

Local Air Quality Management

Updating and Screening Assessment of the Air Quality within the Kennet District



2006 submission

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CHAPTER 1: Introduction

1.1 The need for a review of air quality

- 1.1.1 As a consequence of the Environment Act 1995 and subsequent regulations, local authorities are required to review and assess the air quality in their area from time to time. These laws form the cornerstone of local air quality management (LAQM), which in turn forms a key part of the UK government strategy to achieve the UK Air Quality Objectives.
- 1.1.2 The objectives themselves are discussed at the start of each chapter within this report. Each chapter considers one of the seven different polluting species, which has been allocated an air quality objective.

1.2 The phased approach to review and assessment

- 1.2.1 The principal underlying the local air quality management process is that local authorities should only undertake a level of assessment that is commensurate with the risk of an air quality objective being exceeded locally.
- 1.2.2 Historically, up to a four stage process has been undertaken in order to review and assess the air quality within local authority areas, and in some cases the process continues to this day with the declaration of Air Quality Management Areas (AQMA's) as the latest stage in the process.
- 1.2.3 For other authorities where air quality is less of a problem, the first round of reviewing and assessing the air quality stopped at an earlier stage in the process. Following a second stage review in 2000, the Kennet District Council declared that the air quality standards would be met by the prescribed deadlines.
- 1.2.4 However, with the ongoing research into air quality and the causes of pollution, combined with increasingly more accurate monitoring equipment and modelling procedures, several air quality standards have been refined and are included in the next phase of the United Kingdoms local air quality management procedure.
- 1.2.5 The latest stage of the current review takes the form of an Updating and Screening Assessment (USA). This is based upon a revised checklist approach in order to identify matters that have changed since the first full USA was completed in 2003.
- 1.2.6 The principal requirements for the Updating and Screening Assessment have not changed and are set out in guidance document LAQM.TG(03). A revised checklist replaces the ones in the original guidance which aim to build upon and utilise information provided in the Progress Reports into Local Air Quality submitted in 2004 and 2005.

- 1.2.7 Thus, this USA will consider all new monitoring data, new sources of pollution, significant changes to existing sources and other local changes that may be significant. New developments alongside busy roads will also be reviewed if considered significant.
- 1.2.8 If the Updating and Screening Assessment should identify a risk that an air quality objective will be exceeded at a location with relevant public exposure then a Detailed Assessment is required to be undertaken. This is aimed at concluding with reasonable certainty, whether or not likely exceedences of the air quality objective will occur.
- 1.2.9 Where likely exceedences are identified, then the assessment should be sufficiently detailed to determine both the magnitude and geographic extent. It will then be possible for the local authority to declare an AQMA.

1.3 The Kennet district

- 1.3.1 Kennet is one of five local authorities in the County of Wiltshire. It covers approximately 375 square miles and is home to about 75,000 people. The main settlements are the historic towns of Devizes and Marlborough. Pewsey, Ludgershall and Tidworth provide further centres of population, although half the population lives in the extensive network of scattered villages.
- 1.3.2 The district is mainly rural and agricultural in character. About two thirds of the district is included within the North Wessex Downs Area of Outstanding Natural Beauty and a further 20 per cent is designated a Special Landscape Area. The major physical features are the extensive chalk downlands of the Marlborough Downs, to the North, and Salisbury Plain to the South. The Vale of Pewsey, which runs from west to east, roughly midway through the district, separates these upland areas. The main railway service and the recently restored Kennet and Avon Canal also follow this route. The River Kennet and the Salisbury Avon have cut other significant valleys into the chalk. To the west of the District, the chalk uplands give way to the clay vale in the western part of the County.
- 1.3.3 Employment and economic activity is scattered. Historically it has centred on agriculture and Ministry of Defence Establishments. Structural changes have come from reduced opportunities in agriculture and changes in military presence following defence reviews. Unemployment is below average, but many people commute to jobs outside the district.

CHAPTER 2: Updating and Screening Assessment of carbon monoxide

2.1 Introduction

2.1.1 A maximum daily 8-hr mean concentration of 10 mg/m^3 has been set as the United Kingdom air quality standard for carbon monoxide, which was to be achieved by the end of 2003.

2.2 Assessment of carbon monoxide – background concentrations

2.2.1 The estimated corrected annual mean background concentrations for the Kennet district was calculated in the 2003 USA at a concentration of 0.165 mg/m^3 .

2.3 Assessment of carbon monoxide – A) Monitoring data

2.3.1 Kennet District Council is currently not monitoring for carbon monoxide. The continuous monitoring reported in the 2003 USA has been discontinued.

2.4 Assessment of carbon monoxide – B) Very busy roads or junctions in built up areas

2.4.1 Box 2.2 of the Technical Guidance requires identification of ‘very busy’ roads and junctions in areas where the current year background concentration is expected to be above 1 mg/m^3 .

2.4.2 The following criteria are used to define ‘very busy’:

- Single carriage roads with daily average traffic flows $>80,000$ vehicles per day
- Dual carriageway roads (2 or 3 lanes) with daily average traffic flows which exceed $120,000$ vehicles per day
- Motorways with daily average traffic flows $>140,000$ vehicles per day

2.4.3 Additionally, box 2.2 states that it is only necessary to include very busy roads and junctions not considered previously; where there has been a significant increase ($>10\%$ AADT) in traffic flows or where there is new relevant exposure.

