



## **Ashfield District Council**

### **Local Air Quality Management Progress Report 2006**

*Environmental Protection Section*

**ASHFIELD DISTRICT COUNCIL**

**Review & Assessment  
Local Air Quality Management**

**Process Report  
APRIL 2006**

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## Acknowledgements

The Council would like to thank those who have provided help, co-operation, information and resources to enable Ashfield District Council to undertake this Updating and Screening Assessment.

## Chapter One     **Ashfield District Council Progress Report 2007**

### **Executive Summary**

Part IV of the Environment Act 1995 requires local authorities to review and assess the current and future air quality in their areas against objectives set out for eight key air pollutants, under the provisions of the National Air Quality Regulations 2000 and the Air Quality (Amendment) Regulations 2002 (Table 1.0).

A review and assessment of air quality is the first step in the Local Air Quality Management (LAQM) process. Part IV of the Act requires each local authority to review air quality 'from time to time'. The National Air Quality Regulations 2000 and the Air Quality (Amendment) Regulations 2002 prescribe air quality objectives and the dates for meeting them. For each objective, local authorities have to consider present and future air quality and assess whether the objectives are likely to be achieved by the prescribed date.

Review and assessment is now undertaken using a phased approach, initially conducting an 'Updating and Screening Assessment'; this is based on a checklist approach to identify those matters that have changed since the first round of review and assessment was completed and which now require further assessment. Then a 'Detailed Assessment' where the updating and screening assessment indicates that an Air Quality Objective may be compromised. Guidance for progress reports has been given in Technical Guidance LAQM. TG(03).

### **Progress Reports**

Progress reports were introduced into the Local Air Quality Management (LAQM) system following a detailed evaluation of the first round of review and assessment. The evaluation report recommended that *"Careful consideration should be given to requiring an annual LAQM report instead of less frequent review and assessment reports. It would help ensure continuity in resourcing air quality within local authorities so as to maintain the capacity and skills required to manage LAQM. Such a report should provide both a review and update on air quality issues, including information on developments that might affect air quality and the results of monitoring. It would ensure that circumstances requiring a detailed assessment were identified early and acted upon without delay"*.

Progress reports are designed to ensure continuity in the LAQM process. They thus fill the gaps between the three yearly requirements to carry out a review and assessment of air quality. Guidance for progress reports has been given in LAQM.PR(03).

Progress reports are only required in years when the authority is not carrying out an Updating and Screening Assessment or a Detailed Assessment. Thus, this report forms the second Progress Report produced by Ashfield District Council following the most recent Updating and Screening Assessment submitted to Defra in 2006.

### **Summary**

A review of air quality measurement during 2006/07 has demonstrated that all the air quality objectives continue to be achieved across Ashfield. There is no requirement to proceed to a Detailed Assessment for any of the Air Quality Strategy pollutants as a result of air quality data reported within this Progress Report.

## Introduction

The aim of this report is to detail the progress on implementing local air quality management across Ashfield by presenting new monitoring data and a review of local developments which might affect local air quality. This Progress Report represents the seventh report on air quality produced by Ashfield District Council. It is recommended that the report is read in conjunction with the preceding reports, Air Quality Review and Assessment Third Stage August 2001, Updating and Screening Assessment May 2003, Detailed Assessment April 2004 and Detailed Assessment December 2004. Progress Report April 2005 and Updating and Screening Assessment April 2006

The objectives of this report are to:

- Provide an update on monitoring that has taken place since the Updating and Screening Assessment submitted to Defra in April 2006.
- Review any new developments or changes that might have an affect on local air quality
- Provide the means for communicating air quality information to members and the public.

The report adopts the same format as the Updating and Screening Assessment by utilising the profile suggested within the Technical Guidance LAQM. TG(03) and the Progress Report Guidance LAQM.PRG(03). Air quality has been assessed against a list of guidance criteria and where necessary new monitoring data has been reviewed and updated.

## Public Exposure

The Regulations make clear that likely exceedances of the objectives should be assessed in relation to *'the quality of the air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present'*<sup>1</sup>. Review and assessments should thus be focussed on those locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Authorities are advised not to consider exceedances of the objectives at any location where public exposure would not be realistic<sup>2</sup>.

## Consultation

DEFRA advise that local authorities will not need to consult widely on progress reports however they have advised that results from this process should be made available to the public.

This report and associated appendices will be made available to the public via libraries in the district, at the Council Offices in Kirkby-in-Ashfield and on the Council's Web Site. The Nottinghamshire Air Quality Steering Group, established during the first round of review and assessment to co-ordinate consultation across Nottinghamshire authorities, will continue to be involved in Local Air Quality Management. A copy of this report will be put before this group for consultation.

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<sup>1</sup>

Part IV of the Environment Act 1995, Local Air Quality Management, Technical Guidance, LAQM.TG(03), DEFRA. 2003

<sup>2</sup>

Part IV of the Environment Act 1995, Local Air Quality Management, Technical Guidance, LAQM.TG(03), DEFRA. 2003.

**Table 1.0**

*Objectives included in the Air Quality Regulations (England) (Wales) 2000 and in Air Quality (England) (Wales) (Amendment) Regulations 2002 for the purpose of Local Air Quality Management.*

| Pollutant   | Air Quality Objective   |                                   | Date to be achieved by |
|---|---|-----------------------------------|------------------------|
|   | Concentration   | Measured As                       |                        |
| <b>Benzene</b> <sup>1.</sup>  | 16.25 µg/m <sup>3</sup>   | Running annual mean               | 31.12.2003             |
|   | 5 µg/m <sup>3</sup>   | Annual mean                       | 31.12.2010             |
| <b>1,3-Butadiene</b>  | 2.25 µg/m <sup>3</sup>  | Running annual mean               | 31.12.2003             |
| <b>Carbon monoxide</b> <sup>1.</sup>  | 10.0 mg/m <sup>3</sup>  | Maximum daily running 8-hour mean | 31.12.2003             |
| <b>Lead</b>   | 0.5µg/m <sup>3</sup>  | Annual mean                       | 31.12.2004             |
|   | 0.25µg/m <sup>3</sup>   | Annual mean                       | 31.12.2008             |
| <b>Nitrogen dioxide</b> <sup>2.</sup>   | 200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year. | 1-hour mean                       | 31.12.2005             |
|   | 40 µg/m <sup>3</sup>  | annual mean                       | 31.12.2005             |
| <b>Particles (PM<sub>10</sub>) (gravimetric)</b> <sup>3.</sup>  | 50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year.  | 24-hour mean                      | 31.12.2004             |
|   | 40 µg/m <sup>3</sup>  | annual mean                       | 31.12.2004             |
| <b>Sulphur dioxide</b>  | 350µg/m <sup>3</sup> not to be exceeded more than 24 times a year.  | 1-hour mean                       | 31.12.2004             |
|   | 125µg/m <sup>3</sup> not to be exceeded more than 3 times a year.   | 24-hour mean                      | 31.12.2004             |
|   | 266µg/m <sup>3</sup> not to be exceeded more than 35 times a year.  | 15-minute mean                    | 31.12.2005             |
| <p><sup>1.</sup> The Air Quality Objective of 5 µg/m<sup>3</sup> for benzene and the objective of 10µg/m<sup>3</sup> for carbon monoxide came into force in separate Air Quality (Amendment) Regulations for England and Wales on 11 December 2002 and 31 December 2002 respectively.</p> <p><sup>2.</sup> The objectives for nitrogen dioxide are provisional.</p> <p><sup>3.</sup> Measured using the European gravimetric transfer sampler or equivalent</p> |   |                                   |                        |



## Chapter Two

# Carbon Monoxide

The Government and Devolved Administrations have set a new objective of 10mg/m<sup>3</sup> as a daily running mean concentration, which was to be achieved by the end of 2003, bringing it into line with the Second Air Quality Daughter Directive limit value.

### National Objective:

**10mg/m<sup>3</sup>** Max daily running eight-hour mean (31<sup>st</sup> December 2003).

## 2.1 (A) Monitoring Data

No local monitoring has been undertaken for carbon monoxide in Ashfield since the Updating and Screening Assessment reported in 2003, which concluded that the annual objective concentration of 10mg/m<sup>3</sup> in 2003 will be met across the district. There has been no significant increase in carbon monoxide sources identified within Ashfield.

### Air Quality Emission Inventory

A carbon monoxide emission inventory for Ashfield has been revised since the second round of review and assessment, undertaken by consultants acting on behalf of Nottinghamshire authorities and based upon 2004 data<sup>3</sup>. Considerable data relating to emissions of carbon monoxide has been compiled and entered into the new inventory. The inventory clearly demonstrates a reduction in carbon monoxide levels across Ashfield and Nottinghamshire since the second round.

Table 2.0 tabulates the reduction in carbon monoxide emissions from road transport along with a number of other pollutants evaluated within this Updating and Screening Assessment predominantly showing a downward trend.

Table 2.0 *Emission reductions from Road Transport within Nottinghamshire 1997 –2004 (tonnes/year)*

| Pollutant                                       | Emissions from Road Transport |                        |                        |                 |
|---|-------------------------------|------------------------|------------------------|-----------------|
|   | 1997<br>(tonnes /year)        | 2001<br>(tonnes /year) | 2004<br>(tonnes /year) | %<br>Reduction* |
| Carbon Monoxide (CO)                            | 45283                         | 29863                  | 15291                  | 49              |
| Nitrogen Oxides (NOx)                           | 16812                         | 12993                  | 10223                  | 23              |
| Non Methane Volatile Organic Compounds (NMVOCs) | 9095                          | 3280                   | 1334                   | 64              |
| Particulates PM <sub>10</sub>                   | 769                           | 462                    | 389                    | 40              |
| Benzene   | 312                           | 45                     | 49                     | -               |
| 1,3 Butadiene                                   | 75                            | 51                     | 25                     | 32              |

There has been no significant increase in carbon monoxide sources identified within Ashfield. Low resolution modelling conducted during the first round of review and assessment indicated that carbon monoxide levels were predicted to be between 0.3 mg/m<sup>3</sup> – 0.6 mg/m<sup>3</sup> (1997), considerably below the new objective.

<sup>3</sup> Nottingham Emissions Inventory, (CATE) April 2004

### Automatic Urban Network Stations

A summary of maximum 8-hour mean concentrations measured at nearby Automatic Urban Network Stations (Table 2.1) indicate there has been no exceedances of the objective and results are well below the standard. \*Note that data for 2005 includes some provisional and un-ratified data.

**Table 2.1** *Summary of Maximum Carbon Monoxide 8-Hour mean concentrations measured at a number of National Network Monitoring Sites (2001 – 2005)*

| Site                      | Site Classification | Maximum daily 8-hour mean concentration<br>(Objective 10mg/m <sup>3</sup> ) |                           |                           |                           |
|---------------------------|---------------------|---|---------------------------|---------------------------|---------------------------|
|                           |                     | 2002<br>mg/m <sup>3</sup>   | 2003<br>mg/m <sup>3</sup> | 2004<br>mg/m <sup>3</sup> | 2005<br>mg/m <sup>3</sup> |
| Nottingham Centre         | Urban Centre        | 0.39  | 0.43                      | 0.47                      | 0.4                       |
| Birmingham East (*Centre) | Urban Background    | 0.26  | 0.27                      | 0.23                      | *0.34                     |
| Sheffield Centre          | Urban Centre        | 0.41  | 0.40                      | 0.37                      | 0.34                      |
| Leicester Centre          | Urban Centre        | 0.49  | 0.49                      | 0.34                      | 0.21                      |

### Background concentrations

Background concentration maps for carbon monoxide have **not** been updated by Defra for this third round of review and assessment, as the pollutant is not considered as a high priority. The maximum estimated background concentration within Ashfield in 2001 was 0.458mg/m<sup>3</sup>. When corrected to the objective year of 2003 the maximum estimated background concentration in Ashfield was calculated as 0.378mg/m<sup>3</sup> well below the air quality objective.

## **2.2 (B) Very Busy Roads or junctions in Built-up areas**

1. Local authorities are only required to undertake a review and assessment for road traffic sources of carbon monoxide in respect of the 2003 objective, where the background concentration is expected to be above 1 mg/m<sup>3</sup> in areas where there are 'very busy' roads with daily average traffic (AADT) flows that exceed the following criteria:

- single carriageway roads with daily average traffic flows which exceed 80,000 vehicles per day.
- dual carriageway (2 or 3 lanes) roads with daily average traffic flows which exceed 120,000 vehicles per day.
- Motorways with daily average traffic flows which exceed 140,000 vehicles per day.

Updated traffic flow data for 2004 has been reviewed and it has been determined that there are no roads in Ashfield that have been identified as 'very busy' and therefore no further assessment has been undertaken for this section.

## **2.3 CONCLUSION**

The assessment of carbon monoxide has been reviewed against the 2006 revised checklist criteria contained in the LAQM Technical Guidance (03). It is expected that the annual objective concentration of 10mg/m<sup>3</sup> in 2003 will continue be met across Ashfield.

|  |
|--|
| <b>There is no requirement to undertake a detailed assessment for carbon monoxide in any location within Ashfield.</b> |
|--|

The Government and Devolved Administrations have adopted a running annual mean of  $16.25\mu\text{g}/\text{m}^3$  as the air quality standard for benzene, with an objective for the standard to be achieved by the end of 2003. However, in light of the health advice from the Expert Panel on Air Quality Standards (EPAQS) and the Department of Health's Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (COC), additional tighter objectives have been set. The Second Air Quality Daughter Directive for benzene, which has been transposed into UK legislation, sets a limit value, annual mean of  $5\mu\text{g}/\text{m}^3$  to be achieved by 1<sup>st</sup> January 2010<sup>4</sup>.

