

# Updating and Screening Assessment of Air Quality in the Borough of Ashford

Report prepared by: Penny Wilson and Dr Ben Marner  
of: Air Quality Consultants Ltd<sup>1</sup>

With support from: Richard Woodcock  
of: Ashford Borough Council<sup>2</sup>

Authorised by: Prof. Duncan Laxen  
of: Air Quality Consultants Ltd<sup>1</sup>

May 2003

<sup>1</sup> Air Quality Consultants Ltd., 12 St Oswalds Road, Bristol. BS6 7HT

<sup>2</sup> Civic Centre, Tannery Lane, Ashford, Kent, TN23 1PL



---

## Contents

### Executive Summary

<b>1</b>	<b>Introduction</b>	<b>3</b>
<b>2</b>	<b>Methodology</b>	<b>7</b>
<b>3</b>	<b>Updating and Screening for Carbon Monoxide</b>	<b>9</b>
<b>4</b>	<b>Updating and Screening for Benzene</b>	<b>10</b>
<b>5</b>	<b>Updating and Screening for 1,3-butadiene</b>	<b>13</b>
<b>6</b>	<b>Updating and Screening for Lead</b>	<b>14</b>
<b>7</b>	<b>Updating and Screening for Nitrogen Dioxide</b>	<b>15</b>
<b>8</b>	<b>Updating and Screening for Sulphur Dioxide</b>	<b>21</b>
<b>9</b>	<b>Updating and Screening for PM<sub>10</sub></b>	<b>23</b>

### Glossary

### References

### Appendices

**Appendix 1** Summary of the Health Effects of the Pollutants Covered by the Air Quality Strategy

**Appendix 2** Summary of the First Round of Review and Assessment

**Appendix 3** Approximate Pictorial Representations of Projected Background Concentrations in Kent

**Appendix 4** Summary of Data from the Kent & Medway Air Quality Network and National Network Sites

**Appendix 5** Air Quality Monitoring Locations

**Appendix 6** Screening Nomograms Calculated From the DMRB

**Appendix 7** QA/QC of Monitoring Data

**Appendix 8** Calculation of Diffusion Tube Bias

**Appendix 9** Verification of Predicted PM<sub>10</sub> Concentrations

---

## Executive Summary

An Updating and Screening Assessment of air quality has been carried out for the Borough of Ashford. This is a requirement of Part IV of the Environment Act 1995, which obliges local authorities to periodically, review and assess the current, and likely future, air quality in their area. The role of this process is to identify areas where it is unlikely that the air quality objectives will be achieved. These locations must then be designated as Air Quality Management Areas (AQMAs). The first round of review and assessment for the Borough of Ashford was completed in 2001. No potential exceedences of the air quality objectives were identified and therefore no AQMAs were declared. This report is the initial stage of the second round of review and assessment. It focuses on changes that have occurred since the previous round.

The conclusions of this report are that potential exceedences of the 24-hour PM<sub>10</sub> air quality objective for 2004 have been identified near to the M20 in Ashford. Therefore a Detailed Assessment is proposed for PM<sub>10</sub> at these locations, which will be completed by April 2004. No further action is required for sources of carbon monoxide, benzene, 1,3-butadiene, lead, nitrogen dioxide and sulphur dioxide until the third round of review and assessment, which is due to begin in 2006. Although a Progress Report will be published in 2005, which will include any monitoring and significant changes to sources of these pollutants.

### Summary of the Conclusions of the Updating and Screening Assessment

Pollutant	Conclusion
Carbon monoxide	No further action required
Benzene	No further action required
1,3 butadiene	No further action required
Lead	No further action required
Nitrogen dioxide	No further action required
Sulphur dioxide	No further action required
PM <sub>10</sub>	<b>Detailed Assessment required.</b>

---

# 1 Introduction

## Introduction to the Second Round of Review and Assessment

- 1.1 The Government's Air Quality Strategy for England, Scotland, Wales and Northern Ireland<sup>1</sup> and the addendum to it, published in February 2003<sup>2</sup>, set out a framework for air quality improvements, which includes a series of air quality objectives. National and international measures are likely to achieve these objectives in most locations, but where areas of poor air quality remain, local air quality management will be necessary. Part IV of the Environment Act 1995 requires local authorities to periodically review and assess the current, and likely future, air quality in their area. The role of this process is to identify areas where it is unlikely that the air quality objectives will be achieved. These locations must be designated as Air Quality Management Areas (AQMAs) and subject to active management.
- 1.2 Air quality will change in response to changes in emitting activities. Air quality objectives and Review and Assessment guidance change with advances in knowledge; much of which is learnt from the Review and Assessment process itself. As a result, Review and Assessment is a long-term, rolling process, structured as a series of 'rounds'. Most local authorities in England, Scotland and Wales have now completed the first round of Review and Assessment and the second round is currently underway.
- 1.3 The revised Local Air Quality Management Technical Guidance (LAQM. TG(03))<sup>3</sup> sets out a phased approach to Review and Assessment. This prescribes an initial Updating and Screening Assessment (USA), which all authorities must undertake. It is based on a checklist to identify any matters that have changed since the first round and may now require further assessment. The Updating and Screening Assessment should cover each of the following:
- Any new monitoring data.
  - Any new objectives.
  - Any new pollutant sources, or significant changes to existing sources, either locally or in neighbouring authorities.
  - Any other local changes that might affect air quality.

---

If the USA identifies any potential areas where there is a risk that the objectives may be exceeded, which were not identified in the first round, then the Local Authority should progress to a Detailed Assessment (DA).

- 1.4 This report describes the USA for Borough of Ashford. It aims to identify any potential exceedences of the air quality objectives. Such exceedences might result from changes in pollutant emissions, or they might be caused by pollutant sources not previously assessed or changes in the objectives themselves.

### **The Air Quality Objectives**

- 1.5 The Government's Air Quality Strategy<sup>1</sup> defines both standards and objectives for each of a range of air pollutants. The 'standards' are set as concentrations below which health effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of a particular pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of the costs, benefits, feasibility and practicality of achieving the standards. The objectives are prescribed within The Air Quality (England) Regulations 2000<sup>4</sup> and The Air Quality (England) (Amendment) Regulations 2002<sup>5</sup>. This latter publication set revised, more stringent objectives for benzene and carbon monoxide which are relevant to this second round, but which were absent in the first. The addendum to the air quality strategy<sup>2</sup> contains provisional objectives for PM<sub>10</sub> to be achieved in 2010. As these are not in the regulations, they do not strictly need to be covered in the Review and Assessment process. However, for completeness they are discussed in this report. Table 1 summarises the objectives, which are relevant to this report. Appendix 1 sets out the individual health effects of each of these "strategy pollutants".
- 1.6 These air quality objectives are only applicable where members of the public are likely to be regularly present and are likely to be exposed over the averaging time of the objective<sup>3</sup>. For annual mean and 24-hour objectives relevant exposure is limited to residential properties, schools and hospitals. The 1-hour and 15-minute objectives apply at these and at any outdoor location where a member of the public might reasonably be expected to stay for the averaging period of the objective, such as shopping streets, parks and sports grounds, as well as bus stations and railway stations that are not fully enclosed.