2.4.4 As stated, the corrected background level for carbon monoxide in the Kennet district is well below 1 mg/m^3 .

2.4.5 Data concerning traffic flow levels for the Kennet district has been obtained from the Wiltshire County Council and is summarised in Appendix 1. In 2005 the maximum measured daily average traffic flow on a road in the Kennet district was 18495, well below the 80,000 threshold for a single carriageway road. There is no likelihood of the criteria for a busy junction being located in the Kennet district

2.4.6 It is therefore considered that there are no roads or junctions meeting the criteria of ‘very busy’ as defined in the revised checklists to guidance document LAQM.TG(03). Additionally, background levels of CO are expected to be well below 1 mg/m^3 .

2.5 Conclusion

- 2.5.1 In light of the information set out in this chapter, it is considered that there have been no significant changes with regard to carbon monoxide emissions in the Kennet district since the matter was last assessed and that a **detailed assessment for carbon monoxide is not required.**

CHAPTER 3: Updating and Screening Assessment of benzene

3.1 Introduction

- 3.1.1 A maximum running annual mean concentration of $16.25 \mu\text{g}/\text{m}^3$ has been set as the air quality standard for benzene, which was to be achieved by the end of 2003. However, in light of health advice from government advisors, an additional objective has been set.
- 3.1.2 The additional objective is for a fixed annual mean of $5 \mu\text{g}/\text{m}^3$ to be achieved by the end of 2010 (for England and Wales).

3.2 Assessment of benzene – background concentrations

- 3.2.1 The estimated annual mean background concentrations of benzene for 2003 for the Kennet district were given in chapter 3.2.2 of the 2003 USA for the Kennet district at a concentration of **$0.16 \mu\text{g}/\text{m}^3$** .
- 3.2.2 For the purposes of this report, this figure can be corrected to reflect the estimated annual mean background level for 2010. The correction figure given in Box 3.3 of LAQM.TG(03) is 0.875, which gives a **corrected background level for the Kennet district of $0.14 \mu\text{g}/\text{m}^3$** .

3.3 Assessment of benzene – A) Monitoring data outside an AQMA.

- 3.3.1 Kennet District Council monitors for levels of benzene as part of an air quality study at 5 sites in the south west of the district. At each monitoring location a BTEX diffusion tube is used and data collected for 5 chemical species; benzene, toluene, ethyl-benzene, mp-xylene and o-xylene.
- 3.3.2 Annex 1 of the technical guidance sets out how local monitoring data for benzene obtained by using diffusion tubes is to be ratified. Box A1.4 and paragraph A1.80 sets out the information required to ensure that results are properly calculated and reported, this information is summarised in table 3.1 below:

Table 3.1 – Benzene monitoring information

Name of laboratory	Lambeth Scientific Services
Participation in round robin exercises	Workplace Analysis Scheme for Proficiency
Formal accreditation	No
Type of tubes	BTEX diffusion – limit of detection +/- 0.10-0.15 ng
Type of absorbent	Chromosorb 106
Uptake rate	Benzene 1.72, toluene 1.94, ethylbenzene 1.9, xylenes 2.10
Monitoring location	Various (see results summary). Tubes mounted at least 2.5m from ground and 10cm away from walls etc
Exposure duration	One month

3.3.3 Monitoring for benzene and associated species has been carried out using this methodology since the start of 2005 and the annual mean concentrations detected are summarised in table 3.2 below:

Table 3.2 – Summary of BTEX monitoring 2005

BTEX monitoring						
Site	benzene ($\mu\text{g}/\text{m}^3$)	benzene (ppb)	toluene	ethyl benzene	mp-xylene	o-xylene
Avon Road, Devizes	1.26	0.39	0.58	0.14	0.25	0.52
Devizes Castle	1.44	0.44	0.64	0.11	0.27	0.23
Easterton	1.22	0.38	0.56	0.11	0.24	0.31
Erlestoke	1.39	0.43	0.62	0.10	0.25	0.21
Potterne	1.66	0.51	0.79	0.14	0.41	0.23

*all toluene, ethyl benzene and xylene species data is given in ppb only as no conversion factor available.

3.3.4 Methodology for the ratification of the above data is set out in paragraphs A1.81 and A1.82 of the technical guidance. Given that the purpose of the monitoring for BTEX species within the Kennet district is as a screening device, particular to the impact of a local industrial process it is not considered necessary to engage in ratification above the simple checks outlined in paragraph A1.82.

3.3.5 Paragraph A1.82 of LAQM.TG(03) suggests using a known ambient ratio of the concentrations of BTEX species as an indicator of the accuracy of the results. The ratio of BTEX compounds in the air is of the order: benzene: toluene: ethyl benzene: mp-xylene: o-xylene is approximately 1:3.5:1:2:1 i.e. if benzene is $1\mu\text{g}/\text{m}^3$ then the toluene should be $3.5\mu\text{g}/\text{m}^3$ etc.

3.3.6 However, it is clear from the data presented in table 3.2 that the ratios in the reported data do not reflect the ratios suggested for use as ratification in the technical guidance. For example, although the reported toluene levels are consistently higher than benzene, it is by less than a factor of 2, rather than the 3.5 suggested in the guidance. No explanation for this discrepancy is apparent, i.e. there are no local sources of any of the species tested and as such the results will be treated with a degree of caution

3.3.7 With regard to the monitoring locations, it is considered that all locations are relevant for public exposure for annual when reference is made to paragraphs 1.19 to 1.21 of LAQM.TG(03).

