The Lake Lothing (Lowestoft) Third Crossing Order 201[*]

Lake Lothing THIRD CROSSING

Document 6.3: Environmental Statement Volume 3 Appendices

Appendix 8G

Ecological Assessment Detailed Results and Impacts

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Appendix 8G - Ecological Assessment Detailed Results and Impacts

1.1 Barnby Broad and Marshes SSSI

1.1.1 The NO_x concentrations for transect points modelled at 10m intervals from the nearest modelled road (the A146) and across the Barnby Broad and Marshes SSSI are presented in Table 0-1. Air quality dispersal modelling for NO_x showed a change in NO_x concentrations up to a distance of 68.5m from the nearest modelled road. Beyond this distance there was no difference in concentrations of NO_x between the Do Minimum and Do Something scenarios.

1.1.2 Modelling does not indicate an increase in NO_x concentrations greater of than 2 µg/m^3 at the Barnby Broad and Marshes SSSI. The annual mean objective for NO_x (30 µg/m^3), established for the protection of vegetation and ecosystems is not exceeded. Therefore, as specified in the DMRB guidance[1], no further assessment of ecological impacts at the Barnby Broad and Marshes SSSI as a result of changes in NO_x concentrations is required.

1.1.3 The location of the modelled transect for Barnby Broad and Marshes SSSI is presented in Figure 1.

Figure 1 – Barnby Broad and Marshes SSSI Modelled Transect

[1] Highways Agency (2007) Design Manual for Roads and Bridges HA 207/07, Volume 11, Section 3, Part 1 Air Quality.

Table 0-1 - Annual Mean NOx Concentration at Barnby Broads and Marshes SSSI

Distance from edge of nearest modelled road link A146 (m)	Total NOx Concentrations (µg/m^3)			
	Annual Mean NO_x			
	2016 BY	2022 DM	2022 DS	DS-DM
58.5	18.6	14.6	14.6	0.1
68.5	17.7	14.0	14.0	0.0
78.5	17.1	13.5	13.6	0.0
88.5	16.6	13.2	13.2	0.0
98.5	16.1	12.9	12.9	0.0
108.5	15.8	12.7	12.7	0.0
118.5	15.5	12.5	12.5	0.0
128.5	15.2	12.3	12.3	0.0
138.5	15.0	12.1	12.1	0.0
148.5	14.8	12.0	12.0	0.0

1.1.4 The results for predicted Nitrogen deposition rates (N-deposition) across the Barnby Broad and Marshes SSSI modelled transect are presented in Table 0-2. There is no change in N-deposition between the DM and DS scenario. As such, further assessment of the impacts of the Scheme upon ecology at Barnby Broad and Marshes SSSI due to changes in air quality is not required.

Table 0-2 Annual Mean N Deposition Rates Concentration at Barnby Broad & Marshes SSSI

Distance from edge of nearest modelled road link A146 (m)	Total N Deposition Rate (kg N ha^{-1} yr^{-1})			
	2016 BY	2022 DM	2022 DS	2022 DS-DM
58.5	16.5	14.1	14.1	0.0
68.5	16.5	14.1	14.1	0.0
78.5	16.4	14.1	14.1	0.0
88.5	16.4	14.0	14.1	0.0
98.5	16.4	14.0	14.0	0.0
108.5	16.4	14.0	14.0	0.0
118.5	16.3	14.0	14.0	0.0
128.5	16.3	14.0	14.0	0.0
138.5	16.3	14.0	14.0	0.0
148.5	16.3	14.0	14.0	0.0
Critical Load	15-30 kg N ha-1 yr-1			

1.2 Brooke Yachts & Jeld Wen County Wildlife Site

1.2.1 The NO_x concentrations for transect points modelled from the nearest modelled road (Waveney Drive) across the Brooke Yachts and Jeld Wen County Wildlife Site (CWS) showed

a change in NO_x concentrations between the DM and DS scenarios up to a distance of 410m from edge of the road. The results are presented in Table 0-3.

1.2.2 The maximum increase in NO_x concentrations is predicted to be 1.1 µg/m^3 and the 30 µg/m^3 objective for NO_X is not exceeded. Therefore, as specified in the DMRB guidance, no further assessment of ecological impacts at the Brook Yachts and Jeld Wen CWS as a result of changes in NO_x concentrations is required.