**Table 1 Air Quality Objectives Relevant to This Report.**

<b>Pollutant</b>	<b>Time Period</b>	<b>Objective</b>	<b>To be achieved by<sup>1</sup></b>
Benzene	Running annual mean	16.25 µg/m <sup>3</sup>	2003
	Annual mean	5 µg/m <sup>3</sup>	2010
1,3-Butadiene	Running annual mean	2.25 µg/m <sup>3</sup>	2003
Carbon Monoxide	Maximum daily running 8-hour mean	10 mg/m <sup>3</sup>	2003
Lead	Annual mean	0.5 µg/m <sup>3</sup>	2004
	Annual mean	0.25 µg/m <sup>3</sup>	2008
Nitrogen Dioxide	1-hour mean	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	2005
	Annual mean	40 µg/m <sup>3</sup>	2005
Sulphur Dioxide	1-hour mean	350 µg/m <sup>3</sup> not to be exceeded more than 24 times a year	2004
	24-hour mean	125 µg/m <sup>3</sup> not to be exceeded more than 3 times a year	2004
	15-minutes mean	266 µg/m <sup>3</sup> not to be exceeded more than 35 times a year	2005
Fine particles (PM <sub>10</sub> ) <sup>2</sup>	24-hour mean	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year	2004
	Annual mean	40 µg/m <sup>3</sup>	2004
	24-hour mean <sup>3</sup>	50 µg/m <sup>3</sup> not to be exceeded more than 7 times a year	2010
	Annual mean <sup>3</sup>	20 µg/m <sup>3</sup>	2010

<sup>1</sup> The achievement dates are all by the end of the specified year.

<sup>2</sup> Measured by the gravimetric method.

<sup>3</sup> Provisional objectives not included in the Regulations.

---

### **Summary of the First Round of Review and Assessment**

- 1.7 Reports from the first round of review and assessment are summarised in Appendix 2. Stage one indicated that benzene, 1,3-butadiene and carbon monoxide were likely to meet the air quality standards throughout the district, but that nitrogen dioxide, PM<sub>10</sub> sulphur dioxide and lead required further investigation. At the second stage, it was determined that no industrial sources were likely to cause an objective exceedence for nitrogen dioxide, sulphur dioxide, PM<sub>10</sub> or lead. However, the appraisal carried out on behalf of Defra, determined that a Stage 3 assessment should be carried out for sulphur dioxide. A screening model indicated that road traffic may lead to exceedences of the nitrogen dioxide and PM<sub>10</sub> objectives close to roads in Ashford. Further detailed modelling was carried out for the stage 3 assessment. Modelling results showed that the 2 power stations outside the Borough were not likely to lead to exceedences of the sulphur dioxide objectives within the Borough of Ashford. The results of detailed traffic modelling showed that exceedences of the nitrogen dioxide and PM<sub>10</sub> objectives may be likely near to the M20, A2070, A292 and A28, however there was no relevant exposure in any of these locations. It was therefore determined that an AQMA was not required. Following additional correspondence, these conclusions have been accepted by the appraisal carried out on behalf of Defra.

---

## 2 Methodology

- 2.1 Air pollutant concentrations in the vicinity of an emission source will be related to both the source strength and the background concentration. Interpolated background concentrations of the strategy pollutants have been produced from the national map of background concentrations available from the Air Quality Archive on the internet<sup>6</sup>. These maps of the Borough of Ashford and the whole of Kent are presented in Appendix 3.
- 2.2 The results of air quality monitoring carried out in the Borough of Ashford are published on the internet as part of the Kent & Medway Air Quality Network (KMAQN)<sup>7</sup>, which is maintained by the Kings College London, Environment Research Group (ERG). Some of the sites that are reported as part of this network are also part of the Government's Automatic Urban and Rural Network (AURN)<sup>6</sup>. Results from the KMAQN are summarised in Appendix 4. Powergen operates monitoring stations in Gillingham and Rochester, to inform the air quality management plan for Kingsnorth Power Station<sup>8</sup>. The results from which are included in Appendix 4, along with the data from a site at Wormdale, which is within the Borough of Swale, where monitoring was discontinued in 2001. The locations of these monitoring sites are shown in Appendix 5.
- 2.3 Trunk road traffic flow data have been obtained from the National Atmospheric Emissions Inventory<sup>9</sup>. Traffic data for other roads have been acquired from Babbie, who maintain this information on behalf of Kent County Council. The measured traffic data have been projected forward to 2005 and 2010 using local growth factors obtained from TEMPRO v4.2.1 combined with National Road Traffic Forecast data, as recommended by Babbie.
- 2.4 Using the Design Manual for Roads and Bridges (DMRB) screening method V1.01 (Feb'03)<sup>10</sup>, nomograms which predict the traffic flow needed to create a potential exceedence of the NO<sub>2</sub> and PM<sub>10</sub> objectives for a range of background concentrations have been generated generally worst-case road conditions, (see Appendix 6). These have facilitated an initial screening of the traffic flow data in order to identify which roads might create an exceedence of the air quality objectives for NO<sub>2</sub> and PM<sub>10</sub> given the local background concentrations. Where potential exceedences of the objectives have been identified, detailed DMRB

---

calculations have been carried out for these specific locations. Spreadsheets containing the input data used in these calculations are available.

- 2.5 Lists of industrial processes obtained from the Environment Agency and held by the Borough Council, have been used to identify point source emissions within the Borough of Ashford. The Environment Agency regulates large industrial processes, known as Part A1. Smaller industrial sources, which are known as Part A2 and Part B processes, are regulated by Ashford Borough Council. Point sources in neighbouring Local Authority areas have also been taken into account by way of correspondence with Rother, Maidstone, Tunbridge Wells, Swale, Canterbury and Shepway Councils. New or changed processes have been checked against the list of potentially significant processes that are set out in the Technical Guidance<sup>3</sup>. The Borough Council also holds a list of large petrol stations and these were screened using the criteria, prescribed in the Technical Guidance<sup>3</sup>.
- 2.6 The occurrence of other potential sources of air pollutants in the area, such as railway sidings, bus stations, large boilers and fugitive sources of PM<sub>10</sub> has been identified using local knowledge and screened using the criteria set out in the Technical Guidance<sup>3</sup>.

---

### 3 Updating and Screening of Carbon Monoxide

#### Updating and Screening Summary for Carbon Monoxide.

Source, location or data which need to be assessed	Action
New monitoring data	No further action required
Very busy roads or junctions in built up areas	No further action required

#### New monitoring data

- 3.1 There has been no monitoring of carbon monoxide carried out within the Borough of Ashford. Monitoring has been carried out as part of the KMAQN at a background location in Medway and near to the roadside in Canterbury, Maidstone and Sevenoaks. The results, which are set out in Appendix 4 (Table 4.1), show that there have been no measured exceedences of the objective, which is a maximum daily running 8-hour concentrations of greater than 10 mg/m<sup>3</sup> to be achieved in 2003, at any of these locations. The Maidstone roadside monitoring site is near to a junction a busy junction in the town centre. As no exceedence of the objective was measured at this location and concentrations are expected to continue to decline it is unlikely that there will be any exceedence of the objective in the Borough of Ashford.

#### Very busy roads or junctions in built-up areas

- 3.2 Monitoring data from across the country indicate that the carbon monoxide objective is only likely to be exceeded near to 'very busy' roads and junctions<sup>1</sup>, where the 2003 background concentration is greater than 1 mg/m<sup>3</sup>. The highest estimated background concentration is 0.299 mg/m<sup>3</sup>. This confirms that the objective will be achieved at all locations within the Borough.

