

A358 Taunton to Southfields Dualling Scheme

Preliminary Environmental Information Report - Appendix 5.3
Air Quality Baseline Data

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1 Baseline data

1.1 Local air quality monitoring

- 1.1.1 Measurements of nitrogen dioxide (NO₂) concentrations in the study area (i.e. within 200m of the Affected Road Network (ARN)) were undertaken using passive monitoring diffusion tubes at 56 locations between 2015 and 2019. No continuous monitoring of NO₂ concentrations was undertaken in the study area. Measurements of Particulate Matter (PM₁₀ and PM_{2.5}) were undertaken using continuous monitoring at one location in the study area between 2018 and 2019.
- 1.1.2 Results of local monitoring are available from the *2020 Air Quality Annual Status Reports* (ASR) from Sedgemoor District Council (SDC) [1], Exeter City Council (ECC) [2], Mid Devon District Council (MDDC) [3], Somerset West and Taunton Council (SWTC) [4] and East Devon District Council (EDDC) [5]. Details of the local authority monitoring sites are presented in Table 1-1 and Table 1-2 and can be seen in Figure 5.7 Monitoring Locations.
- 1.1.3 A summary of diffusion tube monitoring results for local air quality monitoring sites in the study area is presented in Table 1-3 for annual mean NO₂ concentrations from 2015 to 2019. Any NO₂ annual mean concentrations shown in the table which exceed the air quality objective (AQO) of 40µg/m³ (micrograms per cubic metre) are highlighted in bold. Concentrations of annual mean NO₂ concentrations exceeding the AQO have been recorded in 2015 to 2019 in the study area.
- 1.1.4 A summary of automatic monitoring for PM₁₀ and PM_{2.5} can be found in Table 1-4 and Table 1-5 respectively.
- 1.1.5 Further description and analysis of the monitoring data can be found in Chapter 5 Air quality.

Table 1-1 Details of local authority diffusion tube NO₂ monitoring sites

Local authority and ID	Site name	Site classification	National grid reference		In AQMA (Y/N)
			X	Y	
Sedgemoor DT6	St Saviours Avenue	Roadside	330061	136858	N
Sedgemoor DT8	Monmouth Street	Roadside	330388	137263	N
Sedgemoor DT9	Monmouth Street	Roadside	330456	137391	N
Sedgemoor DT12	Church Street	Roadside	331972	147301	N
Sedgemoor DT13	Rooksbridge M5 bridge	Roadside	336300	153380	N
Sedgemoor DT14	Rooksbridge road	Roadside	336378	153293	N
Sedgemoor DT15	Mendip road	Roadside	336112	152946	N
Sedgemoor DT18	Huntworth	Roadside	330584	134059	N
Sedgemoor DT22	Taunton road	Roadside	330331	135726	N
Sedgemoor DT23	Parkway	Roadside	331328	138101	N
Sedgemoor DT24	Bath road	Roadside	330942	137801	N
Sedgemoor DT31	Taunton road	Roadside	330072	136452	N
Exeter DT47	Langaton Lane	Urban Background	296984	94327	N
Exeter DT79	Tithebarn Link Road	Roadside	296827	93886	N
Mid devon DT5	Market Place, Willand	Kerbside	303360	111293	N
Mid devon DT6	Silver Street/B3181, Willand	Roadside	303373	110348	N
Mid devon DT8	1 Culm Lea, Cullompton	Kerbside	303005	107418	N
Mid devon DT9	Gerbera Way, Cullompton	Kerbside	303040	107238	N
Mid devon DT10	Police Station, Cullompton	Roadside	302187	107549	N
Mid devon DT11	HSBC, Cullompton	Roadside	302050	107359	N
Somerset West and Taunton 2	Henlade East	Roadside	326972	124071	N
Somerset West and Taunton 3	Monks Close	Roadside	323668	125110	N
Somerset West and Taunton 6	Wellington High	Kerbside	314041	120773	N
Somerset West and Taunton 10	Market House	Urban Centre	322719	124474	N
Somerset West and Taunton 12	Bridge Street	Roadside	322540	125007	N
Somerset West and Taunton 13	Station Road	Roadside	322717	125206	N
Somerset West and Taunton 15	Haydon Road	Roadside	323350	124596	N
Somerset West and Taunton 16	Park Gate	Roadside	323523	124627	N
Somerset West and Taunton 18	Hurdle Way	Roadside	322987	124349	N
Somerset West and Taunton 19	Ilminster Road	Roadside	325002	124838	N
Somerset West and Taunton 21	Cann Street	Roadside	322305	124276	N
Somerset West and Taunton 22	Priory Bridge Road	Roadside	323103	125035	N