1.2.3 The location of the modelled transect for Brooke Yachts and Jeld Wen CWS is presented in Figure 2.

Figure 2 – Brooke Yachts and Jeld Wen CWS Modelled Transect

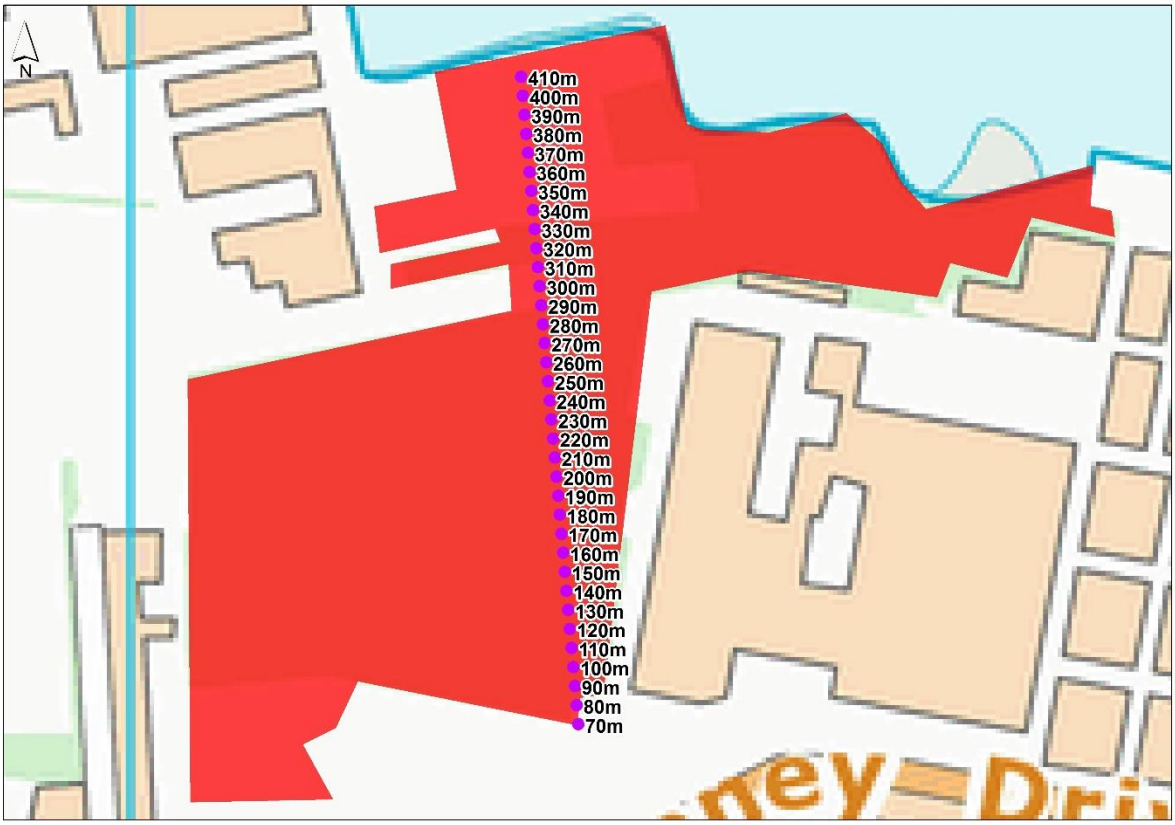


Table 0-3 Annual Mean NO_x Concentration at Brooke Yachts and Jeld Wen CWS

Distance from edge of nearest modelled road link (Waveney Drive) (m)	Total NOx Concentrations (µg/m^3)			
	2016 BY	Annual Mean NO_x		
		2022 DM	2022 DS	DS-DM
70	19.0	15.5	16.6	1.1
80	18.8	15.3	16.3	1.0
90	18.6	15.1	16.0	0.9
100	18.4	15.0	15.8	0.8
110	18.3	14.9	15.7	0.8
120	18.2	14.8	15.5	0.7
130	18.1	14.7	15.4	0.7
140	18.0	14.6	15.3	0.6

Distance from edge of nearest modelled road link (Waveney Drive) (m)	Total NOx Concentrations (µg/m^3)			
	2016 BY	Annual Mean NO_x		
		2022 DM	2022 DS	DS-DM
150	17.9	14.6	15.2	0.6
160	17.8	14.5	15.1	0.6
170	17.8	14.5	15.0	0.5
180	17.7	14.4	14.9	0.5
190	17.7	14.4	14.9	0.5
200	17.6	14.3	14.8	0.5
210	17.6	14.3	14.8	0.5
220	17.5	14.3	14.7	0.5
230	17.5	14.3	14.7	0.5
240	17.5	14.2	14.7	0.4
250	17.5	14.2	14.6	0.4
260	17.4	14.2	14.6	0.4
270	17.4	14.2	14.6	0.4
280	17.4	14.2	14.6	0.4
290	17.4	14.1	14.5	0.4
300	17.4	14.1	14.5	0.4
310	17.3	14.1	14.5	0.4
320	17.3	14.1	14.5	0.4
330	17.3	14.1	14.5	0.4
340	17.3	14.1	14.5	0.4
350	17.3	14.1	14.5	0.4
360	17.3	14.1	14.5	0.4
370	17.3	14.1	14.4	0.4
380	17.3	14.1	14.4	0.4
390	17.3	14.1	14.4	0.4
400	17.3	14.1	14.4	0.4
410	17.3	14.1	14.4	0.4

1.2.4 The results for N-deposition across the Brooke Yachts and Jeld Wen CWS modelled transect are presented in Table 0-4. There is predicted to be a small increase in N-deposition between the DM and DS scenario up to a distance of 80m from the nearest modelled road.

1.2.5 N-deposition at the CWS has been assessed against the critical load (CL) representative of heath and non-Mediterranean grasses, as prescribed by the UNECE. The CL range for heath is 10-20kgN.ha^{-1}.yr^{-1} and for non-Mediterranean grasses it is 10-15kgN.ha^{-1}.yr^{-1}, both of which are predicted to be exceeded in the 2016 Base year and 2022 DM scenario. The predicted N-deposition contribution from the modelled road emissions in each scenario were added to the respective 5x5km grid square background N-deposition value, as provided by the Air Pollution Information System (APIS)[2].

1.2.6 The results presented in Table 1-4 demonstrate that, with the Scheme in operation, the exceedance of both habitat CL ranges is predicted to remain. However, the increase in N-

[2] Atmospheric Pollution Information System (APIS) http://www.apis.ac.uk/

deposition attributed to the Scheme in the DS scenario is predicted to be below 1% of the lower end of the CL range. The change in N-deposition rate between DM and DS is considered to be negligible up to 80m from the nearest modelled road, with no change in deposition predicted beyond this distance.

