ENVIRONMENTAL STATEMENT - VOLUME 3 - APPENDIX 6.5 (CLEAN)

Operation Phase Air Quality Assessment Results Tables: Ecological Receptors

Drax Bioenergy with Carbon Capture and Storage

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - 5(2)(a)

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AUTHOR: B Tuckett-Jones

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1. OPERATION PHASE AIR QUALITY ASSESSMENT RESULTS TABLES: ECOLOGICAL RECEPTORS

1.1. IMPACTS ON ECOLOGICAL RECEPTORS

1.1.1. The results of the modelling assessment at each modelled ecological receptor are presented in the below tables for each relevant pollutant and averaging period applicable to the study. The maximum modelled concentration and deposition values are presented, which is based on modelling over all five years of meteorological data (2016-2020). The change in PC and PEC, as a percentage of the relevant critical level / load, is presented for each receptor.

1.1.2. The PC impact in the with Proposed Scheme scenario represents the change in concentration / deposition between the Baseline scenario and Proposed Scheme scenario.

1.1.3. In all results tables presented in this appendix, the following designated site names are shortened to 'Thorne Moor SPA' and Thorne Moor SSSI', respectively:

- **a.** Thorne & Hatfield Moors SPA
- **b.** Thorne, Crowle and Goole Moors SSSI.

1.1.4. In the latest version of this Appendix, the results have been updated (see red table text) in response to changes to background pollutant concentrations and deposition on the APIS web platform in May 2023. Further details are provided in Air Quality Technical Note 3 (document reference 8.20) submitted at Deadline 8. The majority of changes on APIS do not affect the assessment outcome and, as such, updates in this Appendix have been limited to those that potentially impact on the significance of any effects. These include:

- **a.** Reduction in background NOx concentrations over the Humber Estuary SAC/SPA/SSSI, where in comparison to data reported in Appendix 6.5 of the ES (APP-129), the site is moved from a situation where the PEC exceeds the critical level to a situation where the PEC is within the critical level, and
- **b.** Increase in critical load for acid deposition over Lower Derwent Valley SAC and Barn Hill Meadows SSSI, where the site is moved from a situation where the PEC exceeds the critical load and the PC is greater than 1% of the critical load to a situation where the PEC is within the critical load and the maximum PC is less than 1% of the critical load.

CORE MODEL SCENARIOS

1.1.5. Results pertaining to the core model scenarios are presented in **Tables 1.1 to 1.6**.

Table 1.1 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Mean NO_x

Receptor	Annual Mean NO_x concentration ($\mu g/m^3$)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
River Derwent SAC	30	11.91	0.163	0.5%	12.13	40.4%
Thorne Moor SAC/SPA/SSSI	30	13.21	0.076	0.3%	13.32	44.4%
Lower Derwent Valley SAC	30	9.92	0.166	0.6%	10.15	33.8%
Lower Derwent Valley SPA	30	9.92	0.166	0.6%	10.15	33.8%
Skipwith Common SAC	30	9.76	0.058	0.2%	9.84	32.8%
Skipwith Common SSSI	30	9.76	0.058	0.2%	9.84	32.8%
Humber Estuary SAC	30	14.50[a]	0.147	0.5%	14.70	49.0%
Humber Estuary SPA/SSSI	30	14.50[a]	0.147	0.5%	14.70	49.0%
Breighton Meadows SSSI	30	9.92	0.166	0.6%	10.15	33.8%
Eskamhorn Meadows SSSI	30	11.35	0.046	0.2%	11.40	38.0%
Derwent Ings SSSI	30	9.80	0.134	0.4%	9.99	33.3%
Went Ings SSSI	30	12.09	0.052	0.2%	12.16	40.5%
Barn Hill Meadows SSSI	30	12.89	0.152	0.5%	13.09	43.6%
Burr Closes SSSI	30	10.53	0.062	0.2%	10.61	35.4%
Common Plantation SINC	30	11.43	0.017	0.1%	11.45	38.2%
Disused Railway Embankment SINC	30	10.76	0.040	0.1%	10.81	36.0%
Barmby-on-the-Marsh LWS	30	10.48	0.076	0.3%	10.57	35.2%
Brockholes SINC	30	11.22	0.019	0.1%	11.24	37.5%
Meadow East of Orchard Farm SINC	30	10.83	0.009	0.0%	10.84	36.1%
Barmby Pond LWS	30	9.96	0.127	0.4%	10.12	33.7%
Cobble Croft Wood SINC	30	11.62	0.027	0.1%	11.65	38.8%
Hagg Green Lane SINC	30	10.93	0.103	0.3%	11.07	36.9%