Local authority and ID	Site name	Site classification	National grid reference		In AQMA (Y/N)
			X	Y	
Somerset West and Taunton 25	Creech Castle	Roadside	324946	125602	N
Somerset West and Taunton 27	Henlade West	Roadside	326426	124332	N
Somerset West and Taunton 35	Wellington Centre	Roadside	313942	120667	N
Somerset West and Taunton 44	East Reach Lights	Roadside	323119	124532	N
Somerset West and Taunton 45	East Street	Roadside	323064	124508	N
Somerset West and Taunton 50	Priory Avenue/Shell	Roadside	323346	124974	N
Somerset West and Taunton 51	Bridgewater Road	Kerbside	324923	125428	N
Somerset West and Taunton 52	Park Street	Roadside	322271	124346	N
Somerset West and Taunton 53	Upper High Street	Roadside	322471	124203	N
Somerset West and Taunton 57	St James Street	Kerbside	322705	124760	N
Somerset West and Taunton 61	Trull Road	Roadside	322229	124178	N
Somerset West and Taunton 62	Thornfalcon	Roadside	327585	123724	N
Somerset West and Taunton 67	Wood Street	Roadside	322516	124766	N
Somerset West and Taunton 69	Whitehall	Roadside	322642	125322	N
Somerset West and Taunton 70	Priory Park	Roadside	323293	125186	N
Somerset West and Taunton 71	Henlade AQMA West	Roadside	326783	124138	Y
Somerset West and Taunton 72	Henlade AQMA East	Roadside	326871	124093	Y
Somerset West and Taunton 73	East Reach AQMA east	Roadside	323271	124553	Y
Somerset West and Taunton 74	East Reach AQMA west	Roadside	323188	124539	Y
East Devon N60	N60 Sowton - Sowton Lodge (Nearest)	Roadside	297029	93140	Y
East Devon N61	N61 Sowton - Sowton Lodge (Furthest)	Roadside	297018	93139	N
East Devon N78	N78 Beare - Beare House	Industrial	299763	102177	N
East Devon N13	N13 Clyst St Mary - Opp P. O.	Roadside	297314	91056	N
East Devon N81	N81 rear of Lammorric	Roadside	297327	90998	N

Table 1-2 Details of local authority automatic PM₁₀ and PM_{2.5} monitoring sites

Local authority and ID	Site name	Site classification	National grid reference		In AQMA (Y/N)
			X	Y	
Sedgemoor PM3	Taunton Road	Kerbside	330030	136644	N

