12.2004 |
| Sulphur dioxide | 350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year | 1-hour mean | 31.12.2004 |
| | 125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year | 24-hour mean | 31.12.2004 |
| | 266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year | 15-minute mean | 31.12.2005 |

1.4 Summary of Previous Review and Assessments

Timeline of Significant Reports Prepared and Submitted by South Cambridgeshire District Council

| Report | Year | Conclusion |
|--|------|---|
| Review and Assessment | 1998 | The report progressed benzene, 1-3 butadiene, lead, carbon monoxide, PM ₁₀ and nitrogen dioxide to a Stage 2 assessment. The overall conclusion was that all objectives were likely to be met. |
| Review and Assessment | 2000 | All objectives likely to be met, however, given the increasing traffic on the A14 and the introduction of new industrial sources, it was concluded that detailed monitoring would be required for nitrogen dioxide, PM ₁₀ and sulphur dioxide. |
| Updating and Screening Assessment | 2003 | Based on monitoring results, it was concluded that all objectives were likely to be met. |
| Progress Report | 2004 | Monitoring results were showing exceedences of the annual mean for nitrogen dioxide along a stretch of the A14, therefore a Detailed Assessment was required for NO ₂ . All other objectives were predicted as likely to be met. |
| Detailed Assessment of Nitrogen Dioxide Along the A14 Corridor | 2006 | The annual mean objective for nitrogen dioxide was not likely to be met along the A14 between Bar Hill and Milton, therefore, it was necessary to declare an Air Quality Management Area. |
| Progress Report | 2007 | Monitoring results were showing exceedences of the daily mean for PM ₁₀ along a stretch of the A14, therefore a Detailed Assessment was required for PM ₁₀ . Monitoring of NO ₂ along the A14 continued to show exceedences of the annual mean objective. Further assessment of NO ₂ was required. All other objectives were predicted as likely to be met. |
| Detailed Assessment of PM ₁₀ Along the A14 Corridor | 2008 | The daily mean objective for PM ₁₀ was not likely to be met along the A14 between Bar Hill and Milton, therefore, it was necessary to declare an Air Quality Management Area. |
| Progress Report | 2008 | A Further Assessment of NO ₂ and PM ₁₀ was required. Objectives for all other pollutants were predicted as likely to be met. |
| Further Assessment of nitrogen dioxide and PM ₁₀ Along the A14 Corridor | 2008 | The AQMA for NO ₂ and PM ₁₀ was declared. An Air Quality Action Plan (AQAP) is required and consultation is underway in its' development. |
| Updating and Screening Assessment | 2009 | Based on the monitoring results from the previous year, it was concluded that levels of NO ₂ and PM ₁₀ along the A14 between Bar Hill and Milton would remain above the national objective. No other significant developments or increases in traffic or industrial emissions were identified. |
| Air Quality Action Plan | 2010 | Submission of Air Quality Action Plan to Defra. Awaiting feedback/comments. |

Figure 1.1 Map of AQMA Boundary (for NO₂ and PM₁₀)

The Air Quality Management Area (as pictured in Figure 1.1, above) was initially declared in July 2007 following measured and modelled exceedences of the annual mean objective for nitrogen dioxide. The following year, exceedences of the daily mean objective for PM₁₀ were identified at the Bar Hill and Impington continuous monitoring stations. As a result of this, a Detailed Assessment of PM₁₀ was carried out which led to the revocation of the original AQMA and the designation of a 2nd AQMA to include PM₁₀ in July 2008. After discussions with Defra, it was decided that the boundary for the PM₁₀ (which was originally slightly smaller than that of the NO₂ AQMA) would be the same as the original boundary for the nitrogen dioxide.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

South Cambridgeshire District Council currently operates automatic monitoring stations at 3 sites within the District. Details of these sites are provided in Table 2.1.

- QA/QC of automatic monitoring data is carried out by AEA Technology (<http://www.aeat.co.uk>).
- An annual audit of the monitoring stations is carried out by AEA Technology.
- Services are carried out bi-annually by the equipment suppliers. In the case of Bar Hill and Impington, this is AirMonitors Ltd and the site at Orchard Park School is serviced by Enviro-Technology.
- The sites are manually calibrated on a bi-monthly basis by the Local Site Operative. The output from the calibrations is forwarded to AEAT.
- South Cambridgeshire District Council is a member of the Calibration Club, operated by AEAT.
- All NO_x analysers are chemiluminescence analysers
- All particulate matter analysers are BAMs. In line with current guidance, BAM data is multiplied by 1.3 to give the gravimetric equivalent.
- A 4th automatic monitoring station is currently on order. This is likely to be placed close to the site of the proposed development in North West Cambridge, close to the A14, M11 and Huntingdon Road. It will monitor PM₁₀, PM_{2.5}, NO_x and NO₂.

Figure 2.1 Map of Automatic and Non-automatic Monitoring Sites

Map of monitoring locations along the A14



★ = nitrogen dioxide diffusion tube, ■ = continuous monitoring station

N.B:

The monitoring station at Orchard Park Primary School was commissioned on 22nd April 2009

Table 2.1 Details of Automatic Monitoring Sites

| Site Name | Site Type | OS Grid Ref | Pollutants Monitored | Analyser Model | In AQMA ? | Relevant Exposure? (Y/N with distance (m) to relevant exposure) | Distance to kerb of nearest road (N/A if not applicable) | Worst-case Location? |
|-----------------------------------|------------------|----------------------|---|--|-----------|---|--|----------------------|
| Bar Hill (A14) | Roadside | X 538685 Y 263760 | NO _x (NO ₂) PM ₁₀ PM _{2.5} | Thermo 42C Eberline BAM (FH62) Eberline BAM (FH62) | Y | Y (8m) | N/A | Y |
| Impington (A14) | Roadside | X 543739 Y 261625 | NO _x (NO ₂) PM ₁₀ | Thermo 42C Eberline BAM (FH62) | Y | Y (12m) | N/A | Y |
| Orchard Park Primary School (A14) | Urban background | X 544558 Y 261579 | NO _x (NO ₂) PM ₁₀ | ET 200E ET BAM1020 | Y | Y (1m) | N/A | Y |

2.1.2 Non-Automatic Monitoring

The monitoring of nitrogen dioxide by diffusion tube has been an ongoing project since 1995. There are currently 25 sites within the District (3 of these form a co-location study) as detailed in Figure 2.1.

The tubes are supplied and analysed by Harwell Scientifics, a UKAS accredited laboratory (0322). The tube preparation method is 50% TEA in Acetone and analysis is by desorption with distilled water, and the extract analysed using a segmented flow auto analyser with ultraviolet detection. The exposure periods for the diffusion tubes are those of the UK Nitrogen Dioxide Diffusion Tube Network run by NETCEN which effectively is a four or five week duration. QA/QC procedures are as detailed in the UK NO₂ Diffusion Tube Network Instruction Manual, this document can be found at www.airquality.co.uk/archive/reports/cat06/no2instr.pdf

The diffusion tube bias adjustment is calculated from a co-location study at Orchard Park School, Arbury Park, Cambridge. This gives a bias adjustment factor of 0.8 for 2009. Table 2.2, below, gives further detail on the tube locations.

Summary of tube details:

- Analysing lab: Scientifics Ltd
551 South Becquerel Avenue
Harwell Science and Innovation Campus
Didcot
Oxfordshire
OX11 0TB
- Diffusion tube preparation method used: 50:50 (acetone:triethanolamine)
- Scientifics Ltd confirm that the methods and procedures they follow meet the guidelines set out in Defras' "Diffusion Tubes For Ambient Monitoring: Practical Guidance". A copy of the confirmation is provided in Appendix A.
- South Cambridgeshire District Council previously relied on the bias adjustment factors provided on the Air Quality Archive web database, however, a co-location study began at Orchard Park Primary School (grid reference 544557, 261571) in April 2009. Using this local study, a bias adjustment factor of 0.8 was calculated. This is similar to the figure of 0.81 supplied for 2009 on the Air Quality Review and Assessment Helpdesk website.
- From the "Summary of Laboratory Performance in WASP R98-102" (prepared by AEA on behalf of Defra, 2008), the performance of Scientifics Ltd against both the old and new criteria was rated as "good".

Table 2.2 Details of Non- Automatic Monitoring Sites

| Site Name | Site Type | OS Grid Ref | Pollutants Monitored | In AQMA? | Relevant Exposure? (Y/N with distance (m) to relevant exposure) | Distance to kerb of nearest road (N/A if not applicable) | Worst-case Location? |
|-------------------------------------|------------------|------------------|----------------------|----------|--|---|----------------------|
| 1 The Coppice, Histon | Urban background | 544230 262048 | NO ₂ | N | Y (7m) | 0.5m | Y |
| Narrow Lane, Histon | Roadside | 544026 264165 | NO ₂ | N | Y (10m) | 0.5m | N |
| The Gables, High Street, Histon | Roadside | 543976 263675 | NO ₂ | N | Y (5m) | 1m | Y |
| White Lion, 96 High Street, Sawston | Urban background | 548600 249136 | NO ₂ | N | Y (5m) | 1m | Y |
| 15 Paddock Way, Sawston | Roadside | 548777 249373 | NO ₂ | N | Y (5m) | 0.5m | N |
| 22 Water Lane, Histon | Roadside | 544050 263306 | NO ₂ | N | Y (2m) | 0.5m | Y |
| 1 Brook Close, Histon | Urban background | 543955 263588 | NO ₂ | N | Y (2m) | 1m | Y |
| 72 Cambridge Road, Impington | Urban background | 544243 261819 | NO ₂ | Y | Y (7m) | 0.5m | Y |
| 19 Lonetree Avenue | Roadside | 544119 261862 | NO ₂ | Y | Y (7m) | 0.5m | Y |
| 1A New Road, Sawston | Roadside | 548400 249753 | NO ₂ | N | Y (10m) | 1m | N |
| 5 Mill Lane, Sawston | Roadside | 548545 249366 | NO ₂ | N | Y (15m) | 1m | N |
| Heath House, A505, Thriplow | Urban background | 544034 244585 | NO ₂ | N | Y (10m) | 1m | Y |
| 64 High Street, Linton | Roadside | 556179 246815 | NO ₂ | N | Y (7m) | 0.5m | Y |
| 47 High Street, Harston | Urban background | 542554 251002 | NO ₂ | N | Y (5m) | 1m | Y |
| 20 High Street, Tadlow | Roadside | 528131 247399 | NO ₂ | N | Y (10m) | 2m | N |
| 1A Weavers Field, Girton | Urban background | 542537 261467 | NO ₂ | Y | Y (15m) | 1m | Y |
| 3 Garner Close, Milton | Urban background | 547452 263175 | NO ₂ | N | Y (5m) | 1m | N |
| 1 Catchall Farm Cottages | Roadside | 540509 262290 | NO ₂ | Y | Y (1m) | 10m | Y |
| Crafts Way, Bar Hill | Roadside | 538472 263675 | NO ₂ | N | Y (15m) | 1m | N |
| Orchard Park School | Urban background | 544557 261571 | NO ₂ | Y | Y (1m) | 50m | Y |
| Orchard Park School | Urban background | 544557 261571 | NO ₂ | Y | Y (1m) | 50m | Y |
| Orchard Park School | Urban background | 544557 261571 | NO ₂ | Y | Y (1m) | 50m | Y |
| Chieftain Way, Arbury Park | Roadside | 544828 261738 | NO ₂ | Y | Y (1m) | 0.5m | Y |
| Topper Street, Arbury Park | Roadside | 545056 261784 | NO ₂ | Y | Y (1m) | 0.5m | Y |
| Grange Farm Cottages, A14 | Roadside | 541056 261910 | NO ₂ | Y | Y (5m) | 4.5m | Y |

2.2 Comparison of Monitoring Results with Air Quality Objectives

The monitoring stations at Bar Hill and Impington are considered to be sites representative of nearby receptors situated alongside the A14, whilst the Orchard Park monitor is located within the grounds of a school. All 3 are located within the existing Air Quality Management Area for nitrogen dioxide and PM₁₀.