#### National Objectives:

$16.25\mu\text{g}/\text{m}^3$  running annual mean 31<sup>st</sup>. December 2003

$5\mu\text{g}/\text{m}^3$  annual mean 31<sup>st</sup>. December 2010

### 3.1 (A) Monitored Data

No local monitoring has been undertaken for benzene in Ashfield since the Updating and Screening Assessment reported in 2003, which concluded that the annual objective concentrations of  $16.25\mu\text{g}/\text{m}^3$  (2003) and  $5\mu\text{g}/\text{m}^3$  (2010) would be met across Ashfield.

#### Air Quality Emission Inventory

A benzene emission inventory for Ashfield has been revised since the second round of review and assessment, undertaken by consultants acting on behalf of Nottinghamshire authorities and based upon 2004 data<sup>5</sup>. Considerable data relating to emissions of benzene has been compiled and entered into the new inventory. The inventory identifies that benzene levels have increased very slightly which may be associated with the inventory reflecting a more accurate determination of concentrations than in previous years (see table 2.0 Chapter 2).

#### Automatic Monitoring Network Data

A summary of maximum annual running mean concentrations measured at nearby Automatic Urban Network Stations (Table 3.0) indicate there has been no exceedances of the objective and results are well below the standard.

**Table 3.0** *Summary of Maximum Running Annual Mean Concentrations measured at National Monitoring Sites (2001-2005)*

| AUN Site     |                      | Maximum Running Annual Mean Concentration |                          |                          |                          |                          |
|--------------|----------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|
|              |                      | 2001                                      | 2002                     | 2003                     | 2004                     | 2005                     |
|              |                      | $\mu\text{g}/\text{m}^3$                  | $\mu\text{g}/\text{m}^3$ | $\mu\text{g}/\text{m}^3$ | $\mu\text{g}/\text{m}^3$ | $\mu\text{g}/\text{m}^3$ |
| Urban Centre | London Marylebone Rd | 4.55                                      | 3.93                     | 3.31                     | 2.76                     | *2.33                    |
| Rural        | Harwell              | 0.62                                      | 0.62                     | 0.58                     | 0.42                     | *0.87                    |

<sup>4</sup> Part IV of the Environment Act 1995, Local Air Quality Management, Policy Guidance, LAQM.PG(03), DEFRA. 2003.  
<sup>5</sup> Nottingham Emissions Inventory, (CATE) April 2004

Figures in the above table are well below the air quality objective before correction factors have been applied (which will reduce the figures further). \*Note that data for 2005 includes some provisional and un-ratified data.

### **3.2 (B) Monitoring data within an AQMA**

The assessment for this section is only applicable to authorities that have declared Air Quality Management Areas. Ashfield have not declared any Air Quality Management Areas within the district. No further updating and screening assessment has been undertaken for this section.

### **3.3 (C) Very busy roads or junctions in built-up areas**

Local authorities are only required to undertake a review and assessment for road traffic sources of benzene in respect of the 2003 objective, where there are 'very busy' roads with daily average traffic (AADT) flows that exceed the following criteria:

- i. single carriageway roads with daily average traffic flows which exceed 80,000 vehicles per day.
- ii. dual carriageway (2 or 3 lanes) roads with daily average traffic flows which exceed 120,000 vehicles per day.
- iii. Motorways with daily average traffic flows which exceed 140,000 vehicles per day.

There are no roads in Ashfield that have been identified as 'very busy' and therefore no further review and assessment has been undertaken for this section.

### **3.4 (D) Industrial sources**

There have been no new industrial sources of benzene identified within Ashfield and there are no sources within neighbouring authorities close to the district boundary as determined against the checklist in Annex 2 of the LAQM Technical Guidance (03) and therefore no further assessment has been undertaken for this section.

### **3.5 (E) Industrial sources with substantially increased emissions, or new relevant exposure.**

There have been no new industrial sources with substantially increased emissions identified within Ashfield. No further updating and screening assessment has been undertaken for this section.

### **3.6 (F) Petrol stations**

None of the Petrol stations in Ashfield meet the required criteria for assessment stipulated in the LAQM Technical Guidance (03) and therefore no further assessment has been undertaken.

### **3.7 (G) Major fuel storage depots (Petrol only)**

There are no major fuel storage depots located within Ashfield or within adjacent authorities close to the district boundary and therefore no further assessment has been undertaken for this section.

### **3.8 CONCLUSION**

The assessment for benzene has been completed against the 2006 revised criteria checklist contained in the LAQM Technical Guidance (03). It is expected that the annual objective concentrations of 16.25 µg/m<sup>3</sup> (2003) and 5µg/m<sup>3</sup> (2010) will be met across Ashfield.

|  |
|--|
| <b>There is no requirement to undertake a detailed assessment for benzene within Ashfield.</b> |
|--|

## Chapter Four

# 1,3 Butadiene

The Government and Devolved Administrations have adopted a maximum running annual mean concentration of  $2.25 \mu\text{g}/\text{m}^3$  as an air quality standard for 1,3 butadiene. The objective is for the standard to be achieved by the end of 2003.

### National Objectives:

**$2.25 \mu\text{g}/\text{m}^3$**  running annual mean 31<sup>st</sup>. December 2003

#### 4.1 (A) Monitoring Data

No monitoring for 1,3-butadiene has been undertaken in Ashfield since the Updating and Screening Assessment in 2003, which concluded that the annual objective concentration of  $2.25 \mu\text{g}/\text{m}^3$  (2003) will be met across the district. There has been no significant increase in 1,3-butadiene sources identified within Ashfield.

#### Air Quality Emission Inventory

A 1,3-butadiene emission inventory for Ashfield has been revised since the second round of review and assessment, undertaken by consultants acting on behalf of Nottinghamshire authorities and based upon 2004 data<sup>6</sup>. Considerable data relating to emissions of 1,3-butadiene has been compiled and entered into the new inventory. The inventory clearly demonstrates a reduction in the levels of this pollutant across Ashfield and Nottinghamshire since the second round (see table 2.0, chapter 2).

#### Automatic Monitoring Network Data

A summary of annual mean concentrations measured at Automatic Urban Network Stations (Table 4.0) indicate there has been no exceedances of the objective and results are well below the standard.

Table 4.0      *Summary of annual mean concentration of 1,3-butadiene (2002 – 2005)*

| Annual Mean Concentration |                   |                          |                          |                          |                          |
|---------------------------|-------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| AUN Site                  |                   | 2002                     | 2003                     | 2004                     | 2005                     |
|                           |                   | $\mu\text{g}/\text{m}^3$ | $\mu\text{g}/\text{m}^3$ | $\mu\text{g}/\text{m}^3$ | $\mu\text{g}/\text{m}^3$ |
| Rural Background          | Harwell           | 0.04                     | 0.03                     | 0.02                     | *0.20                    |
| Urban Background          | London Marylebone | 0.95                     | 0.64                     | 0.57                     | *0.51                    |

\*Note that data for 2005 includes some provisional and un-ratified data.

#### 4.2 (B) New Industrial Sources

There have been no new industrial sources identified since the previous Updating and Screening Assessment likely to give rise to exceedances of the running average mean objective for 1,3-butadiene.

#### 4.3 (C) Industrial sources with substantially increased emissions.

<sup>6</sup> Nottingham Emissions Inventory, (CATE) April 2004

There has been no substantial increase of 1,3-butadiene emissions identified in Ashfield since the previous Updating and Screening Assessment likely to give rise to exceedances of the running average mean objective for 1,3-butadiene.

#### 4.4 CONCLUSION

The assessment of 1,3-butadiene has been reviewed against the 2006 revised checklist criteria contained in the LAQM Technical Guidance (03). There have been no significant changes and it is expected that the annual objective concentration of  $2.25\mu\text{g}/\text{m}^3$  (2003) will continue to be met across Ashfield.

**There is no requirement to undertake a detailed assessment for 1,3-butadiene within Ashfield.**

The Government and Devolved Administrations have adopted an annual mean concentration of  $0.5\mu\text{g}/\text{m}^3$  as the air quality standard for lead, with an objective for the standard to be achieved by the end of 2004. In addition, a lower air quality objective of  $0.25\mu\text{g}/\text{m}^3$  to be achieved by the end of 2008 has also been set<sup>7</sup>.

### National Objectives:

**$0.5\mu\text{g}/\text{m}^3$**  annual mean 31<sup>st</sup>. December 2004

**$0.25\mu\text{g}/\text{m}^3$**  annual mean 31<sup>st</sup>. December 2008

### 5.1 (A) Monitoring Data

No local monitoring has been undertaken within Ashfield to determine the concentrations of lead against the objective concentrations. The emission inventory compiled for Ashfield did not consider this pollutant as evidence suggested that there was no risk of the objective being exceeded. There has been no significant increase in sources of lead since the previous Updating and Screening Assessment.

### 5.2 (B) New industrial sources

There have been no new industrial sources of lead identified since the Updating and Screening Assessment as likely to give rise to exceedances of the annual mean objectives for lead in 2004 or 2008.

### 5.3 (C) Industrial source with substantially increased emissions

There has been no substantial increase in lead emissions from any source within Ashfield therefore no further assessment has been made.

### 5.4 CONCLUSION

The review for lead has been completed against the 2006 revised criteria contained in the LAQM Technical Guidance (03). It is expected that the annual objective concentration of  $0.5\mu\text{g}/\text{m}^3$  (2004) and  $0.25\mu\text{g}/\text{m}^3$  (2008) will be met across Ashfield.

**There is no requirement to undertake a detailed assessment for lead within Ashfield.**

<sup>7</sup>

Part IV of the Environment Act 1995, Local Air Quality Management, Policy Guidance, LAQM.PG(03), DEFRA. 2003.

The Government and Devolved Administrations have adopted two Air Quality Objectives for nitrogen dioxide, as an annual mean concentration of 40µg/m<sup>3</sup> and a 1-hour mean concentration of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year. The objectives are to be achieved by the end of 2005<sup>8</sup>.

The first Air Quality Daughter Directive also sets limit values for nitrogen dioxide, which has been transposed into UK legislation. The directive includes a 1-hour limit value of 200µg/m<sup>3</sup> not to be exceeded more than 18 times per year and an annual mean limit value of 40µg/m<sup>3</sup> both to be achieved by 1<sup>st</sup> January 2010<sup>9</sup>.

#### UK National Objectives:

**200 µg/m<sup>3</sup>** 1 hour mean (18 exceedances) 31<sup>st</sup>. December 2005

**40 µg/m<sup>3</sup>** annual mean 31<sup>st</sup>. December 2005

### 6.1 (A) Monitoring Data

Monitoring of nitrogen dioxide has been undertaken at three locations since the second round of Updating and Screening Assessment. Assessments carried out at two of these locations have already been submitted and accepted by Defra and included within Ashfield's Progress Report issued in April 2005<sup>10</sup>. For completeness a summary for these reports is given below. The reader is referred to the Ashfield's 2005 Progress Report for more comprehensive information.

### 6.2 Summary of Ashfield's 2005 Progress Report

Table 6.0 *Summary of Estimated nitrogen dioxide annual mean concentration for 2007 and 2010 at Stoneyford Court, Sutton-in-Ashfield.*

| Location                     | Estimated Annual Mean in 2003 (µg/m <sup>3</sup> ) | Estimated Annual mean in 2005 (µg/m <sup>3</sup> ) | Estimated Annual mean in EU 2010 (µg/m <sup>3</sup> ) | 2005 & 2010 Annual mean Objective (µg/m <sup>3</sup> ) |
|------------------------------|--|--|---|--|
| Stoneyford Court<br>2006 -07 |  |  |   |  |

<sup>8</sup> Part IV of the Environment Act 1995, Local Air Quality Management, Technical Guidance, LAQM.TG(03), DEFRA. 2003.

<sup>9</sup> Part IV of the Environment Act 1995, Local Air Quality Management, Technical Guidance, LAQM.TG(03), DEFRA. 2003.

<sup>10</sup> Air Quality Review and Assessment - Progress Report Ashfield District Council (April 2005)



**Table 6.1**      *Measured nitrogen dioxide annual mean concentration for 2006 Stoneyford Court – Priestic Road Sutton-in-Ashfield.*

|                 | <b>24 hour means (monitoring period)</b>       |                                      |   | <b>EU 2010</b>   |
|-----------------|--|--------------------------------------|---|--|
| <b>Location</b> | <b>Measured Period Mean (µg/m<sup>3</sup>)</b> | <b>Min 1 hour (µg/m<sup>3</sup>)</b> | <b>Max 1 hour mean (µg/m<sup>3</sup>)</b> | <b>No of 1-hour limit value exceedances &gt;200 (µg/m<sup>3</sup>)</b> |
| Stoneyford Road |  |                                      |   |  |

Only short-term data was available for the Progress Report at this location as recorded above (xxx 2006 to February 2007). The estimated annual mean was calculated in accordance with the LAQM Technical Guidance (03) to determine whether the 2007 and 2010 (Ref. Box 6.5 and 6.6 of guidance) objectives would be compromised. Table 6.2 tabulates the results for this location.