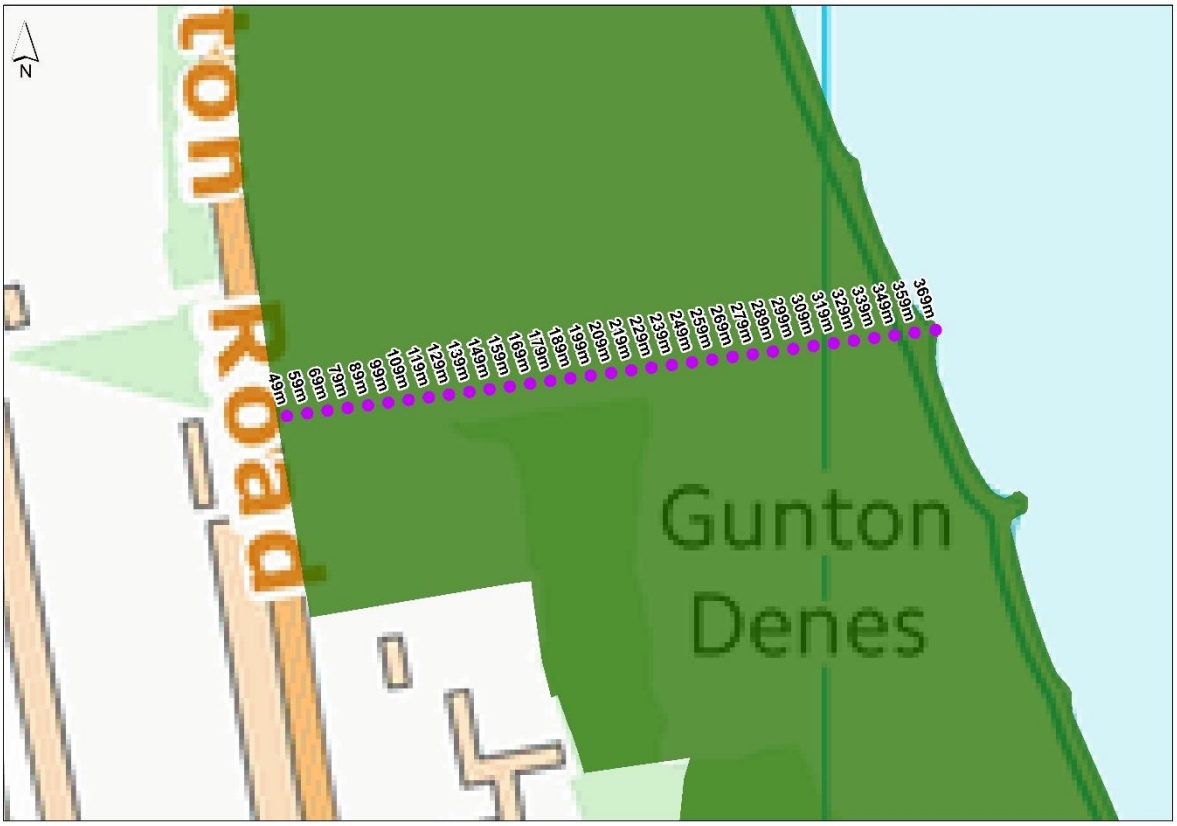
Table 0-4 Annual Mean N-Deposition Rates at Brooke Yachts and Jeld Wen CWS

Distance from edge of nearest modelled road link Waveney Drive (m)	Total N Deposition Rate (kg N ha^{-1} yr^{-1})			
	2016 BY	2022 DM	2022 DS	2022 DS-DM
70	15.0	12.9	13.0	0.1
80	15.0	12.9	13.0	0.1
90	15.0	12.9	13.0	0.0
100	15.0	12.9	13.0	0.0
110	15.0	12.9	12.9	0.0
120	15.0	12.9	12.9	0.0
130	15.0	12.9	12.9	0.0
140	15.0	12.9	12.9	0.0
150	15.0	12.9	12.9	0.0
Critical Load	10-20 kg N ha^{-1} yr^{-1} (heath) 10-15 kg N ha^{-1} yr^{-1} (non-Mediterranean grasses)			

1.3 Gunton Warren Local Nature Reserve

The predicted NO_x concentrations for transect points modelled from the nearest modelled road (Corton Road) across the Gunton Warren Local Nature Reserve (LNR) showed a change in NO_x concentrations between the DM and DS scenarios up to a distance of 14m

from edge of the road. The results are presented in Figure 4 – Gunton Warren LNR Modelled Transect 3



1.3.1 Table 0-5.

1.3.2 The maximum increase in NO_x concentrations is predicted to be 0.1 µg/m^3 and the 30 µg/m^3 objective for NO_X is not exceeded. Therefore, as specified in the DMRB guidance, no further assessment of ecological impacts at the Gunton Warren LNR as a result of changes in NO_x concentrations is required.