3.3.8 It is clear from the results set out in table 3.2 that despite a degree of care being required in the interpretation of the results as a result of the ratification of the data in accordance with the guidance, the annual mean concentrations of benzene monitored are low and well below the air quality objective limits for the species.

3.4 Assessment of benzene – B) Monitoring data within an AQMA

3.4.1 There are no Air Quality Management Areas within the Kennet district.

3.5 Assessment of benzene – C) Very busy roads or junctions in built up areas

3.5.1 As demonstrated in paragraphs 2.4.5 & 2.4.6 of this USA, there are no roads or junctions meeting the criteria of very busy as set out in the revised USA checklist to the technical guidance and summarised in paragraph 2.4.2 of this report.

3.6 Assessment of benzene – D) New industrial sources

3.6.1 There are no new petrochemical works located within or near to the Kennet DC boundaries.

3.7 Assessment of benzene – E) Industrial sources with substantially increased emissions, or new relevant exposure

3.7.1 No sources have previously been identified during previous rounds of review and assessment for the Kennet district as potentially significant with regard to benzene. Equally, no sources in neighbouring authorities have been identified.

3.8 Assessment of benzene – F) Petrol Stations

3.8.1 According to the latest submission of information necessary for the permitting of Petroleum Service Stations Installations under the Pollution Prevention and Control regulations 1999, there are no new or existing petrol stations in the Kennet district with a throughput of over 2000 m³ per annum.

3.9 Assessment of benzene – G) Major fuel storage depots

3.9.1 There are no new major fuel storage depots located within or close to the Kennet district and its boundaries.

3.10 Conclusion

3.10.1 In light of the information set out in this chapter of the Updating and Screening Assessment for the Kennet district, it is considered that there have been no significant changes with regard to benzene emissions within the authority since the matter was last assessed and as such **a detailed Assessment for benzene will not be required.**

CHAPTER 4: Updating and Screening Assessment of 1,3-butadiene

4.1 Introduction

4.1.1 A maximum running annual mean concentration of 2.25 g/m^3 has been set as an air quality standard for 1,3-butadiene. The objective was for the standard to be achieved by the end of 2003.

4.2 Assessment of 1,3-butadiene – background concentrations

4.2.1 The estimated annual mean background concentrations of 1,3-butadiene for the Kennet district were stated in chapter 4.4.2 of the 2003 USA for the Kennet district at a concentration of $0.07 \text{ }\mu\text{g/m}^3$.

4.3 Assessment of 1,3-butadiene – A) Monitoring data

4.3.1 This authority is currently not monitoring for levels of 1,3-butadiene.

4.4 Assessment of 1,3-butadiene – B) Industrial sources

4.4.1 No new industrial sources likely to emit 1,3 butadiene or existing sources with increased emissions of the species have been identified within or near to the boundaries of the Kennet district.

4.5 Conclusion

4.5.1 In light of the information set out in this chapter of the Updating and Screening Assessment for the Kennet district, it is considered that there have been no significant changes with regard to 1,3 butadiene emissions in this authority since the matter was last assessed. As such, **this assessment concludes that a Detailed Assessment for 1,3-butadiene is not required**

CHAPTER 5: Updating and Screening Assessment of lead

5.1 Introduction

5.1.1 An annual mean concentration of $0.5 \mu\text{g}/\text{m}^3$ has been adopted as the air quality standard for lead, with an objective for this to be achieved by the end of 2004. A lower objective of $0.25 \mu\text{g}/\text{m}^3$ to be achieved by the end of 2008 has also been set.

5.2 Assessment of lead – A) Monitoring data

5.2.1 Kennet District Council has no monitoring for levels of lead within the district.

5.3 Assessment of lead – B) Industrial sources

5.3.1 This criterion was fully assessed during the previous Updating and Screening Assessment submitted in 2003. At that time it was concluded that no sources were identified as potentially significant for the emissions of lead in the Kennet district.

5.3.2 No new industrial sources likely to give rise to an exceedence of the annual mean objective for lead have been introduced to the Kennet district. Equally, new existing sources with increased emissions within or near to the boundary of the district have been identified.

5.4 Conclusion

5.4.1 With regard to the information set out in this chapter of the Updating and Screening Assessment for the Kennet district, it is considered that there have been no significant changes with regard to lead emissions in the Kennet district since the matter was last assessed and that **a Detailed Assessment for lead will not be required.**

CHAPTER 6: Updating and Screening Assessment of nitrogen dioxide

6.1 Introduction

- 6.1.1 Two air quality objectives have been adopted for nitrogen dioxide, an annual mean concentration of $40 \mu\text{g}/\text{m}^3$ and a 1-hour mean concentration of $200 \mu\text{g}/\text{m}^3$, not to be exceeded more than 18 times per year. The objectives are to be achieved by the end of 2005.
- 6.1.2 The first European 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 $200 \mu\text{g}/\text{m}^3$, not to be exceeded more than 18 times a year, and an annual mean limit value of $40 \mu\text{g}/\text{m}^3$, both to be achieved by the 1st Jan 2010.

