AIR QUALITY SUMMARY 2007

1.0 NITROGEN DIOXIDE DIFFUSION TUBES – TOWN CENTRE

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
Site29, 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

2.0 NITROGEN DIOXIDE DIFFUSION TUBES – M3 STUDY OTTERBOURNE

GRID REF'S	49443 28927	46537 24704	47037 25204	46659 24655	46414 24279	46030 23672	45920 23331	45505 22345	46694 24642
SAMPLING PERIOD	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9
	ALL RESULTS IN PPB (BLANK SUBTRACTED)								
12/01/07 - 14/02/07		17.3	17.4	21.3	17.4	14.0	13.0	15.6	18.6
14/02/07 - 05/04/07	13.4	11.8	16.0	20.0	15.7		11.3	13.8	17.0
05/04/07 - 02/05/07	17.6	17.9	17.6	23.1	18.8		13.6	13.9	19.7
02/05/07 - 29/05/07	11.7	9.2	16.5	22.5			11.5	12.9	
29/05/07 - 13/07/07	12.9	13.0	15.9	18.9			10.7	12.3	16.7
13/07/07 - 30/08/07	14.4	12.1	16.7	20.3			11.0	13.1	16.6
30/08/07 - 28/09/07	11.6	9.9	17.0	22.2			11.8	15.6	19.3
28/09/07 - 26/10/07		19.4	18.6	22.2	17.2	14.7	14.1	16.9	18.4
26/10/07 - 23/11/07	17.3	13.8	21.1	28.1	12.8	19.9	15.4	20.8	26.0
23/11/07 - 28/12/07	18.7	17.1	23.4	21.2	19.2	17.0	16.4	12.7	20.3

YEARLY AVERAGE	14.7	14.2	18.0	22.0	16.8	16.4	12.9	14.8	19.2

BIAS CORRECTED in ug/m3	30.3	29.2	37.3	45.4	34.8	33.9	26.6	30.5	39.6

Percentage change from 2006	-2.2	-26.3	2.8	6.6	6.0	15.3	-2.2	-10.6	5.2

Site 1 = Gordon Road, Winchester
Site 2 = Shephards Down Road, Compton
Site 3 = Pearson Lane, Shawford
Site 4 = Southdown Road, Otterbourne (near road)
Site 5 = Highways Road, Otterbourne
Site 6 = Bourne Close, Otterbourne
Site 7 = Cranbourne Drive, Otterbourne
Site 8 = Chapel Lane, Otterbourne
Site 9 = Southdown Road, Compton (property)

3.0 REAL TIME AIR QUALITY DATA - WINCHESTER TOWN 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
	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

Numbers in red FAILED the annual mean objective

4.0 TURNKEY (OSIRIS LIGHT SCATTERING) PM10 MONITORING SITES

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 with no more than 35 failures /year**)	4	1	6	12	2	7
PERCENTAGE COLLECTION	85.5	90.0	88.2	90.0	83.0	90.0

5.0 TECHNICAL NOTES

5.1 Diffusion Tube Data

All diffusion tubes were from GRADKO and used a mixture of 50 percent TEA in water. The tubes were changed nominally at monthly periods.

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 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.

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 was again suspended to allow for a continued study of exposures along the M3 in the Otterbourne area. Except for site 4, the locations have been chosen to represent nearest relevant public exposure locations i.e. domestic building facades.

5.2 Real Time Monitoring Results

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. 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 2007 was 90 percent or greater. There was an unfortunate incident towards the end of 2007 where the background site data was not polled by Environmental Technology Services and an incomplete data backup had to be used. This was traced to the background site being logged as closed on their database, although no satisfactory answer was ever obtained as to why this happened. A full independent backup of all data is now performed to prevent such a recurrence. This reduced the collection efficiency of the background data compared to that of the roadside site.

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 using air quality consultants used by DEFRA.

5.3 Turnkey (Osiris) Monitoring Results

Three instruments were installed in December 2006 with funding from Hampshire County Council. One instrument is located at a roadside location (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 1.190.

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 service contract.

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 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.

7.2 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, compared to 2006, is due to its relocation away from the middle of the school car park to a site considered more representative.

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

All sites are in compliance with both the current 24 hour and annual objectives. The Osiris monitoring extends coverage of PM_{10} data and shows again that the roadside monitoring location is likely to be a worse case scenario for Winchester City Centre.

7.4 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.