During 2009, none of the monitoring stations exceeded relevant national objectives for nitrogen dioxide whereas the monitoring station at Bar Hill exceeded the daily objective for PM₁₀ and the monitoring station at Impington recorded exceedences of both the annual mean and daily mean PM₁₀.

After bias adjustment, all the nitrogen dioxide diffusion tubes showed compliance with the objectives with the exception of the tube located within the Air Quality Management Area at Grange Farm Cottages (66.5µg/m³). These cottages are to be demolished as part of the scheme for improvement of the A14 and this diffusion tube has since been removed and relocated to a more relevant location at Flack End, Arbury Park (grid ref: 545435, 261906).

Automatic Monitoring Data

- At Bar Hill, the daily mean objective for PM₁₀ was exceeded (48 days where concentrations were calculated to be >50µg/m³). All other objectives were met.
- At Impington, the daily mean objective for PM₁₀ was exceeded (55 days where concentrations were calculated to be >50µg/m³) and the annual mean objective for PM₁₀ was exceeded (41µg/m³ compared to the objective of 41µg/m³). Both objectives for nitrogen dioxide were met.
- At Orchard Park School, all objectives were met.
- Results are given in Tables 2.3a and 2.3b, below.

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

The monitoring stations at Bar Hill and Impington are considered to be sites representative of nearby receptors situated alongside the A14, whilst the Orchard Park monitor is located within the grounds of a school. All 3 are located within the existing Air Quality Management Area for nitrogen dioxide and PM₁₀.

During 2009, the automatic monitoring stations at Bar Hill and Impington both exceeded relevant national objectives for nitrogen dioxide and PM₁₀ whilst the nitrogen dioxide diffusion tubes all showed compliance with the objectives with the exception of the tube located within the Air Quality Management Area at Grange Farm Cottages (72.2µg/m³). These cottages are to be demolished as part of the scheme for improvement of the A14.

- At Bar Hill, all objectives were met for nitrogen dioxide.
- At Impington, all objectives were met for nitrogen dioxide.
- The Orchard Park monitoring station was commissioned on 22nd April 2009. TG(09) has been used to derive an annual mean from shorter term monitoring.
- Results are given in Tables 2.3a and 2.3b, below with an adjusted figure for Orchard Park provided in Table 2.3c (adjusted to annual mean from shorter term monitoring).

Table 2.3a Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

| Location | Within AQMA? | Proportion of year with valid data 2009 % | Annual mean concentrations ($\mu\text{g}/\text{m}^3$) | | |
|---------------------|--------------|---|---|-----------|-----------------|
| | | | 2007 | 2008 | 2009 |
| Bar Hill | Y | 93.9 | 34 | 42 | 39 |
| Impington | Y | 97.3 | 41 | 35 | 33 |
| Orchard Park School | Y | 82.3 | N/A | N/A | 20* (see below) |

Table 2.3b Estimation of Annual Mean NO₂ from Short Term Monitoring Data at Orchard Park (Using Box 3.2 from TG(09)).

| Location | Annual Mean ($\mu\text{g}/\text{m}^3$) | Period Mean ($\mu\text{g}/\text{m}^3$) 22/04/09 – 31/12/09 | Ratio (AM/PM) |
|--------------------|--|---|---------------|
| Cambridge Roadside | 41.1 | 47.7 | 0.86 |
| Wicken Fen | 11.7 | 17.3 | 0.68 |
| Thurrock | 31.2 | 39.1 | 0.80 |
| Sandy Roadside | 46.0 | 48.4 | 0.95 |
| Average of Ratios | | | 0.82 |

Correction of annual mean at Orchard Park: $20 \times 0.82 = \underline{16.4\mu\text{g}/\text{m}^3}$

Table 2.3c Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

| Location | Within AQMA? | Data Capture 2009 % | Number of Exceedences of hourly mean ($200 \mu\text{g}/\text{m}^3$) <i>If the period of valid data is less than 90% of a full year, include the 99.8th %ile of hourly means in brackets.</i> | | |
|---------------------|--------------|---------------------|--|------|------|
| | | | 2007 | 2008 | 2009 |
| Bar Hill | Y | 93.9 | 0 | 0 | 0 |
| Impington | Y | 97.3 | 0 | 0 | 0 |
| Orchard Park School | Y | 91.3 | N/A | N/A | 0 |

Figures 2.3a and 2.3b, show the trends in annual mean concentrations as measured by the automatic monitoring stations at Bar Hill and Impington.

Figure 2.3a Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Bar Hill

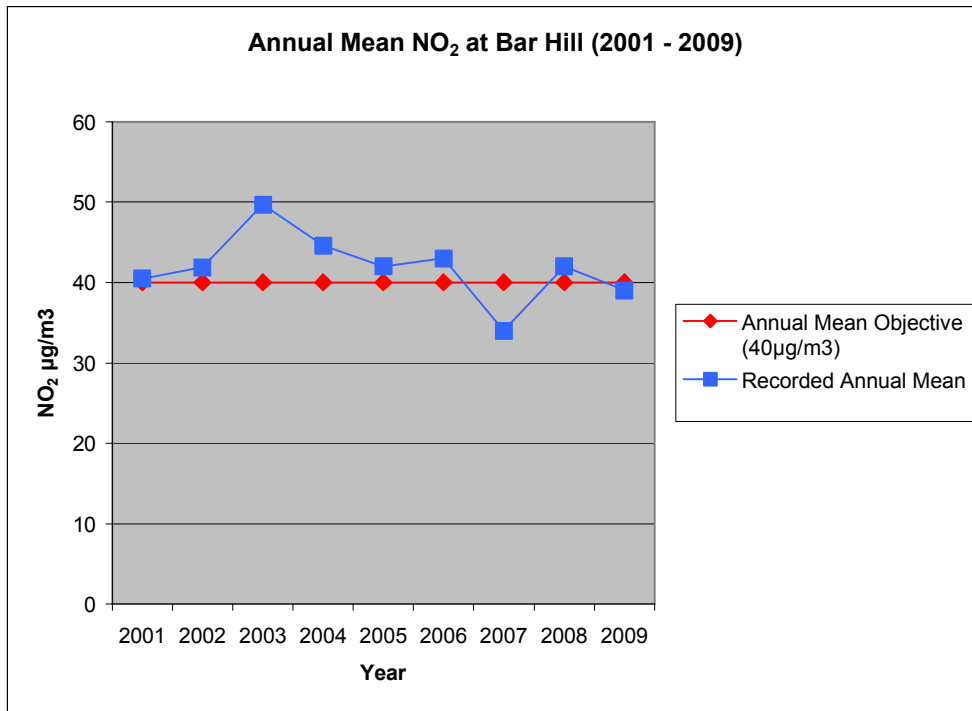
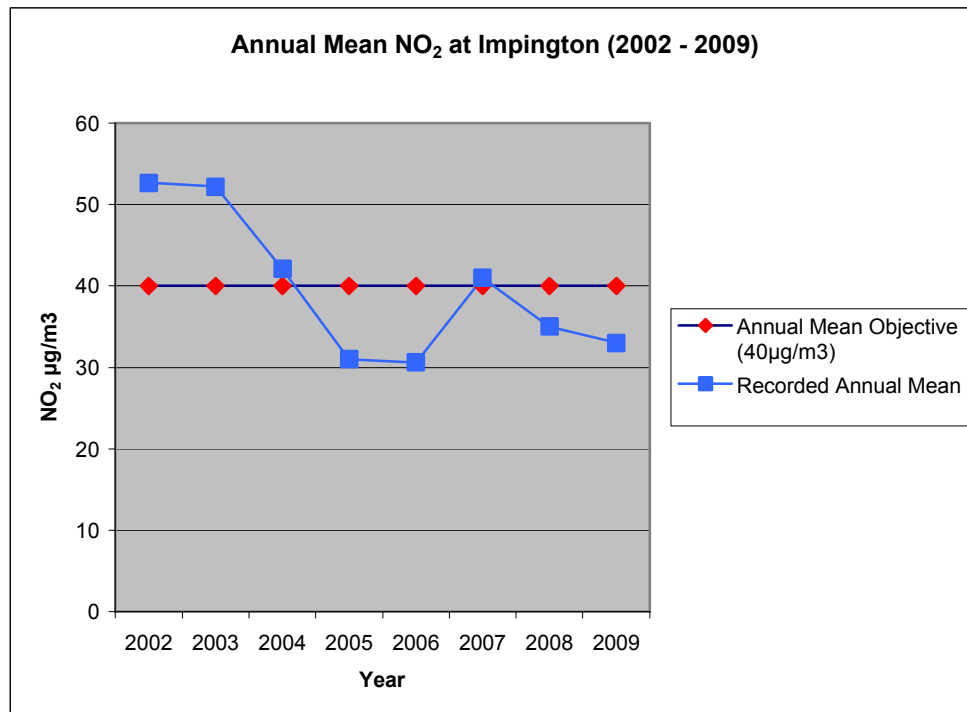


Figure 2.3b Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Impington



Diffusion Tube Monitoring Data

After bias correction, all diffusion tube results show compliance with the national annual mean objective for nitrogen dioxide, with one exception. The exception is the tube located within the Air Quality Management Area at Grange Farm Cottages. This tube was relocated in February 2010 as the cottages the tube sits adjoining are to be demolished under the proposals for the improvements to the A14.

The only other diffusion tube close to the objective is located at The Gables, High Street, Histon. Histon is a narrow village road which although is not subject to excessive traffic flows can become congested at peak times owing to vehicles parking on the road and causing obstructions to the flow of traffic. The tube is adjacent to a residential façade and is therefore in a relevant location. Historically, whilst it has been close to the objective, there has never been an exceedence at this location.

All 2009 diffusion tube results are presented in Tables 2.4a and 2.4b.