6.2 Assessment of nitrogen dioxide – background concentrations

- 6.2.1 The estimated annual mean background concentrations of nitrogen dioxide for 2005 and 2010 for the Kennet district are shown in figs 6.1 and 6.2. The maps have been drawn using the raw background data for the Kennet district provided on the ‘local air quality management’ pages of the www.airquality.co.uk website.
- 6.2.2 The estimated annual average mean background concentration of NO_2 for the Kennet district, taken from this map does not require correction. **Hence the predicted background level for the Kennet district in 2005 is $7.5 \mu\text{g}/\text{m}^3$ and the predicted background level for the Kennet district in 2010 is $6.16 \mu\text{g}/\text{m}^3$.**

6.3 Assessment of nitrogen dioxide – A) Monitoring data outside an AQMA

- 6.3.1 The revised checklist approach for assessment of nitrogen dioxide requires the initial collation of all monitoring data for the Kennet district. Previous Air Quality reports have summarised historical monitoring data, including comment regarding tube site locations and projections for future concentrations based on pre-2005 monitoring. A summary of this work is presented in Appendix 2 to this report.
- 6.3.2 As such, this section will only consider data collected since the 2005 Progress report was published for interpretation and assessment as part of this review.
- 6.3.3 Since the publication of the 2005 progress report, Kennet District Council have slightly expanded the nitrogen dioxide monitoring in the district to include the following sites:
- Devizes Avon Road – new background site included on periphery of the town.
 - Devizes Castle – new urban centre site, a short distance from busy market place.
 - Easterton – new rural background site located in garden of resident.
 - Erlestoke – new rural background site located on church adjacent to quiet road
 - Devizes London Road – kerbside site adjacent to busy route into the town. Site replaces Devizes Town Hall site.

- Seend – rural kerbside site adjacent to busy A361 Devizes to Trowbridge road. Replaces Collingbourne Ducis site.
- 6.3.4 The first stage in the ratification of the data obtained from the 25 monitoring sites employed is to adjust for laboratory bias by using the spreadsheet obtained from the UWE helpdesk website at:
<http://www.uwe.ac.uk/aqm/review/diffusiontube310306.xls>. By inserting the fact that we use tubes prepared and analysed by Lambeth scientific services who use a 50% TEA in acetone method, an **overall adjustment factor for data obtained in 2005 of 1.13** is obtained from the spreadsheet.
- 6.3.5 Thus, Table 6.1 below reports both the measured annual mean concentrations at each of the sites for 2005 and the levels following adjustment for laboratory bias.
- 6.3.6 Table 6.1 also shows the projected NO₂ levels for 2010 obtained by using the year adjustment calculator (version 2.2a) available from www.airquality.co.uk/archive/laqm/tools.php. Projection to 2010 was selected as it is the deadline for a UK air quality objective and as the adjustment calculator allows for a distinction between site types, projections are made based upon the site designation for each monitoring location, either background or roadside.

Table 6.1 Nitrogen dioxide monitoring data

Site Location	Site Type	2005 mean NO ₂ level (measured)	Adjusted 2005 NO ₂ level	Projected 2010 NO ₂ level
Devizes Avon Road	Background	16	18	16
Devizes Castle	Background	16	18	16
Easterton	Background	14	16	14
Erlestoke	Background	13	15	13
Potterne	Kerbside	20	22	19
Pewsey Chapel	Background	14	16	14
Devizes Police	Roadside	21	24	20
Devizes Windsor Drive	Roadside	19	21	18
Devizes Brickley la. Church	Background	13	15	13
Devizes Wansdyke School	Background	13	14	12
Devizes London Road	Kerbside	19	22	19
Devizes Market Place	Kerbside	15	17	15
Marlborough Heard Street	Roadside	26	29	24
Devizes Wadworths	Roadside	23	26	22
Ludgershall Castle	Background	13	15	13
Seend – the Bell	Kerbside	15	16	14
Avebury School	Background	12	14	12
Shanes Castle	Roadside	33	37	31
Devizes Roses	Roadside	33	37	31
Marlborough High Street	Roadside	22	25	21
Marlborough St Peters	Roadside	22	25	21
Marlborough Leisure Centre	Background	13	14	12
Devizes Hillworth Road	Roadside	28	31	26
Urchfont	Background	14	16	14
All Cannings	Background	13	15	13

all levels reported are in $\mu\text{g}/\text{m}^3$

6.3.7 It is clear that no adjusted annual mean concentrations for 2005 at any of the monitoring locations has exceeded the Air Quality Objectives for the end of 2005 or that any projected levels are likely to exceed the 2010 limits set by the first Air Quality Daughter Directive.

6.3.8 As such further assessment of this monitoring data outside an AQMA is not considered necessary.

6.4 Assessment of nitrogen dioxide – B) Monitoring Data within an AQMA

6.4.1 Kennet District Council did not declare an Air Quality Management Area as a result of round one of the Local Air Quality Management procedure. This section of the checklist does therefore not apply to this report.

6.5 Assessment of nitrogen dioxide – C) Narrow congested streets with residential properties close to the kerb

6.5.1 Stage Two of the first round of review and assessment of air quality carried out by this authority specifically included three locations where it was considered that the combination of a high traffic flow level and close proximity of property may combine to lead to exceedences of the objectives.

6.5.2 The sites chosen for assessment were considered to have relevant exposure for significant groups at the nearest point to the road. The DMRB screening model was then applied and the predicted levels for NO₂ in 2005 reported.

6.5.3 For each site, the assessment concluded that the annual mean Air Quality Objective of 40 µg/m³ to be achieved by the end of 2005 would be met.

6.6.4 Additionally, during the USA for the Kennet district submitted in May 2003 it was checked to establish whether any significant changes in traffic flow had taken place since the first round was completed at these locations. None were discovered and no reassessment was required. As such, it is considered that there is no need for further assessment of this criterion.

