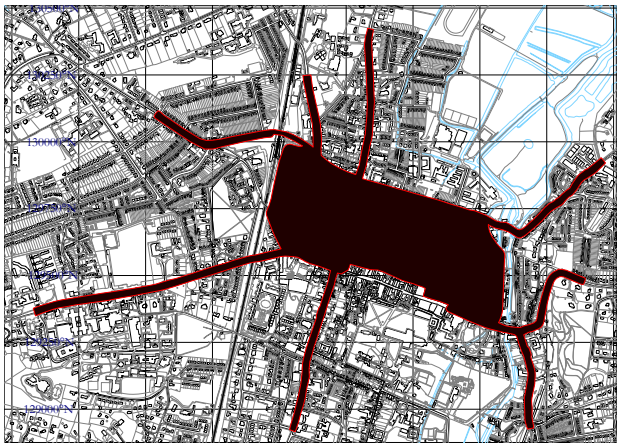
Winchester City Council

AIR QUALITY REVIEW OF WINCHESTER CITY COUNCIL'S DISTRICT



UPDATING AND SCREENING ASSESSMENT 2003

Report for the Department of Environment Food and Rural Affairs (DEFRA)

Compiled in accordance with technical guidance note LAQM TG(3)

SUMMARY

This report has been compiled in accordance with statutory duties under Part IV of the Environment Act 1995 and the Air Quality (England) Regulations 2000 (as amended). It is a reassessment of air quality within Winchester's district to gauge compliance with the standards set within these Regulations. The assessment has been performed in accordance with the new DEFRA technical guidance document LAQM TG(03).

The main air quality issue is within Winchester town centre for the pollutants nitrogen dioxide and particles. This is already the subject of an ongoing detailed assessment and an Air Quality Management Area (AQMA) is currently being proposed.

The review has also highlighted the possibility of non-compliance with the 15-minute sulphur dioxide standard in close proximity to the Watercress line, which runs a combination of diesel and steam trains between Alresford and Alton. This will require a detailed assessment that will need to be submitted to DEFRA by April 2004.

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1.0 INTRODUCTION

Since the implementation of Part IV of the Environment Act 1995 all local authorities have been under a duty to review air quality within their district. The current standards that have to be met are prescribed under the Air Quality (England) Regulations 2000 (as amended). It is a requirement that each local authority conducts a formal staged review of air quality within its district in accordance with a comprehensive set of guidance documents. These reports are then sent to the Department of Environment, Food and Rural Affairs (DEFRA) for approval.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25μg/m^3	Running annual mean	31.12.2003
	5.00μg/m^3	Annual mean	31.12.2010
1,3-butadiene	2.25μg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10.0mg/m^3	Maximum daily running 8 hour mean	31.12.2003
Lead	0.5μg/m^3	Annual mean	31.12.2004
	0.25μg/m^3	Annual mean	31.12.2008
Nitrogen dioxide (Provisional)	200μg/m^3 not to be exceeded more than 18 times a year	1 Hour mean	31.12.2005
	40μg/m^3	Annual mean	31.12.2005
Particles (PM10) (Gravimetric)	50μg/m^3 not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
	40μg/m^3	Annual mean	31.12.2004
	50μg/m^3 not to be exceeded more than 7 times a year[1]	24 hour mean	31.12.2010
	20μg/m^3 [1]	Annual mean	31.12.2010
Sulphur dioxide	350μg/m^3 not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125μg/m^3 not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266μg/m^3 not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1. ***New objectives not currently within regulations but guidance recommends inclusion in an assessment***

Table 1 – Current Air Quality Standards for England set within Regulations for the purpose of Local Air Quality Management

The Regulations include a set of air quality standards with different compliance dates between 2003 and 2010. Where it is predicted that air quality is unlikely to meet these standards then an Air Quality Management Area (AQMA) needs to be declared to implement additional measures to try and achieve such compliance. Current air quality standards, which are required to be assessed as part of this Local Air Quality Management (LAQM) regime, are shown in Table 1 above.