Table 2.4a Results of Nitrogen Dioxide Diffusion Tube Survey 2009

| Location | Within AQMA? | Data Capture 2008 % | Annual mean concentrations |
|-------------------------------------|--------------|---------------------|--|
| | | | 2009 ($\mu\text{g}/\text{m}^3$) Adjusted for bias |
| 1 The Coppice, Histon | N | 100 | 24.5 |
| Narrow Lane, Histon | N | 100 | 21.4 |
| The Gables, High Street, Histon | N | 100 | 39.5 |
| White Lion, 96 High Street, Sawston | N | 100 | 33.1 |
| 15 Paddock Way, Sawston | N | 100 | 18.9 |
| 22 Water Lane, Histon | N | 100 | 33.2 |
| 1 Brook Close, Histon | N | 100 | 26.0 |
| 72 Cambridge Road, Impington | Y | 100 | 35.9 |
| 19 Lonetree Avenue | Y | 100 | 26.2 |
| 1A New Road, Sawston | N | 100 | 21.0 |
| 5 Mill Lane, Sawston | N | 100 | 19.4 |
| Heath House, A505, Thriplow | N | 100 | 29.2 |
| 64 High Street, Linton | N | 100 | 33.4 |
| 47 High Street, Harston | N | 100 | 28.1 |
| 20 High Street, Tadlow | N | 100 | 15.3 |
| 1A Weavers Field, Girton | N | 100 | 35.6 |
| 3 Garner Close, Milton | N | 100 | 24.6 |
| 1 Catchall Farm Cottages | Y | 100 | 27.6 |
| Crafts Way, Bar Hill | Y | 100 | 24.6 |
| Orchard Park School | Y | 100 | 22.9 |
| Orchard Park School | Y | 100 | 22.5 |
| Orchard Park School | Y | 100 | 23.6 |
| Chieftain Way, Arbury Park | Y | 100 | 24.6 |
| Topper Street, Arbury Park | Y | 100 | 26.0 |
| Grange Farm Cottages | Y | 100 | 66.5 |

Table 2.4b Trends in Nitrogen Dioxide Diffusion Tube Survey (2007 – 2009)

| Location | Within AQMA? | Data Capture for monitoring period ^a % | Data Capture for full calendar year 2009 ^b % | Annual mean concentrations (µg/m ³) | | |
|-------------------------------------|--------------|--|--|---|----------------------|-------------------|
| | | | | 2007 ^{c, d} | 2008 ^{c, d} | 2009 ^c |
| 1 The Coppice, Histon | N | 100 | 100 | 21.9 | 21.8 | 24.5 |
| Narrow Lane, Histon | N | 100 | 100 | 20.0 | 19.9 | 21.4 |
| The Gables, High Street, Histon | N | 100 | 100 | 37.7 | 37.9 | 39.5 |
| White Lion, 96 High Street, Sawston | N | 100 | 100 | 33.5 | 33.6 | 33.1 |
| 15 Paddock Way, Sawston | N | 100 | 100 | 18.7 | 17.7 | 18.9 |
| 22 Water Lane, Histon | N | 100 | 100 | 34.3 | 34.7 | 33.2 |
| 1 Brook Close, Histon | N | 100 | 100 | 25.8 | 26.5 | 26.0 |
| 72 Cambridge Road, Impington | Y | 100 | 100 | 27.3 | 27.8 | 35.9 |
| 19 Lonetree Avenue | Y | 100 | 100 | 22.5 | 25.0 | 26.2 |
| 1A New Road, Sawston | N | 100 | 100 | 25.3 | 20.0 | 21.0 |
| 5 Mill Lane, Sawston | N | 100 | 100 | 18.8 | 19.1 | 19.4 |
| Heath House, A505, Thriplow | N | 100 | 100 | 22.7 | 31.5 | 29.2 |
| 64 High Street, Linton | N | 100 | 100 | 33.4 | 33.7 | 33.4 |
| 47 High Street, Harston | N | 100 | 100 | 26.1 | 27.0 | 28.1 |
| 20 High Street, Tadlow | N | 100 | 100 | 13.5 | 14.6 | 15.3 |
| 3 Garner Close, Milton | N | 100 | 100 | 22.3 | 22.8 | 24.6 |
| 1A Weavers Field, Girton | N | 100 | 100 | 32.4 | 34.0 | 35.6 |
| 1 Catchall Farm Cottages | Y | 100 | 100 | N/A | 30.1 | 27.6 |
| Crafts Way, Bar Hill | Y | 100 | 100 | N/A | 27.0 | 24.6 |
| Orchard Park School | Y | 100 | 100 | N/A | 23.4 | 22.9 |
| Orchard Park School | Y | 100 | 100 | N/A | 24.5 | 22.5 |
| Orchard Park School | Y | 100 | 100 | N/A | 25.0 | 23.6 |
| Chieftain Way, Arbury Park | Y | 100 | 100 | N/A | 30.3 | 24.6 |

| | | | | | | |
|----------------------------|---|-----|-----|-----|-------------|-------------|
| Topper Street, Arbury Park | Y | 100 | 100 | N/A | 28.9 | 26.0 |
| Grange Farm Cottages | Y | 100 | 100 | N/A | 72.2 | 66.5 |

- **Bias adjustment factors for 2007 and 2008 used are 0.8 and 0.8 respectively (as taken from the Bias Adjustment Spreadsheet on the AQRA Helpdesk Website). The factor for 2009 is also 0.8, calculated from the local co-location study at Orchard Park Primary School).*
- *N/A represents sites that had not yet been commissioned in 2007*
- *It should be noted that as of February 2010, the diffusion tube at Grange Farm Cottages was removed. This is due to the proposed A14 improvements, which will see the demolition of the subject cottages.*

Historically readings have been high at three tube locations High Street, Histon, Cambridge Road, Girton and High Street, Sawston. Trend data for these sites is reported in Table 2.4c, below with readings corrected for bias and graphed over the measurement period.

Table 2.4c – NO₂ trend data for specific locations in South Cambridgeshire

**All data is bias adjusted*

| Location | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|-----------------------------|------|------|------|------|------|------|------|------|------|
| High Street, Histon. | 35.1 | 38 | 43.7 | 39.2 | 36.4 | 37.7 | 37.7 | 37.9 | 39.5 |
| Water Lane, Histon. | N/a | N/a | N/a | N/a | 43.1 | 38.2 | 34.3 | 34.7 | 33.2 |
| Lone Tree Avenue, Impington | 26.4 | 31.2 | 31.8 | 26.8 | 29.4 | 24.2 | 22.5 | 25.0 | 26.2 |
| Weaversfield, Girton. | 36.4 | 40.3 | 44.8 | 36.2 | 41.7 | 32.7 | 27.4 | 34.0 | 35.6 |
| High Street, Sawston. | 35.3 | 38.6 | 42.6 | 35.9 | 36.5 | 30.1 | 33.4 | 33.6 | 33.1 |
| High Street Linton | 30.4 | 32.4 | 33.6 | 33.3 | 30.0 | 31.2 | 33.4 | 33.7 | 33.4 |
| High Street, Tadlow. | 16.1 | 17.4 | 24.1 | 17.4 | 16.2 | 14.0 | 13.5 | 14.6 | 19.1 |

From Table 2.4c, above, over the last 2 years, the diffusion tubes at High Street, Histon, Lone Tree Avenue in Girton and Tadlow have all shown increases in concentrations, whereas the remaining tubes have all given similar concentrations year-on-year. Despite a rise in the concentrations at some diffusion tube locations in 2008 and 2009, adjusting the figure for bias brings the concentrations down to below the national objective.

The following text and figures (Figure 2.4a to 2.4g), show the trends in annual mean nitrogen dioxide concentrations measured at the Diffusion Tube Monitoring Sites:

High Street, Histon is a narrow village road which although is not subject to excessive traffic flows can become congested at peak times owing to vehicles parking on the road and causing obstructions to the flow of traffic. The tube is adjacent to a residential façade and is therefore in a relevant location.

The diffusion tube at High Street, Histon is located at the façade of a property and approximately 1 metre from the road. The High Street is the busiest road in Histon and due to speed reduction measures, traffic moves slowly through the village.

Additional monitoring locations were commissioned in 2005 when a new road traffic scheme was implemented in the village. The scheme was abandoned after 8 months and any direct effect on air quality was difficult to establish. Concentrations remain below but close to the objective. A graph of the annual results for this diffusion tube location is provided in Figure 2.4a, below:

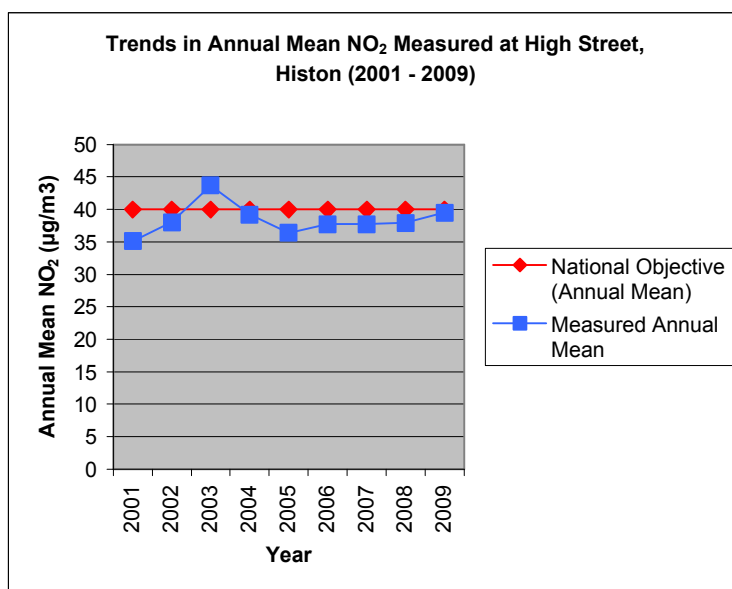


Figure 2.4a

The diffusion tube at **Water Lane in Histon** was commissioned in 2005. Since being established, it has consistently shown high levels of NO₂. Water Lane is a section of the busy B1049, which acts as a distributor road between surrounding villages and the A14 and Cambridge. The tube location is approximately 1.5km North of the junction of the B1049 with the A14.

The highest levels of traffic along the B1049 are experienced during the morning and afternoon rush hours. Figure 2.4b on the following page, shows the concentrations of NO₂ measured at Water Lane. Concentrations show a downward trend since it was established in 2005 but remain within the annual mean objective. Monitoring will continue at this location for the foreseeable future.

The tube is located in a roadside location, approximately 1.6m from a relevant receptor and 1.6m from the road. Concentrations of nitrogen dioxide at this location have remained consistently high although still within the objective level.

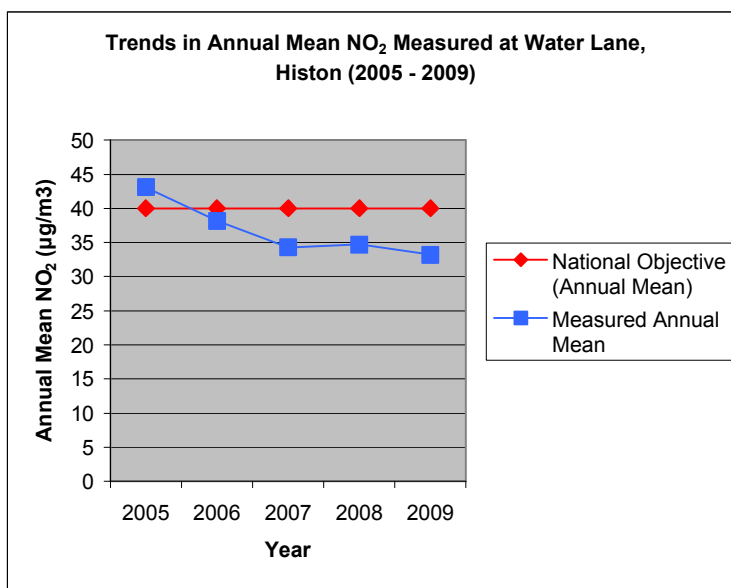


Figure 2.4b

The diffusion tube at **Lone Tree Avenue, Impington** is located approximately 70m from the A14 Eastbound carriageway. It lies on the edge of the Air Quality Management Area. The Avenue itself is a quiet, residential road. Figure 2.4c below, shows the annual trends in concentrations at this location:

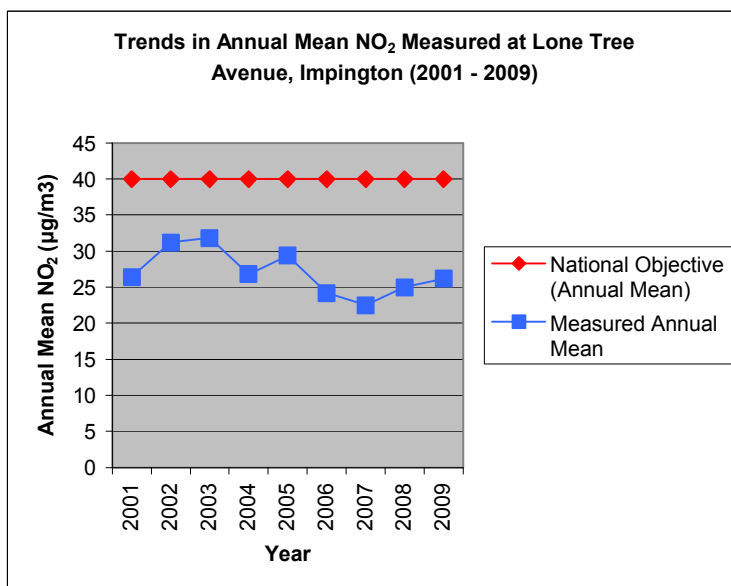


Figure 2.4c

The monitoring location at **Weaversfield, Girton** is at the entrance to a small development and opposite a local shop. The tube is situated on a lamppost in a roadside location, on a bridge over the A14 dual carriageway. The site is an equivalent distance from the A14 as local residential gardens and is a relevant location within the Air Quality Management Area for NO₂. As can be seen from Figure 2.4d, below, the concentration of NO₂ has risen steadily between 2007 and 2009. However, concentrations remain below the national

objective. This location is important within the monitoring network due to the fact that it lies within the AQMA.