Receptor	Annual Mean NO_x concentration ($\mu g/m^3$)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Sand Pitt Wood & Barffs Close Plantation SINC	30	11.43	0.028	0.1%	11.46	38.2%
Env. Agency Screening Criterion (as % of CL)			**1%**			**70%**

a. **Background NOx concentration for Humber Estuary SAC/SPA/SSSI taken from maximum within study area (within 15km of Proposed Scheme, 2020), from** [redacted]

Table 1.2 - Modelled Maximum Operational Impacts at Ecological Receptors – Daily Mean NO_x

Receptor	Daily Mean NO_x concentration ($\mu g/m^3$)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
River Derwent SAC	75	23.82	1.787	2.4%	27.96	37.3%
Thorne Moor SAC/SPA/SSSI	75	26.42	0.893	1.2%	29.27	39.0%
Lower Derwent Valley SAC	75	19.84	0.893	1.2%	23.75	31.7%
Lower Derwent Valley SPA	75	19.84	0.893	1.2%	23.75	31.7%
Skipwith Common SAC	75	19.52	0.646	0.9%	21.71	28.9%
Skipwith Common SSSI	75	19.52	0.646	0.9%	21.71	28.9%
Humber Estuary SAC	75	29.01[a]	1.200	1.6%	32.02	42.7%
Humber Estuary SPA/SSSI	75	29.01[a]	1.200	1.6%	32.02	42.7%
Breighton Meadows SSSI	75	19.84	0.893	1.2%	23.75	31.7%
Eskamhorn Meadows SSSI	75	22.70	1.912	2.5%	25.59	34.1%
Derwent Ings SSSI	75	19.60	0.831	1.1%	23.37	31.2%
Went Ings SSSI	75	24.18	0.971	1.3%	26.60	35.5%
Barn Hill Meadows SSSI	75	25.78	0.962	1.3%	28.30	37.7%
Burr Closes SSSI	75	21.06	0.761	1.0%	22.99	30.7%
Common Plantation SINC	75	22.86	1.038	1.4%	24.19	32.3%

Receptor	Daily Mean NO_x concentration ($\mu g/m^3$)					
	Critical Level	**Background**	**Max PC Impact**	**Max PC Impact as % of CL**	**Proposed Scheme Max PEC**	**Max PEC as % of CL**
Disused Railway Embankment SINC	75	21.52	1.184	1.6%	23.07	30.8%
Barmby-on-the-Marsh LWS	75	20.96	1.621	2.2%	23.44	31.3%
Brockholes SINC	75	22.44	1.623	2.2%	24.44	32.6%
Meadow East of Orchard Farm SINC	75	21.66	0.554	0.7%	22.33	29.8%
Barmby Pond LWS	75	19.92	1.577	2.1%	23.29	31.1%
Cobble Croft Wood SINC	75	23.24	1.176	1.6%	25.28	33.7%
Hagg Green Lane SINC	75	21.86	1.248	1.7%	25.22	33.6%
Sand Pitt Wood & Barffs Close Plantation SINC	75	22.86	1.630	2.2%	24.97	33.3%
Env. Agency Screening Criterion (as % of CL)			**10%**			[redacted]

a. Background NOx concentration for Humber Estuary SAC/SPA/SSSI taken from maximum within study area **(within 15km of Proposed Scheme, 2020), from** [redacted]

