

AIR QUALITY SUMMARY 2014 (REVISED)

1.0 NITROGEN DIOXIDE DIFFUSION TUBES – WINCHESTER CITY CENTRE

LOCATION	GRID REF (SU)	2014 AVERAGE BIAS CORRECTED		PERCENTAGE CHANGE FROM 2013
		UG/M3	Percentage Collection	
Site 1, 10 Eastgate St	48563 29391	35.0	100.0	-13.6
Site 2, Greyfriars 3	48566 29560	32.5	90.0	-10.4
Site 3, Friarsgate	48426 29523	25.8	100.0	-4.4
Site 4, Upper Brook St	48227 29504	37.4	100.0	-11.3
Site 5, Roadside Monitor	48213 29504	39.1	100.0	-14.3
Site 6, Roadside Monitor	48213 29504	38.1	100.0	-14.8
Site 7, Roadside Monitor	48213 29504	38.1	100.0	-12.7
Site 8, St Georges St	48106 29541	51.7	100.0	-13.6
Site 9, St Georges St Lad	48163 29512	55.1	90.0	-8.0
Site 10, Jewry St	48046 29692	44.8	100.0	-8.1
Site 11, Southgate St	47918 29413	37.2	90.0	-12.3
Site 12, Sussex St	47804 29741	34.0	100.0	-7.3
Site 13, City Road	47963 29875	36.5	100.0	-7.3
Site 14, 74 Northwalls	48234 29794	28.9	100.0	-8.1
Site 15, Wales St	48842 29820	30.5	100.0	-9.1
Site 16, Alresford Rd	49557 29437	39.7	90.0	-11.8
Site 17, Chesil St	48679 29068	39.3	100.0	-7.3
Site 18, Stockbridge Rd	47534 30006	23.0	100.0	-5.3
Site 19, Andover Rd	47745 30456	27.3	90.0	-3.8
Site 20, Worthy Rd 1	48092 30411	27.1	100.0	-5.6
Site 21, Worthy Rd 2	48092 30411	28.0	100.0	-3.9
Site 22, Worthy Rd 3	48092 30411	28.0	100.0	-5.0
Site 23, St Cross Rd	47842 29050	33.9	80.0	-10.0
Site 24, Romsey Rd	47495 29511	53.8	100.0	-11.6
Site 25, Andover Rd	47898 30065	33.6	90.0	-8.8
Site 26, Bus Station	48427 29401	35.0	90.0	-8.7

RED = Exceeds air quality objective

2.0 NITROGEN DIOXIDE DIFFUSION TUBES – DISTRICT WIDE STUDY 2014

GRID REF'S (SU)	49443 28927	46537 24704	46659 24655	46414 24279	46030 23672	45920 23331	45505 22345	46694 24642
LOCATION F= Building Façade R = Roadside location	Twyford (F)	Otterbourne (R)	Kings Worthy (F)	New Alresford (R)	Denmead (R)	Wickham (R)	Bishops Waltham (R)	Whiteley (R)
%AGE COLLECTION	90	100	90	90	80	90	100	80
BIAS CORRECTED in ug/m3	29.0	28.7	24.0	29.5	20.2	29.0	29.0	23.5
Percentage change from 2013	-3.3	-10.4	-6.6	-6.3	-7.8	-6.1	-14.0	-0.6

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	N/A	0
2006	8	15	0	0	N/A	0
2007	10	15	0	0	N/A	0
2008	5	9	0	0	NA	0
2009	1	3	0	3	N/A	N/A
2010	1	4	0	0	N/A	N/A
2011	3	9	0	0	N/A	N/A
2012	1	16	0	0	N/A	N/A
2013	3	15	0	1	N/A	N/A
2014	N/A	19	0	0	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	N/A	0.5
2006	20.0	27.0	28.0	51.0	N/A	0.5
2007	19.0	25.0	27.0	51.0	N/A	0.5
2008	18.0	22.0	27.0	48.0	N/A	0.4
2009	18.0	21.0	26.0	48.0	N/A	N/A
2010	17.0	22.0	27.0	50.0	N/A	N/A
2011	20.0	27.0	26.0	46.0	N/A	N/A
2012	20.0	29.0	25.0	46.0	N/A	N/A
2013	23.0	31.0	25.0	47.0	N/A	N/A
2014	N/A	29.0	24.0	41.0*	N/A	N/A

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.

The results have been adjusted by using a bias correction factor using the procedure detailed in DEFRA guidance document Technical Guidance LAQM TG(09). This is usually calculated by locating three diffusion tubes adjacent to the roadside real time analyser and comparing results. The period of tube exposure reported for 2014 is 02 January until 15 December. The local bias correction calculated for 2014 for this period was 0.94. However, as noted below there was no real time data for the period for late August to early October. Initially we chose to use the local bias correction for 2013. Subsequently with the publication of the final National bias correction factor of 0.91 it was considered that this matched more closely the local bias derived for 2014. Data has therefore now been reworked using the national bias correction factor for this year of 0.91.

Two of the sites have triplicate samples to investigate the precision of the tubes. The data for 2014 shows all sites have good precision with coefficients of variation for all sampling periods and locations being less than 10 percent with the annual averages less than 5 percent (1.6 and 1.8 for the two triplicate sites).

The Town Centre diffusion tubes have been located to represent nearest relevant public exposure locations i.e. domestic building facades. There were no changes in tube locations to that of 2013.

The District wide diffusion tube survey continued this year using the same sites as for last year. 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.

Particle results still use an unheated BAM 1024 analyser and have therefore had a correction factor applied as now recommended, data being divided by 1.21. All data from previous years has now had the same correction factor applied. Data collection efficiency for all instruments in 2014 was greater than 95 percent except for the roadside NO_x analyser where only 86.4 percent was achieved. This was due to a fault in the analyser that was only picked up at ratification stage, so data for late August to early October had to be discarded. If it is assumed the ratio between the roadside and background site is reasonably consistent the average at the background during this period was 25.8 which is 7 percent higher than the annual average of 24.0 mean. If "corrected" by the same ratio this would give a roadside mean of 44.0 rather than the reported 41.0.

All results have been zero and span corrected with readings taken approximately every 2 weeks in accordance with DEFRA guidance. All gases used for calibration have been independently AEA certified. All instruments were fully serviced every six months by new external contractors (ESU1).

All data was ratified by an external air quality consultant (AQDM).

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	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 (PM ₁₀) (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. There is a drop in the annual roadside mean but as already noted this might be due to poor data capture rather than a genuine drop.

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 failures remain concentrated within the one way system around the town centre. Additional diffusion tubes were installed in Feb 2014 in both St Georges St and Romsey Road to investigate further the spatial extent of the highest failures. A detailed assessment of this area will be conducted within 2015 to report further on this specific area. It will include an assessment of the potential for failures of the hourly mean at certain locations on these roads.

The diffusion tubes are located on building facades, therefore in general the nearer the buildings are to the road, the higher the results.

There is a significant drop in levels this year but further data will be needed to show this is a trend rather than a one off (or even due to the lower national bias correction factor used in the diffusion tube analysis for 2014).

7.2 Nitrogen dioxide – District

In 2013 all sites remained in compliance with the annual mean objective.

7.3 Particles (PM₁₀) – Winchester Town Centre

The roadside sites remain in compliance with both the current 24 hour and annual objectives. Winchester City Council has now undeclared for PM₁₀ levels that were initially part of the AQMA. As there has been a slight increase in PM₁₀ levels monitoring continued in 2014 but only at the roadside location.

7.4 Carbon monoxide – Winchester Town Centre

Monitoring is no longer performed.