Table 1-3 Local authority NO₂ monitoring results

Local authority and ID	Site name	Annual mean NO ₂ (µg/m ³)				
		2015	2016	2017	2018	2019
Sedgemoor DT6	St Saviours Avenue	21.0	20.1	20.2	19.8	19.8
Sedgemoor DT8	Monmouth Street	28.8	27.9	26.0	28.4	28.7
Sedgemoor DT9	Monmouth Street	36.5	34.4	35.9	35.6	34.5
Sedgemoor DT12	Church Street	27.0	26.2	22.8	24.3	24.8
Sedgemoor DT13	Rooksbridge M5 bridge	25.3	24.6	25.5	23.1	19.7
Sedgemoor DT14	Rooksbridge road	17.9	21.0	17.4	17.2	14.8
Sedgemoor DT15	Mendip road	18.1	17.1	16.9	16.0	14.1
Sedgemoor DT18	Huntworth	29.5	27.5	28.8	27.7	24.1
Sedgemoor DT22	Taunton road	22.1	23.5	26.0	27.3	25.9
Sedgemoor DT23	Parkway	21.2	21.0	22.7	23.1	22.1
Sedgemoor DT24	Bath road	24.5	23.0	23.3	25.8	22.8
Sedgemoor DT31	Taunton road	29.8	29.9	32.0	40.4	30.2
Exeter DT47	Langaton Lane	16.7	18.1	15.7	18.7	17.9
Exeter DT79	Tithebarn Link Road	n/a	n/a	n/a	n/a	19.5
Mid Devon DT5	Market Place, Willand	n/a	n/a	n/a	n/a	22.6
Mid Devon DT6	Silver Street/B3181, Willand	n/a	n/a	n/a	n/a	20.3
Mid Devon DT8	1 Culm Lea, Cullompton	n/a	16.7	15.7	17.8	15.6
Mid Devon DT9	Gerbera Way, Cullompton	n/a	n/a	n/a	n/a	9.9
Mid Devon DT10	Police Station, Cullompton	24.0	27.4	22.7	28.8	24.8
Mid Devon DT11	HSBC, Cullompton	n/d	31.0	24.1	37.1	32.4
Somerset West and Taunton 2	Henlade East	27.0	32.0	21.0	30.0	22.0
Somerset West and Taunton 3	Monks Close	24.0	25.0	23.0	n/a	n/a
Somerset West and Taunton 6	Wellington High	31.0	33.0	27.0	34.0	28.0
Somerset West and Taunton 10	Market House	31.0	31.0	25.0	31.0	25.0
Somerset West and Taunton 12	Bridge Street	32.0	34.0	29.0	37.0	29.0
Somerset West and Taunton 13	Station Road	29.0	31.0	26.0	32.0	24.0
Somerset West and Taunton 15	Haydon Road	23.0	26.0	20.0	24.0	19.0
Somerset West and Taunton 16	Park Gate	20.0	22.0	17.0	20.0	17.0
Somerset West and Taunton 18	Hurdle Way	28.0	32.0	27.0	32.0	26.0
Somerset West and Taunton 19	Ilminster Road	28.0	30.0	27.0	31.0	25.0
Somerset West and Taunton 21	Cann Street	n/a	32.0	25.0	32.0	25.0
Somerset West and Taunton 22	Priory Bridge Road	19.0	20.0	16.0	19.0	15.0

Local authority and ID	Site name	Annual mean NO ₂ (µg/m ³)				
		2015	2016	2017	2018	2019
Somerset West and Taunton 25	Creech Castle	25.0	26.0	23.0	28.0	23.0
Somerset West and Taunton 27	Henlade West	31.0	30.0	27.0	30.0	23.0
Somerset West and Taunton 35	Wellington Centre	26.0	28.0	25.0	27.0	24.0
Somerset West and Taunton 44	East Reach Lights	37.0	37.0	33.0	44.0	36.0
Somerset West and Taunton 45	East Street	33.0	34.0	30.0	36.0	30.0
Somerset West and Taunton 50	Priory Avenue/Shell	22.0	27.0	22.0	29.0	22.0
Somerset West and Taunton 51	Bridgewater Road	25.0	30.0	25.0	33.0	25.0
Somerset West and Taunton 52	Park Street	30.0	32.0	27.0	32.0	27.0
Somerset West and Taunton 53	Upper High Street	24.0	28.0	23.0	28.0	21.0
Somerset West and Taunton 57	St James Street	24.0	26.0	21.0	25.0	18.0
Somerset West and Taunton 61	Trull Road	26.0	29.0	24.0	31.0	23.0
Somerset West and Taunton 62	Thornfalcon	23.0	25.0	23.0	23.0	19.0
Somerset West and Taunton 67	Wood Street	25.0	26.0	22.0	26.0	22.0
Somerset West and Taunton 69	Whitehall	17.0	18.0	14.0	19.0	15.0
Somerset West and Taunton 70	Priory Park	n/a	17.0	14.0	17.0	14.0
Somerset West and Taunton 71	Henlade AQMA West ^a	n/a	47.0	32.0	54.0	39.0
Somerset West and Taunton 72	Henlade AQMA East	n/a	49.0	41.0	45.0	37.0
Somerset West and Taunton 73	East Reach AQMA east	n/a	42.0	41.0	46.0	37.0
Somerset West and Taunton 74	East Reach AQMA west	n/a	42.0	41.0	50.0	38.0
East Devon N60	N60 Sowton - Sowton Lodge (Nearest)	26.2	32.6	26.7	27.7	n/a
East Devon N61	N61 Sowton - Sowton Lodge (Furthest)	26.5	29.9	25.5	27.1	n/a
East Devon N78	N78 Beare - Beare House	7.2	10.9	9.2	9.7	n/a
East Devon N13	N13 Clyst St Mary - Opp P. O.	19.2	22.0	23.2	22.3	n/a
East Devon N81	N81 rear of Lammorric	n/a	n/a	n/a	24.9	n/a

Notes: n/a refers to years where monitoring was not undertaken. ^aAccording to the SWTC 2020 ASR It is not clear why there were relatively large increases in NO₂ concentrations from 2017 to 2018 followed by a decrease in 2019, as there is no evidence that traffic volumes have varied significantly over this period.