**Table 6.2**      *Estimated nitrogen dioxide annual mean concentration for 2005 and 2010 Old Bleak Hall, Kirkby-Woodhouse, Nottingham.*

| <b>Location</b>  | <b>Measured Period Mean (µg/m<sup>3</sup>)</b> | <b>Estimated Annual mean in 2005 (µg/m<sup>3</sup>)</b> | <b>Estimated Annual mean in EU 2010 (µg/m<sup>3</sup>)</b> | <b>2005 &amp; 2010 Annual mean Objective (µg/m<sup>3</sup>)</b> |
|------------------|--|---|--|---|
| Stoneyford Court |  |   |  | 40  |

The estimated annual mean at Stoneyford Court for 2006 was calculated as X µg/m<sup>3</sup> based upon a X month monitoring period commencing X to X. The estimated annual mean in 200X was calculated as Xµg/m<sup>3</sup> below the 200X objective of 40µg/m<sup>3</sup>. The estimated annual mean at Stoneyford Court for 2010 was Xµg/m<sup>3</sup> well below the 2010 objective of 40µg/m<sup>3</sup>.

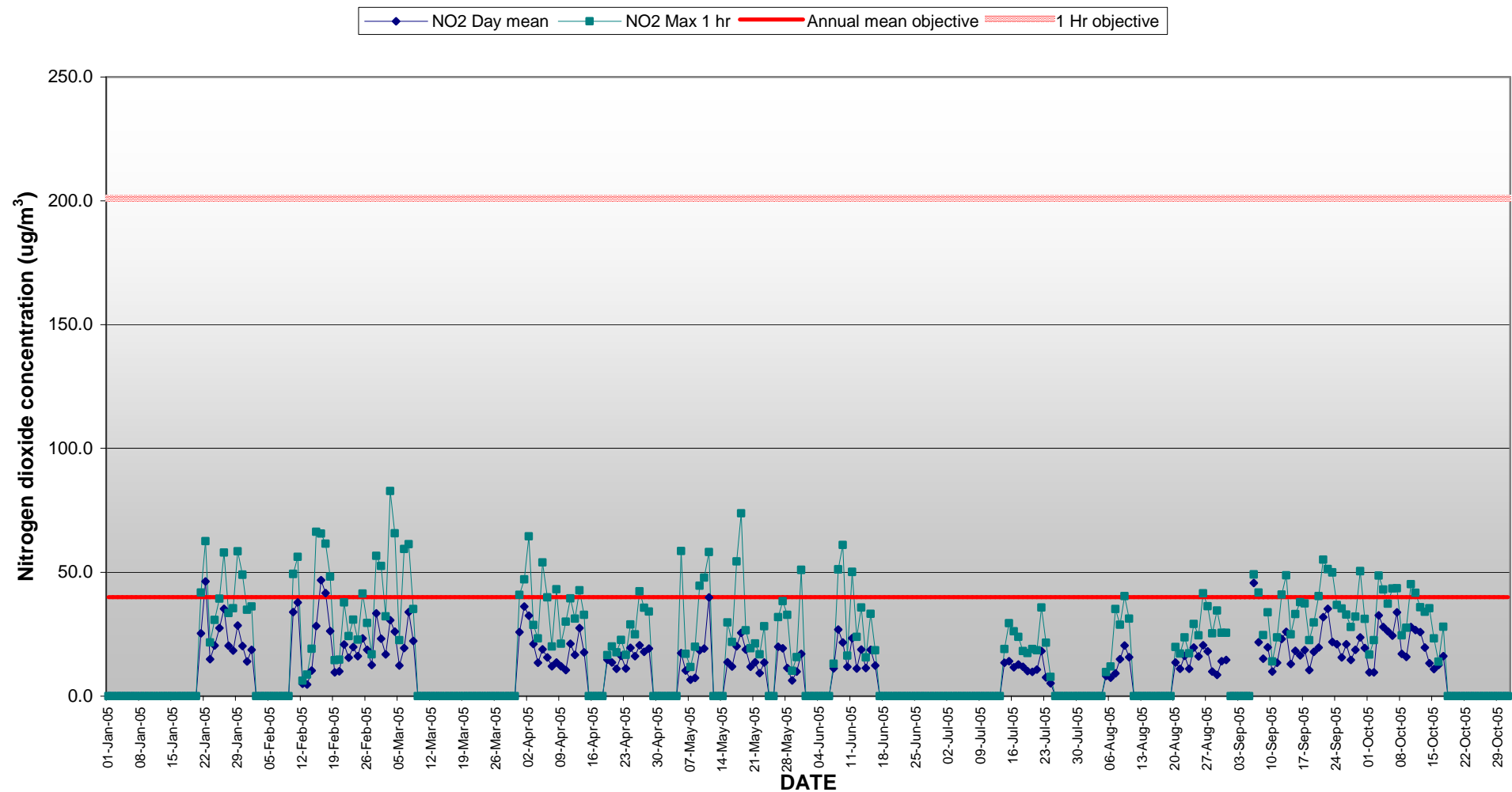
### **Conclusion**

**Assessment has been made against the NO<sub>2</sub> air quality objectives for 2005 and 2010**

**No further review and assessment is required at this location for nitrogen dioxide concentrations.**

Figure 6.1

**Nitrogen Dioxide Monitoring results at Old Bleak Hall, Kirkby -Woofhouse, Nottingham**  
**Summary of results from the chemiluminescence analyser**



## 6.4 Nitrogen Dioxide Diffusion Tubes Network - update

The supply and analysis of nitrogen dioxide diffusion tubes is currently undertaken by Harwell Scientifics who have held this contract since October 1999. A UKAS 1:1 acetone:triethanolamine method is utilised based upon a four week tube exposure period. The annual mean for 2005 has been calculated and bias (Bias Factor (A) adjusted using the methodology established in the LAQM Technical Guidance (03). The bias corrected annual mean has then been compared to the 2005 objective (see table 6.3).

### Bias Correction for Diffusion Tubes

An approach to bias correction for nitrogen dioxide diffusion tubes is provided within the LAQM Technical Guidance (03). The method can only be calculated based upon the collocation of diffusion tubes with a continuous chemiluminescence monitor, typically over a full year's study. Ashfield have undertaken a collocation study from 21<sup>st</sup> January 2005 – 17<sup>th</sup> October 2005 covering a period of approximately 9 months, whilst the chemiluminescence monitor was at Old Bleak Hall in Kirkby-Woodhouse, Nottingham.

The diffusion tube bias was evaluated using one of the local authority spreadsheet tools available from the 'Air Quality Archive' web site<sup>11</sup>. The spreadsheet tool provides a means to assist diffusion tubes users in calculating the precision and accuracy (bias) of their collocation studies and adjusting diffusion tube results using the bias adjustment calculated. The spreadsheet considers a 95% confidence interval in the bias adjustment calculations.

Diffusion tube results from Old Bleak Hall were entered into the spreadsheet corresponding to the nine month chemiluminescence monitoring period (see Appendix item ii.). Whilst the tubes demonstrated good overall precision, problems associated with frequent power cuts resulted in poor data capture for Ashfield's continuous chemiluminescence monitor. Quality checks within the spreadsheet reject data periods that have a data capture level below 75% and exclude them from further calculations. Additionally, if the data capture for the overall assessment is below 90% the survey is considered of poor data capture and recommends that any conclusions from the study are treated with caution.

Bias correction results were therefore only calculated for 3 periods out of the nine periods entered into the spreadsheet for this location. This produced a 'Bias Factor (A)' of  $0.643 \pm 0.178$  based upon a data capture of 87%.

**Having considered the poor data capture Ashfield have decided to reject this collocation survey and use a bias adjustment factor provided by Harwell Scientific.**

Harwell Scientifics provide a 'Bias Factor A' with each respective analysis report based upon comparison with a chemiluminescence continuous monitor (Nitrogen Dioxide network field comparison by Health and Safety Laboratory). The bias is calculated as set out within the LAQM Technical Guidance (03). Harwell Scientific are currently ranked as a **Category Good** laboratory by the WASP Intercomparison Scheme<sup>12</sup>.

Current Bias Factor (A) = **0.69**<sup>13</sup>

**Bias Factor (A) = chemiluminescence mean (Cm)/Diffusion tube (Dm)**

$$A = Cm / Dm = 0.69$$

<sup>11</sup> Web Site <http://www.airquality.co.uk/archive/index.php>, January 2006.

<sup>12</sup> Nitrogen dioxide diffusion tube analysis report, Scientifics (2005).

<sup>13</sup> Base upon a 12 month collocation study

It was considered that this would be a more accurate adjustment factor until a more accurate co-location study could be undertaken by Ashfield. Annual diffusion tube results for 2005 have therefore been adjusted for each monitored location (see table 6.3).

**Table 6.3**      *Estimated annual mean nitrogen dioxide concentrations 2005 objective*

| <b>Diffusion Tube Location</b> | <b>Measured Annual Mean For 2005 Based on 12 months data (<math>\mu\text{g}/\text{m}^3</math>)</b> | <b>Harwell Scientific 2005 Bias Factor (A) 0.69 (<math>\mu\text{g}/\text{m}^3</math>)</b> | <b>Estimated Annual Mean For 2005 (AQ Objective 40 <math>\mu\text{g}/\text{m}^3</math>)</b> |
|--------------------------------|--|---|---|
| Sutton. Outram Street          | 46.0   | 31.7  | <b>31.7</b>   |
| Sutton Baths                   | 28.3   | 19.5  | <b>19.5</b>   |
| A 38 Fire Station              | 38.6   | 26.6  | <b>26.6</b>   |
| Selston Kwik Save              | 37.4   | 25.8  | <b>25.8</b>   |
| Hucknall High street           | 50.6   | 34.9  | <b>34.9</b>   |
| Hucknall Croft/Beardall St     | 33.6   | 23.2  | <b>23.2</b>   |
| Kirkby Nag's Head              | 56.7   | 39.1  | <b>39.1</b>   |
| M1 Salmon Lane                 | 63.4   | 43.7  | <b>43.7</b>   |
| M1 Pinxton                     | 43.4   | 29.9  | <b>29.9</b>   |
| Castle Hill                    | 48.1   | 33.2  | <b>33.2</b>   |

### Monitoring Results

The most recent bias adjusted nitrogen dioxide diffusion tube monitoring results indicate that the highest annual mean concentrations are typically situated along roads within the urban centres of Hucknall and Kirkby and within the vicinity of the M1. The annual mean concentrations estimated for 2005 at these locations were between 35 – 44 $\mu\text{g}/\text{m}^3$  with only one exceedance above the 2005 objective of 40 $\mu\text{g}/\text{m}^3$  (M1 Salmon Lane). However, exposure in these locations would only be short term and it would be unlikely that anyone would be exposed to these levels of nitrogen dioxide over a whole year. A few metres back from the road it would be expected that the nitrogen dioxide concentrations would be less than at the roadside.

### Conclusions

The nitrogen dioxide diffusion tube results have indicated that one location slightly exceeded the 2005 objective. However, it should be noted that this site is a roadside location where public exposure would be expected to be short term and minimal. It is therefore not considered suitable to represent relevant exposure to the annual mean objective (LAQM Technical Guidance (03) Box 1.4), It is however, an invaluable indicative source of spatial distribution of nitrogen dioxide for this location.

### Recommendations

The nitrogen dioxide diffusion tube results do not required Ashfield to proceed to a detailed assessment in these areas.

Ashfield will conduct a further co-location study utilising duplicate diffusion tubes adjacent to the chemiluminescence monitor over the next 12 month period.

#### 6.5 (B) Monitoring data within an AQMA.

The assessment for this section is only applicable to authorities that have declared Air Quality Management Areas. Ashfield have not declared any Air Quality Management Areas within the district. No further updating and screening assessment has been undertaken for this section.

#### 6.6 (C) Narrow congested streets with residential properties close to the kerb.

Local authorities are only required to undertake assessments of roads where there are narrow congested streets with residential properties within 5m of the kerb and which have traffic flows greater than 10,000 per day. This criterion has been reassessed against roads which have seen an increase above 10,000 ADDT since the previous 2<sup>nd</sup> round USA.

No locations were identified to warrant the use of the DMRB screening model for narrow congested streets in any location within Ashfield and therefore no further assessment has been undertaken for this section.

#### 6.7 (D) Junctions.

Local authorities are required to undertake assessment of busy junctions within their districts. The LAQM Technical Guidance (03) interprets a 'busy' junction as '*one with more than 10,000 vehicles per day*'. Additionally there should be a relevant exposure within 10 metres of the kerb. A comprehensive assessment of busy junctions was undertaken during the 2<sup>nd</sup> Round USA utilising GIS software and local knowledge. Seven busy junctions were evaluated using the DMRB model which demonstrated that the air quality objective would not be compromised at these locations.

These busy junctions have been re-evaluated during the 3<sup>rd</sup> Round of USA, having considered revised AADT traffic flow data for 2004, updated UK background concentration maps and a re-assessment for relevant exposure.