To date the following reports have been issued regarding air quality:

- ***Winchester City Council Stage 1 Review*** – Concluded that only three pollutants needed further assessment, these being Carbon monoxide (CO), Nitrogen dioxide (NO_2) and Particles (PM_{10}'s).

- ***Winchester City Council Stage 2/3 Review*** – Concluded that CO, NO_2, and PM_{10} levels would comply with relevant standards. However, DEFRA required further assessment for Nitrogen dioxide levels at houses close to main roads within the town centre.

- ***Winchester City Council Air Quality Review and Assessment (Additional Assessment of Nitrogen dioxide levels within Winchester Town Centre) -*** This report was in response to DEFRA's comments. It concluded that there were a small number of properties close to busy city centre roads that could have levels higher than the background site and that dispersion modelling should be performed to investigate these locations further. DEFRA rejected this conclusion advising that we should declare an AQMA and then perform this dispersion modelling.

New guidance on the assessment of air quality with regards to these standards has been issued this year by DEFRA. The most important document being Technical Guidance LAQM TG(03), which provides comprehensive guidance on performing such an assessment. In accordance with this guidance a re-review of the initial assessments has to be made in light of this document. In the old guidance this assessment was broken down into three increasingly detailed stages 1 to 3. The new guidance now breaks this process down into two stages called the Updating and Screening Assessment (USA) and the Detailed Assessment. This report's objective is to fulfil the duty to conduct this initial reassessment or USA.

This report has been designed to give a concise summary of the work performed in conducting this USA. For those that require the full technical data this is included on an accompanying CD. Throughout this report technical data is referenced to relevant folders on the CD. By default this report is issued without the CD, if you require a copy then please contact Phil Tidridge on 01962 840222 ext. 2519 or E-mail ptidridge@winchester.gov.uk.

2.0 CARBON MONOXIDE

USA FOR CARBON MONOXIDE		
	COMMENT	**CD REF**
PREVIOUS ASSESSMENT	Stage 2/3 assessment conducted during last assessment. It concluded that compliance with the standard at that time (11.6μg/m^3 8 hour running mean by 2005) would be achieved across the District.	*Air Quality Reports/Stage2-3Report/WinchesterCity CouncilStage2&3Assessment.*
MONITORING DATA AVAILABLE	Two real time monitoring sites located within Winchester Town centre. No failures of standard ever recorded at either the roadside or background locations. For 2002 maximum 8 hour running mean was 5.3ppm (6.2mg/m^3) for the roadside location and 2.1 (2.4mg/m^3) for the background. Data collection efficiency was 81 percent at the roadside site and 93 percent at the background site.	*Results from Winchester Monitoring Stations.* Data contained in yearly Excel data files. Details of location/equipment specification and QC/QA. stored as Word documents
MODELLING DATA AVALABLE	2003 Carbon monoxide emissions were estimated for industrial sources as part of the CES Stage 3 Air Quality Review and Assessment (August 2000) using Aaquire model. No failures of the standard were predicted at such locations.	*Air Quality Reports/Stage2-3Report/CES Stage 3 Air Quality Assessment*
POTENTIAL SOURCES		
1.0 ROAD TRAFFIC	No single carriageway roads over trigger value of 80,000. No dual carriageway roads over trigger value of 120,000. No motorways over trigger value of 140,000.	*Other Data/HCC Traffic Data.* Data on all roads over 30,000.
2.0 DOMESTIC	N/A	
3.0 INDUSTRIAL	N/A	
4.0 OTHER	N/A	

CONCLUSION	No reason to change conclusion of initial assessment. Carbon monoxide levels considered already to be in compliance with new standard of 10.0mg/m^3	