Table 1-4 Local authority PM₁₀ monitoring results

Local authority and ID	Site name	Annual mean PM ₁₀ (µg/m ³)				
		2015	2016	2017	2018	2019
Sedgemoor PM3	Taunton Road	n/a	n/a	n/a	10.7	11.9
Notes: n/a refers to years where monitoring was not undertaken.						

Table 1-5 Local authority PM_{2.5} monitoring results

Local authority and ID	Site name	Annual mean PM _{2.5} (µg/m ³)				
		2015	2016	2017	2018	2019
Sedgemoor PM3	Taunton Road	n/a	n/a	n/a	9.2	10.7
Notes: n/a refers to years where monitoring was not undertaken.						

1.2 Background pollution concentrations

1.2.1 Background concentrations refer to the existing levels of pollution in the atmosphere, produced by a variety of sources, such as roads and industrial processes. The Department for Environment, Food and Rural Affairs (Defra) has produced estimated background air pollution data for each 1x1km Ordnance Survey (OS) grid square for each local authority area in the UK [6]. Background maps are available for 2018 and are projected through to 2030.

1.2.2 Estimated background air pollution data for 2019 for NO₂ and PM₁₀ for the local authorities within the ARN are presented in Table 1-6. The table shows the maximum, minimum and average concentrations for the grid squares in the following local authorities:

- EDDC
- ECC
- MDDC
- SDC
- SWTC

1.2.3 As Table 1-6 shows, none of the background concentrations are above the relevant annual mean AQO for NO₂ or PM₁₀ in 2019 (40µg/m³).

Table 1-6 Predicted background pollutant concentrations for 2019

Local authority	Annual mean NO ₂ concentration (µg/m ³)			Annual mean PM ₁₀ concentration (µg/m ³)		
	Max	Min	Average	Max	Min	Average
East Devon District Council	14.6	3.3	4.8	12.5	8.0	9.9
Exeter City Council	16.8	5.8	9.9	14.3	9.1	11.2
Mid Devon District Council	11.5	3.5	4.5	13.4	8.0	9.7
Sedgemoor District Council	14.5	3.8	5.7	16.1	9.5	11.2
Somerset West and Taunton Council	14.3	3.7	5.4	14.2	9.1	10.9

1.2.4 A comparison of the local authority monitored background data at background monitoring sites in the vicinity of the study area and the Defra mapped concentrations has been carried out as shown in Table 1-7. There is limited background monitoring in the study area. There is one diffusion tube (DT47) located adjacent to the ARN. The closest automatic monitoring site (the Honiton automatic site) has also been included which is 14.5km away from the ARN located on Dove Close.

1.2.5 Both of the monitored background concentrations are well below the annual mean air quality objective for NO₂. Due to the limited existing background monitoring data available specifically for the study area, and the geographical spread of the ARN, this assessment has used concentrations from the Defra maps to provide background concentrations.

Table 1-7 Comparison between Defra modelled background concentration and local authority background monitoring

Site ID	Grid square		Local authority	Distance from ARN (m)	Local authority monitored NO ₂ 2019 (µg/m ³)	Defra background NO ₂ 2019 (µg/m ³)	Difference (µg/m ³)	% change
	X	Y						
Honiton AURN (Dove Close)	315500	99500	East Devon	14,500	8.1	5.9	2.2	27%
Exeter DT47	296500	94500	Exeter	50	17.9	9.2	8.7	49%

References

- [1] "Air Quality Annual Status Report," Sedgemoor District Council, 2020.
- [2] "2020 Air Quality Annual Status Report," Exeter City Council, 2020.
- [3] "Annual Status Report 2020," Mid Devon District Council, 2020.
- [4] "2020 Air Quality Annual Status Report," Somerset West and Taunton, 2020.
- [5] "Annual Status Report 2020," East Devon District Council, 2020.
- [6] "Defra background maps," DEFRA, [Online]. Available: <https://uk-air.defra.gov.uk/data/laqm-background-home>. [Accessed April 2021].
- [7] "2019 and 2020 Air Quality Annual Status Report," South Somerset District Council, 2020.