6.7 Assessment of nitrogen dioxide – D) Junctions

6.7.1 Busy junctions were assessed during the previous USA submitted for the Kennet district in 2003 and none were considered to have a relevant exposure. No new junctions meeting the criteria have been established since this review. As such, there is no need for further assessment of this criterion.

6.8 Assessment of nitrogen dioxide – E) Busy streets where people may spend 1-hour or more close to traffic

6.8.1 This type of location was considered during the last USA submitted for the Kennet district and further investigation was not considered necessary.

6.9 Assessment of nitrogen dioxide – F) Roads with high flows of buses and/or HGV's

6.9.1 This type of location was considered during the last USA submitted for the Kennet district and further investigation was not considered necessary.

6.10 Assessment of nitrogen dioxide – G) New roads constructed or proposed since the first round of review and assessment

6.10.1 No roads meeting these criteria have been constructed or have been proposed since the last USA was submitted.

6.11 Assessment of nitrogen dioxide – H) Roads with significantly changed traffic flows or new relevant exposure

6.11.1 Appendix 1 sets out the traffic flow data for monitoring points within the Kennet district as reported by Wiltshire County Council. It is clear that there are no roads which have had an increase in traffic flow of 25% since the last USA for the Kennet district was published in May 2003. Equally, no new exposure to existing roads has been identified. As such, no further investigation is required.

6.12 Assessment of nitrogen dioxide – I) Bus Stations

6.12.1 There are no bus stations located within the Kennet district. Devizes marketplace and Marlborough High Street are the stopping points for buses to and from Bath and Swindon as well as local buses but the number of bus movements a day is significantly lower than the 1000 threshold stated in Box 6.2 of the revised checklist.

6.13 Assessment of nitrogen dioxide – J) New industrial sources

6.13.1 No significant new industrial sources have been located in the Kennet district since the submission of the 2003 USA.

6.14 Assessment of nitrogen dioxide – K) Industrial sources with substantially increased emissions

6.14.1 No local industrial sources of nitrogen dioxide were identified during the first round of the review and assessment process within the Kennet district.

6.14.2 However, Lafarge Cement plant in Westbury, located approximately 6km from the border of the Kennet district has varied a process at the plant and now burns waste tyres as a fuel within the main cement kiln and is considering further changes to the fuel stock of the process. Considerable local concern has been expressed with regard to the impact of this process upon local air quality.

6.14.3 The potential impact of further changes to this process has been discussed in previous air quality reports submitted by Kennet District Council. There has been no change to the situation with regard to the fuel make up at the process since the 2005 progress report was submitted and as such this matter will not be considered any further in this Updating and Screening Assessment.

6.15 Assessment of nitrogen dioxide – L) Aircraft

6.15.1 As there are no airports within the or near to the boundary of the Kennet district, no further investigation of this criterion is required.

6.16 Conclusion

6.16.1 With regard to the information set out in this chapter of the Updating and Screening Assessment for the Kennet district, considering the 13 criteria set out in Box 6.2 of the Technical Guidance, it is considered that **a detailed assessment for nitrogen dioxide is not required.**

6.16.2 However, should a negative impact upon the local air quality be suggested as a result of changes to the fuel at a process located in a neighbouring district council area then this will be addressed as part of the next stage of the ongoing process of Local Air Quality Management.

Fig 6.1 – page to be removed an ades map inserted

Fig 6.2 – page to be replaced by Adrians map

CHAPTER 7: Updating and Screening Assessment of sulphur dioxide

7.1 Introduction

- 7.1.1 A maximum 15-minute mean of 266 $\mu\text{g}/\text{m}^3$ has been adopted as an air quality standard for the UK for sulphur dioxide, with an objective for the standard not to be exceeded more than 35 times by the end of 2005.
- 7.1.2 Additional objectives have also been set which are equivalent to the EU limit values specified in the First Air Quality Daughter Directive. These are for a 1-hour mean objective of 350 $\mu\text{g}/\text{m}^3$, to be exceeded no more than 24 times a year and a 24-hour objective of 125 $\mu\text{g}/\text{m}^3$, to be exceeded no more than 3 times a year, to be achieved by the end of 2004.

7.2 Assessment of sulphur dioxide – background concentrations

- 7.2.1 The estimated annual mean background concentration for sulphur dioxide for 2005 for the Kennet district was calculated in the 2003 USA, chapter 7.2.3. This data was compiled using the raw background data for the Kennet district provided on the 'local air quality management' pages of the www.airquality.co.uk website and corrected to produce **the estimated annual average mean background concentration of sulphur dioxide for the Kennet district for 2005 is 1.65 $\mu\text{g}/\text{m}^3$.**

7.3 Assessment of sulphur dioxide – A) & B) Monitoring data

- 7.3.1 This authority is currently monitoring for levels of SO_2 at 5 sites in the south west of the district. The monitoring programme is linked to a proposed change to an industrial process in a neighbouring district. However, the survey employs diffusion tubes and the revised USA checklist states that diffusion tube data should not be included. As such, there is no relevant data to report in this section of the Updating and Screening Assessment.

7.4 Assessment of sulphur dioxide – C) New Industrial Sources

- 7.4.1 No new industrial sources of SO_2 have been identified within or near to the Kennet district boundary.