1.3.3 The location of the modelled transect for Gunton Warren LNR is presented in Figure 3 and Figure 4.

Figure 3 – Gunton Warren LNR Modelled Transect 1 and 2

Figure 4 – Gunton Warren LNR Modelled Transect 3

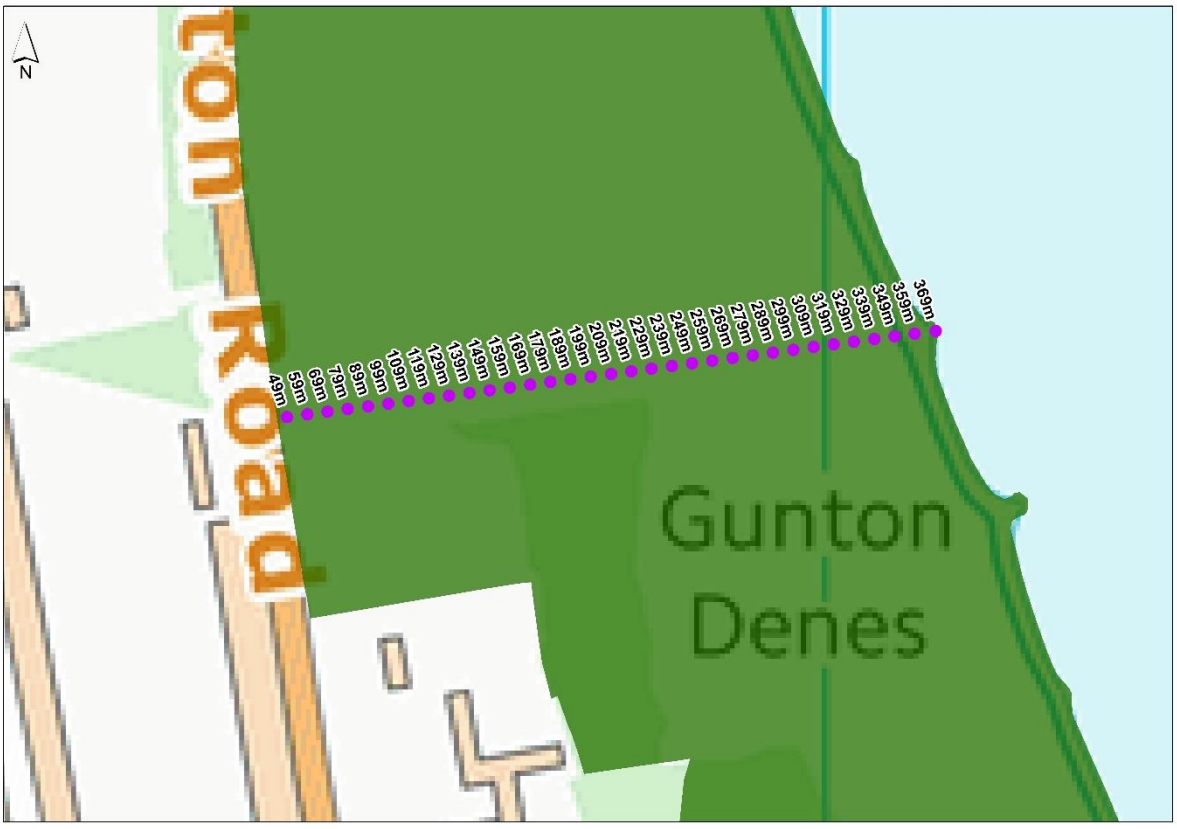


Table 0-5 Annual Mean NO_x Concentration at Gunton Warren LNR

Distance from edge of nearest modelled road link B1385 Corton Road (m)	Total NOx Concentrations (µg/m^3)			
	2016 BY	Annual Mean NO_x		
		2022 DM	2022 DS	DS-DM
Transect 1				
4	17.0	13.6	13.6	0.1
14	15.2	12.3	12.4	0.1
24	14.7	12.0	12.0	0.0
34	14.5	11.8	11.8	0.0
44	14.3	11.7	11.7	0.0
54	14.2	11.6	11.6	0.0
64	14.2	11.6	11.6	0.0
74	14.1	11.6	11.6	0.0
84	14.1	11.5	11.5	0.0
94	14.1	11.5	11.5	0.0
104	14.1	11.5	11.5	0.0
114	14.1	11.5	11.5	0.0
124	14.0	11.5	11.5	0.0
134	14.0	11.5	11.5	0.0
144	14.0	11.5	11.5	0.0
154	14.0	11.5	11.5	0.0
164	14.0	11.5	11.5	0.0
174	14.0	11.5	11.5	0.0
184	14.0	11.5	11.5	0.0
194	14.0	11.5	11.5	0.0
204	14.0	11.5	11.5	0.0
214	14.0	11.5	11.5	0.0
224	14.0	11.5	11.5	0.0
234	14.0	11.5	11.5	0.0
Transect 2				
28	18.8	14.8	14.8	0.1
38	15.6	12.6	12.6	0.0
48	14.8	12.0	12.0	0.0
58	14.5	11.8	11.8	0.0
68	14.3	11.6	11.7	0.0
78	14.2	11.6	11.6	0.0
88	14.1	11.5	11.5	0.0
98	14.0	11.5	11.5	0.0
108	14.0	11.4	11.5	0.0
118	14.0	11.4	11.4	0.0
128	13.9	11.4	11.4	0.0
Transect 3				
39	15.2	12.4	12.4	0.0
49	17.4	13.9	13.9	0.0
59	16.3	13.2	13.2	0.0
69	15.9	12.9	12.9	0.0

Distance from edge of nearest modelled road link B1385 Corton Road (m)	Total NOx Concentrations (µg/m^3)			
	2016 BY	Annual Mean NO_x		
		2022 DM	2022 DS	DS-DM
79	15.7	12.8	12.8	0.0
89	15.5	12.7	12.7	0.0
99	15.4	12.6	12.6	0.0
109	15.4	12.5	12.5	0.0
119	15.3	12.5	12.5	0.0
129	15.3	12.5	12.5	0.0
139	15.2	12.4	12.4	0.0
149	15.2	12.4	12.4	0.0
159	15.2	12.4	12.4	0.0
169	15.1	12.4	12.4	0.0
179	15.1	12.3	12.4	0.0
189	15.1	12.3	12.3	0.0
199	15.1	12.3	12.3	0.0
209	15.0	12.3	12.3	0.0
219	15.0	12.3	12.3	0.0
229	15.0	12.3	12.3	0.0
239	15.0	12.3	12.3	0.0
249	15.0	12.3	12.3	0.0
259	15.0	12.3	12.3	0.0
269	15.0	12.3	12.3	0.0
279	15.0	12.2	12.3	0.0
289	14.9	12.2	12.2	0.0
299	14.9	12.2	12.2	0.0
309	14.9	12.2	12.2	0.0
319	15.2	12.5	12.5	0.0
329	15.2	12.5	12.5	0.0
339	15.2	12.5	12.5	0.0
349	15.2	12.4	12.5	0.0
359	15.2	12.4	12.5	0.0
369	15.3	12.5	12.5	0.0
379	15.3	12.5	12.5	0.0
389	15.2	12.5	12.5	0.0
399	15.2	12.4	12.4	0.0
409	15.2	12.4	12.4	0.0
419	15.4	12.6	12.6	0.0
429	15.4	12.5	12.6	0.0
439	15.3	12.5	12.5	0.0
449	15.3	12.5	12.5	0.0
459	15.3	12.5	12.5	0.0
469	15.3	12.5	12.5	0.0
479	15.3	12.5	12.5	0.0
489	15.3	12.5	12.5	0.0
499	15.3	12.5	12.5	0.0