Table 1.3 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Mean NH_3

Receptor	Annual Mean NH_3 concentration ($\mu g/m^3$)					
	Critical Level	**Background**	**Max PC Impact**	**Max PC Impact as % of CL**	**Proposed Scheme Max PEC**	**Max PEC as % of CL**
River Derwent SAC	3	4.57	0.007	0.2%	4.58	152.7%
Thorne Moor SAC/SPA/SSSI	1	2.59	0.003	0.3%	2.60	259.5%
Lower Derwent Valley SAC	3	4.57	0.007	0.2%	4.58	152.7%
Lower Derwent Valley SPA	3	4.57	0.007	0.2%	4.58	152.7%
Skipwith Common SAC	1	2.58	0.002	0.2%	2.58	258.4%
Skipwith Common SSSI	1	2.58	0.002	0.2%	2.58	258.4%
Humber Estuary SAC	3	3.58	0.004	0.1%	3.59	119.5%
Humber Estuary SPA/SSSI	3	3.58	0.004	0.1%	3.59	119.5%

Receptor	Annual Mean NH_3 concentration ($\mu g/m^3$)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Breighton Meadows SSSI	3	3.08	0.007	0.2%	3.09	103.0%
Eskamhorn Meadows SSSI	3	2.40	0.002	0.1%	2.40	80.1%
Derwent Ings SSSI	3	4.57	0.005	0.2%	4.58	152.6%
Went Ings SSSI	3	2.35	0.002	0.1%	2.35	78.4%
Barn Hill Meadows SSSI	3	2.32	0.005	0.2%	2.33	77.6%
Burr Closes SSSI	3	2.50	0.003	0.1%	2.50	83.5%
Common Plantation SINC	3	2.33	0.001	0.0%	2.33	77.7%
Disused Railway Embankment SINC	1	2.28	0.002	0.1%	2.28	76.1%
Barmby-on-the-Marsh LWS	3	2.28	0.003	0.1%	2.28	76.1%
Brockholes SINC	3	2.28	0.001	0.0%	2.28	76.0%
Meadow East of Orchard Farm SINC	1	2.33	0.000	0.0%	2.33	77.7%
Barmby Pond LWS	1	2.28	0.006	0.2%	2.29	76.2%
Cobble Croft Wood SINC	3	2.33	0.001	0.0%	2.33	77.7%
Hagg Green Lane SINC	3	3.09	0.004	0.1%	3.10	103.2%
Sand Pitt Wood & Barffs Close Plantation SINC	3	2.33	0.001	0.0%	2.33	77.7%
Env. Agency Screening Criterion (as % of CL)				**1%**		**70%**

Table 1.4 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Mean SO_2

Receptor	Annual Mean SO_2 concentration ($\mu g/m^3$)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
River Derwent SAC	20	3.93	0.072	0.4%	4.03	20.2%
Thorne Moor SAC/SPA/SSSI	20	1.34	0.033	0.2%	1.39	7.0%
Lower Derwent Valley SAC	20	1.70	0.073	0.4%	1.81	9.0%