#### Results

Table 6.4      *Estimated Annual mean NO<sub>2</sub> conc. For 2006 and 2010 at busy junctions*

| Receptor Ref: | Coordinates x.y | Busy Junctions     | Est. Annual Mean 2006 NO <sub>2</sub> (µg/m <sup>3</sup> ) | Est. Annual Mean 2010 NO <sub>2</sub> (µg/m <sup>3</sup> ) |
|---------------|-----------------|--------------------|--|--|
| A             | 450,180 358,594 | A38 – B6022        | 29.5   | 25.3   |
| B             | 448,969 356,303 | B6018 – B6020      | 23.2   | 21.8   |
| C             | 450,814 353,809 | A611 – Forest Road | 29.0   | 24.6   |
| D             | 448,800 358,684 | B6023 – B6026      | 25.0   | 21.2   |
| E             | 449,295 358,973 | B6023 – Lammas     | 25.3   | 21.0   |
| F             | 449,295 358,973 | B6023 – B6028      | 25.2   | 21.0   |
| G             | 448,323 360,747 | B6014 – B6028      | n/a  | n/a  |

Modelling undertaken at the above busy junctions has determined that the air quality objective for nitrogen dioxide will be met at all these locations. No modelling was required at receptor G as the location no longer represented relevant exposure.

**There is no requirement for Ashfield to proceed to a detailed assessment for any busy junctions within the district.**

#### 6.8 (E) Busy streets where people may spend 1-hour or more close to traffic.

Local authorities are only required to undertake review and assessment against this section where there are busy street locations identified where members of the public might regularly spend 1-hour or more, e.g. streets with many shops, streets with outdoor cafes/bars. The guidance interprets 'busy' as those streets with more than 10,000 vehicles per day. This criterion has been reassessed against roads which have seen an increase above 10,000 AADT since the previous 2<sup>nd</sup> Round USA.

There are no streets within Ashfield, which meet all the criteria of this section and therefore no further assessment has been undertaken.

#### 6.9 (F) Roads with high flows of buses and/or HGVs

Authorities are only required to undertake an updating and screening assessment for this section where roads are identified as having an unusually high proportion of buses or HGVs. An 'unusual high proportion of Buses or HGVs' is taken to be greater than 20% of the AADT, LAQM Technical Guidance (03) Box 6.2.

This was evaluated during the 2<sup>nd</sup> round USA. There were no roads determined as having an unusually high proportion of buses or HGV's. There has been no change to this position.

#### 6.10 (G) New roads constructed or proposed since first round of review and Assessment.

The Mansfield and Ashfield Regeneration Route (MARR) was completed in December 2004. DMRB modelling undertaken during the 2<sup>nd</sup> Round USA did not predict any exceedances of the nitrogen dioxide Air Quality Objectives. There has been no change to this position.

#### 6.11 (H) Roads with significantly changed traffic flows

Authorities are only required to undertake the assessment of roads with traffic flows greater than 10,000 vehicles per day that have experienced a large increase in traffic. The LAQM Technical Guidance (03) has interpreted 'large increase' as '*more than a 25% increase in traffic*'. The aim of the assessment is to establish whether there is a risk of exceedances along the existing roads with a significant change in flows.

Improved AADT traffic data for 2004 was compared with 2001 AADT data to identify roads which had experienced an increase in traffic flow above 25%. The following roads were re-evaluated in respect of significantly changed traffic flows.

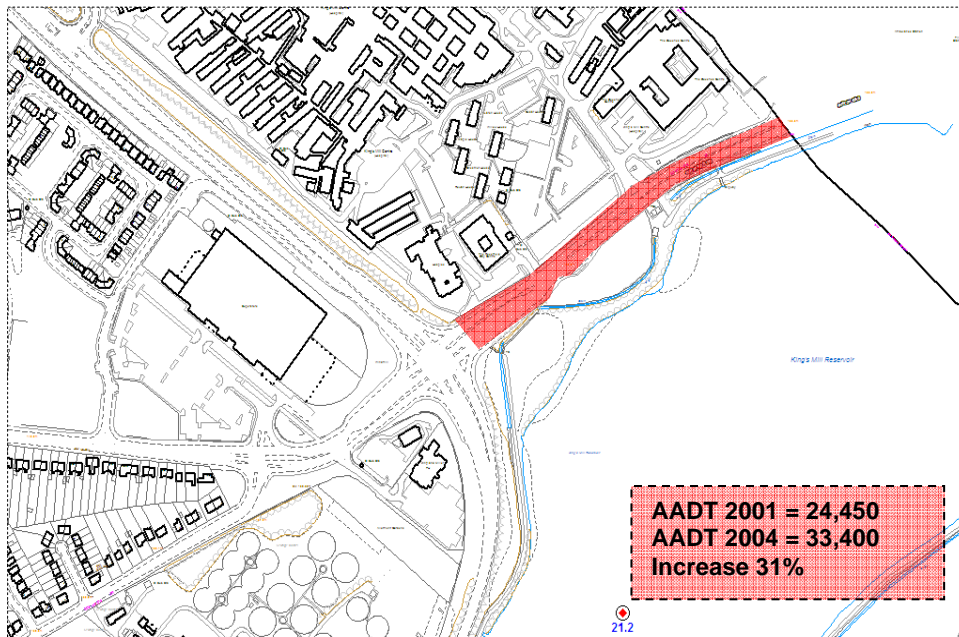
**Table 6.5** *Evaluation of roads with significantly changed traffic flows*

| Item | Road  | Description  | AADT 2001 | AADT 2004 | % Increase |
|------|-------|--|-----------|-----------|------------|
| 1    | A6075 | Mansfield Road to Kings Mill Island                      | 24,450    | 33,400    | 31         |
| 2    | A611  | Derby Road (Between Coxmoor Lane and Cauldwell Road)     | 9,950     | 15,250    | 53         |
| 3    | A611  | Hucknall Bypass (between Annesley Road and Watnall Road) | 11,300    | 14,150    | 25         |
| 4    | B6014 | Mansfield Road to Forest Road                            | 9,050     | 11,300    | 25         |
| 5    | B6026 | From Common Lane to the boarder of Ashfield              | 2,800     | 5,400     | 93         |
| 6    | B6026 | From Common Lane to Sutton.                              | 5,500     | 7,650     | 38         |



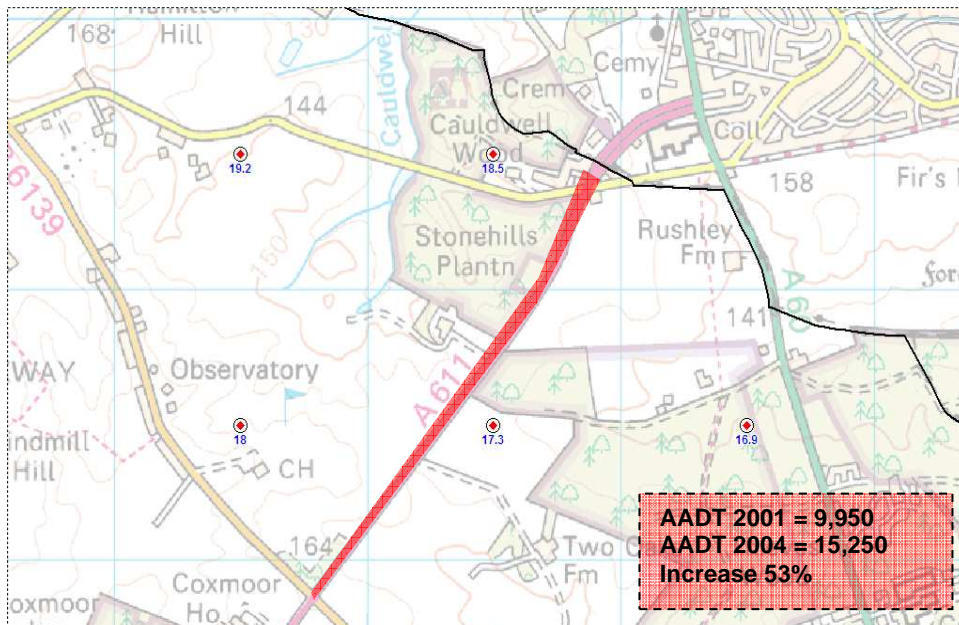
- **(1) A6075 Mansfield Road to Kings Mill Island**

GIS evaluation has determined that there is no relevant exposure to this section of road. The nearest buildings are associated with Kings Mill Hospital Complex and are at least 40m from the road.



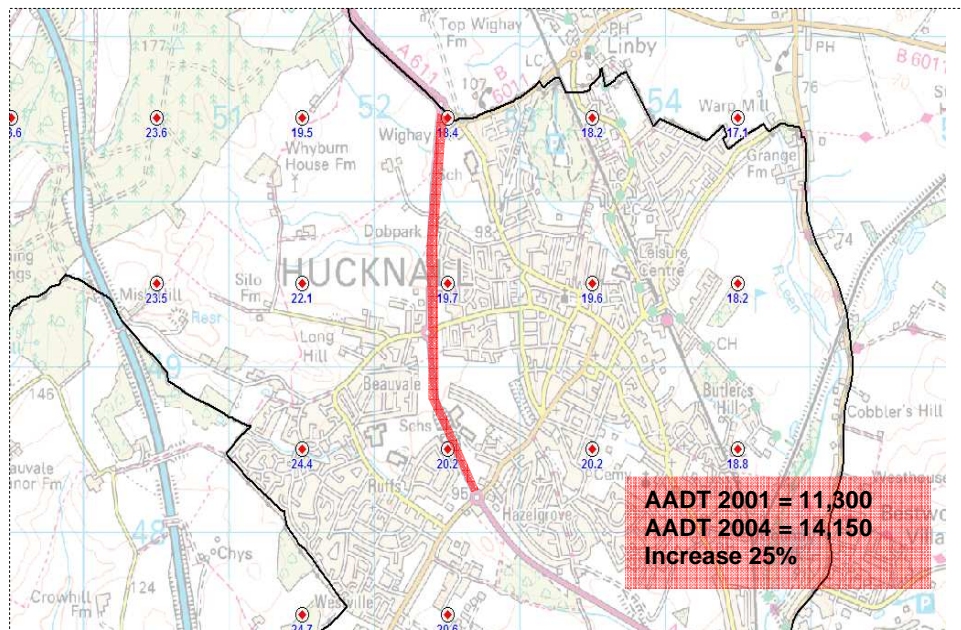
- **(2) A611 Derby Road (Between Coxmoor and Cauldwell Road)**

GIS evaluation has determined that there are no relevant receptors within 10m of the road and therefore no further assessment has been undertaken.



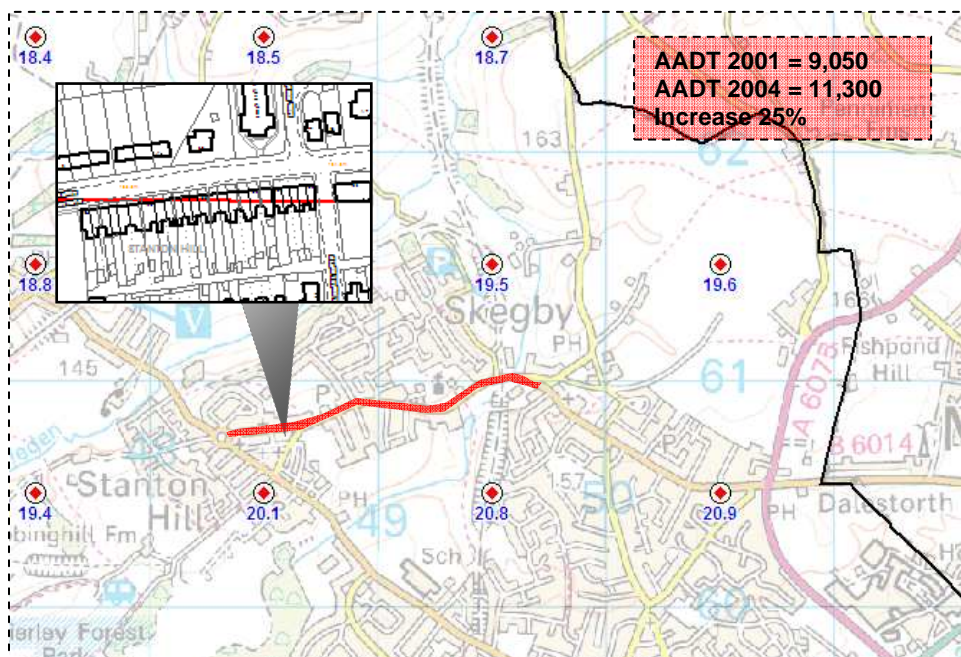
- **(3) A611 Hucknall Bypass (Annesley Road and Watnall Road)**

GIS evaluation has determined that there are no relevant receptors within 10m of the road and therefore no further assessment has been undertaken.