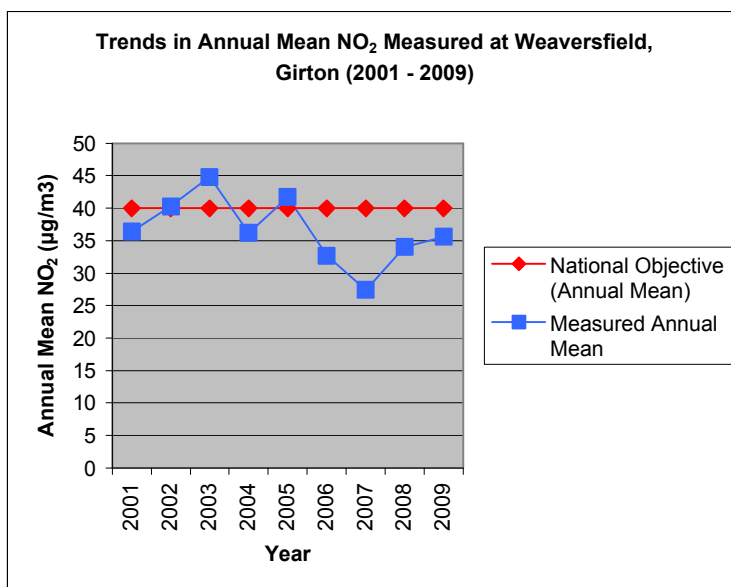


Figure 2.4d

The fourth location that previously exceeded the annual mean objective is located at **High Street, Sawston**, currently our largest village with a population of 8,000. It lies approximately 10km South of the AQMA and 4km East of the M11. The monitoring site is adjacent to the façade of a local public house and the same distance from the roadside as the façade of residential properties and is therefore in a relevant location.

As can be seen from Figure 2.4e, these results have been below the annual mean objective since 2004. No further action is considered necessary at this stage, however, monitoring will continue at this location in future years.

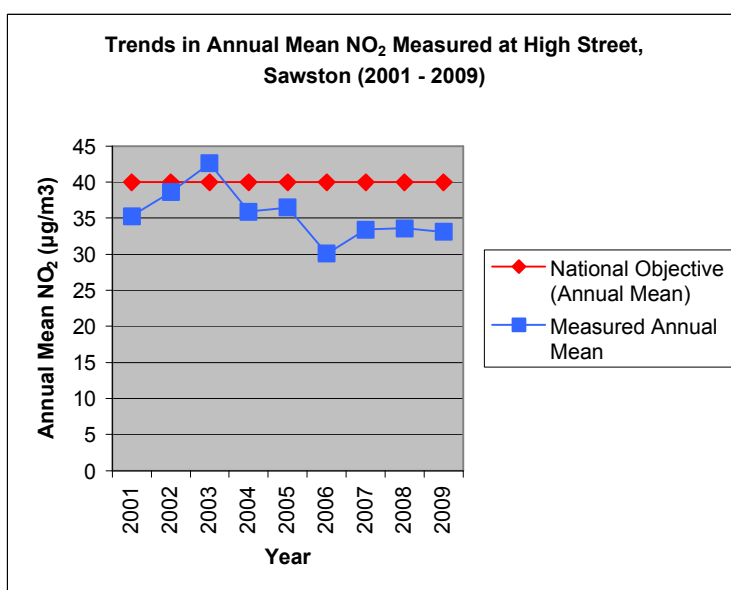


Figure 2.4e

The diffusion tube at **High Street, Linton** is located on the façade of a property at a point where the road is narrow and is the same distance from the road as the houses in this area, thus a relevant location. Recent alterations in the road layout may be having an impact on air quality however this will continue to be monitored closely to ensure that air quality does not deteriorate significantly. Trends in concentrations are shown in Figure 2.4f, below:

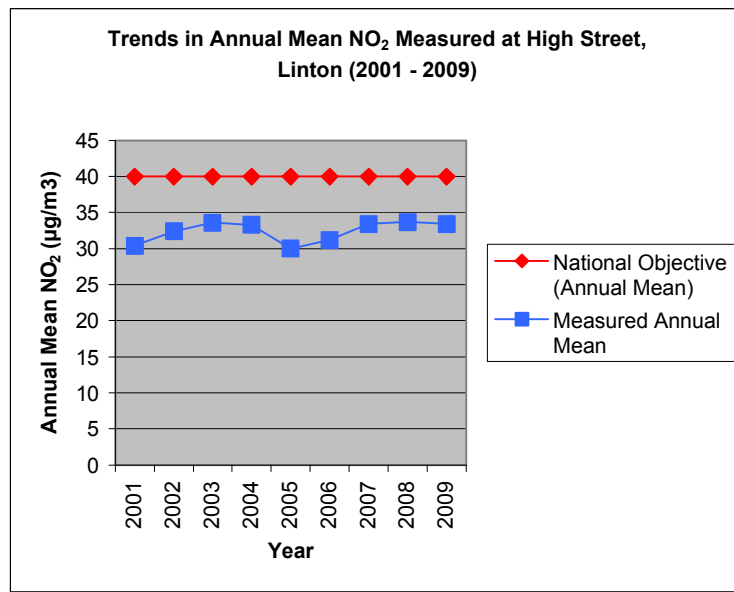


Figure 2.4f

Tadlow is thought to be representative of concentrations close to rural background. Tadlow is a small village, comprising approximately 40 houses. Access is via a small service road with houses lining each side up to the junction with the B1042, which has a mean daily traffic flow of approximately 6700 vehicles, around 5% of which is made up of heavy duty vehicles. The diffusion tube is located approximately 100m South of the B1042 at one of the residential premises. When compared to the concentrations obtained from the diffusion tubes at the busiest locations (along the A14), an indication as to how much traffic emissions are responsible for poor air quality within South Cambridgeshire can be obtained. Figure 2.4g, below shows the year-on-year trends in nitrogen dioxide concentrations at this location:

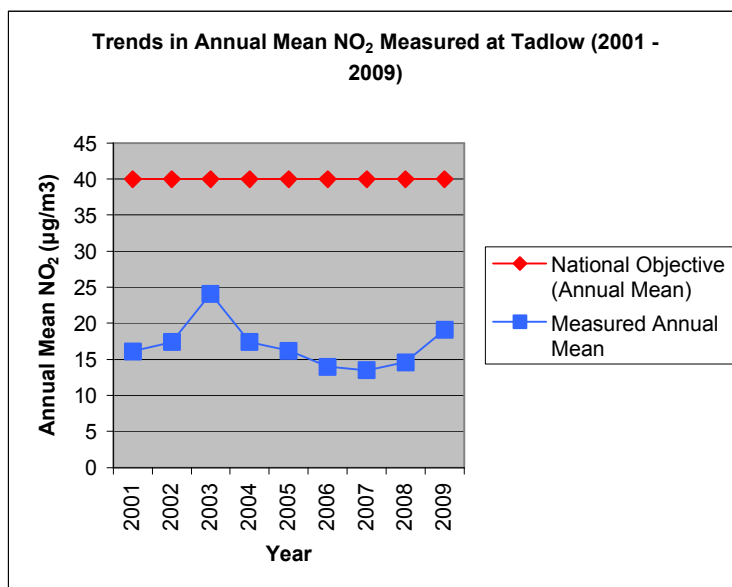


Figure 2.4g

2.2.2 PM₁₀

During 2009, fine particles were monitored at three locations in South Cambridgeshire, on the A14(E) (538685, 263760) at Bar Hill and on the A14(W) (543739, 261625) at Impington and at Orchard Park School (554558, 261579). Measurements at Impington and Bar Hill sites are made using an Eberline FH 62-IR Beta-attenuation Monitor. This instrument has a heated inlet manifold, which is held at 40°C, the temperature is sufficient to drive off the volatile content of the sample and therefore the guidance given in LAQM.TG(09) is to correct for this by multiplying all measurements by a factor of 1.3 prior to comparison with the air quality objective. Results are quoted as µg/m³ gravimetric equivalent.

- **At Bar Hill, the daily mean objective for PM₁₀ was exceeded (48 days over the limit of 50µg/m³).**

The PM₁₀ results measured at Bar Hill are quality assured and reported by “netcen”. The site was commissioned in March 2001 there is a fully scaled and ratified dataset available pursuant to this period.

- **At Impington, the daily mean objective for PM₁₀ was exceeded (55 days over the limit of 50µg/m³).**
- **At Impington, the annual mean objective for PM₁₀ was exceeded (41µg/m³ compared to the limit of 40µg/m³).**

Monitoring at the A14(W) in Impington has been operating since 19 February 2002. The analyser is identical to the one at Bar Hill and therefore the data has been handled in the same manner. Air Quality Monitoring Services Ltd provided data ratification and auditing services at this site until 2004, since then netcen have provided a full data audit and ratification process for this dataset.

- **At Orchard Park, the daily mean objective for PM₁₀ was not exceeded (0 days over the limit of 50µg/m³).**

Monitoring at Orchard Park School, close to the A14 junction with the B1049, has been operating since 22nd April 2009. As with the other 2 sites, data is ratified by netcen, for which there is a full set from the time of commissioning.

Results of the PM₁₀ monitoring are supplied in Tables 2.5a and 2.5b below:

Table 2.5a Results of PM₁₀ Automatic Monitoring: Comparison with Annual Mean Objective

| Location | Within AQMA? | Data Capture 2009 % | Annual mean concentrations (µg/m ³) | | |
|---------------|--------------|---------------------|---|------|-----------|
| | | | 2007 | 2008 | 2009 |
| Bar Hill | Y | 98.4 | 36 | 36 | 33 |
| Impington | Y | 79.5 | 34 | 33 | 41 |
| Orchard Park* | Y | 82.3 | N/A | N/A | 16* |

* Box 3.2 of TG(09) was used to adjust levels of PM₁₀ from 8 months to a full year. The correction factor obtained is 0.81, which, when applied, brings the annual mean PM₁₀ to 12.1µg/m³. This is not deemed a suitable figure as it is 37% below the expected local background level of 19µg/m³. The unadjusted level of 16µg/m³ is thought to be a more realistic figure.

Table 2.5b Results of PM₁₀ Automatic Monitoring: Comparison with 24-hour Mean Objective

| Location | Within AQMA? | Data Capture 2008 % | Number of Exceedences of hourly mean (50 µg/m ³) <i>If data capture < 90%, include the 90th %ile of hourly means in brackets.</i> | | |
|---------------|--------------|---------------------|--|-----------|-----------|
| | | | 2007 | 2008 | 2009 |
| Bar Hill | Y | 98.4 | 49 | 52 | 48 |
| Impington | Y | 79.5 | 34 | 43 | 55 |
| Orchard Park* | Y | 82.3 | N/A | N/A | 0 |

*Installation/commissioning date: 22nd April 2009

Figures 2.5a and 2.5b, below, show the annual trend data of measured annual mean concentrations against the annual mean objective level of 40µg/m³. There are no particular patterns that arise. The concentrations generally fall and rise year on year.