Receptor	Annual Mean SO_2 concentration (µg/m^3)					
	Critical Level	**Background**	**Max PC Impact**	**Max PC Impact as % of CL**	**Proposed Scheme Max PEC**	**Max PEC as % of CL**
Lower Derwent Valley SPA	20	1.70	0.073	0.4%	1.81	9.0%
Skipwith Common SAC	20	1.42	0.025	0.1%	1.46	7.3%
Skipwith Common SSSI	20	1.42	0.025	0.1%	1.46	7.3%
Humber Estuary SAC	20	7.49	0.069	0.3%	7.59	38.0%
Humber Estuary SPA/SSSI	20	7.49	0.069	0.3%	7.59	38.0%
Breighton Meadows SSSI	20	1.70	0.073	0.4%	1.81	9.0%
Eskamhorn Meadows SSSI	20	1.29	0.021	0.1%	1.32	6.6%
Derwent Ings SSSI	20	1.69	0.059	0.3%	1.78	8.9%
Went Ings SSSI	20	1.31	0.023	0.1%	1.34	6.7%
Barn Hill Meadows SSSI	20	1.81	0.072	0.4%	1.91	9.5%
Burr Closes SSSI	20	1.23	0.027	0.1%	1.27	6.3%
Common Plantation SINC	20	1.44	0.008	0.0%	1.45	7.2%
Disused Railway Embankment SINC	20	1.32	0.019	0.1%	1.34	6.7%
Barmby-on-the-Marsh LWS	20	1.32	0.036	0.2%	1.36	6.8%
Brockholes SINC	20	1.32	0.009	0.0%	1.33	6.7%
Meadow East of Orchard Farm SINC	20	1.44	0.004	0.0%	1.44	7.2%
Barmby Pond LWS	20	1.32	0.058	0.3%	1.40	7.0%
Cobble Croft Wood SINC	20	1.44	0.013	0.1%	1.46	7.3%
Hagg Green Lane SINC	20	1.43	0.047	0.2%	1.50	7.5%
Sand Pitt Wood & Barffs Close Plantation SINC	20	1.44	0.013	0.1%	1.46	7.3%
Env. Agency Screening Criterion (as % of CL)				**1%**		**70%**

Table 1.5 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Nitrogen Deposition Rate

Receptor	Annual Nitrogen Deposition Rate (kgN/ha/yr)					
	Critical Load	**Background**	**Max PC Impact**	**Max PC Impact as % of CL**	**Proposed Scheme Max PEC**	**Max PEC as % of CL**
River Derwent SAC	15	30.22	0.054	0.4%	30.30	202.0%
Thorne Moor SAC	5	21.31	0.025	0.5%	21.35	426.9%
Thorne Moor SPA	10	21.31	0.025	0.2%	21.35	213.5%
Thorne Moor SSSI	5	21.31	0.025	0.5%	21.35	426.9%
Lower Derwent Valley SAC	20	30.22	0.055	0.3%	30.30	151.5%
Lower Derwent Valley SPA	20	30.22	0.055	0.3%	30.30	151.5%
Skipwith Common SAC	10	21.12	0.019	0.2%	21.14	211.4%
Skipwith Common SSSI	10	21.12	0.019	0.2%	21.14	211.4%
Humber Estuary SAC	20	28.87	0.034	0.2%	28.92	144.6%
Humber Estuary SPA/SSSI	20	28.87	0.034	0.2%	28.92	144.6%
Breighton Meadows SSSI	20	23.51	0.055	0.3%	23.58	117.9%
Eskamhorn Meadows SSSI	10	19.95	0.016	0.2%	19.97	199.7%
Derwent Ings SSSI	20	30.22	0.043	0.2%	30.29	151.5%
Went Ings SSSI	15	19.38	0.017	0.1%	19.41	129.4%
Barn Hill Meadows SSSI	20	20.43	0.039	0.2%	20.48	102.4%
Burr Closes SSSI	20	20.64	0.020	0.1%	20.67	103.3%
Common Plantation SINC	10	33.74	0.010	0.1%	33.75	337.5%
Disused Railway Embankment SINC	10	33.32	0.022	0.2%	33.35	333.5%
Barmby-on-the-Marsh LWS	10	33.32	0.043	0.4%	33.37	333.7%