- **(4) B6014 Mansfield Road to Forest Road**

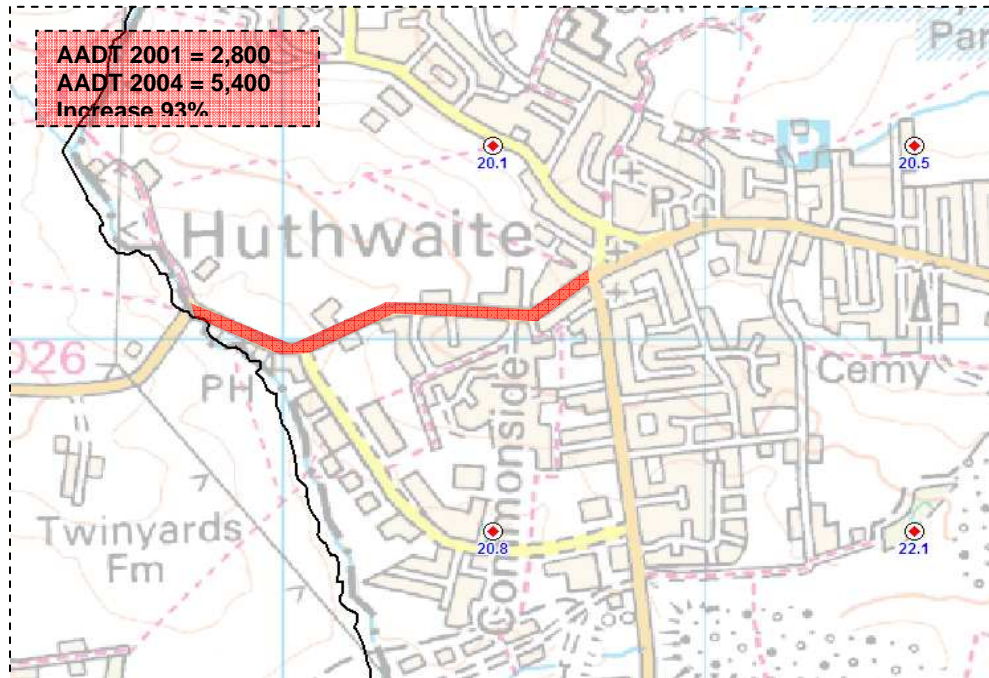
GIS evaluation has determined that there are a number of properties within 10m of this section of road. DMRB modelling has been undertaken for this receptor which has estimated an annual nitrogen dioxide concentration of  $21.5\mu\text{g}/\text{m}^3$  demonstrating that the air quality objective will not be compromised at this location.





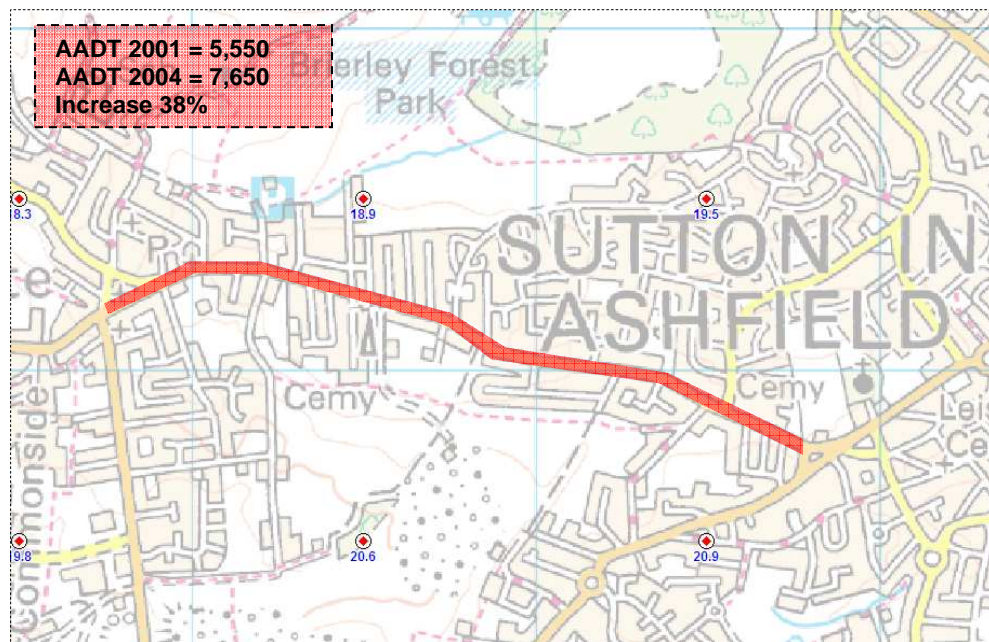
- **(5) B6026 from Common Lane to Ashfield Boundary**

AADT traffic flows for this road have increased by 93% however the AADT does not exceed 10,000 vehicles per day. No further assessment has been undertaken.



- **(6) B6026 from Common Lane to Sutton-in-Ashfield**

AADT traffic flows for this road have increased by 38% however the AADT does not exceed 10,000 vehicles per day. No further assessment has been undertaken.



#### **6.12 (I) Bus Stations**

There is only one bus station within Ashfield located at Sutton-in-Ashfield. The guidance only requires the updating and screening process to be undertaken if bus movements exceed 1000 movements a day, and if there is a relevant receptor within 10m, assessed against the 1-hour objective. An evaluation of the bus station has determined that there are well below 1000 bus movements per day. It is also very unlikely that any members of the public would remain in this location for over an hour. No further review and assessment has been undertaken for this section.

#### **6.13 (J) New Industrial sources**

A considerable amount of data relating to emissions of nitrogen dioxide has been compiled and entered into a revised emission inventory. There have been no new industrial sources of nitrogen dioxide identified within Ashfield. No further updating and screening assessment has been undertaken for this section.

#### **6.14 (K) Industrial sources with substantially increased emissions**

There have been no new industrial sources with substantially increased emissions identified within Ashfield. No further updating and screening assessment has been undertaken for this section.

#### **6.15 (L) Aircraft**

There are no relevant air quality issues relating to aircraft within Ashfield and therefore no further updating and screening has been undertaken for this section.

#### **6.16 CONCLUSION**

Further assessment for nitrogen dioxide has been completed against the 2006 revised checklist criteria listed in the LAQM Technical Guidance (03). It is expected that the Air Quality Objectives of 200µg/m<sup>3</sup> 1-hour mean (18 exceedances) 2005 and 40µg/m<sup>3</sup> annual mean 2005, will be met across Ashfield.

|   |
|---|
| <b>There is no requirement for Ashfield to proceed to a detailed assessment for nitrogen dioxide at any location within the district.</b> |
|---|

The Government and Devolved Administrations have adopted a 15-minute mean of 266µg/m<sup>3</sup> as an air quality standard for sulphur dioxide, with an objective for the standard not to be exceeded more than 35 times per year by the end of 2005. Additional objectives have also been set which are equivalent to the EU limit values specified in the First Daughter directive. These are for a 1-hour mean objective of 350µg/m<sup>3</sup> to be exceeded no more than 24 times per year and a 24-hour objective of 125 µg/m<sup>3</sup> to be exceeded no more than 3 times per year, to be achieved by the end of 2004<sup>4</sup>.

#### UK National Objectives:

**266 µg/m<sup>3</sup>** 15 minute mean (35 exceedances) 31st. December 2005

**350 µg/m<sup>3</sup>** 1-hour mean (24 exceedances) 31st. December 2004

**125 µg/m<sup>3</sup>** 24-hour mean (3 exceedances) 31st. December 2004

### 7.1 (A) Monitoring Data

#### Air Quality Emission Inventory

A sulphur dioxide emission inventory for Ashfield has been revised since the second round of review and assessment, undertaken by consultants acting on behalf of Nottinghamshire authorities and based upon 2004 data<sup>14</sup>. Considerable data relating to emissions of sulphur dioxide has been compiled and entered into the new inventory. The inventory clearly demonstrates a reduction in sulphur dioxide levels across Ashfield and Nottinghamshire since the second round assessment.

#### King's Mill Hospital

Kings Mill Hospital was the subject of a Stage Three review during the first round of review and assessment against the 15-minute objective. Monitoring undertaken for the assessment determined that the objective would not be compromised subject to the hospital burning low sulphur coal<sup>15</sup>. The hospital trust has now made a decision to convert the boiler house at the hospital to natural gas. The proposed changeover is scheduled to be completed in 2007. Until that time the hospital will continue to burn low sulphur coal. Monitoring carried out by Mansfield District Council close to King's Mill Hospital and reported in Ashfield's 2<sup>nd</sup> Round USA determined that none of the Air Quality objectives were being exceeded at this location.

### 7.2 (B) Monitoring data within an AQMA

The assessment for this section is only applicable to authorities that have declared Air Quality Management Areas. Ashfield have not declared any Air Quality Management Areas within the district. No further assessments have been undertaken for this section.

### 7.3 (C) New Industrial Source

A considerable amount of data relating to emissions of sulphur dioxide has been compiled and entered into a revised emission inventory<sup>16</sup>. There have been no new industrial sources of sulphur dioxide identified within Ashfield. No further updating and screening assessment has been undertaken for this section.

<sup>14</sup> Nottingham Emissions Inventory, (CATE) April 2004

<sup>15</sup> Air Quality Review and Assessment Stage Three Report, Ashfield District Council, 2001.

<sup>16</sup> Nottingham Emissions Inventory, (CATE) April 2004

There have been no new sources of sulphur dioxide identified within Ashfield. No further assessment has been undertaken for this section.

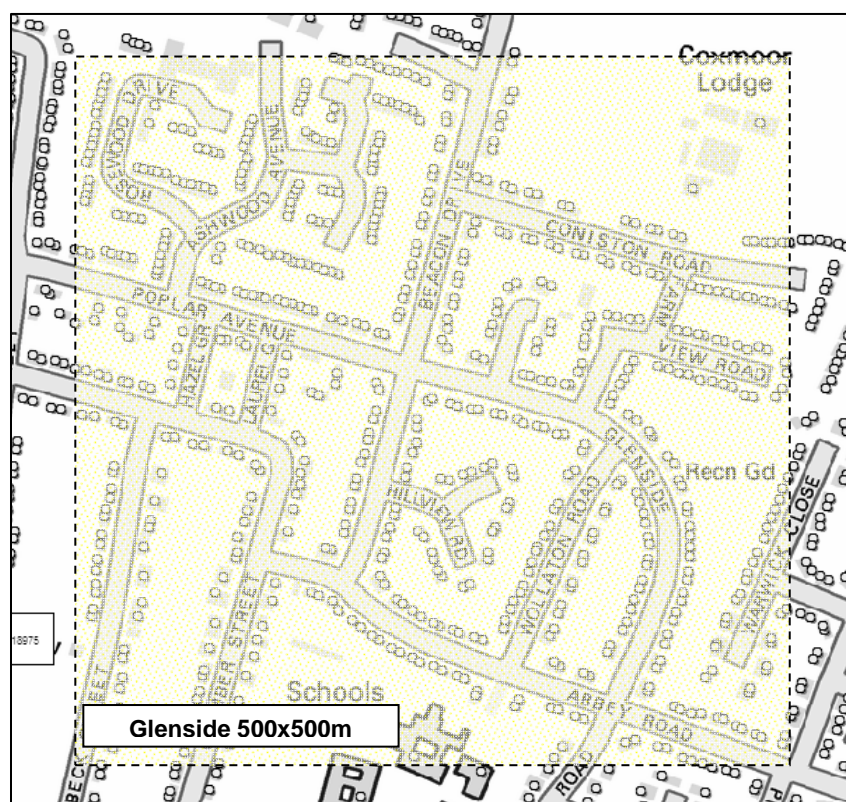
#### 7.4 (D) Industrial Sources with substantially increased emissions

There have been no new industrial sources with substantially increased emissions identified within Ashfield. No further updating and screen has been undertaken for this section.

#### 7.5 (E) Areas of domestic coal burning

Consideration of results from the first round of review and assessment has indicated that areas of densely populated houses burning solid fuel could constitute significant sources of sulphur dioxide, even if smokeless fuel is consumed. The LAQM Technical Guidance (03) has determined 'significant coal burning' as 'any area of 500x500m which contains more than 100 houses burning solid fuel as their primary source of heating'<sup>17</sup>.

Ashfield undertook a comprehensive district wide survey of all potential solid fuel burning areas based upon the above criteria during the 2<sup>nd</sup> Round USA. The survey demonstrated that there was no significant solid fuel burning taking place within Ashfield. However, diffusion tube analysis results for 2005 indicated that one area at Glenside, within Kirby-in-Ashfield had risen in concentration. Considering this location had not been subject to a previous assessment a review of this area was undertaken.



#### Results

Within an area of 500 x 500m there were a total of 47 houses which were identified as using solid fuel burning. There is therefore no significant coal burning in this area. During the evaluation it was determined that a local school was using solid fuel for heating and that the plume from the chimney was within the prevailing wind direction of the diffusion tube.



No further assessment has since taken place. It is envisaged that solid fuel burning will continue to decrease throughout all other areas in the district.

**7.6 (F) Small boilers >5 MW<sub>(thermal)</sub>**

An emissions inventory for Ashfield has been revised and updated for the Updating and Screening Assessment, which included all boilers above 0.4MW. Details relating to boiler plants have been used to derive estimated emission maps for the district. There were no boilers within the district identified as being greater than 5MW<sub>(thermal)</sub>.

No further assessment has been undertaken for this section.

**7.7 (G) Shipping**

There are no relevant air quality issues relating to shipping within Ashfield. No further assessment has been undertaken for this section.

**7.8 (H) Railway Locomotives.**

Authorities are only required to undertake assessment at locations where there is relevant exposure to diesel or coal fired locomotives, which are regularly stationary for periods of 15-minutes or more. There are no locations identified within Ashfield, which meet these criteria, and therefore no further assessment has been undertaken.

**7.9 CONCLUSION**

The continual assessment for sulphur dioxide has been completed against the checklist criteria contained in the LAQM Technical Guidance (03). It is expected that the Air Quality Objectives of 266µg/m<sup>3</sup> 15 minute mean (35 exceedances) 2005, 350µg/m<sup>3</sup> 1-hour mean (24 exceedances) 2004, and 125µg/m<sup>3</sup> 24-hour mean (3 exceedances) 2004, will be met across Ashfield. As there are no new sources of Sulphur Dioxide likely to compromise the Air Quality Objective, Ashfield District Council no longer undertake monitoring for this pollutant.

|  |
|--|
| <b>There is no requirement for Ashfield to proceed to a detailed assessment for sulphur dioxide in any location within the district.</b> |
|--|

The Government has adopted two Air Quality Objectives for fine particles (PM<sub>10</sub>), which are equivalent to the European Union Stage 1 limit values in the first Air Quality Daughter Directive. The objectives are 40µg/m<sup>3</sup> as the annual mean and 50µg/m<sup>3</sup> as the fixed 24-hour mean not to be exceeded more than 35 days per year. Both standards must be achieved by the end of 2004<sup>18</sup>.