Distance from edge of nearest modelled road link B1385 Corton Road (m)	Total NOx Concentrations (µg/m^3)			
	2016 BY	Annual Mean NO_x		
		2022 DM	2022 DS	DS-DM
509	15.2	12.5	12.5	0.0
519	15.2	12.5	12.5	0.0
529	15.2	12.5	12.5	0.0
539	15.2	12.4	12.5	0.0
549	15.2	12.4	12.5	0.0
559	15.2	12.4	12.4	0.0
569	15.2	12.4	12.4	0.0
579	17.4	13.9	13.9	0.0
589	16.3	13.2	13.2	0.0
599	15.9	12.9	12.9	0.0
609	15.7	12.8	12.8	0.0
619	15.5	12.7	12.7	0.0
629	15.4	12.6	12.6	0.0

1.3.4 The predicted N-deposition results across the Gunton Warren LNR modelled transects are presented in Table 0-6. There is predicted to be no increase in Nitrogen deposition between the DM and DS scenario up to a distance of 309m from the nearest modelled road.

1.3.5 N-deposition at the Gunton Warren LNR has been assessed against the critical load (CL) representative of inland dune pioneer or siliceous grasslands with a CL range of 8-15kgN.ha^{-1}.yr^{-1}. The predicted N-deposition contribution from the modelled road emissions in each scenario were added to the respective 5x5km grid square background N-deposition value, as provided by the Air Pollution Information System (APIS).

1.3.6 The results presented in Table 0-6 demonstrate that the lower end of the critical load range is exceeded in the Base year and the exceedance would still be present in the opening year 2022 although the deposition rates are predicted to reduce by 2022 without the Scheme, and the Scheme does not worsen or improve the exceedance.

1.3.7 On the basis of there being no predicted change in N-deposition rates with the Scheme in operation, further assessment of impacts upon the Gunton Warren LNR is not required.

Table 0-6 Annual Mean N-Deposition Rates at Gunton Warren LNR

Distance from edge of nearest modelled road link B1385 Corton Road (m)	Total N Deposition Rate (kg N ha^{-1} yr^{-1})			
	2016 BY	2022 DM	2022 DS	2022 DS-DM
Transect 1				
4	14.4	12.5	12.5	0.0
14	14.4	12.4	12.4	0.0
24	14.4	12.4	12.4	0.0
34	14.4	12.4	12.4	0.0
44	14.4	12.4	12.4	0.0
54	14.4	12.4	12.4	0.0
64	14.4	12.4	12.4	0.0

Distance from edge of nearest modelled road link B1385 Corton Road (m)	Total N Deposition Rate (kg N ha^{-1} yr^{-1})			
	2016 BY	2022 DM	2022 DS	2022 DS-DM
74	14.4	12.4	12.4	0.0
84	14.4	12.4	12.4	0.0
94	14.4	12.4	12.4	0.0
104	14.4	12.4	12.4	0.0
Transect 2				
28	14.4	12.5	12.5	0.0
38	14.4	12.4	12.4	0.0
48	14.4	12.4	12.4	0.0
58	14.4	12.4	12.4	0.0
68	14.5	12.4	12.4	0.0
78	14.5	12.4	12.4	0.0
88	14.4	12.4	12.4	0.0
98	14.4	12.4	12.4	0.0
108	14.4	12.4	12.4	0.0
118	14.4	12.3	12.4	0.0
128	14.4	12.3	12.3	0.0
Transect 3				
39	15.2	12.4	12.4	0.0
49	17.4	13.9	13.9	0.0
59	16.3	13.2	13.2	0.0
69	15.9	12.9	12.9	0.0
79	15.7	12.8	12.8	0.0
89	15.5	12.7	12.7	0.0
99	15.4	12.6	12.6	0.0
109	15.4	12.5	12.5	0.0
119	15.3	12.5	12.5	0.0
129	15.3	12.5	12.5	0.0
139	15.2	12.4	12.4	0.0
149	15.2	12.4	12.4	0.0
159	15.2	12.4	12.4	0.0
169	15.1	12.4	12.4	0.0
179	15.1	12.3	12.4	0.0
189	15.1	12.3	12.3	0.0
199	15.1	12.3	12.3	0.0
209	15.0	12.3	12.3	0.0
219	15.0	12.3	12.3	0.0
229	15.0	12.3	12.3	0.0
239	15.0	12.3	12.3	0.0
249	15.0	12.3	12.3	0.0
259	15.0	12.3	12.3	0.0
269	15.0	12.3	12.3	0.0
279	15.0	12.2	12.3	0.0
289	14.9	12.2	12.2	0.0
299	14.9	12.2	12.2	0.0

Distance from edge of nearest modelled road link B1385 Corton Road (m)	Total N Deposition Rate (kg N ha^{-1} yr^{-1})			
	2016 BY	2022 DM	2022 DS	2022 DS-DM
309	14.9	12.2	12.2	0.0
Critical Load	8-15kg N ha^{-1} yr^{-1}.			

1.4 Kirkley Ham County Wildlife Site

1.4.1 The NO_x concentrations for transect points modelled from the nearest modelled road (A12 Tom Crisp Way) across the Kirkley Ham County Wildlife Site (CWS) showed a change in NO_x concentrations across the entire transect distance which was modelled to 107.5m from edge of the nearest modelled road. An increase in NO_x concentrations is observed in the DS scenario relative to the DM scenario. The results are presented in Table 0-7.

1.4.2 The maximum increase in NO_x is predicted to be 9.5 µg/m^3. Kirkley Ham is a CWS, which does not constitute a Designated Site by the definition of the DMRB Guidance however it is of value at the County level (see Chapter 11 and Table 11-1). The annual mean objective for NO_x is exceeded in the Base year at a distance of 6m from Tom Crisp Way and without the Scheme the exceedance is predicted to be removed by the Opening year 2022. However in the DS scenario, at the point in the modelled transect situated 6m from the roadside of Tom Crisp Way, there is a predicted exceedance of the 30 µg/m^3 NO_x objective. Concentrations are predicted to fall below the objective at a distance of 16m from the road.

