AIR QUALITY SUMMARY 2009

1.0 NITROGEN DIOXIDE DIFFUSION TUBES – WINCHESTER CITY CENTRE

LOCATION	GRID REF (SU)	2009 AVERAGE BIAS CORRECTED		PERCENTAGE CHANGE FROM 2008
		UG/M3	Percentage Collection	
Site 1, 10 Eastgate St	48563 29391	42.9	100	13.6
Site 2, Greyfriars 1	48566 29560	40.3	100	7.4
Site 3, Greyfriars 2	48566 29560	40.8	100	5.2
Site 4, Greyfriars 3	48566 29560	41.1	82	9.0
Site 5, Friarsgate	48426 29523	36.7	100	16.2
Site 6, Upper Brook St	48227 29504	44.0	82	-7.2
Site 7, Roadside Monitor	48213 29504	47.0	100	3.8
Site 8, Roadside Monitor	48213 29504	47.6	100	3.4
Site 9, Roadside Monitor	48213 29504	48.1	100	4.3
Site 10, St Georges St	48106 29541	61.4	100	6.3
Site 11, St Georges St Lad	48163 29512	69.8	91	15.0
Site 12, Jewry St	48046 29692	52.3	91	16.2
Site 13, Jewry St	48029 29666	59.5	100	7.7
Site 14, Southgate St	47918 29413	46.3	100	10.1
Site 15, Southgate St	47929 29409	58.9	100	21.1
Site 16, Sussex St	47804 29741	46.3	73	5.5
Site 17, City Road	47963 29875	45.8	100	18.3
Site 18, 74 Northwalls	48234 29794	49.0	91	9.2
Site 19, 15 Northwalls	48297 29789	40.0	100	13.7
Site 20, Wales St	48842 29820	38.5	82	16.3
Site 21, Alresford Rd	49557 29437	39.7	100	3.7
Site 22, Chesil St	48679 29068	44.7	100	7.9
Site 23, Romsey Rd (Hilliers)	47003 29425	29.7	82	23.1
Site 24, Stockbridge Rd	47534 30006	28.6	100	11.5
Site 25, Andover Rd	47745 30456	36.0	73	6.7
Site 26, Worthy Rd 1	48092 30411	34.7	91	9.3
Site 27, Worthy Rd 2	48092 30411	35.9	91	10.0
Site 28, Worthy Rd 3	48092 30411	37.5	82	12.9
Site29, St Cross Rd	47842 29050	41.8	91	5.9
Site 30, Romsey Rd	47495 29511	66.5	91	25.2
Site 31, Andover Rd	47898 30065	42.8	100	11.9
Site 32, Bus Station	48427 29401	44.8	73	7.3

RED = Exceeds air quality objective

2.0 NITROGEN DIOXIDE DIFFUSION TUBES – DISTRICT WIDE STUDY

GRID REF'S (SU)	48062 24372	46690 24645	42835 25162	49161 32291	58828 32707	65915 12047	57305 1173	55331 17399	53638 08258
LOCATION F= Building Façade R = Roadside location	Twyford (F)	Otterbourne (R)	Hursley (F)	Kings Worthy (F)	New Alresford (R)	Denmead (R)	Wickham (R)	Bishops Waltham (R)	Whiteley (R)
%AGE COLLECTION	100	100	100	100	80	90	100	100	100
BIAS CORRECTED in ug/m3	**34.9**	**36.9**	**18.9**	**31.3**	**35.2**	**25.8**	**37.6**	**39.8**	**34.6**
Percentage change from 2008	4.6	2.1	9.9	-8.5	1.0	13.1	10.7	11.1	8.9

3.0 REAL TIME AIR QUALITY DATA - WINCHESTER CITY CENTRE

3.1 Short Term Air Quality Objectives

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
2008	5	9	0	0	NA	0
2009	1	3	0	3	N/A	N/A
	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					

3.2 Long 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
2008	18.0	22.0	27.0	**48.0**	NA	0.4
2009	18.0	21.0	26.0	**48.0**	NA	NA

Numbers in red FAILED the annual mean objective

5.0 TECHNICAL NOTES

5.1 Diffusion Tube Data

All diffusion tubes were from Gradko and used a mixture of 20 Percent TEA in water. This is the first year that this formulation has used as in accordance with DEFRA recommendations.

The results have been adjusted by using a locally generated bias correction factor using the procedure detailed in the new DEFRA guidance document Technical Guidance LAQM TG(09). This was calculated by locating three diffusion tubes adjacent to the roadside real time analyser and comparing results. The bias correction calculated for 2009 was 1.13 which does not compare well with the national average of 0.90. Advice was taken from the DEFRA funded monitoring helpline and it was agreed that the local bias correction should be used.

Previous years bias corrections are 1.01, 1.08, 1.26, 1.22 and 1.23 for 2008 to 2004 respectively but these used a Gradko 50 percent TEA in water formulation.

Three of the sites have triplicate samples to investigate precision of the tubes. The data for 2009 shows all sites have good precision with coefficients of variation for all sampling periods and locations being less than 20 percent with an average variation of less than 10 percent (1.1. 1.2 and 3.9 for the three triplicate sites).

The Town Centre diffusion tubes have been located to represent nearest relevant public exposure locations i.e. domestic building facades.

The District wide diffusion tube survey continued this year using the same sites as for 2008. The study is a mix of roadside sites and nearest domestic building facades. In general the older sites were roadside locations and these have been maintained in order to ensure consistency in data trends. The new sites have been located at distances representing the nearest domestic building façade in the study area.

5.2 Real Time Monitoring Results

The roadside site is located 2.75 metres from the kerb on St Georges St (Grid Ref SU 48506 29525) whilst the urban background site is located 18 metres from the kerb off Friarsgate (Grid Ref SU 48213 29504). The background site samples at a height of 2.80 metres and the roadside site at 2.65 metres. New instruments (like for like) were installed in March 2005.

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. Data collection efficiency for all instruments in 2009 was 93 percent or greater.

All results have been zero and spanned corrected with readings taken approximately every 2 weeks in accordance with DEFRA guidance. All gases used for calibration have been independently certified.

All data was ratified externally by one of the air quality consultants used by DEFRA.

5.3 Turnkey (Osiris) Monitoring Results

These instruments have now been decommissioned

6.0 SUMMARY OF RELEVANT AIR QUALITY OBJECTIVES

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Carbon monoxide	10.0mg/m^3	Maximum daily running 8 hour mean	31.12.2003
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

7.0 DISCUSSION

7.1 Nitrogen dioxide – Winchester City Centre

Both real time 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 show that there are still areas adjacent the main roads within the Air Quality Management Area (AQMA) that fail to meet the 2005 annual mean objective. These are spatially concentrated within the one way system around the town centre with the highest levels being in St Georges Street, where the roadside real time analyser is located.

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.

Most of the diffusion tube results are higher than for 2008, although these used a local bias correction of 1.13 compared to the national average of 0.9. If a national average bias correction was applied than the results would be comparable to those of 2008. This upward trend is not present in the averages obtained from the two real time monitoring stations, which show averages comparable with 2008. It is therefore considered that another year's data using the new formulation tubes is necessary before commenting further.

7.2 Nitrogen dioxide – District.

In 2009 all sites were in compliance with the annual mean objective, although results we higher for all but one site compared to 2008. See comments made regarding Winchester City Centre diffusion tube results.

7.3 Particles (PM_{10}) – Winchester Town Centre

All sites are in compliance with both the current 24 hour and annual objectives.

7.4 Carbon monoxide – Winchester Town Centre

Due to the values being well below the air quality objectives we have now ceased monitoring for Carbon monoxide.