#### Conclusion

- 3.3 No further action required for carbon monoxide.

---

<sup>1</sup> 'Very busy' junctions are defined as single carriageways with greater than 80,000 vehicles per day, dual carriageways with greater than 120,000 vehicles per day or motorways with more than 140,000 vehicles per day

---

## 4 Updating and Screening of Benzene

### Updating and Screening Summary for Benzene.

Source, location or data which need to be assessed	Action
New monitoring data	No further action required
Very busy roads or junctions in built-up areas	No further action required
Industrial sources	No further action required
Petrol stations	No further action required
Major petroleum storage depots	No further action required

#### New monitoring data

- 4.1 There has been no monitoring of benzene carried out within the Borough of Ashford. Monitoring has been carried out using diffusion tubes at a number of other locations in the KMAQN, the results of which are shown in Figure 1 and Appendix 4 (Table 4.2). The locations of these sites are shown in Appendix 5 (Figure 5.1). Details of the laboratory that supplies and analyses the tubes, and QA/QC measures used are detailed in Appendix 7.
- 4.2 The results show the decrease in benzene concentrations in recent years, brought about by the reduction of the concentration of benzene permissible in petrol. Concentrations in 2003 and 2010 have been estimated by projecting forward measured values for 2002 using factors in the Technical Guidance<sup>3</sup>. These results also indicate that the annual mean benzene objectives of 16.25  $\mu\text{g}/\text{m}^3$  in 2003 and 5  $\mu\text{g}/\text{m}^3$  in 2010 will be achieved at the locations where monitoring has been carried out within Kent. This suggests that they will also be achieved in the Ashford Borough Council area.

#### Very busy roads or junctions in built-up areas

- 4.3 Monitoring data from across the country indicate that the benzene objective for 2010 is only likely to be exceeded near to 'very busy' roads and junctions<sup>2</sup>, where the 2010 background concentration is greater than 2  $\mu\text{g}/\text{m}^3$ . The highest estimated background concentration is 0.306  $\mu\text{g}/\text{m}^3$ . This confirms that the objective will be achieved at all locations within the Borough.

---

<sup>2</sup> 'Very busy' junctions are defined as single carriageways with greater than 80,000 vehicles per day, dual carriageways with greater than 120,000 vehicles per day or motorways with more than 140,000 vehicles per day

---

### **Industrial sources**

- 4.4 No industrial processes were found to emit significant quantities of benzene in the previous round of Review and Assessment. There have been no new processes introduced and no significant changes to existing industrial processes either in the Borough of Ashford or nearby in neighbouring authorities. Therefore there continues to be no exceedences of the benzene objective.

### **Petrol stations**

- 4.5 Petrol stations are only likely to lead to an exceedence of the 2010 objective for benzene if they have a large throughput of petrol (greater than 2 million litres per annum) and are near to a busy road, with more than 30,000 vehicles per day. There must also be relevant exposure, i.e. a residential property, within 10 m of the petrol pumps. There are no petrol stations within the Borough of Ashford that fulfil these criteria, and therefore it is not likely that petrol stations will lead to an exceedence of the benzene objectives in 2003 or 2010.

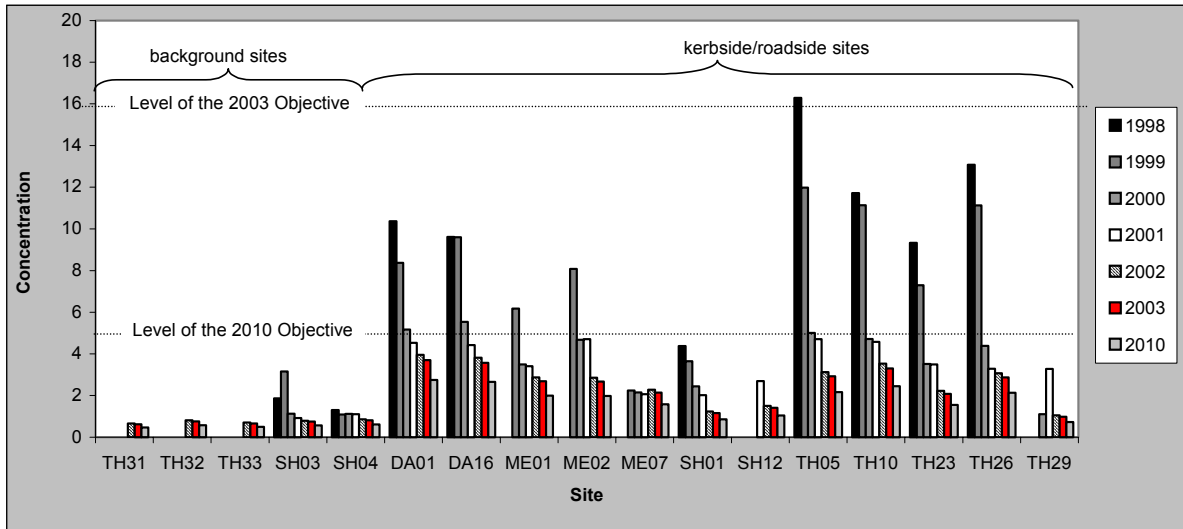
### **Major fuel storage depots (petroleum only)**

- 4.6 There are no major fuel storage depots in the Borough of Ashford.

### **Conclusion**

- 4.7 No further action required for benzene.

**Figure 1 Annual Mean Benzene Concentrations ( $\mu\text{g}/\text{m}^3$ ) Measured at Locations in the KMAQN and Estimated for 2003 and 2010**



TH31= High St Manston, TH32= Bell Davies Drive, Manston, TH33= Hill House Drive, Manston, SH03= Bodenham Road, Folkestone, SH04= Whitecliff Way, Folkestone, DA01= Lowefield St, Dartford, DA16= Princes Road, Dartford, ME01= High St, Rainham, ME02= High St, Strood, ME07= Hollywood Ln, Strood, SH01= Cheriton Pl, Folkestone, SH12= Cheriton Rd, Folkestones, TH05= The Broadway, Broadstairs, TH10= College Rd, Margate, TH23= Cecil Square, Margate, TH26= King St, Ramsgate, TH29= Derwent Avenue, Ramsgate

---

## 5 Updating and Screening of 1,3-butadiene

### Updating and Screening Summary for 1,3-butadiene.

Source, location or data which need to be assessed	Action
New monitoring data	No further action required
New industrial sources	No further action required
Existing industrial sources with significantly increased emissions	No further action required

#### New monitoring data

- 5.1 There has been no monitoring of 1,3-butadiene carried out within the Borough Ashford or anywhere else in the KMAQN. Monitoring has been carried out as part of the national AURN at Marylebone Road (kerbside), University College (roadside) and Eltham (suburban), London and at a rural location in Harwell. The results, which are set out in Appendix 4 (Table 4.3), show that the running annual mean objective of 2.25 µg/m<sup>3</sup> in 2003 is expected to be achieved at all of these locations. As there are no particular sources of 1,3-butadiene in Ashford, other than road traffic, it would be fair to assume that the objective will not be exceeded in the Borough.