3.0 BENZENE

USA FOR BENZENE		
	COMMENT	**CD REF**
PREVIOUS ASSESSMENT	Stage 1 assessment conducted during last assessment. It concluded that compliance with the only standard at that time (16.25μg/m^3 annual average by 2005) would be achieved across the District.	*Air Quality Reports/Stage 1 Report/WCC Stage 1 Air Quality Report*
MONITORING DATA AVAILABLE	Limited diffusion tube survey (4 locations) conducted for 1 year during 1999/2000 no bias study performed therefore of limited accuracy. Table A1.2 in Annex 1 (Monitoring) to TG(03) reports that diffusion tubes over read by approximately 30 percent compared with gas chromatography analysers, so results likely to be a worse case scenario. Highest average was found within Winchester town centre (City Road) at 6.3μg/m^3 (1.9ppb). Applying TG(03) correction factor for 2001 to 2010 predicted level in 2010 would be 4.1μg/$m^{3,}$ which is below the standard of 5μg/m^3 (1.5ppb). The other three locations were already below the 2010 standard of 5μg/m^3 (1.5ppb). All results below 2003 standard of 16.25μg/m^3 (5ppb). Portsmouth and Southampton AUN sites do not measure for Benzene.	*Diffusion Tube Data/Benzenedif /992000*
MODELLING DATA AVALABLE	2003 Benzene emissions were estimated for industrial sources as part of the CES Stage 3 Air Quality Review and Assessment (August 2000) using Aaquire model. No failures of the standard were predicted at such locations.	*Air Quality Reports/Stage2-3Report/CES Stage 3 Air Quality Assessment*
POTENTIAL SOURCES		
1.0 ROAD TRAFFIC	No single carriageway roads over trigger value of 80,000. No dual carriageway roads over trigger value of 120,000. No motorways over trigger value of 140,000.	*Other Data/HCC Traffic Data.* Data on all roads over 30,000.
2.0 DOMESTIC	N/A	

3.0 INDUSTRIAL	No industrial sources with significant benzene emissions. No Part A processes in, or near to, Winchester's District that are listed in Appendix E to Annex 2 (Estimating emissions) to TG(03). No new part A or B processes since last assessment.	*Other Data/EPA Authorised Processes*
4.0 OTHER	**Petrol Stations –** All petrol stations over 500m^3 annual throughput are authorised Part B processes. The only such service stations located on roads with a traffic flow greater than 30,000 are those associated with rest areas on motorways/dual carriageways. None of these have a relevant exposure within 10 meters of the pumps. **Major Fuel Storage Depots (Petrol Only)** – None in, or near, to Winchester's District.	*Other Data/EPA Authorised Processes*
CONCLUSION	No reason to change conclusion of initial assessment. Benzene levels considered to be in compliance with 2003 objective target. Compliance with the tighter 2010 standard should also be achieved by the deadline.	

4.0 1,3-BUTADIENE

USA FOR 1,3-BUTADIENE		
	COMMENT	**CD REF**
PREVIOUS ASSESSMENT	Stage 1 assessment conducted during last assessment. It concluded that compliance with the standard (deadline was 2005) would be achieved across the District	*Air Quality Reports/Stage 1 Report/WCC Stage 1 Air Quality Report*
MONITORING DATA AVAILABLE	No local data. Portsmouth and Southampton AUN sites do not measure for Butadiene.	
MODELLING DATA AVALABLE	2003 Butadiene emissions were estimated for industrial sources as part of the CES Stage 3 Air Quality Review and Assessment (August 2000) using Aaquire model. No failures of the standard were predicted at such locations.	*Air Quality Reports/Stage2-3Report/CES Stage 3 Air Quality Assessment*
POTENTIAL SOURCES		
1.0 ROAD TRAFFIC	N/A – Reduction by national measures on fuel control	
2.0 DOMESTIC	N/A	
3.0 INDUSTRIAL	No industrial sources with significant butadiene emissions. No Part A processes in, or near to, Winchester's District that are listed in Appendix E to Annex 2 (Estimating emissions) to TG(03). No new part A or B processes since last assessment.	*Other Data/EPA Authorised Processes*
4.0 OTHER	N/A	
CONCLUSION	No reason to change conclusion of initial assessment. 1,3-Butadiene levels considered to be in compliance with 2003 objective.	

