



Winchester
City Council

AIR QUALITY PROGRESS REPORT 2008

SUMMARY

This document provides an update on air quality issues in Winchester's District since publication of the Updating and Screening Assessment of 2006 and the Air Quality Progress Report 2007.

It presents information relating to:

- Updated air quality data till the end of 2007.
- Consideration of new developments with air quality impacts.

Further information, including a copy of the Air Quality Action Plan, is available on our website ***www.winchester.gov.uk/airquality***, alternately please contact us at:

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CONTENTS

	Page No
1.0 Introduction	3
2.0 Monitoring Data	3
2.1 Real Time Monitoring Equipment	3
2.2 Osiris PM ₁₀ Monitoring Sites	3
2.3 Real Time Results	4
2.4 Diffusion Tube Results	4
2.5 Comment	6
3.0 Detailed Assessments	9
4.0 New Local Developments	9

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. 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.

There is a comprehensive rolling programme of reports required under DEFRA guidance that includes:

- Updating Screening Assessments
- Detailed Assessments
- Further Assessments
- Action Plans
- Progress Reports

This report is the Progress report for 2008. In producing this report we have followed DEFRA Progress Report Guidance LAQM.PRG(03).

The report provides up to date information on all the air quality monitoring data till the end of 2007.

2.0 Monitoring Data

2.1 Real Time Monitoring Equipment

There have been no changes to the real time monitoring equipment or procedures to that detailed in the progress report of 2007. The roadside site is located 2.75 metres from the kerb on St Georges St whilst the urban background site is located 18 metres from the kerb off Friarsgate. The background site samples at a height of 2.80 metres and the roadside site at 2.65 metres.

Particle results still use an unheated BAM 1024 analyser and have therefore had a correction factor applied as now recommended, data being divided by 1.2. All data from previous years has now had the same correction factor applied.

All results have been zero and spanned corrected with zero and span readings taken every 2 weeks in accordance with DEFRA guidance. All gases used for calibration have been independently certified. All instruments are serviced every six months by the equipment provider, Environmental Technology Services Ltd.

All data was ratified externally by Air Quality Consultants Ltd.

2.2 Osiris PM₁₀ Monitoring Sites

Three Turnkey Osiris instruments were installed in December 2006 with funding from Hampshire County Council. Instruments are located at roadside locations (1.5 metres from kerb) at both City Road and North Walls, initially at a height of between 3 to 4 metres. In November 2006 these were relocated to a height of 2.5 metres to ensure a more representative sampling height and safer access. The third instrument is

currently co-located at the background station. This has allowed the performance of the Osiris to be cross referenced to the fully approved methodology used at these sites and a bias correction factor calculated. For 2007 this was calculated to be 1.19.

These instruments use a light scattering methodology to provide 15 minute readings for particle (PM_{10}) concentrations. The instruments are checked remotely every fortnight by mobile phone connection and the pump filters are changed quarterly by site visit. These instruments are on a yearly return to base service contract.

2.3 Diffusion Tube Surveys

There have been no changes in supplier or specification of the diffusion tubes used since the last progress report. All diffusion tubes were from Gradko and used a mixture of 50 percent TEA in water. In light of the recent publication titled "Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance" it is proposed to continue with this formulation until the end of 2008 and then change to a formulation of 20 percent TEA in water.

The Town Centre diffusion tubes have been located to represent nearest relevant public exposure locations i.e. domestic building facades. All sampling locations were as for 2006.

The diffusion tube survey of exposures along the M3 in the Otterbourne conducted in 2006 continued throughout 2007. Except for site 4, the locations have been chosen to represent nearest relevant public exposure locations i.e. domestic building facades. Site 2 was relocated to a more representative location, as it was discovered to be immediately adjacent to where the school coaches parked.

The results have been adjusted by using a locally generated bias correction factor using the procedure detailed in DEFRA guidance document Technical Guidance LAQM TG(03). This was calculated by locating three diffusion tubes adjacent to the roadside real time analyser and comparing results. The bias correction calculated for 2007 was 1.08 which is a lower than previous years (1.26, 1.22 and 1.23 for 2006, 2005 and 2004 respectively). However, the bias correction is within the variance found for these tubes on the national AEA bias correction database.