Receptor	Annual Nitrogen Deposition Rate (kgN/ha/yr)					
	Critical Load	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Brockholes SINC	10	19.74	0.007	0.1%	19.75	197.5%
Meadow East of Orchard Farm SINC	20	19.88	0.003	0.0%	19.88	99.4%
Barmby Pond LWS	10	19.74	0.044	0.4%	19.80	198.0%
Cobble Croft Wood SINC	10	33.74	0.015	0.2%	33.76	337.6%
Hagg Green Lane SINC	10	40.74	0.058	0.6%	40.82	408.2%
Sand Pitt Wood & Barffs Close Plantation SINC	10	33.74	0.016	0.2%	33.76	337.6%
Barlow Common LNR	10	33.74	0.010	0.1%	33.75	337.5%
Env. Agency Screening Criterion (as % of CL)				**1%**		**70%**

Table 1.6 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Acid Deposition Rate

Receptor	Annual Acid Deposition Rate (keq/ha/yr)					
	Critical Load	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Thorne Moor SAC	0.462	1.73	0.006	**1.3%**	1.74	376.9%
Thorne Moor SSSI	0.462	1.73	0.006	**1.3%**	1.74	376.9%
Lower Derwent Valley SAC	4.856	2.40	0.013	0.3%	2.42	49.9%
Skipwith Common SAC	0.802	1.73	0.005	0.6%	1.73	216.0%
Skipwith Common SSSI	0.802	1.73	0.005	0.6%	1.73	216.0%
Breighton Meadows SSSI	0.643	1.92	0.013	**2.1%**	1.94	302.2%
Eskamhorn Meadows SSSI	1.998	1.64	0.004	0.2%	1.64	82.2%
Derwent Ings SSSI	0.643	2.40	0.010	**1.6%**	2.42	376.5%
Went Ings SSSI	2.008	1.59	0.004	0.2%	1.60	79.6%
Barn Hill Meadows SSSI	4.856	1.69	0.010	0.2%	1.70	35.1%

Receptor	Annual Acid Deposition Rate (keq/ha/yr)					
	Critical Load	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Burr Closes SSSI	1.248	1.68	0.005	0.4%	1.69	135.2%
Env. Agency Screening Criterion (as % of CL)				**1%**		**70%**

WITH PROPOSED SCHEME MITIGATION MODEL SCENARIOS

1.1.6. Results pertaining to the core model scenarios, including the With Proposed Scheme Mitigation (as detailed in **Section 6.10 of Chapter 6 (Air Quality)** (APP-042)) are presented in **Tables 1.7 to 1.12**.

Table 1.7 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Mean NO_x (Including Mitigation)

Receptor	Annual Mean NO_x concentration ($\mu g/m^3$)				
	Critical Level	Max PC Impact – No Mitigation	Max PC Impact – With Mitigation	Max PC Impact as % of CL – No Mitigation	Max PC Impact as % of CL – With Mitigation
River Derwent SAC	30	0.163	0.133	0.5%	0.4%
Thorne Moor SAC/SPA/SSSI	30	0.076	0.064	0.3%	0.2%
Lower Derwent Valley SAC	30	0.166	0.138	0.6%	0.5%
Lower Derwent Valley SPA	30	0.166	0.138	0.6%	0.5%
Skipwith Common SAC	30	0.058	0.049	0.2%	0.2%
Skipwith Common SSSI	30	0.058	0.049	0.2%	0.2%
Humber Estuary SAC	30	0.147	0.125	0.5%	0.4%
Humber Estuary SPA/SSSI	30	0.147	0.125	0.5%	0.4%
Breighton Meadows SSSI	30	0.166	0.138	0.6%	0.5%
Eskamhorn Meadows SSSI	30	0.046	0.034	0.2%	0.1%
Derwent Ings SSSI	30	0.134	0.114	0.4%	0.4%
Went Ings SSSI	30	0.052	0.042	0.2%	0.1%
Barn Hill Meadows SSSI	30	0.152	0.124	0.5%	0.4%
Burr Closes SSSI	30	0.062	0.050	0.2%	0.2%
Common Plantation SINC	30	0.017	0.011	0.1%	0.0%
Disused Railway Embankment SINC	30	0.040	0.029	0.1%	0.1%
Barmby-on-the-Marsh LWS	30	0.076	0.057	0.3%	0.2%
Brockholes SINC	30	0.019	0.013	0.1%	0.0%
Meadow East of Orchard Farm SINC	30	0.009	0.006	0.0%	0.0%
Barmby Pond LWS	30	0.127	0.098	0.4%	0.3%
Cobble Croft Wood SINC	30	0.027	0.020	0.1%	0.1%
Hagg Green Lane SINC	30	0.103	0.083	0.3%	0.3%