Figure 2.5a Annual Trends in PM₁₀ Concentrations at Bar Hill

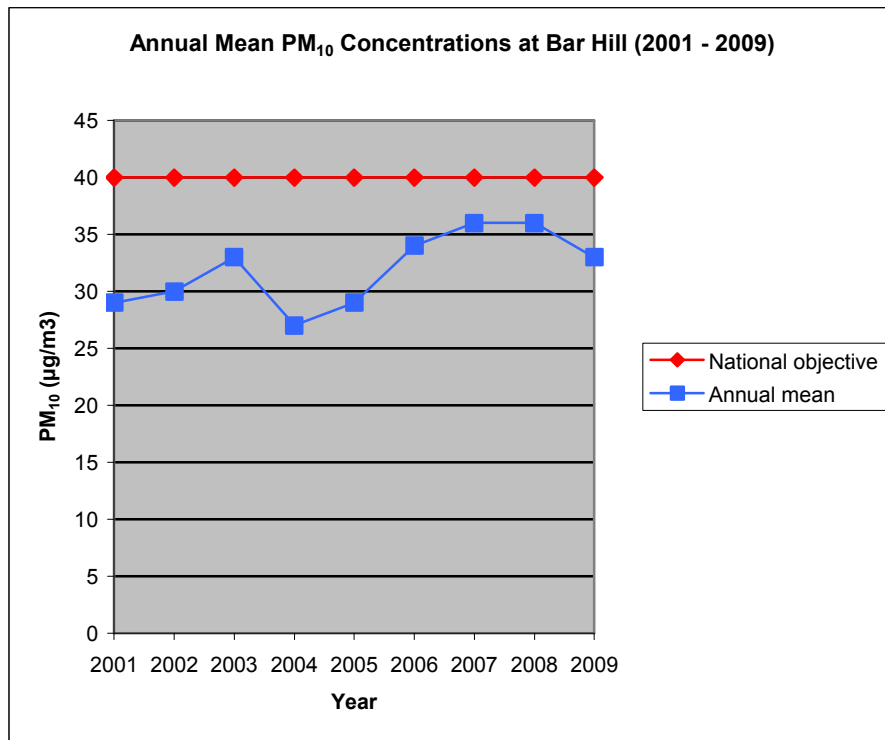
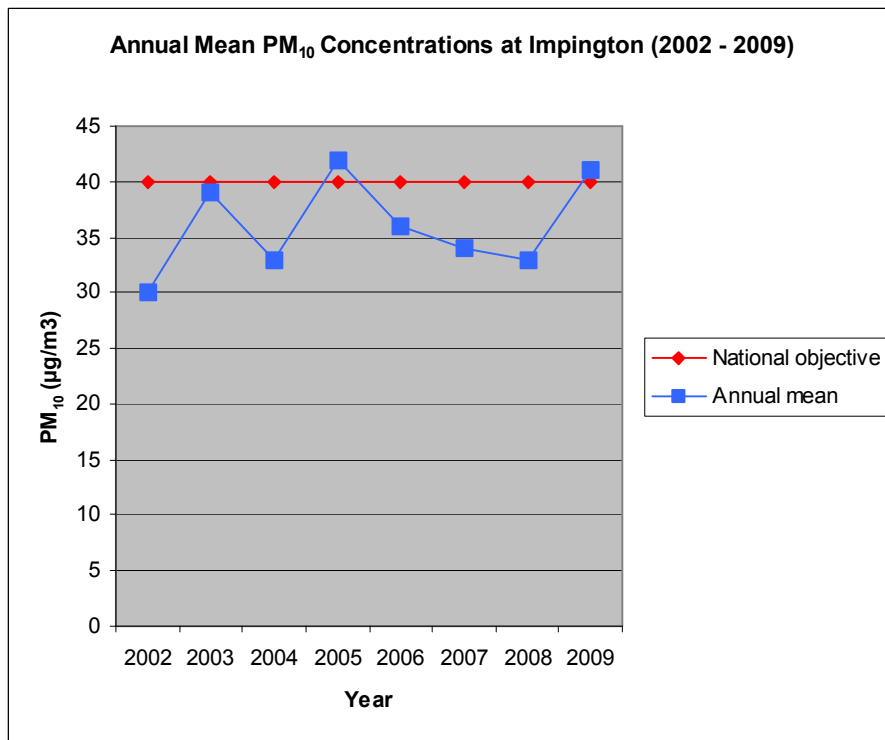


Figure 2.5b Annual Trends in PM₁₀ Concentrations at Impington



Figures 2.5c and 2.5d, below, show the annual trend data of number of days of exceedence of the daily mean objective for PM₁₀ against the daily mean objective level of 50µg/m³, not to

be exceeded more than 35 times per year. The general trend at Bar Hill is a rise in the number of days of exceedence, whereas at Impington, there is less of a pattern with figures rising and falling annually.

Figure 2.5c Annual Trends in PM₁₀ in Comparison with the Daily Mean Objective at Bar Hill

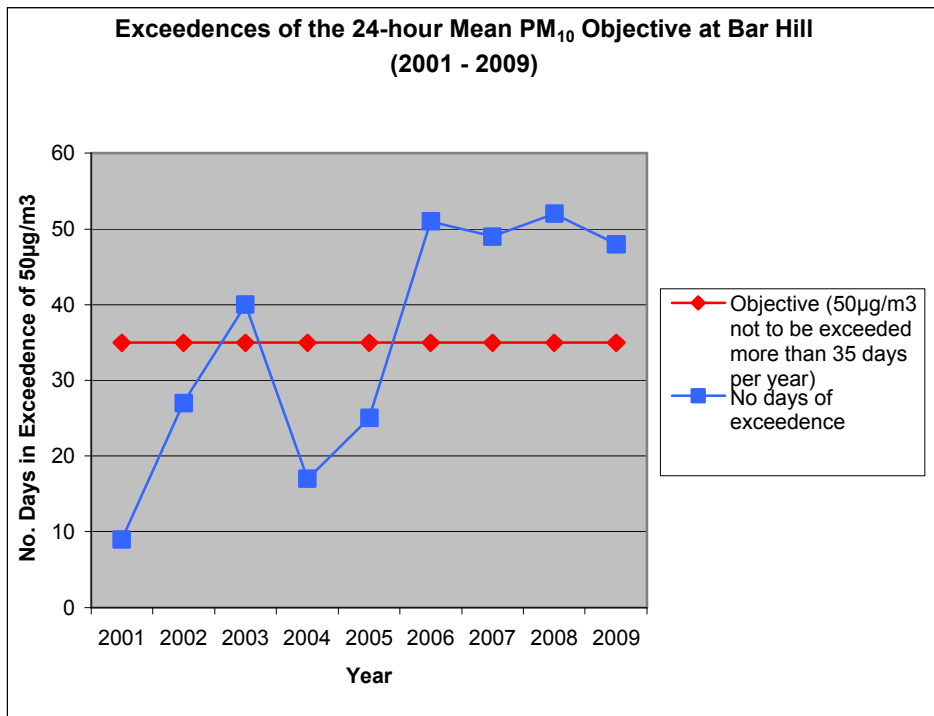
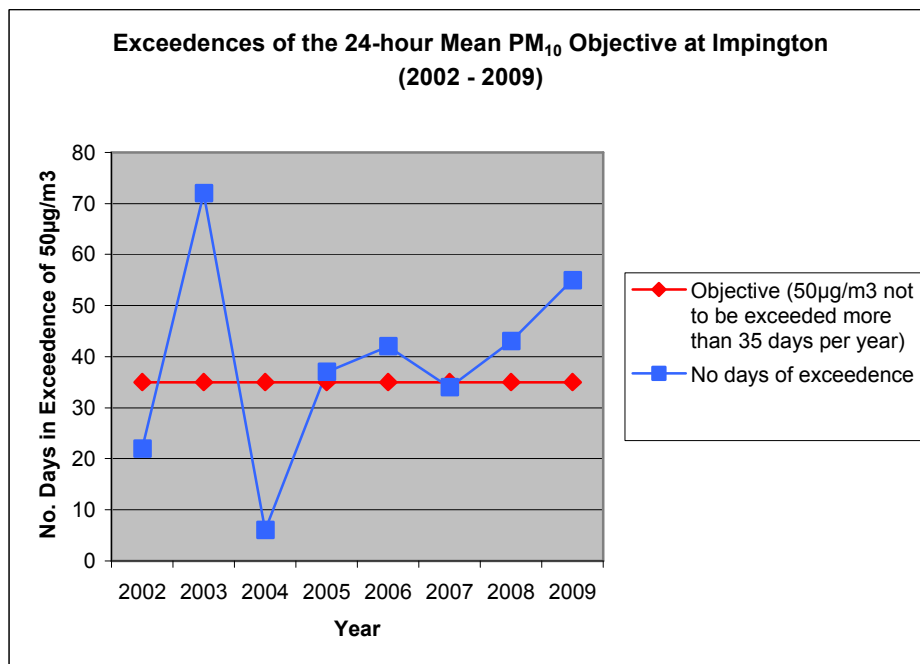


Figure 2.5d Annual Trends in PM₁₀ in Comparison with the Daily Mean Objective at Impington



2.2.3 Sulphur Dioxide

South Cambridgeshire District Council monitored Sulphur Dioxide at the Cemex Cement Works, Barrington until October 2008.

2.2.4 Benzene

Benzene is not monitored within the District

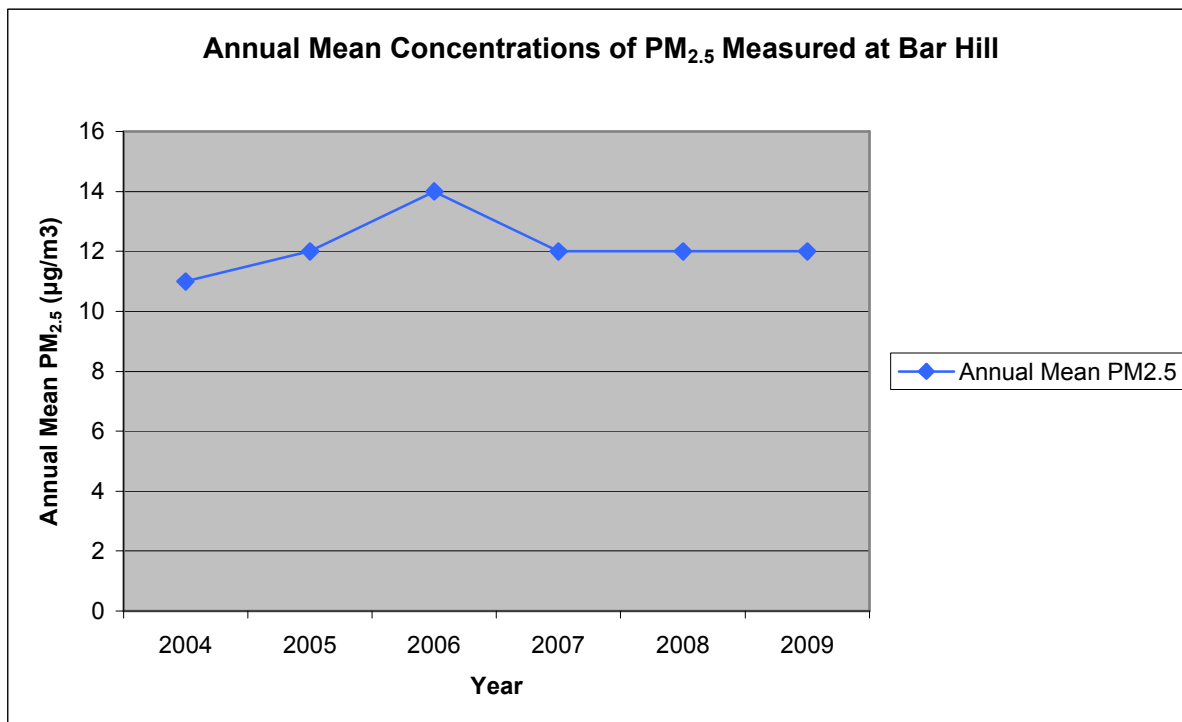
2.2.5 Other pollutants monitored: PM_{2.5}

South Cambridgeshire District Council monitors PM_{2.5} at the continuous monitoring station in Bar Hill. It has been in place since 2001 and concentrations have remained fairly stable throughout the monitoring period. The highest level recorded was 14µg/m³ measured in 2006. Since then, the annual mean concentrations have stabilised at 12µg/m³. Table 2.6, below, shows the latest datasets whilst Figure 2.6 shows the annual trends in concentrations.