#### UK National Objectives:

**50 µg/m<sup>3</sup>** (35 exceedances) 24hr mean to be achieved by 31<sup>st</sup>. December 2004

**40 µg/m<sup>3</sup>** annual mean to be achieved by 31<sup>st</sup>. December 2004

The Government has also announced new objectives for PM<sub>10</sub>. These supplement and strengthen substantially the current objectives set in the Air Quality Strategy. These European Union Stage 2 limit values are 20µg/m<sup>3</sup> as the annual mean and 50µg/m<sup>3</sup> as the 24-hour mean to be exceeded on no more than 7 days per year. The new particulate objectives for England, Wales, Northern Ireland and Greater London are not currently included in Regulations for the purpose of Local Air Quality Management. Local Authorities have no statutory obligation to assess air quality against these limits, however informal guidance has been provided to enable them to do so. Review and Assessment within Ashfield has taken consideration of these potential new limits<sup>19</sup>.

### 8.1 (A) Monitoring

Ashfield District Council has undertaken two Detailed Assessments for particles since the submission of the Updating and Screening Assessment in 2003. Both assessments have been submitted and approved by DEFRA and a summary of their results is contained within this section for completeness. The reader is referred to the Detailed Assessments for more comprehensive information<sup>20 21</sup>.

Recent monitoring has been undertaken at a location where it is anticipated a planning application is due to be submitted to the Council for a landfill site. Preliminary results of this air quality assessment were reported within Ashfield's Progress Report 2005<sup>22</sup>. The completed assessment is reported in this section.

Real time monitoring locations for 2002 - 2005.

**Table 8.0** *PM<sub>10</sub> Monitoring undertaken for 2002 - 2005, locations and dates.*

| Location                            | Year        | Period          |
|-------------------------------------|-------------|-----------------|
| Oakfield Avenue, Kirkby (A38)       | 2002 - 2003 | Aug - May       |
| Pinxton Green (M1)                  | 2003 - 2004 | July - February |
| Old Bleak Hall, Kirkby<br>Woodhouse | 2004 - 2005 | Sept - Sept     |

<sup>18</sup> Part IV of the Environment Act 1995, Local Air Quality Management, Technical Guidance, LAQM.TG(03), DEFRA. 2003.  
<sup>19</sup> Part IV of the Environment Act 1995, Local Air Quality Management, Technical Guidance, LAQM.TG(03), DEFRA. 2003  
<sup>20</sup> Air Quality Review and Assessment, Detailed Assessment for PM10 at Oakfield Ave, Kirkby (December 2004)  
<sup>21</sup> Air Quality Review and Assessment, Detailed Assessment for PM10 at Pinxton Green (April 2004)  
<sup>22</sup> Air Quality Review and Assessment - Progress Report Ashfield District Council (April 2005)

## 8.2 Summary of the Detailed Assessment Process

### **Oakfield Avenue**

A detailed assessment for PM<sub>10</sub> at Oakfield Avenue adjacent to a single dwelling within close proximity to the junction of the A38 and B6018 has been completed against the criteria contained within the LAQM Technical Guidance (03). Detailed assessment of data considered over the period 6<sup>th</sup> August 2002 to 30<sup>th</sup> May 2003 has determined that the air quality objectives for PM<sub>10</sub> will be achieved in this location.

### **Pinxton Green (M1 Location)**

A detailed assessment for PM<sub>10</sub> adjacent to a single dwelling within close proximity to the M1 Motorway at Pinxton has been completed against the criteria contained within the LAQM Technical Guidance (03). Detailed monitoring conducted from 24<sup>th</sup> July 2003 until 21<sup>st</sup> February 2004, has determined that the air quality objectives for PM<sub>10</sub> will be achieved in this location.

## 8.3 Particulate monitoring at Old Bleak Hall, Kirkby Woodhouse, Nottingham.

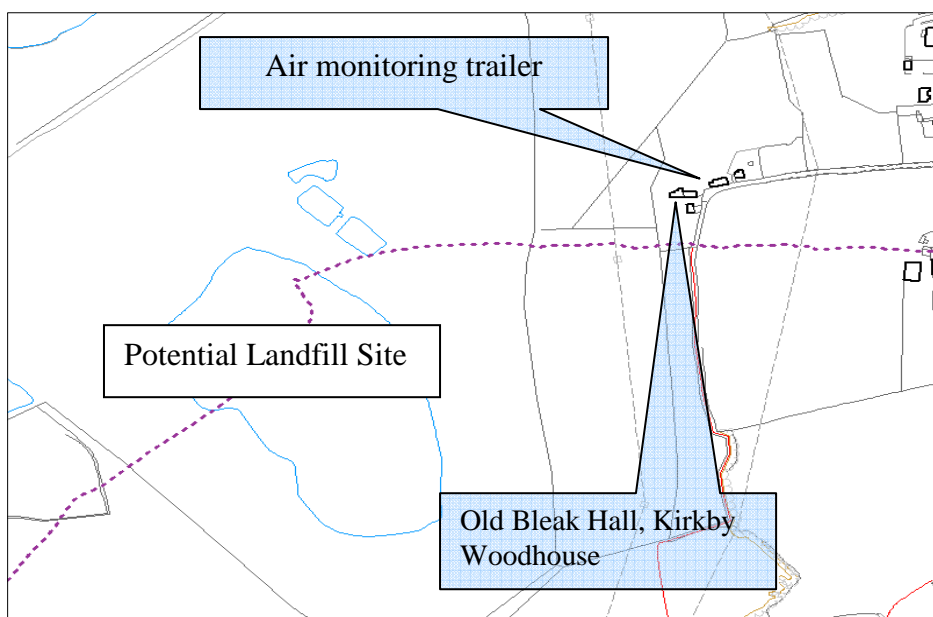
Monitoring for PM<sub>10</sub> has been undertaken at Old Bleak Hall on the edge of a potential landfill development site. Based upon proposed plans, Old Bleak Hall would be among a number of properties located adjacent to this new development and approximately 1.1 kilometres away from the M1 Motorway. Emissions from landfill sites are not well documented and it is difficult to predict PM<sub>10</sub> concentrations. The Council chose to measure background concentrations at this location to provide a baseline for comparison with future concentrations to determine whether air quality had deteriorated.

### Location Description

Monitoring was carried out at this location as residential receptors are situated adjacent to the perimeter of the potential landfill site and within the prevailing wind of the proposed site. (See figure 7.0).

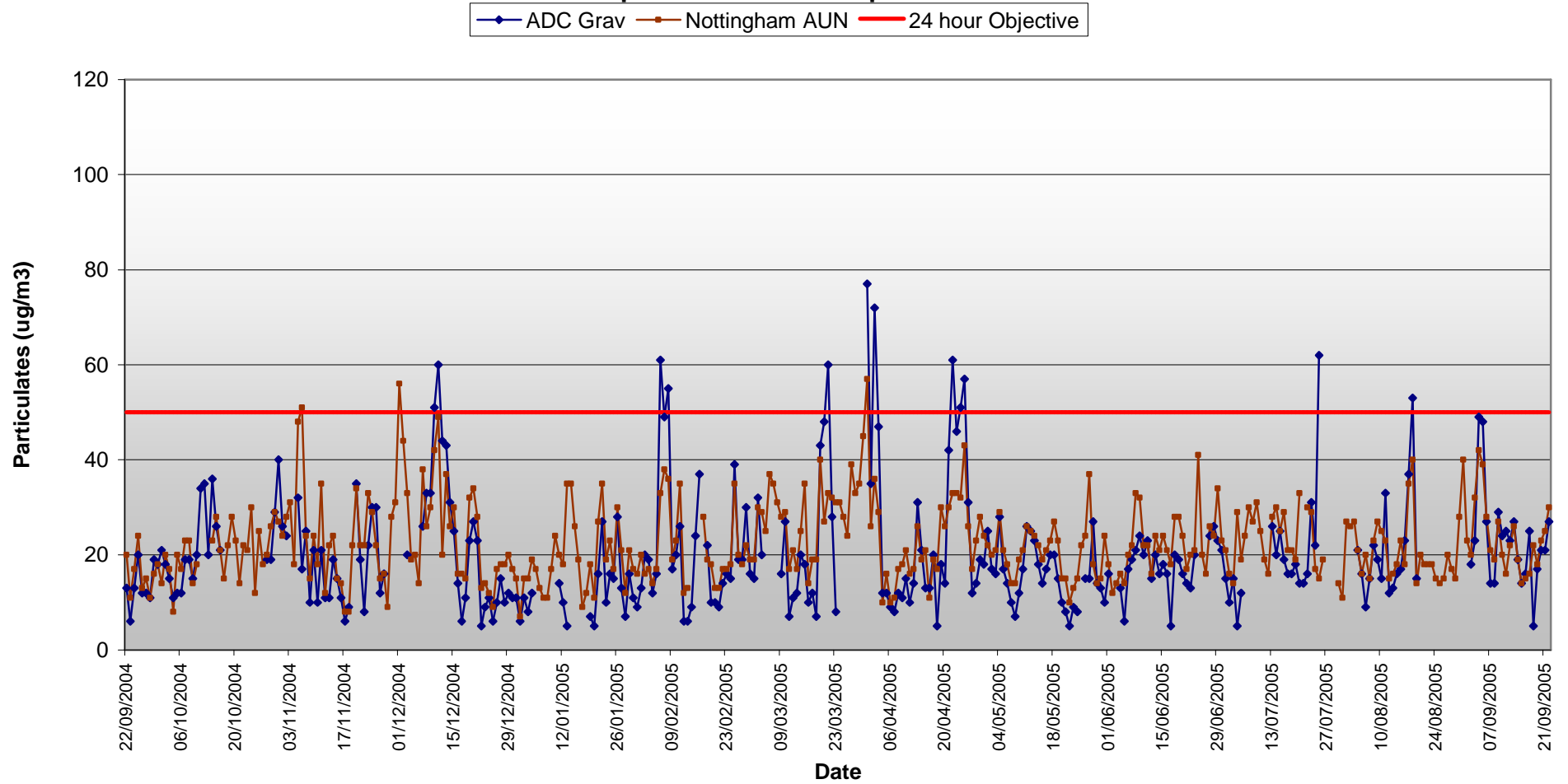
Measurement period: 22<sup>nd</sup> September 2004 to 22<sup>nd</sup> September 2005.  
Total data capture to date 266 days out of a total of 286 days.

**Figure 7.0** *Location of the Sequential Gravimetric Analyser at Old Bleak Hall, Kirkby Woodhouse.*



**Figure 8.1**  
**PM<sub>10</sub> Monitoring results when the gravimetric sampler was at Old Bleak Hall, Kirkby Woodhouse,**  
**Nottingham.**

**From 22nd September 2004 to September 22nd 2005**





## Monitoring Results

The 24-hour objective refers to 35 exceedances per year. There have been 12 exceedances of this objective throughout the monitoring period (see fig 8.1). Elevated levels of PM<sub>10</sub> were observed intermittently throughout the year, typically associated with higher regional background concentrations. There were however a small number of exceedances which are likely to be associated with local sources of particulate matter. The mean PM<sub>10</sub> concentration during this monitoring period was 20.0µg/m<sup>3</sup>, well below the annual mean objective of 40µg/m<sup>3</sup> (see table 8.1).

**Table 8.1** *Old Bleak Hall, Kirkby Woodhouse, Monitored Period  
22<sup>nd</sup> September 2004 to 22<sup>nd</sup> September 2005*

| Location                         | 24 hour means                             |                          |                          |   |
|----------------------------------|---|--------------------------|--------------------------|---|
|                                  | Measured Period Mean (µg/m <sup>3</sup> ) | Min (µg/m <sup>3</sup> ) | Max (µg/m <sup>3</sup> ) | No. of exceedances of the 50µg/m <sup>3</sup> objective |
| Old Bleak Hall, Kirkby Woodhouse | 20  | 5                        | 77                       | 12  |

### **Conclusion**

Concentrations measured during this air quality assessment has determined that the air quality objective will not be compromised at this location.

**Based upon the results of the monitoring undertaken at this location, there is no requirement for Ashfield to proceed to a detailed assessment for particles in respect of the 2004 objectives.**

#### **8.4 (B) Monitoring Data within an Air Quality Management Area.**

The assessment for this section is only applicable to those authorities that have declared Air Quality Management Areas. Ashfield have not declared any Air Quality Management Areas within the district. No further assessment has been undertaken for this section.

#### **8.5 (C) Busy roads and junctions in Scotland**

This section is not applicable to Ashfield.

#### **8.6 (D) Junctions.**

Local authorities are required to undertake assessment of busy junctions within their districts. The LAQM Technical Guidance (03) interprets a 'busy' junction as '*one with more than 10,000 vehicles per day*'. Additionally there should be a relevant exposure within 10 metres of the kerb. A comprehensive assessment of busy junctions was undertaken during the 2<sup>nd</sup> Round USA utilising GIS software and local knowledge. Seven busy junctions were evaluated using the DMRB model which demonstrated that the air quality objective would not be compromised at these locations.