7.5 Assessment of sulphur dioxide – D) Industrial Sources with substantially increased emissions

- 7.5.1 No industrial sources with substantially increased emissions have been identified within or near to the Kennet district boundary,

7.6 Assessment of sulphur dioxide – E) Areas of domestic coal burning

- 7.6.1 This was examined in the 2003 USA with the conclusion that the Kennet district is not considered to have any areas where significant coal burning is taking place. The county of Wiltshire contains no coal reserves and the major conurbations of

the Kennet district are well served by gas supplies. There has been no change in this position.

7.7 Assessment of sulphur dioxide – F) Small boilers >5MW

7.7.1 There have been no new small boilers within this authority since the last USA was undertaken.

7.8 Assessment of sulphur dioxide - G) Shipping

7.8.1 There are no local sources of shipping emissions.

7.9 Assessment of sulphur dioxide – H) Railway Locomotives

7.9.1 This was examined in the 2003 USA and was not considered to be a relevant source of SO₂ within the Kennet district. There has been no change in rail services or exposure since the publication of this document.

7.10 Conclusion

7.10.1 There have been no significant changes with regards to SO₂ emissions in this authority and it is considered that **a Detailed Assessment for sulphur dioxide is not required.**

CHAPTER 8: Updating and Screening Assessment for PM₁₀

8.1 Introduction

8.1.1 Two Air Quality Objectives for fine particles (PM₁₀) have been adopted for the UK. The objectives are 40 µg/m³ as the annual mean and 50 µg/m³ as the fixed 24-hour mean to be exceeded on no more than 35 days per year, to be achieved by the end of 2004. The objectives are based upon measurements carried out using the European gravimetric transfer reference sampler or equivalent.

8.2 Assessment for PM₁₀ – background concentrations

8.2.1 The estimated annual mean background PM₁₀ concentrations for 2005 and 2010 for the Kennet district are shown in fig 8.1 & 8.2 respectively. The maps have been compiled using the raw background data for the Kennet district provided on the ‘local air quality management’ pages of the www.airquality.co.uk website.

8.2.2 **The estimated annual average mean background concentration for PM₁₀ for the Kennet district for 2005 is 17.18 µg/m³ and for 2010 is 15.87 µg/m³.** All concentrations are expressed as gravimetric.

8.3 Assessment for PM₁₀ – A) Monitoring data outside an AQMA

8.3.1 Kennet district council operate an Osiris Environmental Dust Monitor, manufactured by Turnkey Instruments Ltd. The device uses a light scattering technique to determine the concentration of airborne dust in the particle size range from 0.5 microns (µm) diameter to 15 microns.

8.3.2 The equipment has been fitted with a PM₁₀ impactor head and all results are expressed as micrograms per cubic meter (µg/m³), with a resolution to 0.1 micrograms. Results are obtained by downloading the results to a laptop computer. The results are then processed using Turnkey ‘AirQ’ software.

8.3.3 However, problems continue to be experienced with the monitoring equipment operated by Kennet District Council which has failed to produce a rate of collection of data above the recommended 75% for use in an updating and screening assessment, as set out in Annex 1 of the technical guidance.

8.3.4 It is therefore considered that the monitoring carried out in Devizes has not met with the Quality Assessment standards set as suitable for further assessment as described in paragraphs 8.23 – 8.29 of the technical guidance.

8.4 Assessment for PM₁₀ – B) Monitoring data within an AQMA.

8.4.1 Kennet District Council has not declared an AQMA as a result of previous assessments of air quality.

8.5 Assessment for PM₁₀ - D) Junctions

- 8.5.1 One busy junction was identified in the 2003 USA as meeting the criteria for relevant exposure. The report concluded that whilst a possible relevant location for exposure to PM₁₀ within the Kennet district existed, previous work has indicated that the risk of exceeding the air quality standards to be minimal, even when a worst case scenario is applied with regard to traffic growth factors, average vehicle speeds and background levels.
- 8.5.2 There has been no change to this situation since the 2003 USA was submitted and no further assessment is required.

8.6 Assessment for PM₁₀ – E) Roads with high flows of buses and/or HGV's

- 8.6.1 There are not considered to be any roads within the Kennet district with an unusually high proportion of heavy-duty vehicle movements (greater than 20% of AADT flow).
- 8.6.2 As such, no further investigation of these criteria of road is required in this report.

8.7 Assessment for PM₁₀ - F) New roads constructed or proposed since the last round of review and assessment

- 8.7.1 No new significant roads have been proposed or constructed within the Kennet district since the last round of review and assessment of air quality.

8.8 Assessment for PM₁₀ - G) Roads with significantly changed traffic flows or new relevant exposure

- 8.8.1 Appendix 1 sets out the traffic flow data for monitoring points within the Kennet district as reported by Wiltshire County Council. It is clear that there are no roads which have had an increase of 25% since the last USA for the Kennet district was published in May 2003. As such, no further investigation is required.

8.9 Assessment for PM₁₀ – H) Roads close to the objective during the second round of Review and Assessment

- 8.9.1 No locations were identified in the last USA submitted for the Kennet district, where results were close to but just below the objectives.

8.10 Assessment for PM₁₀- I) New industrial sources

- 8.10.1 No significant new industrial sources of PM₁₀ have located in the Kennet district since the last round of the review and assessment process.

8.11 Assessment for PM₁₀- J) Industrial sources with substantially increased emissions, or new relevant exposure

8.11.1 No industrial processes within or near to the boundaries of the Kennet district have a substantially increase level of PM₁₀ emissions since the last USA was submitted. Equally no new relevant exposure locations are considered to have been established.