Three of the town centre sites have triplicate samples to investigate precision of the tubes. The data for 2007 shows all sites have *good precision* with coefficients of variation for all sampling periods and locations being less than 10 percent.

2.4 Real Time Results

Table 1 and 2 below presents a summary of all real time air quality data. All results have greater than 80 percent collection efficiency except for those noted below:

2000 PM_{10} Background – 70 percent
2000 NO_2 Roadside – 66.4 percent
1999 NO_2 Background - 74 percent
2004 PM_{10} Background – 44 percent

All results for 2007 had collection efficiencies greater than 90 percent. The collection efficiency at the background site was lower than that of the roadside site due to partial corruption of data in the November/December period, combined with the failure of the service provider to maintain a backup copy in accordance with their service contract.

Year	Exceedances of Air Quality Objective					
	PM ₁₀ 50ug/m ³ (24 Hr Mean)		NO ₂ 200ug/m ³ (1 Hr Mean)		CO 10mg/m ³ (8hr running mean)	
	Background	Roadside	Background	Roadside	Background	Roadside
1997	8	22	0	299	0	0
1998	5	14	0	6	0	0
1999	1	3	0	8	0	0
2000	2	18	0	15	0	0
2001	3	16	0	12	0	0
2002	2	21	0	161	0	0
2003	21	20*	0	70	0	0
2004	Not enough data	17	0	0	0	0
2005	8	13	1	6	NA	0
2006	8	15	0	0	NA	0
2007	10	15	0	0	NA	0
Pass = less than 35 failures/year		Pass = less than 18 failures/year		Pass = No failures of objective		
Numbers in red FAILED the short term mean air quality objectives						

Notes

PM10 data uses unheated BAM analysers, raw data corrected to gravimetric equivalent by dividing by a correction factor of 1.2
 *Data missing from roadside site during March/April 03 when background site recorded significant pollution episodes.

Table 1 – Number of failures of short term air quality objectives

Year	Compliance with Annual Mean Air Quality Objectives					
	Mean PM ₁₀ in ug/m ³ 40ug/m ³ (Annual Mean)		Mean NO ₂ in ug/m ³ 40ug/m ³ (Annual Mean)		Mean CO in mg/m ³ No annual objective	
	Background	Roadside	Background	Roadside	Background	Roadside
1997	18.4	26.5	35.30	82.7	0.7	1.3
1998	17.2	21.9	39.7	58.1	0.5	1.3
1999	17.6	21.1	31.1	60.2	0.5	1.2
2000	16.4	21.2	33.0	68.6	0.5	1.2
2001	14.8	27.3	33.4	50.8	0.3	1.2
2002	19.8	28.9	27.3	65.5	0.3	1.0
2003	25.7	31.6	41.1	55.8	0.3	1.0
2004	Not enough data	29.8	29.4	52.1	0.3	0.8
2005	21.3	28.1	26.2	53.5	NA	0.5
2006	20.0	27.0	28.0	51.0	NA	0.5
2007	19.0	25.0	27.0	51.0	NA	0.5
Numbers in red FAILED the annual mean objective						

Notes

PM10 data uses unheated BAM analysers, raw data corrected to gravimetric equivalent by dividing by a correction factor of 1.2

Table 2 – Number of failures of long term air quality objectives

PARAMETER	BACKGROUND SITE (CO-LOCATED) SU 48505 29524		CITY ROAD (ROADSIDE) SU 47966 29877		NORTH WALLS (ROADSIDE) SU 48462 29737	
	1996	1997	1996	1997	1996	1997
ANNUAL MEAN OBJECTIVE (40ug/m ³)	20.0	16.4	22.1	21.1	19.8	16.7
FAILURES OF 24 HOUR OBJECTIVE. (50ug/m ³ 35 failures /year)	4	1	6	12	2	7
PERCENTAGE COLLECTION	85.5	90.0	88.2	90.0	83.0	90.0