These busy junctions have been re-evaluated during the 3<sup>rd</sup> Round of USA, having considered revised AADT traffic flow data for 2004, updated UK background concentration maps and a re-assessment for relevant exposure.

## Results

**Table 8.2** *Estimated Annual Mean for PM<sub>10</sub> at busy junctions for 2006 and 2010.*

| Recept<br>or Ref: | Busy<br>Junctions     | Coordinates<br>x.y | Est.<br>Annual<br>Mean<br>2006<br>PM <sub>10</sub><br>(µg/m <sup>3</sup> ) | Days >50<br>(µg/m <sup>3</sup> ) | Est.<br>Annual<br>Mean<br>2006<br>PM <sub>10</sub><br>(µg/m <sup>3</sup> ) | Days >50<br>(µg/m <sup>3</sup> ) |
|-------------------|-----------------------|--------------------|--|----------------------------------|--|----------------------------------|
| A                 | A38 – B6022           | 450,180 / 358,594  | 27.1   | 18                               | 23.9   | 10                               |
| B                 | B6018 –<br>B6020      | 448,969 / 356,303  | 23.4   | 9                                | 22.5   | 7                                |
| C                 | A611 – Forest<br>Road | 450,814 / 353,809  | 25.9   | 15                               | 22.6   | 7                                |
| D                 | B6023 –<br>B6026      | 448,800 / 358,684  | 23.9   | 10                               | 21.2   | 5                                |
| E                 | B6023 –<br>Lammas     | 449,295 / 358,973  | 24.5   | 11                               | 21.6   | 6                                |
| F                 | B6023 –<br>B6028      | 449,295 / 358,973  | 22.6   | 7                                | 21.6   | 6                                |
| G                 | B6014 –<br>B6028      | 448,323 / 360,747  | n/a  | n/a                              | n/a  | n/a                              |

Modelling undertaken at the above junctions has determined that the air quality objective for PM<sub>10</sub> will be met at all these locations. No modelling was required at receptor G as the location no longer represents relevant exposure (See Appendix).

**There is no requirement for Ashfield to proceed to a detailed assessment for PM<sub>10</sub> at any busy junctions within the district.**

### 8.7 (E) Roads with high flow of buses and/or HGVs

Authorities are only required to undertake an assessment for this section where roads are identified as having an unusually high proportion of buses or HGVs. An 'unusually high proportion of Buses or HGVs' is taken to be 'greater than 20% of the AADT' LAQM Technical Guidance (03) Box 8.4. There have been no roads identified within Ashfield which demonstrate an 'unusually high proportion of buses and/or HGVs' and therefore no further assessment has been undertaken for this section.

### 8.8 (F) New roads constructed or proposed since the last round of review and assessment.

#### Mansfield and Ashfield Regeneration Route (MARR)

The Mansfield and Ashfield Regeneration Route (MARR) was completed in December 2004. DMRB modelling undertaken during the 2<sup>nd</sup> Round USA did not predict any exceedances of the PM<sub>10</sub> Air Quality Objectives and there has been no change to this position.

### 8.9 (G) Roads close to the objective during the first round of review and assessment.

As a recommendation from the 2<sup>nd</sup> Round USA a Detailed Assessment for PM<sub>10</sub> has been undertaken at a relevant location adjacent to the M1 Motorway<sup>23</sup>. Additionally a further detailed Assessment for PM<sub>10</sub> has been undertaken at Oakfield Avenue adjacent to a single dwelling within close proximity to the junction of the A38 and B6018<sup>24</sup>. Both assessments concluded that the air quality objective would not be compromised at these locations.

<sup>23</sup> Air Quality Review and Assessment, Detailed Assessment for PM<sub>10</sub> at Pinxton Green (April 2004)

<sup>24</sup> Air Quality Review and Assessment, Detailed Assessment for PM<sub>10</sub> at Oakfield Ave, Kirkby (December 2004)

### 8.10 (H) Roads with significantly changed traffic flows.

Authorities are only required to undertake the assessment of roads with traffic flows greater than 10,000 vehicles per day that have experienced a large increase in traffic. The LAQM Technical Guidance (03) has interpreted 'large increase' as '*more than a 25% increase in traffic*'. The aim of the assessment is to establish whether there is a risk of exceedances along the existing roads with a significant change in flows.

Improved AADT traffic data for 2004 was compared with 2001 AADT data to identify roads which had experienced an increase in traffic flow above 25%. The following roads were re-evaluated in respect of significantly changed traffic flows.

**Table 6.5** *Evaluation of roads with significantly changed traffic flows*

| Item | Road  | Description  | AADT<br>2001 | AADT<br>2004 | %<br>Increase |
|------|-------|--|--------------|--------------|---------------|
| 1    | A6075 | Mansfield Road to Kings Mill Island                      | 24,450       | 33,400       | 31            |
| 2    | A611  | Derby Road (Between Coxmoor Lane and Cauldwell Road)     | 9,950        | 15,250       | 53            |
| 3    | A611  | Hucknall Bypass (between Annesley Road and Watnall Road) | 11,300       | 14,150       | 25            |
| 4    | B6014 | Mansfield Road to Forest Road                            | 9,050        | 11,300       | 25            |
| 5    | B6026 | From Common Lane to the boarder of Ashfield              | 2,800        | 5,400        | 93            |
| 6    | B6026 | From Common Lane to Sutton.                              | 5,500        | 7,650        | 38            |

### Results

Air quality assessment using the DMRB model was only undertaken against properties located adjacent to Mansfield Road above (item 4) as this was the only location where relevant exposure was determined (see also Chapter 6 ref 6.11). Estimated PM<sub>10</sub> concentration at this location was 23.1µg/m<sup>3</sup> with 8 exceedances of the 24-hour mean objective. The assessment determined that the air quality objective would not be compromised at this location.

### 8.11 (I) New industrial sources

A considerable amount of data relating to emissions of PM<sub>10</sub> has been compiled and entered into a revised emission inventory. There have been no new industrial sources of PM<sub>10</sub> identified within Ashfield. No further updating and screening assessment has been undertaken for this section.

### 8.12 (J) Industrial sources with substantially increased emissions.

There have been no new industrial sources with substantially increased emissions of PM<sub>10</sub> identified within Ashfield. No further assessment has been undertaken for this section.

### 8.13 (K) Areas of domestic solid fuel burning.

Consideration of results from the first round of review and assessment has indicated that areas of densely populated houses burning solid fuel could constitute significant sources of particulate matter, even if smokeless fuel is consumed. The LAQM Technical Guidance (03) has determined 'significant coal burning' as '*any area of 500x500m which contains more than 100 houses burning solid fuel as their primary source of heating*<sup>25</sup>'.

Ashfield undertook a comprehensive district wide survey of all potential solid fuel burning areas based upon the above criteria during the 2<sup>nd</sup> Round USA. The survey demonstrated that there was no significant solid fuel burning taking place within Ashfield. However, diffusion tube analysis results for 2005 indicated that one area at Glenside, within Kirby-in-Ashfield had risen in nitrogen dioxide concentration. As this location had not been subject to previous assessment a review of this area was undertaken (see Chapter 7 ref E).

#### Results

Within an area of 500 x 500m there were a total of 47 houses which were identified as using solid fuel burning. There is therefore no significant coal burning in this area.

**There is no requirement for Ashfield to proceed to a detailed assessment for PM<sub>10</sub> in respect of domestic solid fuel burning.**

#### **8.14 (L) Quarries/Landfill sites/opencast coal/handling of dusty cargoes at ports etc.**

Authorities are only expected to undertake a detailed assessment for PM<sub>10</sub> in regard to this section where locations with relevant exposure and substantiated problems associated with dust have been determined.

There is only one location within Ashfield, which meets the criteria of this section. This is Sutton landfill site. It has been determined that the landfill site has areas of relevant exposure, as residential properties are located close to the site boundary. The site has recently withdrawn its IPPC application and is in the process of submitting a closure plan.

There have been no recent complaints about dust emanating from operations on the site or any indication of significant dust problems. There is therefore no requirement for Ashfield to proceed to a detailed assessment for PM<sub>10</sub> in respect of this location.

#### **8.15 (M) Aircraft.**

There are no relevant air quality issues relating to aircraft within Ashfield. No updating and screening has been undertaken for this section.

#### **8.16 CONCLUSION**

Assessment for PM<sub>10</sub> has been completed against the criteria listed in the LAQM Technical Guidance (03). It is expected that the Air Quality Objectives of 50µg/m<sup>3</sup> (35 exceedances) 24hr mean 31<sup>st</sup>. December 2004 and 40µg/m<sup>3</sup> annual mean 31<sup>st</sup>. December 2004 will be met across Ashfield.

**There is no requirement for Ashfield to proceed to a detailed assessment for PM<sub>10</sub> in respect of the 2004 objectives. Further assessments will be undertaken against the 2010 annual mean and 24-Hour mean objectives**

# Appendix

## Content

### i. Busy Junctions

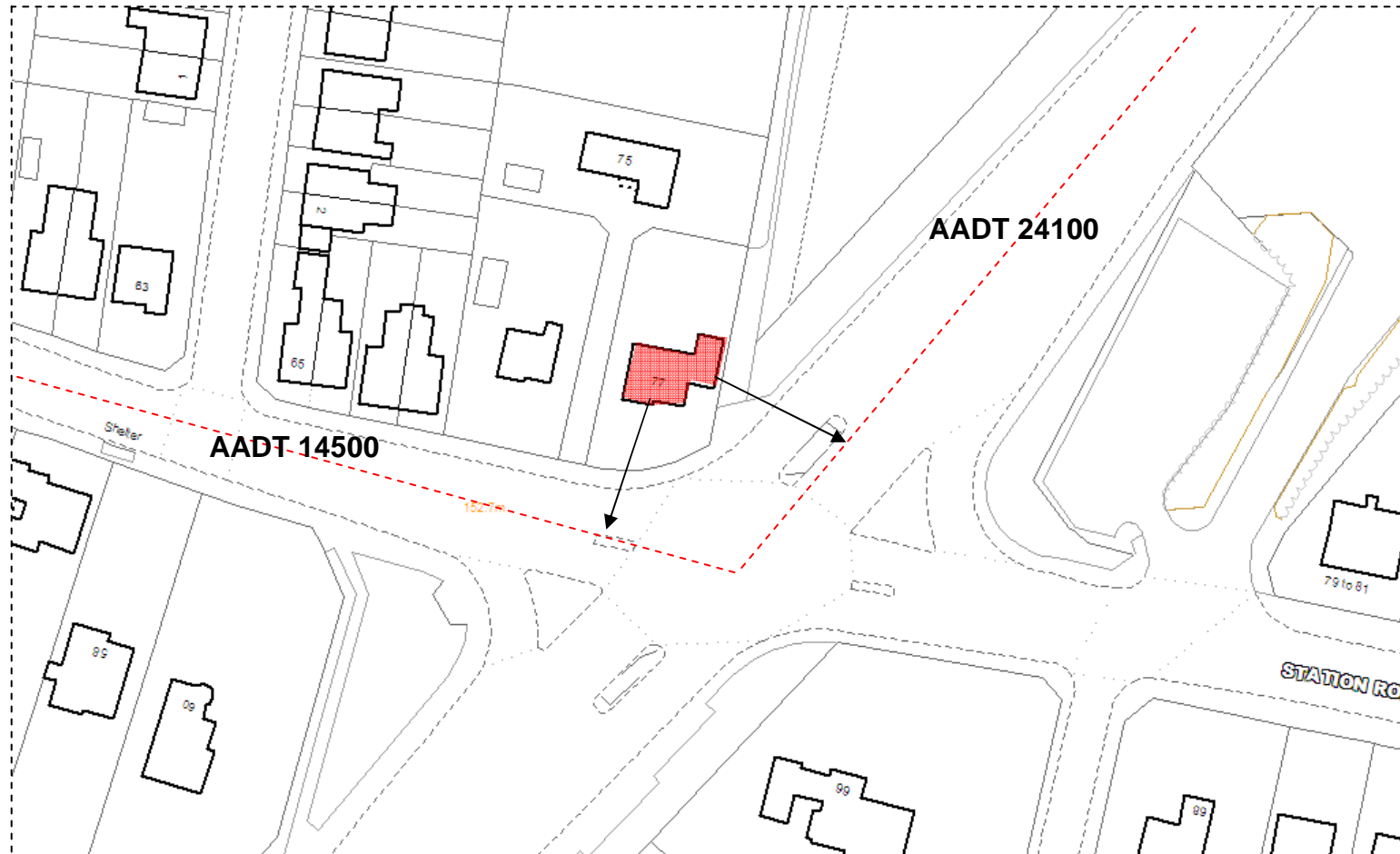
|          |   |                     |
|----------|---|---------------------|
| Receptor | A | A38 – B6022         |
|          | B | B6018 – B6020       |
|          | C | A611 – Forest Road  |
|          | D | B6023 – B6026       |
|          | E | B6023 – Lammas Road |
|          | F | B6023 – B6028       |

