A303 Sparkford to Ilchester Dualling Scheme TR010036

6.3 Environmental Statement

Appendix 5.2 Local Air Quality Monitoring

APFP Regulation 5(2)(a)
Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009
July 2018

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Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

A303 Sparkford to Ilchester Dualling Scheme

Development Consent Order 201[X]

6.3 Environmental Statement
Appendix 5.2 Local Air Quality Monitoring

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Planning Inspectorate Scheme Reference:	TR010036
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Author:	A303 Sparkford to Ilchester Dualling Scheme Project Team, Highways England

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1 Local Air Quality Monitoring

1.1 Overview

1.1.1 A scheme specific monitoring survey of NO_2 concentrations has been undertaken for 16 sites along the scheme extent from January 2016 to June 2016. Monitoring was carried out using diffusion tubes, which are a passive method designed to provide information on long term trends and existing concentrations. The tubes are exposed at each location for approximately 1 month, then collected, sent back to a laboratory for analysis and replaced with new tubes.

1.1.2 The tubes were prepared and analysed by Staffordshire Scientific Services using the 20% triethanolamine (TEA) in water method.

1.2 Monitoring locations

1.2.1 Monitoring sites were selected based on their proximity to major roads and junctions likely to be affected by the scheme and at locations where sensitive receptors are present. The location of each monitoring site is shown in Table 5.10 contained within Chapter 5 Air Quality (Volume 6.1) and Figure 5.5 (Volume 6.2).

1.2.2 The raw data obtained from the 6-month diffusion tube survey was annualised and bias adjusted to enable comparison with the annual mean NO_2 objective. The methodology behind the adjustment process is outlined below.

1.3 Bias adjustment

1.3.1 Diffusion tubes are less accurate than continuous monitoring methods and typically under or over read concentrations. In order to correct for this, diffusion tubes are co-located with continuous monitoring stations, and a bias adjustment factor is calculated by comparing results from both techniques. Bias adjustment factors can be calculated by carrying out a specific co-location study as part of a monitoring survey or by using a combined national bias adjustment factor available from the Department for Environment Food and Rural Affairs (Defra), which is based on the results of co-location studies undertaken by local authorities (which can be filtered by laboratory and tube preparation method).

1.3.2 Triplicate tubes were co-located with the Automatic Urban Rural Network (AURN) rural background site at Charlton Mackrell as part of the scheme survey. The results from these tubes were compared to the results from the AURN for the same period, which provided a bias adjustment factor of 0.94.

1.4 Annual adjustment

1.4.1 Since the diffusion survey was undertaken for 6 months from January 2016 to June 2016, it was necessary to convert the period data to an annual mean concentration for 2016 to allow comparison with the annual mean NO_2 objective. The bias adjusted diffusion tube data was converted to a representative annual mean for 2016 following the approach outlined in Box 7.9 of Defra TG16[1].

1.4.2 Automatic monitoring data was obtained from background automatic monitoring stations within 50 miles of the scheme as shown in Table 1.1, and the period average concentration was compared to the annual mean concentration monitored for the stations in 2016.

Table 1.1 Annualisation factors

Site ID	Honiton AURN		Charlton Mackrell AURN	
	ug/m^3	% DC*	ug/m^3	% DC*
Period mean NO_2 ** (µg/m^3)	7.7	99	6.7	99
2016 mean NO_2 (µg/m^3)	8.1	96	7.4	99
Annualisation factor	1.06		1.10	

*Average for 2016
* DC = Data Capture
**Average for period 14 December 2015 to 17 June 2016

1.4.3 An average annualisation factor of 1.08 was obtained from the Honiton and Charlton Mackrell automatic monitoring stations. The annualisation factor was applied to the bias adjusted diffusion tube results to convert to an annual mean value for 2016.

[1] Department for Environment Food and Rural Affairs (2018) *Local Air Quality Management Technical Guidance* (TG16) [online] available at: https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf (last accessed April 2018).

2 Local Authority Monitoring

2.1 Overview

2.1.1 Diffusion tube monitoring is currently undertaken by South Somerset District Council at 20 sites across the district. All monitoring sites are located within the Yeovil Air Quality Management Area (AQMA). Table 2.1 presents monitoring results from these sites for the past 4 years.

2.1.2 There is a slight downward trend in NO_2 annual mean concentrations within Yeovil between 2013 to 2016.

Table 2.1: South Somerset District Council non-automatic monitoring results

Site ID	Location	Site type	National grid reference		NO_2 annual mean concentration ($\mu g/m^3$)				
			X	Y	2013	2014	2015	2016	2017
Y7	Fiveways	Roadside	355316	116464	**55.1**	**50.9**	**51.3**	**48.6**	**51.3**
Y11	Ilchester Road	RR	355118	116900	**58.0**	**54.2**	**54.0**	**53.7**	**51.6**
Y12	Ilchester Road No. 98	RR	355080	117007	32.4	28.9	28.5	32.2	28.9
Y13	Maternity Unit	Urban background	355608	116257	36.8	NA	NA	NA	NA
Y17	Sparrow Road	Roadside	355375	116556	32.1	30.0	29.5	31.4	32.9
Y26	Lyde Rd	Roadside	356753	116404	**43.6**	39.9	**42.8**	**45.2**	NA
Y102	Wyndam St	RR	356161	116098	29.5	25.7	25.6	26.9	22.8
Y204	Bus Station	Roadside	356018	116037	31.2	26.7	30.3	30.0	25.7
Y401	73 Sherborne Road	RR	356312	116228	34.9	28.7	29.6	30.9	27.9
Y402	Hillside Residential	RR	356520	116360	28.7	27.3	26.7	26.5	26.7
Y403	Sherborne Road	RR	356643	116382	**41.0**	36.3	37.3	37.6	34.4
Y407	Fiveways Flats	RR	355330	116454	39.4	37.3	35.1	37.0	38.6
Y501	42 The Crescent	RR	355212	115705	24.5	21.4	20.1	22.3	20.3
Y502	Everton Road	RR	355449	116292	39.4	36.3	36.1	35.5	36.8
Y503	4 Yarn Barton	RR	355194	115515	19.9	18.4	17.2	18.5	16.8
Y504	New Town	Urban background	356285	116463	16.9	15.9	15.2	18.1	16.9
Y505	Summerlands	Urban background	354204	116767	11.8	10.1	12.5	10.7	9.5
Y613	Hospital Sign	Roadside	355580	116245	NA	**45.0**	**43.5**	**40.7**	35.4

Site ID	Location	Site type	National grid reference		NO_2 annual mean concentration ($\mu g/m^3$)				
			X	Y	2013	2014	2015	2016	2017
Y701	59 Muchelney Way	RR	353039	116802	NA	NA	NA	14.9	13.2
Y702	71 Hendford Hill	RR	355262	115367	NA	NA	NA	33.6	32.1
Y703	1 Brimsgrove Court	Roadside	354357	117679	NA	NA	NA	**42.1**	39.2

Note: exceedances of the annual NO_2 air quality objective are highlighted in **bold**.