1.4.3 The location of the modelled transect for Kirkley Ham CWS is presented in Figure 5.

Figure 5 – Kirkley Ham CWS Modelled Transect

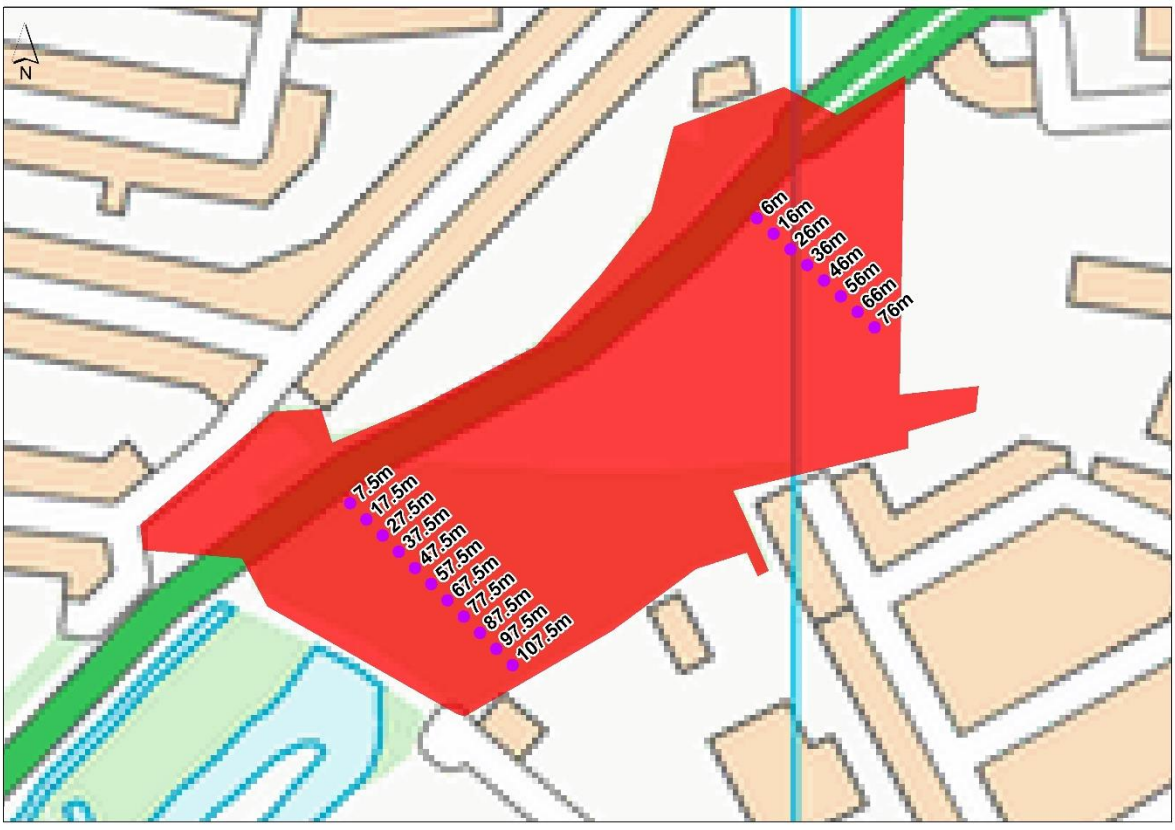


Table 0-7 NO_x Concentration at Kirkley Ham CWS

Distance from edge of nearest modelled road link A12 Tom Crisp Way (m)	Total NOx Concentrations (µg/m^3)			
	Annual Mean NO_x			
	2016 BY	2022 DM	2022 DS	DS-DM
Transect 1				
6	40.7	29.1	38.5	9.5
16	30.3	22.4	27.9	5.5
26	26.2	19.8	23.7	3.9
36	24.4	18.7	21.7	3.1
46	23.0	17.8	20.3	2.5
56	22.1	17.2	19.3	2.1
66	21.4	16.8	18.6	1.9
76	20.9	16.4	18.1	1.6
Transect 2				
7.5	38.3	27.5	35.8	8.3
17.5	29.5	21.8	26.8	5.0
27.5	25.8	19.5	23.1	3.6
37.5	23.8	18.2	21.0	2.8
47.5	22.5	17.4	19.7	2.4
57.5	21.6	16.8	18.8	2.0
67.5	20.9	16.4	18.1	1.8
77.5	20.4	16.1	17.6	1.6
87.5	20.0	15.8	17.2	1.4
97.5	19.7	15.6	16.9	1.3
107.5	19.5	15.4	16.6	1.2

1.4.4 The predicted N-deposition results across the Kirkley Ham CWS modelled transects are presented in Table 1-8. N-deposition at the CWS has been assessed against the critical load (CL) ranges representative of Neutral Grassland species (20-30 kgN.ha^{-1}.yr^{-1}) and Acid Grasslands (5-25 kgN.ha^{-1}.yr^{-1}), both of which are exceeded in the 2016 Base year and 2022 DM scenarios. The predicted N-deposition contribution from the modelled road emissions in each scenario were added to the respective 5x5km grid square background N-deposition value, as provided by the Air Pollution Information System (APIS).

1.4.5 The results presented in Table 0-8 demonstrate that the Scheme results in a maximum increase in N-deposition of 0.5 kgN.ha^{-1}.yr^{-1} at a distance of 6m from the road, which exceeds 1% of the lower CL of 20 kgN.ha^{-1}.yr^{-1} for Neutral Grasslands, and 1% of the lower CL of 5 kgN.ha^{-1}.yr^{-1} for Acid Grasslands, thereby indicating the potential for harm to vegetation. The predicted total N-deposition rate in the base year and the opening year DS scenario is above the lower end of the CL range for acid grasslands in the Base year and the DM and DS scenario. A more detailed assessment has been undertaken within Chapter 11.