Receptor	Annual Mean NO_x concentration ($\mu g/m^3$)				
	Critical Level	Max PC Impact – No Mitigation	Max PC Impact – With Mitigation	Max PC Impact as % of CL – No Mitigation	Max PC Impact as % of CL – With Mitigation
Sand Pitt Wood & Barffs Close Plantation SINC	30	0.028	0.020	0.1%	0.1%
Env. Agency Screening Criterion (as % of CL)				**1%**	

Table 1.8 - Modelled Maximum Operational Impacts at Ecological Receptors – Daily Mean NO_x (Including Mitigation)

Receptor	Daily Mean NO_x concentration ($\mu g/m^3$)				
	Critical Level	Max PC Impact – No Mitigation	Max PC Impact – With Mitigation	Max PC Impact as % of CL – No Mitigation	Max PC Impact as % of CL – With Mitigation
River Derwent SAC	75	1.787	1.321	2.4%	1.8%
Thorne Moor SAC/SPA/SSSI	75	0.893	0.699	1.2%	0.9%
Lower Derwent Valley SAC	75	0.893	0.673	1.2%	0.9%
Lower Derwent Valley SPA	75	0.893	0.673	1.2%	0.9%
Skipwith Common SAC	75	0.646	0.434	0.9%	0.6%
Skipwith Common SSSI	75	0.646	0.434	0.9%	0.6%
Humber Estuary SAC	75	1.200	0.872	1.6%	1.2%
Humber Estuary SPA/SSSI	75	1.200	0.872	1.6%	1.2%
Breighton Meadows SSSI	75	0.893	0.673	1.2%	0.9%
Eskamhorn Meadows SSSI	75	1.912	1.438	2.5%	1.9%
Derwent Ings SSSI	75	0.831	0.670	1.1%	0.9%
Went Ings SSSI	75	0.971	0.651	1.3%	0.9%
Barn Hill Meadows SSSI	75	0.962	1.274	1.3%	1.7%
Burr Closes SSSI	75	0.761	0.561	1.0%	0.7%
Common Plantation SINC	75	1.038	0.684	1.4%	0.9%
Disused Railway Embankment SINC	75	1.184	1.069	1.6%	1.4%
Barmby-on-the-Marsh LWS	75	1.621	1.420	2.2%	1.9%

Receptor	Daily Mean NO_x concentration ($\mu g/m^3$)				
	Critical Level	Max PC Impact – No Mitigation	Max PC Impact – With Mitigation	Max PC Impact as % of CL – No Mitigation	Max PC Impact as % of CL – With Mitigation
Brockholes SINC	75	1.623	1.170	2.2%	1.6%
Meadow East of Orchard Farm SINC	75	0.554	0.385	0.7%	0.5%
Barmby Pond LWS	75	1.577	1.151	2.1%	1.5%
Cobble Croft Wood SINC	75	1.176	0.767	1.6%	1.0%
Hagg Green Lane SINC	75	1.248	0.832	1.7%	1.1%
Sand Pitt Wood & Barffs Close Plantation SINC	75	1.630	1.083	2.2%	1.4%
Env. Agency Screening Criterion (as % of CL)				**10%**	

Table 1.9 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Mean NH_3 (Including Mitigation)