8.12 Assessment for PM₁₀- K) Areas of domestic solid fuel burning

8.12.1 This matter was examined in the 2003 USA and no areas of significant solid fuel burning were identified. There has been no change in this position.

8.13 Assessment for PM₁₀- L) Quarries / landfill sites / opencast coal / handling of dusty cargoes at ports etc

8.13.1 This subject was assessed in the previous Updating and Screening Assessment for the Kennet district and although one fugitive source of dust was identified (Army training on Salisbury Plain) it was not considered to be relevant. This situation has not changed since the submission of the 2003 report.

8.14 Assessment for PM₁₀- M) Aircraft

8.14.1 As there are no airports within the Kennet district or near to the district boundaries, no further investigation of this criterion is required.

8.15 Assessment for PM₁₀- Conclusion

8.8.2 With regard to the information set out in this chapter of the Updating and Screening Assessment for the air quality within the Kennet district it is considered that there have been no significant changes with regard to PM₁₀ emissions in this authority and that **a Detailed Assessment for PM₁₀ is not required.**

Fig 8..1 – Ades map to go in here

Fig 8.2 – Ades map to go in here

CHAPTER 9: Conclusions to the Updating and Screening Assessment for the Kennet district

- 9.1 The Updating and Screening Assessment for the Kennet district has reviewed each of the 7 pollutants by a process set out in the Defra Technical Guidance document LAQM.TG (03). **Each pollutant has been systematically assessed and in every case it has been concluded that a detailed assessment is not required for the Kennet district.**
- 9.2 However, as has been set out in chapters 6 & 7, a process operating in a neighbouring authority is considering altering its fuel mixture.
- 9.3 At the time of the compilation of this report, we are still waiting for confirmation of the proposals which will then need to be cleared by the authorising authority, the Environment Agency; they will then require the consideration of the impact of emissions from the process in question upon the local air quality as part of the application.
- 9.4 It is proposed that the situation continue to be monitored and addressed through the vehicle of the Local Air Quality Management reporting process with the next stage, an Air Quality Progress report due to be submitted at the end of April 2007.

Appendix 1 – Traffic Data for sites in the Kennet district (03 to date)

Road	Site Location	2003	2004	2005	% change since 2003
A342	Upavon Down	2825	2859	2876	1.8
A338	North of Tidworth	6710	6783	6495	-3.2
A338	South of Burbage	7684	7854	7640	-0.6
A346	South of Cadley	8601	8642	8205	-4.6
A4	Savernake Forest	7212	6935	6967	-3.4
A345	North of Pewsey	4303	4727	4172	-3.1
A338	Shalbourne Down	3444	3639	3471	0.8
B3087	Milton Lilbourne	3148	3202	3093	-1.7
A346	North of Marlborough	14941	14173	14305	-4.3
B4192	North West of Aldbourne	2915	2901	2962	1.6
A4361	Winterbourne Monkton	6578	6501	6412	-2.5
A4	West Kennett	8622	8380	8428	-2.3
A361	West of Beckhampton Roundabout	8267	8121	8230	-0.5
A342	Lydeaway Devizes	6221	7186	6564	5.5
B3098	Market Lavington	2924	3769	2771	-5.2
A360	Gore Cross	5096	4847	5001	-1.9
B3098	West of Erlestoke	2967	2995	2845	-4.1
A361	Seend Fork	11687	11927	11881	1.7
A361	New Park Street, Devizes	17710	18331	18495	4.4

all data provided by Wiltshire County Council Transport Planning Team

Appendix 2 – Summary of historical monitoring data**Summary of historical nitrogen dioxide monitoring results (adjusted for laboratory bias) – Kennet District Council**

Kennet District Council												
Nitrogen dioxide Survey - Annual Average Levels												
Site	Site Type	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Devizes Police Station	Roadside	31	31	34	26	30	33	23	27	29	29	28
Devizes Health Centre	Urban Centre	20	16	24	21	19	16	18	20	24	-	-
Brickley Church, Devizes	Urban B'ground	14	14	18	20	14	16	13	21	20	19	18
Wansdyke School	Suburban	12	11	16	15	12	11	11	14	14	12	17
Devizes Market Place	Urban Centre	-	-	-	21	22	22	19	22	25	21	20
Devizes Wadworths	Roadside	-	-	-	31	32	27	23	33	30	31	26
Devizes Roses	Roadside	-	-	-	45	50	53	38	41	38	40	38
Devizes St.Peters School	Roadside	-	-	-	-	-	26	22	24	26	16	-
Shanes Castle, Devizes	Kerbside	-	-	-	-	-	-	-	-	-	47	36
Devizes Town Hall	Roadside	-	-	-	-	-	-	-	-	24	30	23
Devizes Hillworth Road	Roadside	-	-	-	-	-	-	-	-	23	30	31
Windsor Drive, Devizes	Roadside	-	-	-	-	-	-	-	-	-	22	23
Pewsey Police	Urban Centre	26	20	27	25	20	21	19	22	23	-	-
Potterne School	Roadside	23	19	24	25	19	20	21	22	17	16	15
Ludgershall	Urban B'ground	17	15	22	20	11	14	15	17	16	16	16
Collingbourne Ducis	Roadside	19	15	21	20	11	14	13	16	20	18	20
Avebury School	Urban B'ground	16	11	14	17	7	12	10	13	14	14	16
Pewsey Church	Urban Centre	16	15	19	17	11	15	15	16	17	13	16
Marlborough Church	Roadside	38	32	37	34	33	35	42	35	30	33	30
Marlborough High St.	Roadside	-	-	-	-	26	31	25	35	34	33	35
Marlborough Leisure C.	Urban B'ground	-	-	-	-	-	-	11	16	19	14	18
Marlborough Heard St.	Kerbside	-	-	-	-	-	38	33	33	34	34	34

all data quoted in $\mu\text{g}/\text{m}^3$

Predicted nitrogen dioxide monitoring data to 2005 and 2010 for all Kennet district monitoring locations (for data from 2003 and 2004)
(all data quoted in $\mu\text{g}/\text{m}^3$)