Table 0-8 Total N-Deposition Rate at Kirkley Ham CWS

Distance from edge of nearest modelled road	Total N Deposition Rate (kg N ha^{-1} yr^{-1})			
	2016 BY	2022 DM	2022 DS	2022 DS-DM

link A12 Tom Crisp Way (m)				
Transect 1				
6	15.5	13.7	14.1	0.5
16	17.2	13.3	13.6	0.3
26	16.1	13.2	13.4	0.2
36	15.7	13.1	13.3	0.2
46	15.5	13.0	13.2	0.1
56	18.4	13.0	13.1	0.1
66	16.4	13.0	13.1	0.1
76	15.9	13.0	13.1	0.1
Transect 2				
7.5	15.1	13.6	14.0	0.4
17.5	15.1	13.3	13.5	0.3
27.5	15.1	13.2	13.3	0.2
37.5	15.0	13.1	13.2	0.2
47.5	15.7	13.0	13.2	0.1
57.5	15.4	13.0	13.1	0.1
67.5	15.3	13.0	13.1	0.1
77.5	15.2	13.0	13.1	0.1
87.5	15.2	13.0	13.0	0.1
97.5	15.1	12.9	13.0	0.1
107.5	15.1	12.9	13.0	0.1
Critical Load	20-30 kg N ha^{-1} yr^{-1} (Neutral Grassland) 5-25 kg N ha-1 yr^{-1} (Acid Grasslands)			

1.5 Leathes Ham Local Nature Reserve

1.5.1 The NO_x concentrations for transect points modelled from the nearest modelled road (Peto Way) across the Leathes Ham Local Nature Reserve (LNR) showed a change in NO_x deposition with the Scheme up to 315.5m from edge of the nearest modelled road. An increase in NO_x concentrations is observed in the Do Something Scenario. Concentrations are predicted to decrease with increasing distance from the road. The results are presented in Table 0-9.

1.5.2 The maximum increase in NO_x is predicted to be 6.9 µg/m^3. Leathes Ham is a LNR which does not constitute a Designated Site by the definition of the DMRB Guidance but is of significance at the county level (see Table 11-1 in Chapter 11). The annual mean objective for NO_x is predicted to be exceeded in the base year scenario and in the DM scenario the exceedance would be removed. However, with the Scheme in operation, an exceedance occurs at the point in the transect situated 5.5m from Peto Way. The annual mean NO_x concentration is predicted to fall below the objective at a distance of 15.5m from the road. Further discussion on this is included in Chapter 11: Nature Conservation.