5.0 LEAD

USA FOR LEAD		
	COMMENT	**CD REF**
PREVIOUS ASSESSMENT	Stage 1 assessment conducted during last assessment. It concluded that compliance with the only standard at that time (0.5μg/m^3 annual average by 2005) would be achieved across the District.	*Air Quality Reports/Stage 1 Report/WCC Stage 1 Air Quality Report*
MONITORING DATA AVAILABLE	No local data. Portsmouth and Southampton AUN sites do not measure for Lead.	
MODELLING DATA AVALABLE	2004 Lead emissions were estimated for industrial sources as part of the CES Stage 3 Air Quality Review and Assessment (August 2000) using Aaquire model. No failures of the standard were predicted at such locations.	*Air Quality Reports/Stage2-3Report/CES Stage 3 Air Quality Assessment*
POTENTIAL SOURCES		
1.0 ROAD TRAFFIC	N/A – Reduction by national measures on fuel control	
2.0 DOMESTIC	N/A	
3.0 INDUSTRIAL	No industrial sources with significant lead emissions. No Part A processes in, or near to, Winchester's District that are listed in Appendix E to Annex 2 (Estimating emissions) to TG(03). No new part A or B processes since last assessment.	*Other Data/EPA Authorised Processes*
4.0 OTHER	N/A	
CONCLUSION	No reason to change conclusion of initial assessment. Lead levels are considered to be in compliance with the 2004 objective and are expected to achieve the tighter 2008 standard.	

6.0 NITROGEN DIOXIDE

USA FOR NITROGEN DIOXIDE		
	COMMENT	**CD REF**
PREVIOUS ASSESSMENT	Stage 2/3 assessment conducted during last assessment. It concluded that compliance with the hourly and annual average 2005 standards would be achieved across the District. Conclusion rejected by DEFRA who considered additional assessment required adjacent to main town centre roads due to failures of nitrogen dioxide annual mean standard at roadside monitoring site. Background site in compliance with standard. Additional report submitted to DEFRA concluded such locations might exist and that additional modelling work would be performed to investigate this matter further. DEFRA of the view that an Air Quality Management Area (AQMA) should be declared with the modelling work forming part of the stage 4 assessment. Winchester City Council decided to perform modelling before assessing need for AQMA. Final draft of the Breeze based modelling exercise has now been received. Predicts failures to meet 2005 annual average standard at city centre locations.	*Air Quality Reports/Stage2-3Report/WinchesterCity CouncilStage2&3 Assessment.* *Air Quality Reports/Additional Stage 3 Report to DEFRA/DEFRAStage3additional* *Air Quality Reports/CasselleDispersionReport/WinchesterDraftv2*
MONITORING DATA AVAILABLE	**Real Time Monitoring** Two real time monitoring sites located within Winchester Town centre. Since commencement of monitoring in 1997 the roadside location (2.75 metres from Kerb) fails to meet the annual mean whilst the background location (18 metres from kerb) is in compliance. Data shows a downward trend. For 2002 the annual mean at the roadside was 47.0$\mu g/m^3$ (24.6ppb) and at the background 29.6$\mu g/m^3$ (15.5ppb). Data collection efficiency was 96.3 percent at the background site but only 77.4 percent at the roadside site. Since 1998 both sites have been in compliance with the 1-hour mean standard of 200$\mu g/m^3$ (105ppb).	*Results from Winchester Monitoring Stations.* Data contained in yearly Excel data files. Details of location/equipment specification and QC/QA stored as Word documents. For a summary of data see*:* *Air Quality Summaries 1997-2002*