Table 2.6 Results of Automatic Monitoring of PM_{2.5}

| Location | Within AQMA? | Proportion of year with valid data 2009 % | Annual mean concentrations (µg/m ³) | | |
|----------|--------------|---|---|------|------|
| | | | 2007 | 2008 | 2009 |
| Bar Hill | Y | 98.9 | 12 | 12 | 12 |

Figure 2.6: Trends in Annual Mean PM_{2.5} Measured at Bar Hill



2.2.6 Summary of Compliance with AQS Objectives

South Cambridgeshire District Council has measured concentrations of PM₁₀ above the annual mean and 24-hour mean objectives at relevant locations within the AQMA. A detailed Air Quality Action Plan has been submitted to Defra for comment.

Nitrogen dioxide within the AQMA was measured below the objective level at all monitoring locations during 2009.

3 New Local Developments

3.1 Road Traffic Sources

There are two major projects involving roads within South Cambridgeshire. These are as follows:

- 1) Improvements to the A14, to include:
 - Widening of the A14 carriageway between Fen Drayton and Histon – increasing the number of lanes from 2 to 3 on both Eastbound and Westbound carriageways should help to alleviate congestion and speed traffic through-flow.
 - Widening of the A14 carriageway between Histon and Fen Ditton
- 2) Link roads to the proposed new town of Northstowe and associated local routes throughout the proposed development.

For the latter of these, circumstances have not changed since the Updating and Screening Assessment of 2009 and South Cambridgeshire District Council is still awaiting satisfactory air quality assessments.

For the A14 improvements, a detailed air quality assessment has been submitted in draft by the Highways Agency. Comments have been returned by the Council regarding the findings of the assessment and modelling work. Work is continuing towards further modelled output. The improvements to the A14 forms part of the Councils' Priority Actions within the Air Quality Action Plan and are presently deemed to be essential works to help improve air quality along the A14 and lead to a reduction in pollutant concentrations in and around the existing Air Quality Management Area.

South Cambridgeshire District Council is awaiting further air quality assessments for both the projects listed above that will involve the creation of a new road network and major changes to the existing road network. The new/newly identified roads and junctions will be further assessed upon receipt of the outstanding air quality assessments.

3.2 Other Transport Sources

South Cambridgeshire District Council confirms that there are no new or newly identified sources of pollution from other transport emissions which may have an impact on air quality within the Local Authority area.

3.3 Industrial Sources

South Cambridgeshire District Council confirms that there are no new or newly identified sources of pollution from industry which may have an impact on air quality within the Local Authority area.

3.4 Commercial and Domestic Sources

South Cambridgeshire District Council confirms that there are no new or newly identified sources of pollution from commercial and domestic premises which may have an impact on air quality within the Local Authority area.

3.5 New Developments with Fugitive or Uncontrolled Sources

South Cambridgeshire District Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

4 Local / Regional Air Quality Strategy

South Cambridgeshire District Council adopted a Local Air Quality Strategy in September 2008. The Local Air Quality Strategy has been produced in order to give a platform upon which the local air quality within the District can be improved, bringing together all those with an interest or responsibility for air quality.

The Local Air Quality Strategy aims:

- To achieve National Air Quality Standards
- To improve local air quality
- To carry out the above using cost effective and sustainable methods
- Raise awareness of and promote air quality issues and sustainable environments
- To emphasize the role South Cambridgeshire District Council has in improving air quality within the District
- To work together to achieve our goals
- To encourage partnerships between local industry, businesses and residents
- To raise the profile of air quality amongst the wider community
- Where possible, to suggest objectives for continued good working practices and to link the varying appropriate Council Policies, Plans and Strategies to the Air Quality Strategy

Work towards achieving goals set within the Strategy is underway, with the development and adoption of an SPD for Low Emissions Strategies, improved communications between relevant Departments and the development of an air quality “How To” guide for developers.

As part of the overall quality management of the Strategy work, it is important to consider the need to review it from time to time. The current strategy is relevant for 5 years (2009 to 2014), after which, a review programme will take account of:

- Changes to existing legislation, Regulations or the National Air Quality Strategy,
- Introduction of new legislation or Regulations,
- Changes in local circumstances (for example, revocation of an AQMA),
- Introduction of new sources of industrial emissions
- Updates or changes to existing Council policy and/or guidance (including Cambridgeshire County Council)
- Introduction of new, relevant Council policies and/or guidance (including Cambridgeshire County Council)

The Strategy is available to view online at:

http://www.scambs.gov.uk/documents/retrieve.htm?pk_document=908845

5 Planning Applications

Since the Updating and Screening Assessment 2009, no major planning applications have been received by South Cambridgeshire District Council that will have an impact on local air quality. However, there are a series of major development proposals and developments for which planning applications are expected or were received during earlier rounds of the Review and Assessment process. These are shown in Figure 5.1, below and described in further detail:

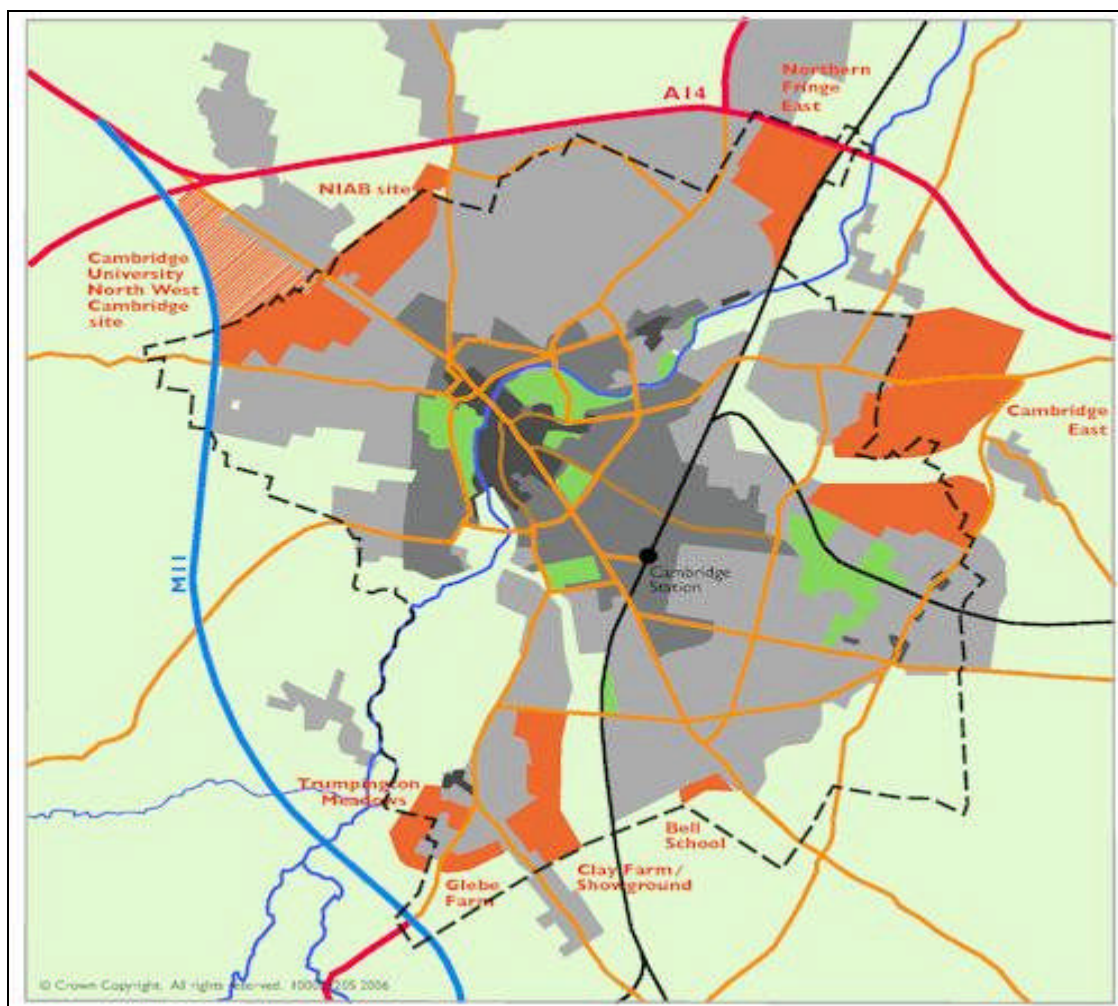


Figure 5.1 Map of Proposed Major Development in South Cambridgeshire
Courtesy of Cambridgeshire Horizons, 2010

Northstowe

Northstowe will ultimately be a new town comprising 9,500 new homes (and a wide range of facilities), which will become a community of up to 24,000 people. The site covers 427 hectares, and is located near Longstanton and Oakington, on the route of the ***Cambridgeshire Guided Busway** (see end of chapter) and approximately 3km North of the A14 and the existing Air Quality Management Area. Important infrastructure improvements are also proposed for upgrading the A14 as part of a comprehensive planning and transport strategy for the A14 corridor.

The development will cover an area of approximately 605 Hectares with 22,800m² floorspace set aside for hotels and indoor leisure facilities, 49,500m² floorspace for A1, A2, A3, A4 and

A5 retail use and 156,000 m² floorspace set aside for B1, B2, B8 and *sui generis* industrial and commercial uses.

Northstowe has been granted Government approval as an eco-town, therefore, all measures to mitigate impacts on air quality must be considered. It is envisaged that the town will obtain a substantial amount of renewable energy from a community-wide biomass Combined Cooling, Heat and Power (CCHP) plant although a range of renewable sources will be considered.

The existing Local Development Framework, Core Strategy and Area Action Plan all put Northstowe at the centre of the development strategy for the area, and all confirm that the new development will have enhanced environmental standards. The Area Action Plan in particular contains Policy NS/23 – “An Exemplar in Sustainability” which states that:

“Northstowe will include within the development exemplar projects in sustainable development, including energy efficient measures. This could be achieved by:

- a. Providing an increased level of sustainability across the development as a whole above current requirements to a material extent;*
- b. Building a proportion of the development to advanced practice which fully addresses sustainability issues and minimises any environmental impact by pushing at the boundaries of the proven technology available at the time of the development.”*

This Policy, along with the recently adopted SPD for Low Emissions Strategies will ensure that the development will take place with the highest regard to environmental issues, including air quality and emissions. A recently successful grant application has provided for a study to consider a Low emission Strategy, exploring best practice for the public realm and street design.

The policy framework that the future applications will be assessed against is contained within the Northstowe Area Action Plan, Development Control Policies adopted July 2007 and the Core Strategy adopted January 2007. The Northstowe planning applications will be assessed against these policies and other Government circulars and guidance.