1.5.3 The location of the modelled transect for Leathes Ham LNR is presented in Figure 6.

Figure 6 – Leathes Ham LNR Modelled Transect

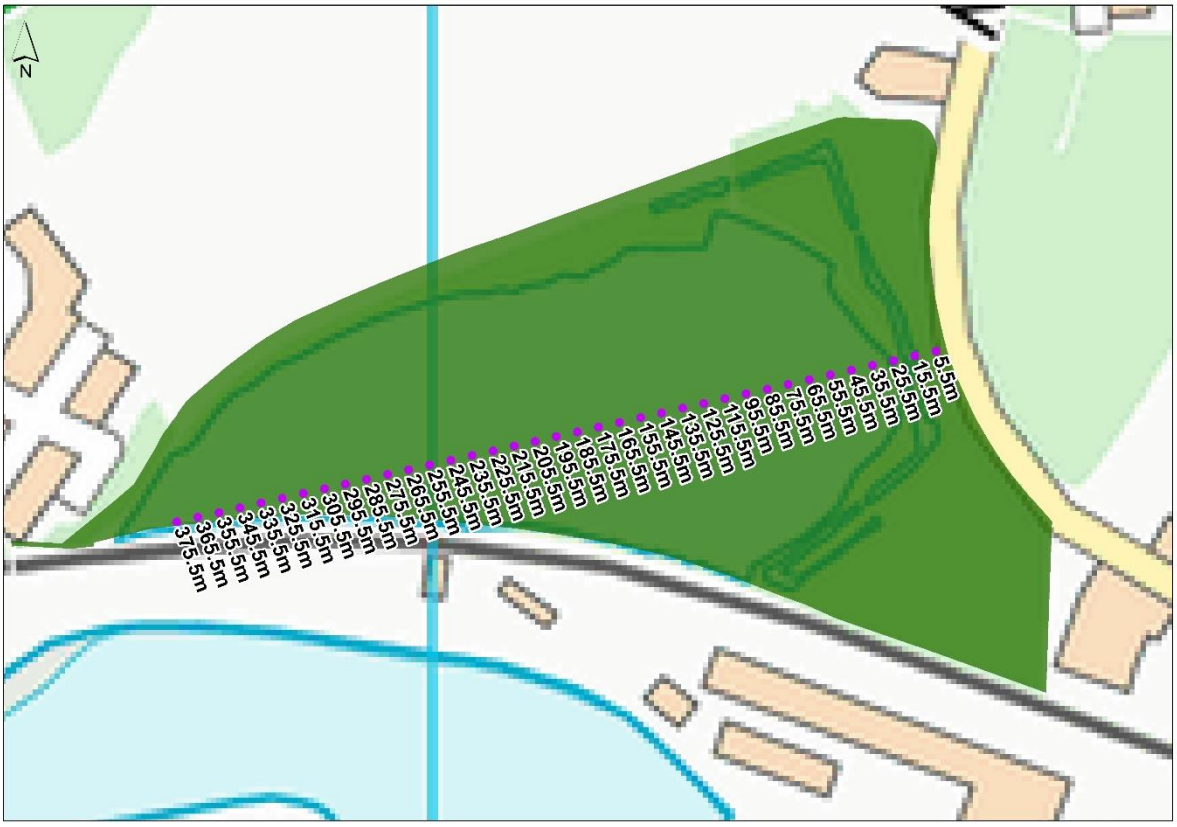


Table 0-9 NO_x Concentration at Leathes Ham LNR

Distance from edge of nearest modelled road link Peto Way (m)	Total NOx Concentrations (µg/m³)			
	2016 BY	Annual Mean NO_x		
		2022 DM	2022 DS	DS-DM
5.5	31.5	24.1	31.0	6.9
15.5	25.0	19.5	23.3	3.9
25.5	22.4	17.6	20.3	2.7
35.5	21.1	16.7	18.8	2.1
45.5	20.2	16.1	17.8	1.7
55.5	19.7	15.7	17.1	1.4
65.5	19.3	15.4	16.6	1.2
75.5	19.0	15.2	16.2	1.0
85.5	18.7	15.0	15.9	0.9
95.5	18.5	14.9	15.7	0.8
115.5	18.4	14.8	15.5	0.7
125.5	18.3	14.7	15.3	0.6
135.5	18.2	14.6	15.2	0.6
145.5	18.1	14.6	15.1	0.5
155.5	18.0	14.5	15.0	0.5
165.5	18.0	14.5	14.9	0.4
175.5	17.9	14.5	14.9	0.4

Distance from edge of nearest modelled road link Peto Way (m)	Total NOx Concentrations (µg/m^3)			
	2016 BY	Annual Mean NO_x		
		2022 DM	2022 DS	DS-DM
185.5	17.9	14.4	14.8	0.4
195.5	17.8	14.4	14.7	0.3
205.5	17.8	14.4	14.7	0.3
215.5	17.8	14.4	14.6	0.3
225.5	17.8	14.4	14.6	0.2
235.5	17.8	14.3	14.6	0.2
245.5	17.7	14.3	14.5	0.2
255.5	17.3	14.0	14.2	0.2
265.5	17.3	14.0	14.1	0.2
275.5	17.3	14.0	14.1	0.1
285.5	17.3	14.0	14.1	0.1
295.5	17.3	14.0	14.1	0.1
305.5	17.3	14.0	14.1	0.1
315.5	17.3	14.0	14.0	0.1
325.5	17.3	14.0	14.0	0.0
335.5	17.3	14.0	14.0	0.0
345.5	17.3	14.0	14.0	0.0
355.5	17.3	14.0	14.0	0.0
365.5	17.3	14.0	14.0	0.0
375.5	17.3	14.0	14.0	0.0

1.5.4 The predicted N-deposition results across the Leathes Ham LNR modelled transects are presented in Table 0-10. There is an increase in predicted N-deposition between the DM and DS scenario up to a distance of 75.5m from the nearest modelled road.

1.5.5 N-deposition at the Leathes Ham LNR has been assessed against the CL representative of Fen, Marsh and Swamp with a CL range of 15-30 kgN.ha^{-1}.yr^{-1}. The predicted N-deposition contribution from the modelled road emissions in each scenario were added to the respective 5x5km grid square background N-deposition value, as provided by the APIS website.

1.5.6 The results presented in Table 0-10 demonstrate that the Scheme results in a maximum increase in N-deposition of 0.4 kgN.ha^{-1}.yr^{-1}. However, the predicted total N-deposition rate in both the DM and DS scenarios remain below the respective lower end of the CL range. As such, further assessment of the impacts of the Scheme upon ecology at Leathes Ham LNR is not required.

Table 0-10 Total N-deposition Rate at Leathes Ham LNR

Distance from edge of nearest modelled road link Peto Way (m)	Total N Deposition Rate (kg N ha^{-1} yr^{-1})			
	2016 BY	2022 DM	2022 DS	2022 DS-DM
5.5	15.1	13.4	13.8	0.4
15.5	15.1	13.2	13.4	0.2
25.5	15.1	13.1	13.2	0.1
35.5	15.0	13.0	13.1	0.1

Distance from edge of nearest modelled road link Peto Way (m)	Total N Deposition Rate (kg N ha^{-1} yr^{-1})			
	2016 BY	2022 DM	2022 DS	2022 DS-DM
45.5	15.0	13.0	13.1	0.1
55.5	15.0	13.0	13.0	0.1
65.5	15.0	12.9	13.0	0.1
75.5	15.0	12.9	13.0	0.1
85.5	15.0	12.9	13.0	0.0
95.5	15.0	12.9	13.0	0.0
105.5	15.0	12.9	12.9	0.0
115.5	15.0	12.9	12.9	0.0
125.5	15.0	12.9	12.9	0.0
135.5	15.0	12.9	12.9	0.0
145.5	15.0	12.9	12.9	0.0
155.5	15.0	12.9	12.9	0.0
165.5	15.0	12.9	12.9	0.0
175.5	15.0	12.9	12.9	0.0
185.5	15.0	12.9	12.9	0.0
195.5	15.0	12.9	12.9	0.0
205.5	15.0	12.9	12.9	0.0
215.5	15.0	12.9	12.9	0.0
225.5	15.0	12.9	12.9	0.0
235.5	15.0	12.9	12.9	0.0
245.5	15.0	12.9	12.9	0.0
255.5	15.0	12.9	12.9	0.0
265.5	15.0	12.9	12.9	0.0
275.5	15.0	12.9	12.9	0.0
285.5	15.0	12.9	12.9	0.0
295.5	15.0	12.9	12.9	0.0
305.5	15.0	12.9	12.9	0.0
315.5	15.0	12.9	12.9	0.0
325.5	15.0	12.9	12.9	0.0
335.5	15.0	12.9	12.9	0.0
345.5	15.1	12.9	12.9	0.0
355.5	15.1	12.9	12.9	0.0
365.5	15.0	12.9	12.9	0.0
375.5	15.0	12.9	12.9	0.0
Critical Load	15-30 kg N ha^{-1} yr^{-1} (fen marsh and swamp)			