### ii. Diffusion tube Assessment results for Precision and Accuracy

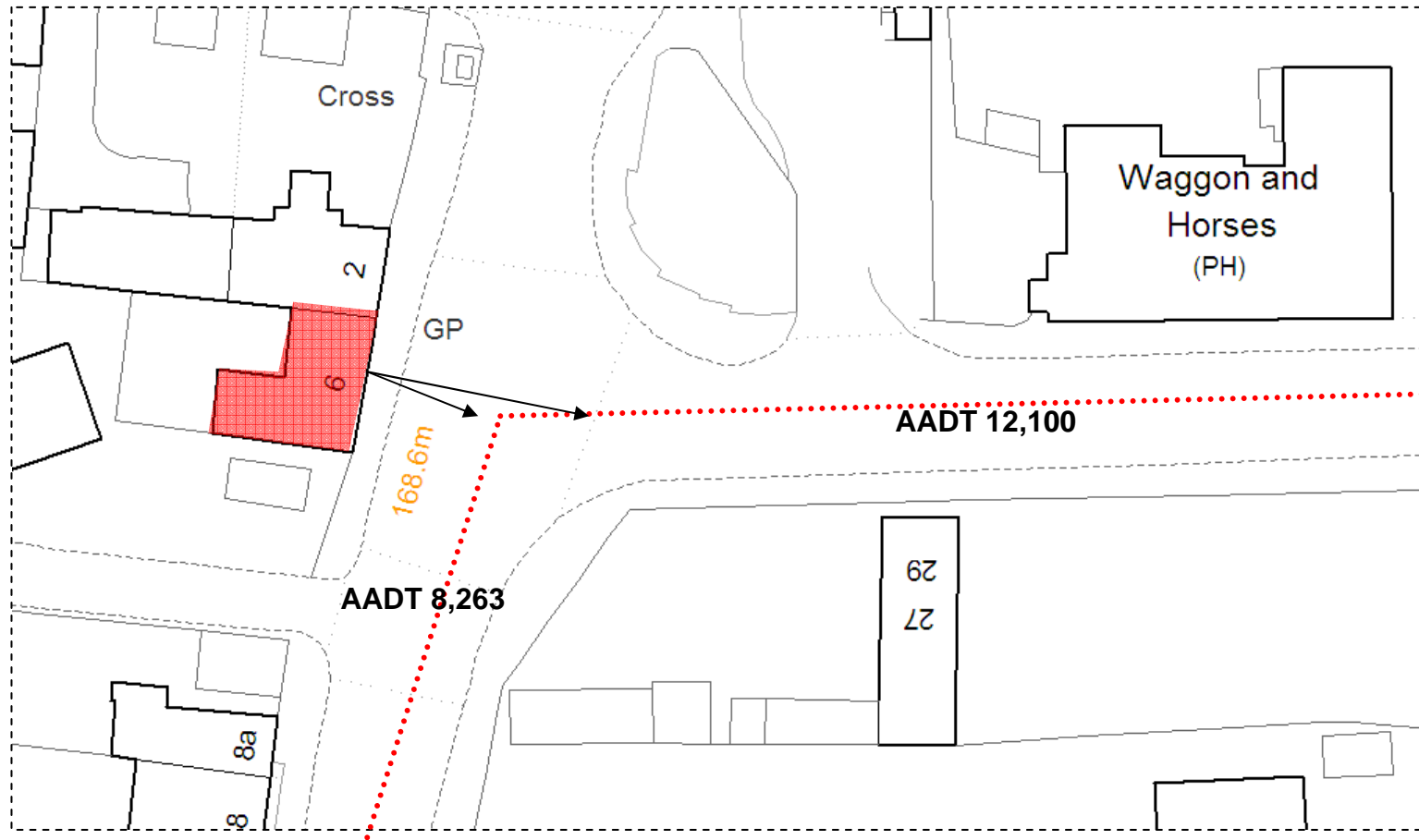
i. Results from DMRB modelling of busy junctions

| Receptor Ref: | Coordinates        | Busy Junctions        | Est. Annual Mean 2006 NO <sub>2</sub> (µg/m <sup>3</sup> ) | Est. Annual Mean 2010 NO <sub>2</sub> (µg/m <sup>3</sup> ) | Est. Annual Mean 2006 PM10 (µg/m <sup>3</sup> ) | Days >50 µg/m <sup>3</sup> | Est. Annual Mean 2006 PM10 (µg/m <sup>3</sup> ) | Days >50 µg/m <sup>3</sup> |
|---------------|--------------------|-----------------------|--|--|---|----------------------------|---|----------------------------|
| A             | 450,180<br>358,594 | A38 – B6022           | 29.5   | 25.3   | 27.1  | 18                         | 23.9  | 10                         |
| B             | 448,969<br>356,303 | B6018 – B6020         | 23.2   | 21.8   | 23.4  | 9                          | 22.5  | 7                          |
| C             | 450,814<br>353,809 | A611 – Forest Road    | 29.0   | 24.6   | 25.9  | 15                         | 22.6  | 7                          |
| D             | 448,800<br>358,684 | B6023 – B6026         | 25.0   | 21.2   | 23.9  | 10                         | 21.2  | 5                          |
| E             | 449,295<br>358,973 | B6023 – Forest Street | 25.3   | 21.0   | 24.5  | 11                         | 21.6  | 6                          |
| F             | 449,295<br>358,973 | B6023 – B6028         | 25.2   | 21.0   | 22.6  | 7                          | 21.6  | 6                          |
| G             | 448,323<br>360,747 | B6014 – B6028         | n/a  | n/a  | n/a   | n/a                        | n/a   | n/a                        |

**DMRB – Receptor A**  
(A38& B6022 x.450.180 y. 358,594)

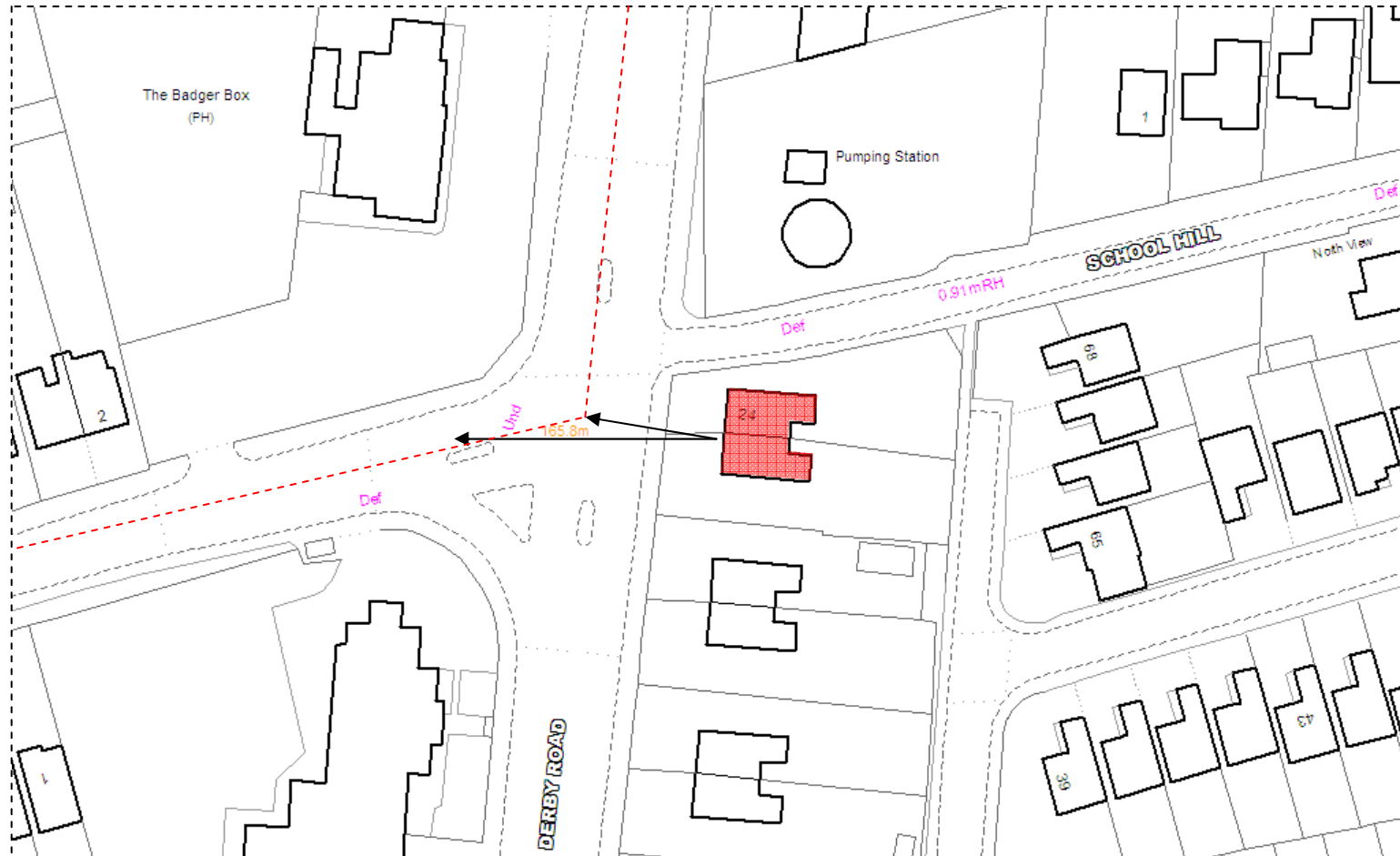


**DMRB – Receptor B**  
(B6018& B6020 x.448.969 y.356,303)

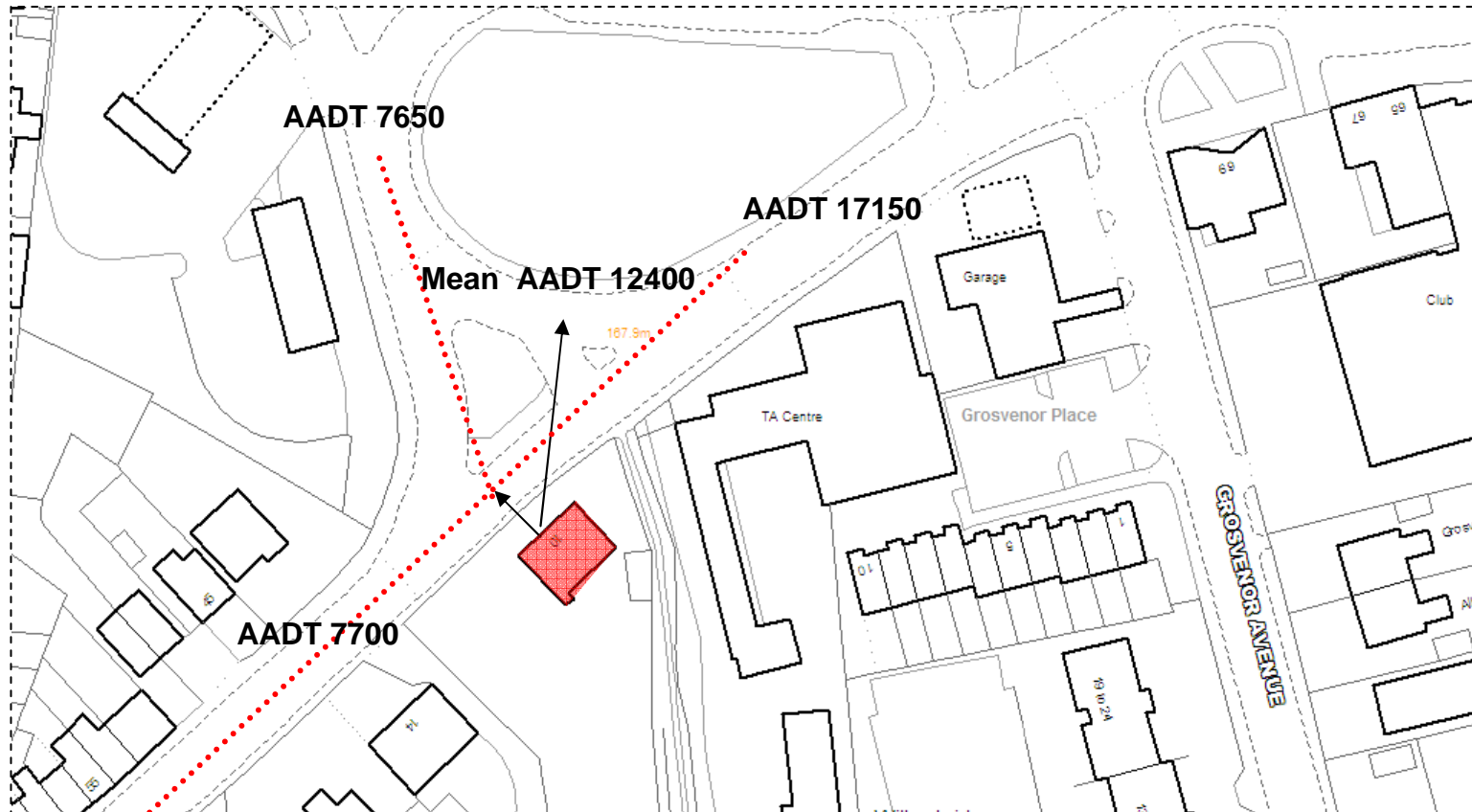




**DMRB – Receptor C**  
(A611 Forest Road x.450.814 y.353,809)



**DMRB – Receptor D**  
(B6023 – B6026 x.448,800 y.358,684)



**DMRB – Receptor E**  
(B6023 – Lammas x.449,295 y.358,973)



**DMRB – Receptor F**  
(B6023 – B6028 x.449,882 y.359,565)