Orchard Park

Orchard Park, formerly known as Arbury Park, is a new development of 900 homes and associated facilities located to the north of Cambridge, within South Cambridgeshire District Council's administrative boundaries. Approximately 50% of the new homes are already occupied, and the community is served by a primary school, which opened in September 2007, formal and informal play areas, a hotel with restaurant and bar facilities, green open spaces and a dedicated community development worker who offers support and advice to all new residents as well as linking up with existing communities in North Cambridge, Histon and Impington.

The large plot of land was split into smaller parcels, which have been the subject of various smaller development proposals and applications. Discussions on developments and applications for parcels closest to the A14 continue as these are within the AQMA. The Council is mindful of the impacts of cumulative development on the AQMA and mitigation measures continue to be discussed with the Planning department and developers. It is envisaged that the opening of the Cambridgeshire Guided Busway will help to alleviate the impact of private vehicle journeys to and from the Orchard Park site.

Cambridge North West

Cambridge North West is a development area that straddles the edge of Cambridge City and South Cambridgeshire. The site consists of two developments, the NIAB site and the University site, which together will form a new community on the northwestern fringe of the city. The University site is between Madingley Road and Huntingdon Road, and will become a new education quarter for the City, including accommodation for University of Cambridge employees and students, as well as market housing. Both new developments will include a high proportion of affordable housing to help meet pressing local demands.

The NIAB development stretches between Huntingdon Road and Histon Road and will provide up to 3,000 new homes whilst the University site lies between Madingley Road and Huntingdon Road, adjoining the A14 to the North (the northern-most part of the site lies within the AQMA) and the M11 to the West. It comprises approximately 83 hectares upon which it is also proposed to construct around 3000 new homes along with a research facility, open spaces and recreational land.

Discussions with the developers and planners on requirements of air quality assessments and possible barriers to development are ongoing.

Cambridge Southern Fringe

Southern Fringe comprises two main residential areas, which have been granted planning consent during previous rounds of Review and Assessment:

Trumpington Meadows - stretches from Trumpington towards the M11 and the Trumpington Park and Ride site. This will provide approximately 1200 new homes.

Clay Farm – Located between the railway line and Trumpington village, it will provide approximately 2,300 new homes.

Both sites will consist of residential development with open spaces, parkland and cycle paths with improved public transport links and work is currently expected to start on the Trumpington Meadows site in Autumn 2010. The sites are approximately 8km South of the

AQMA, however, the traffic generation from the Southern Fringe development (when added to the traffic generation from all major developments) may have a cumulative impact on the local road network.

***Cambridgeshire Guided Busway (CGB)**

The CGB is a public transport scheme that is to link Cambridge, Huntingdon and St. Ives as an alternative to private vehicle journeys along the A14. The northern section runs parallel with the A14 using the old, disused Cambridge to Huntingdon railway link and once through Cambridge City Centre, the CGB heads South to Addenbrookes hospital. The CGB will have stops at the new town of Northstowe and Orchard Park as well as at existing village locations along the route.

It is hoped that the CGB will persuade private vehicle commuters to use public transport and so easing congestion on the A14 and improving air quality in the locality. Construction of the route (North and South) is almost complete and the route is expected to become operational during 2010.

6 Air Quality Planning Policies

South Cambridgeshire District Council has been working on a Supplementary Planning Document (SPD), forming part of the Local Development Framework (LDF). One Section of this relates specifically to air quality and low emissions, specifically, the requirement for new developers to consider and produce a Low Emissions Strategy (LES) for their project. It is intended to bring together the Council, the County Council, the Highways Agency and, through the improved use of s106 agreements, developers in working towards improving the local air quality and reducing emissions. In addition, it will help towards achieving the target within the new National Indicator NI194.

The South Cambridgeshire Local Development Framework contains Policy NE/16, relating to emissions and air quality. The policy reads:

“1. Development proposals will need to have regard to any emissions arising from the proposed use and seek to minimise those emissions to control any risks arising and prevent any detriment to the local amenity by locating such development appropriately.

2. Where significant increases in emissions covered by nationally prescribed air quality objectives are proposed, the applicant will need to assess the impact on local air quality by undertaking an appropriate modelling exercise to show that the national objectives will still be achieved. Development will not be permitted where it would adversely affect air quality in an Air Quality Management Area.”

Emissions will be considered when:

- The Council will identify any developments that have the potential to contribute significant emissions to the local area
- Any developments within or adjacent to an AQMA boundary
- Proposals that will result in increased congestion, a change in traffic volumes – an AADT or peak traffic flow, which increases by more than 5% for roads with more than 10,000 AADT.
- Proposals which change the traffic composition (i.e. increase the proportion of HGV's)
- Proposals that include car parking or the increase in provision for more than 300 spaces
- Developments that could give rise to significant dust emissions in areas where people and/or commercial activities could be exposed.
- Pre-application discussions with the developer to exchange ideas and determine the extent of the LES and possible contributions towards air quality improvements using S.106 agreements
- Low Emissions Strategy to be submitted with Planning Applications.

7 Local Transport Plans and Strategies

Where road traffic is the primary source of pollution leading to declaration of an AQMA, Defra and Department for Transport (DfT) recommend that Action Plans are integrated into Local Transport Plans (LTP) so that as much synergy as possible is achieved between transport planning and air quality management at a local level, such that air quality is dealt with in a more corporate and multi-disciplinary way.

The Cambridgeshire LTP 2006 – 2011 (LTP2) was completed in March 2006. It is one of a number of planning and transport plans and strategies for Cambridgeshire and the East of England aimed at ensuring that large-scale development can take place in the county in a sustainable way. It also looks at existing transport issues and seeks to address them.

The LTP seeks to encourage all areas where air quality improvements can be made such as Travel for Work Partnerships, increase in passenger numbers on public transport services and improve to public transport infrastructure and will identify areas where particular benefits might be gained in Cambridgeshire, and where these will or could fall under the remit of our Full LTP programme to deliver or facilitate although many of the engineering and enforcement options available for the A14 fall under the jurisdiction of the Highways Agency.

In 2009, South Cambridgeshire District Council liaised with Cambridgeshire County Council to ensure that the LTP3 gives consideration to air quality. LTP3 will contain detail on the air quality problems faced by South Cambridgeshire District Council and a section on the requirements and priorities detailed within the Air Quality Action Plan (recently submitted to Defra for comment), which is an additional consideration compared to LTP2.

Consultation on LTP3 and air quality is continuing.

8 Climate Change Strategies

8.1 Climate Change Action Plan

In 2002 the Council signed the Nottingham Declaration and in 2005 published a Climate Plan. Much has changed since then, especially in terms of the required extent and urgency of response to reducing greenhouse gas emissions and preparing for the effects of climate change. We have seen very significant national policy shifts and developments since the Climate Change Act 2008 was placed in the statute books with its legally binding UK target of an 80% reduction in CO₂ emissions by 2050.

The new local government performance framework (first reported through for 2008/09) introduced three very specific climate change national indicators: NI 186 - per capita CO₂ emissions for the local authority area; NI 188 - extent of preparedness to respond to the impacts of climate change, and; NI185 - direct CO₂ emissions from local authority operations. The former are LAA indicators and have very specific targets attached to them for delivery by the end of 2010/11.

The original 2005 Climate Plan laid a firm foundation for its time but the pressure to deliver significant carbon savings and prepare effectively for climate change have seen the Sustainability element of the New Communities Service Plan stretch the Climate Plan's influence to and beyond the point of usefulness. A replacement was therefore placed on the delivery list for 2009/10.

A new Climate Change Action Plan (CCAP) has drafted and is due to go out to consultation with in mind for adoption later in 2010.

8.2 Planning and Climate Change

South Cambridgeshire District Council adopted a District Design Guide SPD in March 2010. It includes a section on reducing carbon dioxide emissions, setting out the relevant strategy and policy that will be used to combat climate change from new developments. Applicants should demonstrate how their proposals will maximise the incorporation of energy conservation and efficiency measures – aiming for a minimum 10% reduction in CO₂/m²/year compared to the current 2006 Building Regulations target. Applicants are also encouraged to show as high a level of the Code for Sustainable Buildings as possible.

All applicants will be expected to carry out calculations of energy consumption using SAP or SBAM methodologies and incorporate designs to make use of energy efficiency measures and heat conservation.

In addition, the SPD covers renewable energy sources and makes reference to LDF Policy NE/3 within which all proposals with an area greater than 1000m² or to include >10 dwellings are required to ensure that a minimum of 10% of the energy requirements are met through renewable technologies. Applicants are also encouraged to consider site-wide renewable energy technologies. The SPD also promotes the installation of CHP and CCHP power plants in a drive towards zero carbon developments.

9 Implementation of Action Plans

Air quality within AQMAs is likely to be influenced by factors beyond local authority boundaries. Air Quality Action Plans may often need to complement those of adjoining authorities. Defra recommend that local authorities consider drawing up regional air quality action plans, where appropriate, and have endorsed preparation of a Joint Air Quality Action Plan for the AQMAs within Cambridge City, Huntingdonshire District Council and South Cambridgeshire District Council.

The Districts have completed a table comprising of approximately 80 actions that will have a positive impact upon air quality. These are currently in place or planned for the near future by the County and all District Councils. Some actions are specifically designed to improve air quality, but many of the actions have been initiated to tackle other areas, for example climate change or reducing congestion. They have been arranged into the following themes:

- Managing the network
- Lowering emissions
- Strategic Planning
- Development Control
- Smarter Travel Choices
- Raising Awareness

Each District has produced a list of five or more individual actions, or packages of measures that will in their opinion have the most beneficial impact on air quality within their area. This list is not exhaustive as there are many other options put forward within the AQAP that may be implemented. For South Cambridgeshire District Council, the 5 priority actions are:

The following measures are considered to be the most likely to have a beneficial impact on air quality within the District:

- Completion and opening of the Cambridgeshire Guided Busway.
- Widening of the A14 carriageway between Fen Drayton and Histon – increasing the number of lanes from 2 to 3 on both Eastbound and Westbound carriageways should help to alleviate congestion and speed traffic through-flow.
- Re-alignment of the A14 and the construction of a local road, between the M11 and Bar Hill junctions as part of the A14 Improvement Scheme.
- Establish a Freight Quality Partnership – the South Cambridgeshire District Council's Further Assessment of air quality along the A14 has identified HGVs as having the greatest impact on air quality in the District. If improvements in air quality are to be achieved on the A14 between Bar Hill and Milton, it is vital that the Council seeks to give an understanding of local air quality issues to freight operators who may in turn be able to offer invaluable input into reducing emissions from their fleet.
- Embedding the LDF Air Quality Policy in Local Development Documents – this will ensure that air quality is considered at the planning stage and therefore not adversely impacted by new development.

Of the above actions, the Guided Busway falls under the responsibility of Cambridgeshire County Council whilst the improvements to the A14 are under the jurisdiction of the Highways Agency. In all circumstances, the District Council will seek to influence decisions made by both the County Council and the Highways Agency in order to bring improvements in air quality to the forefront of decision-making processes.

The priorities have been chosen due to the potential for them to have a dual impact on reducing both NO_x and PM_{10} emissions. Health effects of particulate matter are associated with the primary and secondary source categories. Primary PM_{10} is emitted direct to the atmosphere, secondary PM_{10} is formed by (amongst other things) NO_x in the atmosphere.

Therefore, reducing emissions of NO_x will reduce the emissions of both NO_2 and secondary PM_{10} .

Table 9.1 shows progress (where applicable) on the 5 main priorities. It is the intention of the Council to provide a full and detailed AQAP Progress Report in the Summer of 2010.

