AIR QUALITY SUMMARY 2016

1.0 NITROGEN DIOXIDE DIFFUSION TUBES – WINCHESTER CITY CENTRE

LOCATION	GRID REF (SU)	2016 AVERAGE BIAS CORRECTED		PERCENTAGE CHANGE FROM 2015
		UG/M3	Percentage Collection	
Site 1, 10 Eastgate St	48563 29391	**36.8**	83	0.7
Site 2, Greyfriars 3	48566 29560	**30.0**	100	-8.2
Site 3, Friarsgate	48426 29523	**26.9**	100	1.3
Site 4, Upper Brook St	48227 29504	**37.1**	100	-4.8
Site 5, Roadside Monitor	48213 29504	**37.2**	100	-5.3
Site 6, Roadside Monitor	48213 29504	**38.6**	100	-4.0
Site 7, Roadside Monitor	48213 29504	**37.7**	100	-6.7
Site 8, St Georges St (Bed)	48106 29541	**49.8**	92	-5.2
Site 9, St Georges St (Lad)	48163 29512	**48.9**	92	-9.7
Site 10, Jewry St	48046 29692	**41.7**	100	-0.6
Site 11, Southgate St	47918 29413	**37.0**	92	-6.0
Site 12, Sussex St	47804 29741	**37.3**	92	5.8
Site 13, City Road	47963 29875	**33.8**	92	-10.5
Site 14, 74 Northwalls	48234 29794	**29.7**	100	-3.2
Site 15, Wales St	48842 29820	**31.5**	92	0.3
Site 16, Alresford Rd (M3)	49557 29437	**38.4**	92	-0.9
Site 17, Chesil St	48679 29068	**39.9**	100	6.5
Site 18, Stockbridge Rd	47534 30006	**24.8**	100	12.6
NEW Site 19, Burma Road	47025 29222	**19.3**	100	NA
Site 20, Worthy Rd 1	48092 30411	**22.8**	100	-7.4
Site 21, Worthy Rd 2	48092 30411	**23.8**	100	-4.7
Site 22, Worthy Rd 3	48092 30411	**22.9**	100	-9.0
Site 23, St Cross Rd	47842 29050	**33.4**	83	-8.6
Site 24, Romsey Rd	47495 29511	**56.6**	100	13.0
Site 25, Andover Rd	47898 30065	**32.9**	100	-5.2
Site 26, Bus Station	48427 29401	**30.4**	100	-12.8

RED = Exceeds air quality objective

2.0 TRENDS IN DIFFUSION TUBES GREATER THAN 40 ug/m3 IN 2016

3.0 NITROGEN DIOXIDE DIFFUSION TUBES – DISTRICT WIDE STUDY 2016

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	92	83	92	92	100	75	100	100
BIAS CORRECTED in ug/m3	28.4	29.4	25.5	33.8	19.9	30.6	32.5	22.6
Percentage change from 2015	-1.4	-0.3	-2.5	6.9	6.3	3.6	7.2	1.4

4.0 REAL TIME AIR QUALITY DATA - WINCHESTER CITY CENTRE

4.1 Short Term Air Quality Objectives

Year	Exceedances of Air Quality Objective					
	PM_{10} *50ug/m³ (24 Hr Mean)*		NO_2 *200ug/m³ (1 Hr Mean)*		CO *10mg/m³ (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
2015	N/A	23	N/A	1	N/A	N/A
2016	N/A	26	N/A	1	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					

4.2 Long Term Air Quality Objectives

Year	Compliance with Annual Mean Air Quality Objectives					
	Mean PM_{10} in ug/m^3 *40ug/m³ (Annual Mean)*		Mean NO_2 in ug/m^3 *40ug/m³ (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
2015	N/A	32.0	N/A	**38.0**	N/A	N/A
2016	N/A	31.0	N/A	**38.0**	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 adjustment factor using the procedure detailed in DEFRA guidance document Technical Guidance LAQM TG(16). This was calculated by locating three diffusion tubes adjacent to the roadside real time analyser and comparing results. The local Bias adjustment factor calculated and used was 0.95 (which is consistent with the value of 0.94 obtained in 2015).

Two of the sites have triplicate samples to investigate the precision of the tubes. The data for 2016 shows all sites have good precision with coefficients of variation for all sampling periods and locations being less than 20 percent (with only one result above 10 percent) with annual averages of 3.9 and 5.0 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. The only change in locations for 2015 was site 19, which was relocated from Andover Rd to Burma Rd following concerns expressed regarding traffic congestion between the hospital and university.

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) but was mothballed throughout 2016. The decision has now been made to remove this site in 2017.

Particle results still use an unheated BAM 1024 analyser and have therefore had a correction factor applied as recommended, data being divided by 1.21. All data from previous years has now had the same correction factor applied.

The current roadside site will also be decommissioned in 2017, as the area is marked for improvement as part of Casson Block refurbishment scheme. Two new roadside Nitrogen dioxide only roadside sites will be installed, one further up the road on St Georges St and the other on Chesil St by Station Approach. No PM_{10} monitoring will be performed in 2017 but both new sites have room for a $PM_{2.5}/PM_{10}$ analyser should future resources and demand dictate.

Data collection efficiency for both instruments in 2016 was greater than the required 85 percent (97.4 percent of NO_2 and 93.9 for PM_{10}).

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 certified. All instruments were fully serviced every six months by external contractors (ESU1).

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

The full real time air quality data can be found at http://www.ukairquality.net/

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 (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

For the second year running the roadside site is in compliance with both the hourly and annual mean nitrogen dioxide objectives.

However, 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 and Romsey Rd. It is proposed to issue a new Air Quality Action Plan in 2017 to tackle these remaining hotspots.

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

7.2 Nitrogen dioxide – District

In 2016 all sites remained in compliance with the annual mean objective.

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

The roadside site remains in compliance with both the current 24 hour and annual objectives in 2016.

7.4 Carbon monoxide – Winchester Town Centre

Monitoring is no longer performed.