#### New industrial sources

- 5.2 No new processes, which handle 1,3-butadiene, have been introduced in or near to the Borough of Ashford since the first round of review and assessment.

#### Existing industrial sources with significantly increased emissions

- 5.3 No industrial processes in or near to the Borough of Ashford were found to emit significant quantities of 1,3-butadiene in the first round of Review and Assessment.

#### Conclusion

- 5.4 No further action required for 1,3-butadiene.

---

## 6 Updating and Screening of Lead

### Updating and Screening Summary for Lead.

Source, location or data which need to be assessed	Action
New monitoring data outside an AQMA	No further action required
New industrial sources	No further action required
Industrial sources with substantially increased emissions	No further action required

#### New monitoring data outside an AQMA

- 6.1 There has been no new monitoring of lead carried out within the Borough of Ashford or anywhere else in the KMAQN. Monitoring has been carried out as part of the national AURN at kerbside sites in London and Cardiff and a background site, London Brent. The results, which are set out in Appendix 4 (Table 4.4), show that the annual mean objectives of  $0.5 \mu\text{g}/\text{m}^3$  in 2004 and  $0.25 \mu\text{g}/\text{m}^3$  in 2008 are expected to be achieved at all of these locations. As there are no particular sources of lead in the Borough of Ashford, it would be fair to assume that the objective will not be exceeded in the Borough.

#### New industrial sources

- 6.2 No new processes, which emit lead, have been introduced in or near to the Borough of Ashford since the first round of review and assessment.

#### Industrial sources with substantially increased emissions

- 6.3 No industrial processes in or near to the Borough of Ashford were found to emit significant quantities of lead in the first round of Review and Assessment.

#### Conclusion

- 6.4 No further action required for lead.

## 7 Updating and Screening of Nitrogen Dioxide

### Updating and Screening Summary for Nitrogen Dioxide.

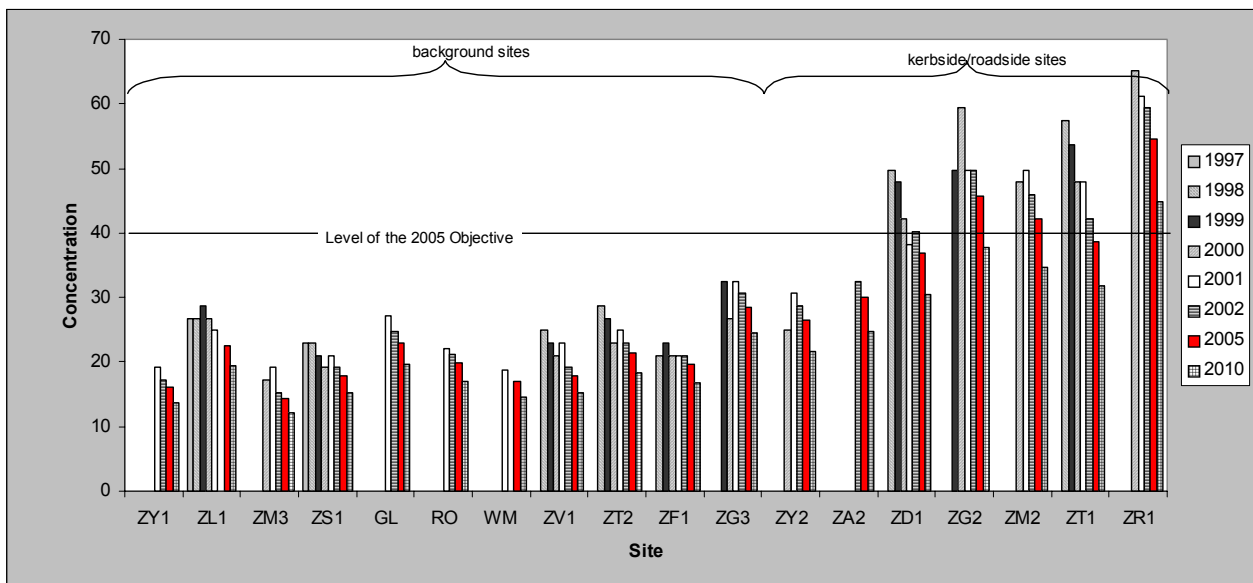
Source, location or data which need to be assessed	Action
New monitoring data outside an AQMA	No further action required
New monitoring data within an AQMA	N/A
Narrow congested streets with residential properties close to the kerb	No further action required
Junctions	No further action required
Busy streets where people may spend 1-hour or more close to traffic	No further action required
Roads with high flow of buses and/or HGVs	No further action required
New roads constructed or proposed since first round of Review and Assessment	No further action required
Roads close to the objective during the first round of Review and Assessment	No further action required
Roads with significantly changed traffic flows	No further action required
Bus Stations	No further action required
New industrial sources	No further action required
Industrial sources with substantially increased emissions	No further action required
Aircraft	No further action required

### New monitoring data outside an AQMA

- 7.1 Ashford Borough Council has carried out continuous monitoring of nitrogen dioxide at a roadside site on Wellesley Road (ZA2). This is in an area where exceedences of the annual mean nitrogen dioxide objective were predicted in the first round of review and assessment. Concentrations were also measured at a site near Wormdale in Swale, on behalf of Kingsnorth Power Station, until 2001. The Wormdale results and those for Ashford and a number of other locations, within the KMAQN, are shown in Figure 2 and Appendix 4 (Table 4.5). They show that the annual mean objective is likely to be exceeded at some busy roadside locations in Kent. The results from the Ashford monitoring, show that the detailed modelling carried out in the previous round of review and assessment over-predicted concentrations and the objective is not likely to be exceeded at this location.
- 7.2 Nitrogen dioxide has been measured using diffusion tubes at 8 locations in the Borough of Ashford. The locations of these monitoring sites are shown in Appendix 5 (Figure 5.3). Harwell Scientifics supplies the diffusion tubes and they are analysed by Kent Scientific Services, both of these laboratories use methods for which they hold UKAS accreditation. Further details of the supply, analysis and QA/QC methods are presented in Appendix 7.

Studies have indicated that there are systematic differences in the performance of different laboratories and preparation methods of diffusion tubes. In order to account for any such bias in the diffusion tubes used by Ashford Borough Council, data from 4 sites where diffusion tubes from the same laboratory have been collocated with continuous monitors for more than 9 months have been examined. Details of this exercise are included in Appendix 8. The results show that the tubes used over-estimated nitrogen dioxide concentrations by around 20%. The diffusion tube results used in this report have therefore been adjusted to account for this bias. Figure 3 and Appendix 4 (Table 4.6), shows that at all the diffusion tube monitoring locations within the Borough of Ashford concentrations are predicted to be below the annual mean objective of 40  $\mu\text{g}/\text{m}^3$ .