	Diffusion Tube Monitoring There are two relevant data sets. The first set provides roadside data across the District of Winchester. This district wide study commenced in 1997 with some locations being added/altered as focus has changed from main roads to town centre locations. Data presented is uncorrected for tube bias. Several co-location studies have been performed the most recent of which was part of the Breeze modelling exercise (see below). This established a bias correction factor of 1.27. Using this correction factor the only failures of the annual average standard in 2002 was at City Road, which is within Winchester town centre and the proposed AQMA. All other sites including other town centres and major roads (M3 at Otterbourne and M27 at Whitely) are in compliance. The second data is for six months (2002/03) within Winchester town centre, which was performed as part of the validation exercise for the Breeze modelling (see below). These were located as far as possible at the curtilage of domestic premises nearest to relevant road exposures. Corrected for bias and converted into an annual average in accordance with LAQM TG(03) Box 6.5, these show non-compliance in 2005 at various town centre locations.	*Diffusion Tube Data/NO2DIF* *Diffusion Tube Data/NO2DIF/2002-03 City Study* *Air Quality Reports/Stage2-3Report/CES Stage 3 Air Quality Assessment. Page 12*
MODELLING DATA AVALABLE	2005 Nitrogen dioxide emissions were estimated for all sources as part of the CES Stage 3 Air Quality Review and Assessment (August 2000) using Aaquire model. Modelling results were obtained for both predicted annual average and the 99.8 percentile of hourly means. Significant traffic sources were modelled (including M27, M3, A303, A34) but model of limited accuracy for town centre locations which are strongly influenced by a conglomeration of smaller unmodelled roads. Maximum annual average predicted at relevant exposure locations adjacent main roads was 30$\mu g/m^3$ and the maximum 99.8 percentile of hourly means was 160$\mu g/m^3$. Cassella Stanger were commissioned to model levels of Nitrogen dioxide within Winchester town centre. A final draft report has now been received. This shows areas of likely non-compliance with the yearly objective.	*Air Quality Reports/Stage2-3Report/CES Stage 3 Air Quality Assessment* *Air Quality Reports/CassellaDispersionReport/WinchesterDraftv2*

POTENTIAL SOURCES		
1.0 ROAD TRAFFIC	**Narrow congested streets with residential properties close to the kerb.**	
	Winchester town centre has roads less than 10 metres wide with average speeds of less then 50 kph (30mph speed limits throughout) and greater than 10,000 vehicles/day (and has residential properties within 5 metres of the kerb). Although not initially assessed as part of the stage 2/3 assessment this matter was pursued by DEFRA due to the monitoring data submitted as part of the first review. A detailed assessment of the town centre was contained in an additional stage 3 report. This concluded that the town centre required further study, which has now been performed.	*Air Quality Reports/Additional Stage 3 Report to DEFRA*
	Based upon the detailed modelling and monitoring (detailed above) an AQMA is currently being recommended to address this matter.	*Air Quality Reports/Proposed AQMA*
	Busy Junctions	
	This is taken to be junctions of more than 10,000 vehicles per day. The only sites identified outside the town centre (already assessed above) are feeder roundabouts associated with the A34, M3 and M27, all of which have no relevant exposure locations within 20m.	
	Busy Streets	
	The main shopping area (High St) within Winchester city centre is pedestrianised there are only limited locations where it is feasible that a member of the public will spend an hour or more in close association with traffic.	
	Importantly roadside monitoring data (see above) indicates that compliance is achieved with the one hour standard at such locations.	*Results from Winchester Monitoring Stations.*
	No such locations identified outside of Winchester town centre. Diffusion tube work would suggest that Winchester town centre offers a worst case scenario, so compliance across the district is anticipated.	
	Roads with high flow of buses and/or HGV's	
	Consultation with Hampshire County Council - No locations identified with greater than 25 percent HDV	