Table 3 – 2006/07 Results from Osiris Particle (PM₁₀) monitoring sites

2.5 Diffusion Tube Results

LOCATION	2007 AVERAGE BIAS CORRECTED		PERCENTAGE CHANGE FROM 2006
	UG/M3	MISSING TUBES (out of 9)	
Site 1, 10 Eastgate St	38.5	0	-16.3
Site 2, Greyfriars 1	41.0	0	-7.6
Site 3, Greyfriars 2	41.4	0	-9.9
Site 4, Greyfriars 3	40.4	0	-9.2
Site 5, Friarsgate	33.9	0	-8.3
Site 6, Upper Brook St	46.8	2	-6.0
Site 7, Roadside Monitor	50.8	1	2.3
Site 8, Roadside Monitor	50.3	1	2.2
Site 9, Roadside Monitor	51.5	1	-4.2
Site 10, St Georges St	65.6	0	-2.3
Site 11, St Georges St Lad	62.4	2	-16.1
Site 12, Jewry St	49.7	0	-7.3
Site 13, Jewry St	59.1	1	-3.3
Site 14, Southgate St	45.0	1	-1.1
Site 15, Southgate St	55.1	3	-1.1
Site 16, Sussex St	44.1	0	-7.4
Site 17, City Road	42.2	0	-16.0
Site 18, 74 Northwalls	46.5	0	-17.7
Site 19, 15 Northwalls	36.7	0	-13.1
Site 20, Wales St	38.9	3	-1.0
Site 21, Alresford Rd	41.2	0	-8.9
Site 22, Chesil St	43.6	0	-9.4
Site 23, Romsey Rd	24.6	1	-28.2
Site 24, Stockbridge Rd	30.1	1	-0.1
Site 25, Andover Rd	36.9	0	1.4
Site 26, Worthy Rd 1	35.9	1	-8.5
Site 27, Worthy Rd 2	36.9	1	-2.3
Site 28, Worthy Rd 3	36.9	1	-4.2
Site 29, St Cross Rd	43.4	0	4.2
Site 30, Romsey Road	66.1	5	1.9
Site 31, Andover Rd	40.5	0	-11.6
Site 32, Bus Station	49.7	1	-11.8
Site 33, Parchment St	32.4	1	-20.3
Site 34, Middle Brook St	28.9	2	-7.3

RED = Exceeds air quality objective

Table 4 – City Centre Diffusion Tube Results 2007

LOCATION	From Kerb (m)		Grid References (SU)
	Distance	Height	
Site 1, 10 Eastgate St	5.55	1.70	48563 29391
Site 2, Greyfriars 1	9.70	1.75	48566 29560
Site 3, Greyfriars 2	9.70	1.75	48566 29560
Site 4, Greyfriars 3	9.70	1.75	48566 29560
Site 5, Friarsgate	4.25	2.40	48426 29523
Site 6, Upper Brook St	8.00	2.45	48227 29504
Site 7, Roadside Monitor	3.10	1.70	48213 29504
Site 8, Roadside Monitor	3.10	1.70	48213 29504
Site 9, Roadside Monitor	3.10	1.70	48213 29504
Site 10, St Georges St TC	4.05	2.45	48106 29541
Site 11, St Georges St Lad	3.60	2.40	48163 29512
Site 12, Jewry St CH	4.05	2.40	48046 29692
Site 13, Jewry St FK	2.75	2.35	48029 29666
Site 14, Southgate St DV	3.65	2.60	47918 29413
Site 15, Southgate St CH	2.10	2.50	47929 29409
Site 16, Sussex St	3.60	2.60	47804 29741
Site 17, City Road	6.55	3.00	47963 29875
Site 18, 74 Northwalls	1.20	2.65	48234 29794
Site 19, 15 Northwalls	3.70	2.30	48297 29789
Site 20, Wales St	1.70	2.45	48842 29820
Site 21, Alresford Rd	5.30	1.90	49557 29437
Site 22, Chesil St	1.30	2.60	48679 29068
Site 23, Romsey Rd HL	15.40	1.90	47003 29425
Site 24, Stockbridge Rd	5.40	2.00	47534 30006
Site 25, Andover Rd	6.50	2.30	47745 30456
Site 26, Worthy Rd 1	2.20	2.50	48092 30411
Site 27, Worthy Rd 2	2.20	2.50	48092 30411
Site 28, Worthy Rd 3	2.20	2.50	48092 30411
Site 29, St Cross Rd	2.40	2.20	47842 29050
Site 30, Romsey Road	1.10	2.50	47495 29511
Site 31, Andover Rd	4.20	2.15	47898 30065
Site 32, Bus Station	NA	2.40	48427 29401
Site 33, Parchment St	1.15	2.15	48173 29568
Site 34, Middle Brook St	1.5	2.3	48368 29624