**Figure 2 Annual Mean Nitrogen Dioxide Concentrations ( $\mu\text{g}/\text{m}^3$ ) Measured by Continuous Monitor as part of the KMAQN and Estimated for 2005 and 2010**

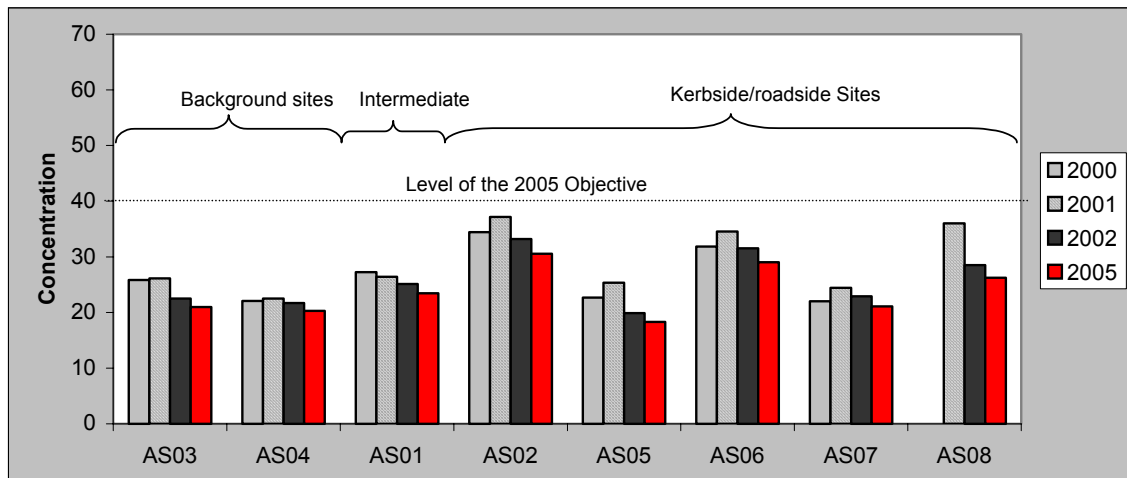


**ZA2=Ashford Roadside, ZY1=Canterbury Background, ZY2=Canterbury Roadside, ZR1=Dartford Roadside – St Clements, ZD1=Dover Roadside – Town Hall, ZD2=Dover Roadside 2 – Townwall St, ZD3=Dover Background, ZF1=Folkestone Suburban, ZG1=Gravesham Background, ZG2=Gravesham Roadside, ZG3=Gravesham Industrial Background, ZL1=Luton Background, ZM2=Maidstone Roadside, ZM3=Maidstone Rural, ZS1=Stoke Rural, ZH1=Thanet Rural, ZH2=Thanet Background, ZT1=Tonbridge Roadside, ZT2=Tunbridge Wells Background, ZT3=Tunbridge Wells Rural, ZR3= Dartford Roadside - Bean, ZV1= Sevenoaks 2 – Greatness. GL=Gillingham Strand, RO=Rochester, WM=Wormdale.**  
**Sites marked in bold are in the Borough of Ashford.**

### New monitoring data within an AQMA

7.3 No AQMAs have been declared for nitrogen dioxide in the Borough of Ashford and therefore this section is not applicable.

**Figure 3 Annual Mean Nitrogen Dioxide Concentrations ( $\mu\text{g}/\text{m}^3$ ) measured by Diffusion Tube at Locations in Ashford and Estimated for 2005**



AS01=East Hill, Ashford (Site 3); AS02=Station Road, Ashford (Site 4); AS03=Queens Street, Ashford (Site 5); AS04=Churchyard, Ashford (Site 6); AS05=Godinton Road, Ashford; AS06=Hythe Road, Ashford; AS07=High Street, Tenterden; AS08=Godinton Road (2), Ashford.

#### **Narrow congested streets with residential properties close to the kerb**

- 7.4 There are no narrow congested streets with residential properties close to the kerb in the Borough of Ashford. Traffic flows in Tenterden High Street can sometimes be fairly slow, however monitoring data from a kerbside site in this street confirms there is unlikely to be a risk of the objectives being exceeded.

#### **Junctions**

- 7.5 The busiest junctions, with relevant exposure, have been identified as those on the Ashford Ring Road, junction 10 of the M20 and the junction of the A28 Canterbury Road and Simon Weil Avenue, which is also close to the M20. There are proposals to alter junction 10 of the M20, to relieve congestion, these are expected to be in place in 2005 and therefore it is the new layout and traffic flows that have been modelled for this junction. Nitrogen dioxide concentrations in 2005 have been calculated at the nearest receptors to these junctions using the DMRB and the results that are presented in Table 2. The nitrogen dioxide concentration has also been calculated at the location of the continuous monitor on Wellesley Rd, which is part of the Ashford Ring Road. The DMRB results for the monitoring site ( $29.8 \mu\text{g}/\text{m}^3$ ) show good agreement with the monitored concentration projected forward to 2005 ( $30 \mu\text{g}/\text{m}^3$ ) which suggests that the model performs well at this type of town centre location in Ashford. The

results in Table 2, indicate that the annual mean nitrogen dioxide objective will be achieved at receptors near to busy junctions in the Borough of Ashford.

**Table 2 Summary of DMRB Calculations of Annual Mean Nitrogen Dioxide ( $\mu\text{g}/\text{m}^3$ )**

Receptor Location	Predicted (2005) Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ )
<b>Junctions</b>	
Nelson Close, near Junction 10 of the M20	28.9
Heathfield Rd, near junction of A28 Canterbury Rd & Simon Weil Ave, also near M20.	30.4
Ring Road – continuous monitor, 4m from Wellesley Rd	29.8
Ring Road – junction of Somerset Rd with North Rd	30.3
<b>Road close to the objective in the previous round of R&amp;A</b>	
Hill View, 25m from M20	33.7
<b>Objective</b>	<b>40</b>

**Busy streets where people may spend 1-hour or more close to traffic**

- 7.6 Bank Street is a street where members of the public are likely to spend an hour or more close to traffic. However the flow on this road is much less than 10,000 AADT (around 3,000 AADT) and therefore unlikely to cause an exceedence of either the annual mean or 1-hour objectives.

**Roads with high flow of buses and/or HGVs**

- 7.7 According to traffic survey data obtained from the National Atmospheric Emissions Inventory and Babtie there are no roads in the Borough of Ashford with a flow of buses and/or HGVs greater than 25%. This is consistent with local knowledge of the area. The highest flow of HGVs is around 17%, on the M20. The predicted concentration at the closest receptor, 25m from the kerb, is  $33.7 \mu\text{g}/\text{m}^3$ , as shown in Table 2.

**New roads constructed or proposed since first round of Review and Assessment**

- 7.8 The Goat Lees Spine Road has been opened, since the first round of review and assessment. This links junction 9 of the M20 with Faversham Road. It has reduced flows on the section of Faversham Road through Kennington and therefore improved air quality at receptors near to this route. There are receptors within 10m of the new road. However, the AADT is less than 10,000 (approximately 5,000) and therefore it is unlikely to lead to a risk of the objectives being exceeded.

---

### Roads close to the objective during the first round of Review and Assessment

7.9 During the first round of Review and Assessment, locations near to the M20 and A2070 Bad Munstreifel Road were identified as being close to the annual mean objective. However, there was found to be no relevant exposure at these locations. No sensitive receptors have been introduced near to these roads since the previous round of Review and Assessment and therefore there continues to be no relevant exposure in these locations. The A2070 has been screened out of this assessment using the nomograms derived from the most recent version of the DMRB (Appendix 6), which includes the latest published emission factors, as shown in Table 3. The flow of HDVs on the M20 is greater than the 10% used in the nomograms, and therefore the concentration at the closest receptor to the road, in Hill View, has been predicted using the DMRB. The results presented in Table 2 show that the concentration is expected to be well below  $40 \mu\text{g}/\text{m}^3$  and therefore the objective is expected to be achieved. Junctions, which are not covered by these nomograms, are discussed in paragraphs 7.4 and 7.5.