	flow and more than 2500 HDV vehicle movements per day. Largest HDV flow is A34 which recorded 18 percent (May 2002 A34 at Whitchurch). The pedestrianised area/bus lane in the town centre is 100 percent buses but has a total flow considerably less than 1,000 movements per day.	
	New roads constructed since last review Consultation with Hampshire County Council - No roads constructed since last review with a flow greater than 10,000 vehicles per day.	
	Roads close to objective during initial review Aaquire dispersion modelling was performed during initial review covering main roads across district (M3, A34, A303, and M27). These used older emission factors which LAQM TQ(03) advises under predict by 10 percent. However, maximum level predicted within Winchester's district was 30$\mu g/m^3$, such locations are still predicted to be in compliance if increased by 10 percent.	*Air Quality Reports/Stage2-3Report/CES Stage 3 Air Quality Assessment*
	Roads with significantly changed traffic flows No roads outside of Winchester town centre were previously identified as having an annual average above 36$\mu g/m^3$. In consultation with Hampshire County Council no roads with a flow of over 10,000 vehicles per day are thought to have experienced any significant changes (25 percent) in traffic flow from 2000 (last assessment) to 2002 (latest data).	*Air Quality Reports/Stage2-3Report/CES Stage 3 Air Quality Assessment*
	Bus stations Bus station in Winchester town centre has less than 1,000 bus movements. Bus timetable data shows an average total movement (Mon-Fri) of about 600 per day and therefore needs no further assessment. Area is included within proposed AQMA.	
2.0 DOMESTIC	N/A	
3.0 INDUSTRIAL	**New industrial sources** No new significant industrial sources. No part A or B processes that are likely to be significant sources of nitrogen dioxide (as per Appendix E to annex 1 of LAQM TG03).	*Other Data/EPA Authorised Processes*

4.0 *OTHER*	**Industrial sources with substantially increased emissions** No sources identified during first round therefore no potential for significant increases. N/A	
CONCLUSION	There are locations within the town centre that are likely to fail the annual average nitrogen dioxide 2005 standard of 40μg/$m^{3.}$ These are limited to houses in close proximity to the main one way system around the town centre and the town centre end of the main roads feeding into this system. This matter has already been subject to detailed modelling using Road Breeze and additional monitoring and it is proposed to declare an AQMA in this location. As this matter is already in hand a further detailed assessment in response to this USA is not required.	*Air Quality Reports/Proposed AQMA*

7.0 SULPHUR DIOXIDE

USA FOR SULPHUR DIOXIDE		
	COMMENT	**CD REF**
PREVIOUS ASSESSMENT	Stage 1 assessment conducted during last assessment. It concluded that compliance with the only standard at that time (266μg/m^3 15 minute average by 2005) would be achieved across the District.	*Air Quality Reports/Stage 1 Report/WCC Stage 1 Air Quality Report*
MONITORING DATA AVAILABLE	No local data. Portsmouth and Southampton AUN sites were in compliance with all sulphur dioxide objectives.	
MODELLING DATA AVALABLE	2005, 99.9 percentile, 15 minute means for sulphur dioxide emissions were estimated for industrial sources as part of the CES Stage 3 Air Quality Review and Assessment (August 2000) using Aaquire model. No failures of the standard were predicted at such locations. LAQM TG(03) advises that the first round of review and assessment confirms that the 15 minute objective is the most stringent standard.	*Air Quality Reports/Stage2-3Report/CES Stage 3 Air Quality Assessment*
POTENTIAL SOURCES *1.0 ROAD TRAFFIC* *2.0 DOMESTIC* *3.0 INDUSTRIAL* *4.0 OTHER*	 N/A No areas with significant domestic coal burning **New Industrial Sources** No new sources as detailed in Appendix E Annex 2 of LAQM TG(03). No new part A or Part B processes in or near to Winchester's district. **Industrial sources with substantially increased emissions** No sources identified during first round therefore no potential for significant increases. **Boilers** Survey of large boiler plant conduct during initial	 *Other Data/EPA Authorised Processes*