Table 5 – Site Locations of City Centre Diffusion Tubes

Site	Grid Ref (SU)	Mean Concentration in $\mu\text{g}/\text{m}^3$	Tubes Missing (From 10)
Site 1, Gordon Rd, Winchester	49443 28927	30.3	2
Site 2, Shepherds' Down Rd, Compton	46537 24704	29.2	0
Site 3, Pearsons Lane, Shawford	47037 25204	37.3	0
Site 4, Southdown Road (Roadside)	46659 24655	45.4	0
Site 5, Highways Road, Otterbourne	46414 24279	34.8	4
Site 6, Bourne Close, Otterbourne	46030 23672	33.9	6
Site 7, Cranbourne Drive, Otterbourne	45920 23331	26.6	0
Site 8, Chapel Lane, Otterbourne	45505 22345	30.5	0
Site 9, Carmans Lane, Compton	46694 24642	39.6	1

RED = Exceeds air quality objective

**Table 6 – M3 Study (Compton to Otterbourne)
Diffusion Tube Results 2007**

2.6 Comment

2.6.1 Nitrogen dioxide – Winchester Town Centre

Air quality results were similar to previous years. Both sites are in compliance with the 24 hour mean objective but as in previous years only the background site complies with the annual mean objective.

The diffusion tube results also show that there are still areas adjacent to busy roads within the Air Quality Management Area (AQMA) that fail to meet the 2005 annual mean objective.

The diffusion tubes are located on building facades, therefore the nearer the buildings are to the road, the higher the results. This explains variations in the results for both Southgate St and North Walls, with much higher results being recorded on the side of the street where the buildings are closer to the road.

Overall the geographical spread of non compliance is similar to previous years. Promisingly, most results were lower than in 2006, although data will be required over a longer time frame to see if this trend continues.

2.6.2 Nitrogen dioxide –M3 Otterbourne

As for the previous year the results show that Site 4 was the only location failing the annual average nitrogen dioxide objective. This site is at a roadside location that has been used previously in the district wide study.

Due to ease of access, this study uses site locations adjacent to local access roads. It is therefore considered to be a slight over estimate of nearby building façade levels and is therefore a worst case scenario.

This study has now ceased to allow data for across the district to be collected in 2008. However, monitoring will continue at Site 4 which will act as a marker to trends in the Otterbourne area. If this site shows significant further increases then monitoring will be recommenced. The significant drop in site 2, compared to 2006, is due to its relocation away from the middle of the school car park to a site considered more representative.

2.6.3 Particles (PM₁₀) – Winchester Town Centre

All sites are in compliance with both the current 24 hour and annual objectives. The Osiris monitoring extends coverage of PM₁₀ data and again shows that the roadside monitoring location is likely to be a worse case scenario for Winchester City Centre.

2.6.4 Carbon monoxide – Winchester Town Centre

No failures recorded. Due to the values being well below the air quality objective we have now ceased monitoring background levels of Carbon monoxide. Roadside monitoring continues only because Carbon monoxide levels are a good marker for transport related pollution episodes.

3.0 Detailed Assessments

The Updating & Screening Assessment of 2006 did not identify the need for any detailed assessments, which was accepted by DEFRA. There are therefore no outstanding detailed assessments.

4.0 New Local Developments

Since the Progress report of 2007, there have been no new industrial processes within Winchester's District that would significantly impinge upon relevant air quality objectives. There have also been no new significant road, mineral or landfill developments within the district.

There have been no new major planning applications with significant air quality considerations within the last year. The report of 2007 discussed the Silverhill development, which has now been granted planning permission. However, there has been no movement to date on the instigation of this proposed development.