### Roads with significantly changed traffic flows

7.10 According to traffic survey data obtained from the National Atmospheric Emissions Inventory and Babbie there are no roads in the Borough of Ashford which have experienced an increase in traffic flow of greater than 25%. However, there are large-scale development plans for the town of Ashford, some of which will be in place and have the potential to significantly change traffic flows in 2005. At the present time there is insufficient traffic data available to assess the combined impact of these developments at various locations, mostly on the outskirts of the town. This situation will be closely monitored and the potential impacts upon air quality assessed, as and when the information becomes available.

**Table 3 Specific Roads Screened Using the Nomograms in Appendix 6.**

Receptors Beside:	NO <sub>2</sub> Objective Exceedence Likely?
M20 between junctions 9 and 10	>10%HDV, nomogram not relevant, DMRB calculation carried out, see Table 2
A2070 Bad Munstreifel Road	No
A28 Canterbury Road	No
A251 Faversham Road	No
High Street, Tenterden	No
Hythe Road	No
A20 Fougères Way	No
A20 Simon Weil Avenue	No
A292 New Street	No
A28 Chart Road	No

---

### **Bus Stations**

- 7.11 There are no bus stations within the Borough of Ashford. There is a designated bus drop off and pick up point in the centre of Ashford but there are less than 1,000 bus movements per day at this location and therefore, according to the Technical Guidance, it is unlikely to lead to any exceedence of the nitrogen dioxide objectives.

### **New industrial sources**

- 7.12 There have been no new processes, which emit significant quantities of nitrogen dioxide, introduced since the first round of review and assessment.

### **Industrial sources with substantially increased emissions**

- 7.13 No industrial processes in or near to the Borough of Ashford were found to emit significant quantities of nitrogen dioxide in the first round of review and assessment. None of these sources has substantially increased emissions.

### **Aircraft**

- 7.14 There are no major airports in or near to the Borough of Ashford.

### **Conclusion**

- 7.15 A Detailed Assessment is not required for nitrogen dioxide.

---

## 8 Updating and Screening of Sulphur Dioxide

### Updating and Screening Summary for Sulphur Dioxide.

Source, location or data which need to be assessed	Action
New monitoring data outside an AQMA	No further action required
New monitoring data within an AQMA	N/A
New industrial sources	No further action required
Industrial sources with substantially increased emissions	No further action required
Areas of domestic coal burning	No further action required
Small boilers (>5MW(thermal)) burning coal or oil	No further action required
Shipping	No further action required
Railway Locomotives	No further action required

#### New monitoring data outside an AQMA

- 8.1 There has been no continuous monitoring of sulphur dioxide carried out in the Borough of Ashford. Powergen operates monitoring sites at Rochester and Gillingham as part of an assessment of Kingsnorth Power Station, in the past sulphur dioxide has also been monitored by Powergen at Wormdale, in the Borough of Swale. The results from these sites, along with those from the KMAQN are presented in Appendix 4 (Table 4.7), and the locations are shown on the map in Appendix 5 (Figure 5.1). These data show the 24-hour and 1-hour objectives have not been exceeded at any of the monitoring locations in Kent, in recent years. In 2001 the monitoring site at Dover recorded 47 15-minute periods above  $266 \mu\text{g}/\text{m}^3$ , the objective is for less than 35 in a year in 2005. The high sulphur dioxide concentrations at this location are due to ships using the port of Dover.

#### Monitoring data within an AQMA

- 8.2 No AQMAs have been declared for sulphur dioxide in the Borough of Ashford and therefore this section is not applicable.

#### New industrial sources

- 8.3 There have been no new processes, which emit significant quantities of sulphur dioxide, introduced since the first round of review and assessment.

#### Industrial sources with substantially increased emissions

- 8.4 No industrial processes in or near to the Borough of Ashford were found to emit significant quantities of sulphur dioxide in the first round of review and assessment. There have been no

---

substantial changes to emissions from the Grain and Kingsnorth Power Stations, which are in Medway.

**Areas of domestic coal burning**

- 8.5 There are no areas of the Borough of Ashford where there is a high density of domestic coal burning.

**Small boilers (>5MW(thermal)) burning coal or oil**

- 8.6 The existence of any schools, hospitals or other large institutional or commercial buildings, which may have boilers using coal or heavy fuel oil has been determined using local knowledge. There are no such boilers, within or near to the Borough of Ashford.

**Shipping**

- 8.7 There is no shipping activity in the Borough of Ashford.

**Railway Locomotives**

- 8.8 There are three locations within the Borough of Ashford where diesel locomotives could potentially be stationary. There is a railhead at Sevington but there is unlikely to be any relevant exposure within 15m of the track and another railhead at Beechbrook Farm, which is due to be dismantled now that the CTRL works are complete. There is also a freight loop on the Ashford to Canterbury line, which is close to houses in Esella Road, Ashford. However this is used infrequently and therefore unlikely to lead to any exceedences of the 15-minute sulphur dioxide objective. Passenger trains using Ashford station are electric and therefore do not emit sulphur dioxide.

**Conclusion**

- 8.9 A Detailed Assessment is not required for sulphur dioxide.

## 9 Updating and Screening of Particles (PM<sub>10</sub>)

### Updating and Screening Summary for PM<sub>10</sub>.

Source, location or data which need to be assessed	Action
New monitoring data outside an AQMA	No further action required
New monitoring data within an AQMA	N/A
Junctions	No further action required
Roads with high flow of buses and/or HGVs	No further action required
New roads constructed or proposed since first round of Review and Assessment	No further action required
Roads close to the objective during the first round of Review and Assessment	Detailed Assessment required
Roads with significantly changed traffic flows	No further action required
New industrial sources	No further action required
Industrial sources with substantially increased emissions	No further action required
Areas with domestic solid fuel burning	No further action required
Quarries, landfill sites, opencast coal, handling of dusty cargoes at ports etc	No further action required
Aircraft	No further action required

#### **New monitoring data outside an AQMA**

- 9.1 Ashford Borough Council has carried out continuous monitoring of PM<sub>10</sub> at a roadside site on Wellesley Road (ZA2). This is in an area where exceedences of the 24-hour PM<sub>10</sub> objective were predicted in the first round of review and assessment. Powergen has carried out some monitoring near Wormdale in Swale on behalf of Kingsnorth Power Station. Results from this site and a number of locations within the KMAQN are shown in Figures 4 and 5, and Appendix 4 (Table 4.8). The results show that there have been no measured exceedences of the annual mean objective of 40 µg/m<sup>3</sup> in the Borough Ashford or any other area of Kent, however the 24-hour objective is unlikely to be met at the Dover roadside monitoring site. The results from the Ashford monitoring, show that the detailed modelling carried out in the previous round of review and assessment over-predicted concentrations and the 24-hour objective is not likely to be exceeded at this location in 2004.