	review and assessment. No changes in such sources, which are all below 5MW or are gas powered. **Shipping** Winchester does not have a coastline. Nearest shipping berths are at Southampton. **Railway Locomotives** The main lines through Winchester's district are used by a combination of electric and diesel locomotives. Network Rail was consulted regarding this matter (Dave Marriott). It was established that the siding at Winchester station is only used by local trains that are electric powered. Based on performance data there are no locations within Winchester's district (Southampton to London main line and small parts of the Eastleigh/Fareham/Portsmouth branch line) where diesel trains are held for more than 15 minutes greater than 35 times a year. There is also a Steam railway called the Watercress Line that runs from Alresford to Alton (East Hampshire District Council). This operates a mixture of steam and diesel trains. The steam trains are often held at or near Alresford station for more than 15 minutes, with the steam trains being primarily a tourist attraction. Exposure to people on the platform and adjacent domestic gardens is possible at less than 15 metres from locomotives	
CONCLUSION	The Watercress line was not assessed during the first round and the area surrounding the station will require a detailed assessment against the 15 minute 2005 standard. It is proposed to co-ordinate this study with East Hampshire District Council, who have the majority of the track in their area. A map of the area requiring further assessment is enclosed on CD, although the station platform is likely to be a worst case scenario. At all other locations sulphur dioxide levels are considered to be in compliance with the 15 minute standard and the newer 1 and 24 hour mean 2004 standards.	*Other Data/Watercress Line&Sulphurdioxide*

8.0 PARTICLES (PM_{10})

USA FOR PARTICLES		
	COMMENT	**CD REF**
PREVIOUS ASSESSMENT	Stage 2/3 assessment conducted during last assessment. It concluded that compliance with the 24 hour running average 2005 standard would be achieved across the District.	*Air Quality Reports/Stage2-3Report/WinchesterCity CouncilStage2&3Assessment.*
MONITORING DATA AVAILABLE	**Real Time Monitoring** Two real time monitoring sites located within Winchester town centre. The BAM analysers use unheated heads and therefore results obtained have been compared directly with the gravimetric based standard i.e. no correction factor applied. Since commencement of monitoring in 1997, the background location (18 metres from kerb) has been in compliance with the 24 hour average 2005 standard. Data from the roadside site failed this 2005 standard for the first time in 2002 with 41 exceedances compared to the 35 allowed. In comparison with the annual average standard both sites have been in compliance since commencement of monitoring. In 2002 the roadside annual average was 34.7$\mu g/m^3$ and at the background site it was 23.7$\mu g/m^3$. 2002 saw higher annual averages and exceedances of the 24 hour standard at both sites in comparison with the previous year. 2002 Data collection efficiency was 93.5 percent at the background site and 88.6 percent at the roadside site. Since commencement of monitoring compliance with the tighter provisional 2010 24 hour mean standard, which allows only 7 exceedances, has only been achieved once at the background site (2001) and never at the roadside site. With reference to the 2010 annual mean, the background site complied in 2000 and 2001 whilst the roadside site has never achieved compliance.	*Results from Winchester Monitoring Stations.* Data contained in yearly Excel data files. Details of location/equipment specification and QC/QA stored as Word documents. For a summary of data see*: Air Quality Summaries 1997-2002*
MODELLING DATA AVALABLE	2004 particle emissions were estimated for all sources as part of the CES Stage 3 Air Quality Review and Assessment (August 2000) using Aaquire model. Modelling results were obtained for both predicted	*Air Quality Reports/Stage2-3Report/CES Stage 3 Air Quality Assessment*