Table 9.1 Action Plan Progress

| No. | Measure | Focus | Lead authority | Planning phase | Implementation phase | Indicator | Target annual emission reduction in the AQMA | Progress to date | Progress in last 12 months* | Estimated completion date | Comments relating to emission reductions |
|-----|--|---|-------------------------------|----------------|----------------------|----------------------------------|--|--|--|---------------------------|--|
| 1 | Completion and opening of the Cambridgeshire Guided Busway. | Reduce unit emissions in the AQMA by reducing private vehicle mileage on the A14 | Cambridgeshire County Council | 2009 - 2010 | 2010 | N/A | No target emissions set | Construction of bus stops and route ongoing | Construction of bus stops and route ongoing | 2010 | |
| 2 | Widening of the A14 carriageway between Fen Drayton and Histon – increasing the number of lanes from 2 to 3 on both Eastbound and Westbound carriageways should help to alleviate congestion and speed traffic through-flow. | Reduce unit emissions in the AQMA by alleviating congestion on the A14 around Cambridge | Cambridgeshire County Council | 2009 – 2013 | 2009 - 2013 | Approval of planning application | No target emissions set | Submission of planning application, carrying out of detailed air quality assessment, public consultation | Submission of planning application, carrying out of detailed air quality assessment, public consultation | 2013 | The draft Environmental Statement shows that air quality will improve in much of the AQMA but may worsen slightly in other areas. However, the modelling shows that all Objectives will be met by 2015 at relevant locations within the AQMA |
| 3 | Re-alignment of the A14 and the construction of a local road, between the M11 and Bar Hill junctions as part of the A14 Improvement Scheme. | Reduce unit emissions in the AQMA by alleviating congestion on the A14 around Cambridge | Cambridgeshire County Council | 2009 - 2015 | 2009 - 2015 | Approval of planning application | No target emissions set | Submission of planning application, carrying out of detailed air quality assessment, public consultation | Submission of planning application, carrying out of detailed air quality assessment, public consultation | 2013 | The draft Environmental Statement shows that air quality will improve in much of the AQMA but may worsen slightly in other areas. However, the modelling shows that all Objectives will be met by 2015 at relevant locations within the AQMA |

| No. | Measure | Focus | Lead authority | Planning phase | Implementation phase | Indicator | Target annual emission reduction in the AQMA | Progress to date | Progress in last 12 months* | Estimated completion date | Comments relating to emission reductions |
|-----|---|---|---------------------------------------|----------------|----------------------|--|--|--|--|--|---|
| 4 | Establish a Freight Quality Partnership | Reduce unit emissions by working with freight operators, Highways Agency and County Council | South Cambridgeshire District Council | 2009 - 2010 | 2010 | Member commitment by 2009, partnership established by 2012 | No target emissions set | Identification of existing FQP and attendance at 1 st meeting | Identification of existing FQP and attendance at 1 st meeting | 2010 | Improvement in vehicle technology and driver behaviour within the AQMA |
| 5 | Embedding the LDF Air Quality Policy in Local Development Documents | Reduce unit emissions by improving emissions from local developments | South Cambridgeshire District Council | 2009 - 2010 | 2010 | LDF Policy NE/16, use of Low Emission Strategy SPD | No target emissions set | SPD for Low Emissions Strategy developed and adopted. | SPD for Low Emissions Strategy developed and adopted. | Ongoing – SCDC will continually review use of the SPD and LDF Policy NE/16 | Major development is proposed for the District. Use of the SPD and LDF Policy NE/16 will minimise the impact of the developments on local emissions |

*The Air Quality Action Plan was completed and submitted to Defra in 2010, therefore, entries for “Progress to date” remain the same as “Progress in last 12 months”

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

New monitoring data has shown that exceedences of both the annual objective and the daily mean objective for PM₁₀ occurred in 2009 within the Air Quality Management Area. An Air Quality Action Plan has been developed jointly with Cambridge City Council and Huntingdonshire District Council and is with Defra for comment. The AQAP went out to full public and stakeholder consultation in March 2009 and the finalised document was completed at the beginning of 2010. The AQAP will be used to aid in the decision-making processes and influence policy and future projects. It is envisaged that the actions detailed within the AQAP will help to reduce the levels of NO₂ and PM₁₀ within the AQMA. Under present conditions, the AQMA cannot be revoked.

Monitoring and assessment of areas within the District and outside the AQMA has shown that there are currently no other areas of concern and no reason to carry out further or detailed assessment.

10.2 Conclusions relating to New Local Developments

Since the Updating and Screening Assessment of 2009, there have been no new local developments that have had a significant impact on local air quality. However, major growth is proposed for the area. These proposals are currently the subject of full and detailed air quality assessments.

10.3 Other Conclusions

This review and assessment process has not identified any new sources of pollution that need further assessment. The air quality in and around the A14 between Bar Hill and Milton still requires improvement to achieve the national air quality objectives. The designation of the Air Quality Management Area along this stretch of the A14 has led to the development of the above-mentioned Air Quality Action Plan.

It is acknowledged that the District will experience major growth within the next 5-20 years which is going to add to the burden on the local road networks and introduce further emissions from domestic and industrial sources. The impact on air quality of the proposed growth has been modelled by Cambridge Environmental Research Consultants (CERC) in a project carried out in liaison with South Cambridgeshire District Council and Cambridge City Council. The modelling has been carried out to give baseline conditions and dispersion modelling has been carried forward into 2016 and 2025 (in line with proposed timescales for major development projects).

The results of the modelling have now been submitted to South Cambridgeshire District Council and show that, even with all the proposed growth, air quality objectives will be achieved by 2016 at all relevant locations in South Cambridgeshire.

10.4 Proposed Actions

During the previous round of review and assessment, detailed assessments for nitrogen dioxide and PM₁₀ were completed, which has resulted in the declaration of an Air Quality Management Area along the A14 between Bar Hill and Milton. Following this, a further assessment for both pollutants confirmed that South Cambridgeshire District Council was correct in declaring the AQMA. An joint Air Quality Action Plan has been developed along with neighbouring Authorities, Cambridge City Council and Huntingdonshire District Council. The AQAP is currently with Defra for comment after being endorsed by the Cabinets of all 3 Councils. A separate Progress Report for the AQAP will be developed and submitted to Defra in the Autumn of 2010.

This Progress Report has not identified any changes in circumstances that require any further work that is currently not in progress.

Additional monitoring has already been proposed for and around the proposed new town of Northstowe. The proposal includes an NO₂ diffusion tube network within Northstowe, 3 continuous "traffic-box" monitors to be located in existing settlements within 1km of the Northstowe development and the provision and setting up of a community web-based air quality information service for future residents of Northstowe and residents of the outlying settlements. In addition, a new monitoring station (for NO_x, PM₁₀ and PM_{2.5}) has been purchased and will be installed on a site on the boundary of the proposed North-West Cambridge development. It is hoped that the diffusion tube monitoring network will also be increased over the next 12 months.

The existing AQMA is for NO₂ and PM₁₀. This report has not identified any need for the AQMA to be updated, modified or revoked. The exceedence of the annual mean PM₁₀ at Impington is currently being considered, however, advice will be sought from Defra as to whether or not it will be necessary to declare an AQMA based on a solitary, marginal exceedence when previous years have achieved the objective (including the worst case year in 2003) and modelling work to date has shown that the objectives are likely to be met in the future.

11 References

- Deriving NO₂ from NO_x for Air Quality Assessments of Roads – Updated to 2006
Air Quality Consultants
- The Environment Act 1995,
HMSO
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2000)
Department for Environment, Food and Rural Affairs
- Air Quality Regulations 2000 and (Amendment) regulations 2002
HMSO
- Local Air Quality Management, Policy Guidance LAQM. PG(09) (2009)
Department for Environment, Food and Rural Affairs
- Local Air Quality Management, Technical Guidance LAQM. TG(09) (2009)
Department for Environment, Food and Rural Affairs
- Air Quality Action Plan for the Cambridgeshire Growth Areas (2010)
South Cambridgeshire District Council, Huntingdonshire District Council, Cambridge City Council
- The Detailed Assessment of Nitrogen Dioxide Along the A14 Corridor (2006)
South Cambridgeshire District Council
- The Detailed Assessment of PM₁₀ Along the A14 Corridor (2007)
South Cambridgeshire District Council
- The Further Assessment of Nitrogen Dioxide and PM₁₀ Along the A14 Corridor (2008)
South Cambridgeshire District Council
- Cambridgeshire Authorities Progress Report (2007)
South Cambridgeshire District Council, Huntingdonshire District Council, East Cambridgeshire District Council, Cambridge City Council, Fenland District Council, Cambridgeshire County Council
- Cambridgeshire Authorities Progress Report (2008)
South Cambridgeshire District Council, Huntingdonshire District Council, East Cambridgeshire District Council, Cambridge City Council, Fenland District Council, Cambridgeshire County Council
- Updating and Screening Assessment (2009)
South Cambridgeshire District Council
- Traffic Monitoring Report (2008)
Cambridgeshire County Council
- The Climate Plan (2005)
South Cambridgeshire District Council

Appendices

Appendix 1: QA/QC Data

Appendix 2: Map of AQMA

Appendix 3: AQAP Measures Considered

Appendix 1: QA:QC Data

QA/QC of diffusion tube monitoring

Diffusion Tube Bias Adjustment Factors

- Suppliers and Analysing lab: Scientifics Ltd
551 South Becquerel Avenue
Harwell Science and Innovation Campus
Didcot
Oxfordshire
OX11 0TB

Factor from Local Co-location Studies

The bias adjustment factors used for 2007 and 2008 are 0.8, taken from the national bias adjustment spreadsheet supplied on the Review and Assessment Helpdesk website. During 2009, South Cambridgeshire District Council carried out its own co-location study at Orchard Park. The calculated bias adjustment factor for that site in 2009 is also 0.8.

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- Diffusion tube preparation method used: 50:50 (acetone:triethanolamine)
- Scientifics Ltd confirm that the methods and procedures they follow meet the guidelines set out in Defra's "Diffusion Tubes For Ambient Monitoring: Practical Guidance". A copy of the confirmation is provided in Appendix A.
- South Cambridgeshire District Council previously relied on the bias adjustment factors provided on the Air Quality Archive web database, however, a co-location study began at Orchard Park Primary School (grid reference 544557, 261571) in 2009. For 2009, the local bias adjustment factor was calculated as being 0.8. This was the same as the bias adjustment factor obtained from the national database for 2008.
- From the "Summary of Laboratory Performance in WASP R98-102" (prepared by AEA on behalf of Defra, 2008), the performance of Scientifics Ltd against both the old and new criteria was rated as "good".

PM Monitoring Adjustment

The BAMs in use in South Cambridgeshire are non-gravimetric with heated inlets. In order that PM₁₀ data is supplied as gravimetric equivalent, all PM₁₀ data has been multiplied by a factor of 1.3.

QA/QC of automatic monitoring

- QA/QC of automatic monitoring data is carried out by AEA Technology (<http://www.aeat.co.uk>).
- An annual audit of the monitoring stations is carried out by AEA Technology.

- Services are carried out bi-annually by the equipment suppliers. In the case of Bar Hill and Impington, this is AirMonitors Ltd and the site at Orchard Park School is serviced by Enviro-Technology.
- The sites are manually calibrated on a bi-monthly basis by the Local Site Operative. The output from the calibrations is forwarded to AEAT.
- South Cambridgeshire District Council is a member of the Calibration Club, operated by AEAT.
- All NO_x analysers are chemiluminescence analysers
- All particulate matter analysers are BAMs. In line with current guidance, BAM data is multiplied by 1.3 to give the gravimetric equivalent.

Appendix 2: List of AQAP Measures Considered (attached as a separate *.pdf)

Appendix 3: Map of AQMA