#### **New monitoring data within an AQMA**

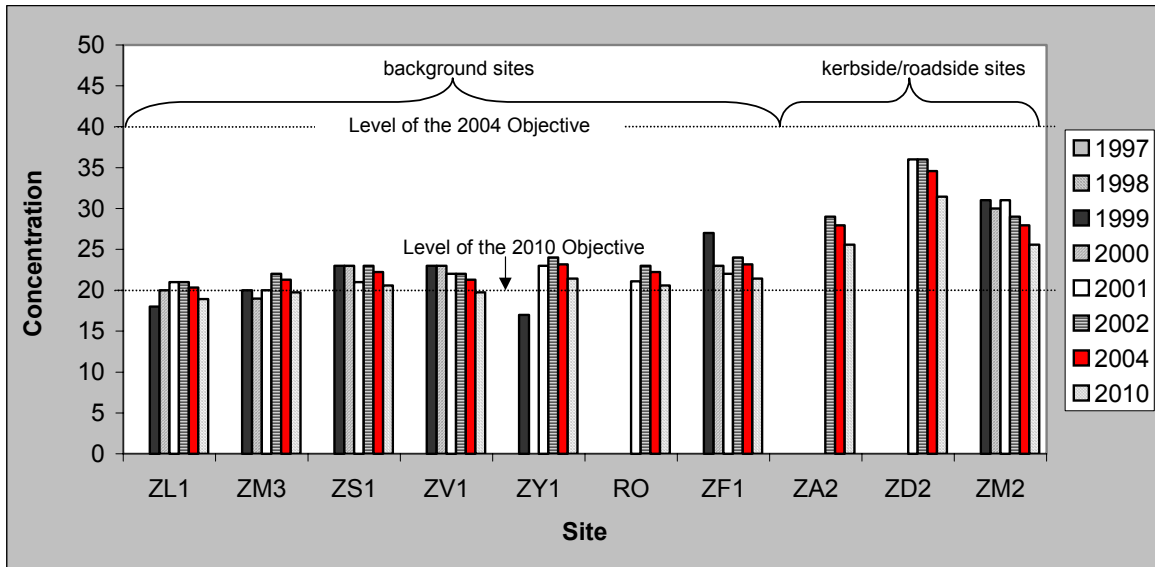
- 9.2 No AQMAs have been declared for PM<sub>10</sub> in the Borough of Ashford and therefore this section is not applicable.

---

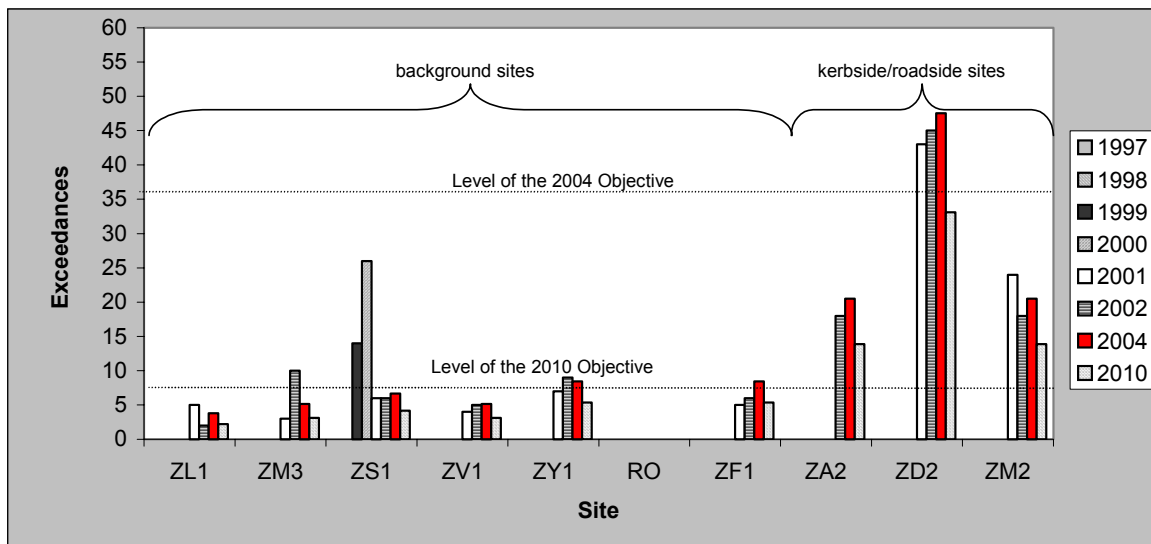
## Junctions

- 9.3 The busiest junctions, with relevant exposure, have been identified as those on the Ashford Ring Road, junction 10 of the M20 and the junction of the A28 Canterbury Road and Simon Weil Avenue, which is also close to the M20. There are proposals to alter junction 10 of the M20, to relieve congestion, these are expected to be in place in 2004 and therefore it is the new layout and traffic flows that have been modelled for this junction. PM<sub>10</sub> concentrations in 2004 and 2010 were calculated at the nearest receptors to these junctions using the DMRB and the results are presented in Table 4. The PM<sub>10</sub> concentration has also been calculated at the location of the continuous monitor on Wellesley Rd, which is part of the Ashford Ring Road. The DMRB result for the monitoring site (annual mean of 24.4 µg/m<sup>3</sup> and 11 days > 50 µg/m<sup>3</sup>) is lower than the monitored concentration projected forward to 2004 (annual mean of 28 µg/m<sup>3</sup> and 20 days > 50 µg/m<sup>3</sup>) which suggests that the model under-estimates concentrations at this location. Therefore an adjustment factor has been derived by comparing the monitored results with those predicted using the DMRB and this factor has been applied to the modelled results for the other receptor locations (see Appendix 9). The results in Table 4 indicate that the 2004 objectives of 40 µg/m<sup>3</sup> as an annual mean and fewer than 36 days with the 24-hour average concentration greater than 50 µg/m<sup>3</sup> will be achieved at receptors near to busy junctions in the Borough of Ashford.
- 9.4 Annual mean concentrations may be above the provisional 2010 objective of 20 µg/m<sup>3</sup>, and the 24-hour objective of fewer than 8 days with a concentration greater than 50 µg/m<sup>3</sup>. This is expected to be the case at a large number of locations across the UK. However, the 2010 objectives are currently provisional and do not need to be considered for the purposes of this assessment.

**Figure 4 Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) Measured as part of the KMAQN and Estimated in 2004 and 2010**



**Figure 5 Exceedences of the 24-hour PM<sub>10</sub> Objective of 50 µg/m<sup>3</sup> Measured as part of the KMAQN and Estimated for 2004 and 2010**



ZA2=Ashford Roadside, ZY1=Canterbury Background, ZD2=Dover Roadside 2 – Townwall St, ZF1=Folkestone Suburban, ZL1=Luton Background, ZM2=Maidstone Roadside, ZM3=Maidstone Rural, ZS1=Stoke Rural, ZV1=Sevenoaks 2 – Greatness, RO=Rochester. Sites marked in bold are in the Borough of Ashford.