	annual average and the 90 percentile of 24 hour means. Significant traffic sources were modelled (including M27, M3, A303, A34) but model of limited accuracy for town centre locations which are strongly influenced by a conglomeration of smaller unmodeled roads. Maximum 2004 annual average predicted at relevant exposure locations adjacent main roads was 27$\mu g/m^3$ and the maximum 2004 90 percentile of hourly means was 40$\mu g/m^3$. Cassella Stanger was commissioned to model levels of particles within Winchester town centre. Unfortunately it has proven impossible to validate the Road Breeze model against the monitoring data available. The model predicts considerably lower concentrations than those actually monitored. This is thought to be due to a combination of topographical effects and high levels of resuspension that are not modelled. This matter is currently being investigated.	
POTENTIAL SOURCES *1.0 ROAD TRAFFIC*	**Busy Junctions** This is taken to be junctions of more than 10,000 vehicles per day. The only sites identified outside the town centre (already assessed above) are feeder roundabouts associated with the A34, M3 and M27, all of which have no relevant exposure locations within 20m. **Roads with high flow of buses and/or HGV's** Consultation with Hampshire County Council - No locations identified with greater than 20 percent HDV flow (AADT) and more than 2000 HDV vehicle movements per day. Largest HDV flow is A34 which recorded 18 percent (May 2002 A34 at Whitchurch). The pedestrianised area/bus lane in the town centre is 100 percent buses but only has a total flow of 448 buses in 5 days. **New roads constructed since last review** Consultation with Hampshire County Council - No roads constructed since last review with a flow greater than 10,000 vehicles per day. **Roads with significantly changed traffic flows** No roads outside of Winchester town centre were previously identified as having a 90th percentile above	*Other Data/Busflows* *Air Quality Reports/Stage2-3Report/CES Stage 3 Air Quality Assessment*

	45μg/m^3. In consultation with Hampshire County Council no roads with a flow of over 10,000 vehicles per day are thought to have experienced any significant changes (25 percent) in traffic flow from 2000 (last assessment) to 2002 (latest data).	
2.0 DOMESTIC	No areas with significant domestic coal burning	
3.0 INDUSTRIAL	**New industrial sources** No new significant industrial sources. No part A or B processes that are likely to be significant sources of nitrogen dioxide (as per Appendix E to annex 1 of LAQM TG03). **Industrial sources with substantially increased emissions** No sources identified during first round therefore no potential for significant increases.	*Other Data/EPA Authorised Processes*
4.0 OTHER	**Fugitive Dust Sources** *Open cast coal mining* – None. *Dusty Ports* – None. *Quarries* – None. *Landfill sites* – None with any dust concerns associated with the facility. **Aircraft** No airports within Winchester's District. Nearest airport is Southampton International Airport (Eastleigh) which is 3km from nearest part of Winchesters district.	
CONCLUSION	Using the methodology presented in Boxes 8.6 and 8.7 of LAQM TG(03) it is possible to project 2002 data forward to 2004 and 2010. This predicts that at the roadside location the annual average in 2004 will be 33.5μg/m^3 suggesting 42 failures of the 24 hour standard and in 2010 the annual average will be 30.6μg/m^3 suggesting 30 failures of the 24 hour standard. At the background site a similar calculation predicts the annual average in 2004 will be 23μg/m^3 suggesting 8 failures of the 24 hour standard and in 2010 the annual average will be 21.4μg/m^3 suggesting 5 failures of the 24 hour standard.	

	Such calculations show that there are locations within Winchester town centre that might fail the 2004 hour standards. These are sites that are best represented by the roadside rather than background data. These will be limited to houses in close proximity to the main one way system around the town centre and the town centre end of the main roads feeding into this system. Compliance with the 2010 standards could also be a problem at such locations. However, there appears to be no definite downwards trend in the roadside data, as would be suggested by Box 8.7 of LAQM TG(03). Using 2001 data rather than 2002 data gives a different picture of compliance for 2010. It is therefore considered too early to predict levels with any certainty in 2010 and additional monitoring/modelling in future years will hopefully clarify this issue. Due to this uncertainty and the lack of meaningful data generated by the road breeze modelling, it has decided to include particles in the Air Quality Management Area, using the same boundaries as for that of Nitrogen dioxide. As this matter is already in hand no further detailed assessment in response to this USA is required.	

9.0 CONCLUSIONS

The main air quality issue is that of nitrogen dioxide and particles within Winchester town centre. This is already the subject of an ongoing detailed assessment and an Air Quality Management Area (AQMA) is currently being proposed.

The review has also highlighted the possibility of non-compliance with the 15-minute sulphur dioxide standard in close proximity to the Watercress line, which runs a combination of diesel and steam trains. This will require a detailed assessment that will need to be submitted to DEFRA by April 2004.