Site	Ratified 2003 level	Predicted 2005 level	Predicted 2010 level	Ratified 2004 level	Predicted 2005 level	Predicted 2010 level
Devizes Police Station	29	27	23	28	27	22
Brickley Church, Devizes	19	18	15	18	18	14
Wansdyke School, Devizes	12	11	9	17	17	14
Devizes Market Place	21	20	16	20	20	16
Devizes Wadworths	31	29	24	26	25	21
Devizes Roses	40	38	31	38	37	30
Shanes Castle, Devizes	47	45	37	36	35	29
Devizes Town Hall	30	28	23	23	22	18
Devizes Hillworth Road	30	28	23	31	30	25
Windsor Drive, Devizes	22	21	17	23	22	18
Potterne School	16	15	12	15	15	12
Ludgershall	16	15	12	16	16	13
Collingbourne Ducis	18	17	14	20	20	16
Avebury School	14	13	11	16	16	13
Pewsey Church	13	12	10	16	16	13
Marlborough Church	33	31	26	30	29	24
Marlborough High St.	33	31	26	35	34	28
Marlborough Leisure Centre	14	13	11	18	18	14
Marlborough Heard St.	34	32	27	34	33	27

Summary of nitrogen dioxide tube monitoring locations

- Devizes Police Station – Roadside site, adjacent to the busy New Park Street and one of the 5 KDC sites reported to netcen as part of the UK wide survey and considered as a worst case site in previous air quality assessments.
- Devizes Health Centre – urban centre, no longer in use.
- Brickley Church, Devizes – background site located within housing estate. Results reported to netcen.
- Wansdyke School, Devizes – suburban school. Part of netcen survey.
- Devizes Market Place – urban centre, popular and busy shopping area, home to twice-weekly markets and occasional Farmers and French markets. The Market place is also used for car parking when no market is taking place. Relevant location for public exposure.
- Devizes Wadworths – Roadside site at roundabout at edge of town centre.
- Devizes Roses – Roadside, originally collocated with real time analyser (now defunct) but beside pedestrian crossing at edge of town shopping area.
- Devizes St Peters School – Roadside school, site no longer in use.
- Shanes Castle, Devizes – Kerbside property, between two main roads, opposite St Peters School and undergoing renovation as a domestic premises. Site considered as a worst case scenario for potential future relevant exposure.
- Devizes Town Hall – A new roadside site located in an area, which is part of proposed traffic reduction scheme for Devizes.
- Devizes Hillworth Road – A new roadside site, within scheme mentioned above.
- Windsor Drive, Devizes – New roadside site, adjacent to new cross-town route and close to a proposed housing development.
- Pewsey Police – Urban centre, village location beside busy through road. Site no longer in use.
- Potterne School – Roadside primary school on tight bend and steep hill.
- Ludgershall – Urban background site, village crossed by ‘A’ road.
- Collingbourne Ducis – Roadside school location beside ‘A’ road and slight slope to road.
- Avebury School – Urban background, school situated away from ‘A’ road.
- Pewsey Church – Urban Centre, village location beside busy road, which bisects village.

- Marlborough Church – Roadside site adjacent to busy A4 which runs through the town centre. Located at western end of the town.
- Marlborough High Street – as above, but in centre of the high street
- Marlborough Leisure Centre – Urban background site, reported to netcen.
- Marlborough Heard Street – Kerbside site adjacent to busy road. Worst case scenario for housing in Marlborough as domestic residences immediately adjacent to the road at a maximum distance of 5 meters from the kerb.

GLOSSARY OF TERMS AND ABBREVIATIONS

<u>Term</u>	-	<u>Description</u>
AADT	-	Annual average daily traffic flow
AQMA	-	Air Quality Management Area
AQS	-	Air Quality Strategy
Chemiluminescence	-	The emission of absorbed energy as light during a chemical reaction. The measurement of the light emitted can give a measure of the concentration of one of the reactants if the other one is known.
CO	-	Carbon Monoxide – a gaseous pollutant formed during incomplete combustion of carbonaceous fuel.
(grav.)	-	Gravimetric method of weighing particulate matter on a filter
m ³	-	Unit of volume cubic metre = 1000 litre
mg/m ³	-	Milligrams per cubic metre
NO	-	Nitric Oxide
NO ₂	-	Nitrogen Dioxide
NO _x	-	Oxides of Nitrogen
PM ₁₀	-	Particulate matter <10µm aerodynamic diameter
SO ₂	-	Sulphur Dioxide
µg	-	Microgram millionth (10 ⁻⁶) of a gram
µg/m ³	-	Micrograms per cubic metre – a unit of concentrations (1 millionth of a gram of pollutant per cubic meter of air)
Kerbside	-	A site sampling within 1m of the edge of a busy road.
Roadside	-	A site sampling within 1 – 5m of a busy road.
Urban background	-	An urban location distanced from sources and therefore broadly representative of city-wide background conditions, e.g. urban residential areas.