**Table 4 Summary of DMRB Calculations For PM<sub>10</sub>.**

Receptor Location	2004	2004	2010	2010
	Predicted Annual Mean Concentration (µg/m <sup>3</sup> )	Predicted Number of Exceedences of 50 µg/m <sup>3</sup> as a 24-Hour Mean	Predicted Annual Mean Concentration (µg/m <sup>3</sup> )	Predicted Number of Exceedences of 50 µg/m <sup>3</sup> as a 24-Hour Mean
<b>Junctions</b>				
Nelson Close, near Junction 10 of the M20	23.7 - 28.1	10 - 21	20.2 - 26.0	4 - 15
Heathfield Rd, near junction of A28 Canterbury Rd & Simon Weil Ave, also near M20.	25.0 - 30.6	12 - 30	21.0 - 27.9	5 - 21
Ring Road – junction of Somerset Rd with North Rd	24.8 - 28.8	12 - 23	21.5 - 26.5	5 - 16
Ring Road – continuous monitor, 4m from Wellesley Rd	24.4 - 27.9	11 - 20	21.1 - 25.6	5 - 14
<b>Road close to the objective in previous round</b>				
Hill View, 25m from M20	25.9 - 32.3	15 - 37	21.5 - 29.4	6 - 25
<b>Objective</b>	<b>40</b>	<b>35</b>	<b>20</b>	<b>7</b>

Results are presented as a range. The lower values are those predicted using the DMRB. The upper values are those adjusted by a factor derived by comparison of the measured data with the DMRB results at the continuous monitoring location (see Appendix 9).

**Table 5 Specific Roads Screened Using the Nomograms in Appendix 6.**

Receptors Beside:	PM <sub>10</sub> Objective Exceedence Likely?
M20 between junctions 9 and 10	>10%HDV, nomogram not relevant, DMRB calculation carried out, see Table 4
A2070 Bad Munstreifel Road	No
A28 Canterbury Road	No
A251 Faversham Road	No
High Street, Tenterden	No
Hythe Road	No
A20 Simon Weil Avenue	No
A20 Fougères Way	No
A292 New Street	No
A28 Chart Road	No

**Roads with high flow of buses and/or HGVs**

9.5 According to traffic survey data obtained from the National Atmospheric Emissions Inventory and Babbie there are no roads in the Borough of Ashford with a flow of buses and/or HGVs greater than 25%. This is consistent with local knowledge of the Borough. The highest flow of HGVs is around 17%, on the M20. The predicted concentrations at the closest receptor, 25m from the kerb, are discussed in paragraph 9.8.

---

### **New roads constructed or proposed since first round of Review and Assessment**

- 9.6 The Goat Lees Spine Road has been opened, since the first round of review and assessment. This links junction 9 of the M20 with Faversham Road. It has reduced flows on the section of Faversham Road through Kennington and therefore improved air quality at receptors near to this route. There are receptors within 10m of the new road. However, the AADT is less than 10,000 (approximately 5,000) and therefore it is unlikely to lead to a risk of the objectives being exceeded.

### **Roads close to the objective during the first round of Review and Assessment**

- 9.7 During the first round of Review and Assessment, locations near to the M20, A2070 Bad Munstreifel Road, A292 Ashford Ring Road, A292 New Street, A28 Chart Road and A28 Canterbury Road were identified as being close to the 24-hour objective in 2004. No sensitive receptors have been introduced near to these roads since the previous round of Review and Assessment and therefore there continues to be no relevant exposure in these locations. Most of these roads have been screened out of this assessment using the nomograms derived from the most recent version of the DMRB (Appendix 6), which includes the latest published emission factors, as shown in Table 5. The flow of HDVs on the M20 is greater than the 10% used in the nomograms. Therefore the concentration at the closest receptor to the road, in Hill View, has been predicted using the DMRB. The results in Table 4 indicate that, there is a risk that the 24-hour objective of fewer than 36 days with a concentration greater than  $50 \mu\text{g}/\text{m}^3$  may not be achieved in 2004 at locations close to the M20. The calculations are based on an estimated background concentrations, which may not be entirely accurate, therefore a Detailed Assessment is proposed for  $\text{PM}_{10}$  at these locations to determine whether an exceedence of the 2004 24-hour objective is likely. Junctions, which are not covered by these nomograms, are discussed in paragraph 9.3.

### **Roads with significantly changed traffic flows**

- 9.8 According to traffic survey data obtained from the National Atmospheric Emissions Inventory and Bابتie there are no roads in the Borough of Ashford that have experienced an increase in traffic flow of greater than 25%. However, there are large-scale development plans for the town of Ashford, some of which will be in place and have the potential to significantly change traffic flows in 2004. At the present time there is insufficient traffic data available to assess the combined impact of these developments at various locations, mostly on the outskirts of the

---

town. This situation will be closely monitored and the potential impacts upon air quality assessed, as and when the information becomes available.

**New industrial sources**

- 9.9 There have been no new processes in or near the Borough of Ashford, which emit significant quantities of PM<sub>10</sub>, introduced since the first round of review and assessment.

**Industrial sources with substantially increased emissions**

- 9.10 No industrial processes in or near to the Borough of Ashford were found to emit significant quantities of PM<sub>10</sub> in the first round of Review and Assessment.

**Areas with domestic solid fuel burning**

- 9.11 There are no areas of the Borough of Ashford where there is a high density of domestic coal burning.

**Quarries, landfill sites, opencast coal, handling of dusty cargoes at ports etc**

- 9.12 There are no quarries, landfill sites or other dusty operations in the Borough of Ashford that have the potential to have a significant effect on PM<sub>10</sub> concentrations at residential properties.

**Aircraft**

- 9.13 There are no major airports in or near to the Borough of Ashford.

**Conclusion**

- 9.14 A Detailed Assessment is required for PM<sub>10</sub> at locations near to the M20 in Ashford.

---

## Glossary

Standards	A nationally defined set of concentrations for eight pollutants below which health effects do not occur or are minimal.
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date, taking into account costs, benefits, feasibility and practicality. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides.
Exceedence	A period of time where the concentration of a pollutant is greater than the appropriate air quality objective.
AQMA	Air Quality Management Area
USA	Updating and Screening Assessment
DA	Detailed Assessment
Defra	Department for Environment Food and Rural Affairs
TG(03)	Technical guidance document provided by Defra to assist local authorities in completion of the next round of the Air Quality Review & Assessment process <sup>3</sup>
DMRB	Design Manual for Roads and Bridges (Highways Agency 2003)
KMAQN	Kent & Medway Air Quality Monitoring Network
PM <sub>10</sub>	Small airborne particles, more specifically particulate matter less than 10 micrometers in aerodynamic diameter.
NO <sub>2</sub>	Nitrogen dioxide.
m	Metres.
µm	Micrometres (one millionth of a metre)
µg/m <sup>3</sup>	Microgrammes per cubic metre.

---

## References

- <sup>1</sup> DETR (January 2000), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.
- <sup>2</sup> Defra, (February 2003), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Addendum.
- <sup>3</sup> Defra, (February 2003), Local Air Quality Management, Technical Guidance LAQM.TG(03).
- <sup>4</sup> The Air Quality (England) Regulations 2000, Statutory Instrument 928
- <sup>5</sup> The Air Quality (England) (Amendment) Regulations 2002, Statutory Instrument 3043
- <sup>6</sup> [www.airquality.co.uk](http://www.airquality.co.uk)
- <sup>7</sup> [www.seiph.umds.ac.uk/envhealth/kent/k\\_home.htm](http://www.seiph.umds.ac.uk/envhealth/kent/k_home.htm)
- <sup>8</sup> Personal Communication with Kevin Brown, March 2003. Data collected for Kingsnorth Power Station Air Quality Management Plan.
- <sup>9</sup> [www.naei.co.uk](http://www.naei.co.uk)
- <sup>10</sup> Highways Agency (February 2003), Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1 Air Quality.