Receptor	Annual Mean NH_3 concentration ($\mu g/m^3$)				
	Critical Level	Max PC Impact – No Mitigation	Max PC Impact – With Mitigation	Max PC Impact as % of CL – No Mitigation	Max PC Impact as % of CL – With Mitigation
River Derwent SAC	3	0.007	0.006	0.2%	0.2%
Thorne Moor SAC/SPA/SSSI	1	0.003	0.003	0.3%	0.3%
Lower Derwent Valley SAC	3	0.007	0.006	0.2%	0.2%
Lower Derwent Valley SPA	3	0.007	0.006	0.2%	0.2%
Skipwith Common SAC	1	0.002	0.002	0.2%	0.2%
Skipwith Common SSSI	1	0.002	0.002	0.2%	0.2%
Humber Estuary SAC	3	0.004	0.005	0.1%	0.2%
Humber Estuary SPA/SSSI	3	0.004	0.005	0.1%	0.2%
Breighton Meadows SSSI	3	0.007	0.006	0.2%	0.2%
Eskamhorn Meadows SSSI	3	0.002	0.002	0.1%	0.1%
Derwent Ings SSSI	3	0.005	0.005	0.2%	0.2%
Went Ings SSSI	3	0.002	0.002	0.1%	0.1%

Receptor	Annual Mean NH_3 concentration ($\mu g/m^3$)				
	Critical Level	Max PC Impact – No Mitigation	Max PC Impact – With Mitigation	Max PC Impact as % of CL – No Mitigation	Max PC Impact as % of CL – With Mitigation
Barn Hill Meadows SSSI	3	0.005	0.005	0.2%	0.2%
Burr Closes SSSI	3	0.003	0.002	0.1%	0.1%
Common Plantation SINC	3	0.001	0.001	0.0%	0.0%
Disused Railway Embankment SINC	1	0.002	0.001	0.1%	0.0%
Barmby-on-the-Marsh LWS	3	0.003	0.003	0.1%	0.1%
Brockholes SINC	3	0.001	0.001	0.0%	0.0%
Meadow East of Orchard Farm SINC	1	0.000	0.000	0.0%	0.0%
Barmby Pond LWS	1	0.006	0.004	0.2%	0.1%
Cobble Croft Wood SINC	3	0.001	0.001	0.0%	0.0%
Hagg Green Lane SINC	3	0.004	0.004	0.1%	0.1%
Sand Pitt Wood & Barffs Close Plantation SINC	3	0.001	0.001	0.0%	0.0%
Env. Agency Screening Criterion (as % of CL)				**1%**	

Table 1.10 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Mean SO_2 (Including Mitigation)

Receptor	Annual Mean SO_2 concentration ($\mu g/m^3$)				
	Critical Level	Max PC Impact – No Mitigation	Max PC Impact – With Mitigation	Max PC Impact as % of CL – No Mitigation	Max PC Impact as % of CL – With Mitigation
River Derwent SAC	20	0.072	0.021	0.4%	0.1%
Thorne Moor SAC/SPA/SSSI	20	0.033	0.008	0.2%	0.0%
Lower Derwent Valley **SAC**	20	0.073	0.020	0.4%	0.1%
Lower Derwent Valley SPA	20	0.073	0.020	0.4%	0.1%
Skipwith Common SAC	20	0.025	0.007	0.1%	0.0%
Skipwith Common SSSI	20	0.025	0.007	0.1%	0.0%
Humber Estuary SAC	20	0.069	0.019	0.3%	0.1%

Receptor	Annual Mean SO_2 concentration ($\mu g/m^3$)				
	Critical Level	Max PC Impact – No Mitigation	Max PC Impact – With Mitigation	Max PC Impact as % of CL – No Mitigation	Max PC Impact as % of CL – With Mitigation
Humber Estuary SPA/SSSI	20	0.069	0.019	0.3%	0.1%
Breighton Meadows SSSI	20	0.073	0.020	0.4%	0.1%
Eskamhorn Meadows SSSI	20	0.021	0.006	0.1%	0.0%
Derwent Ings SSSI	20	0.059	0.015	0.3%	0.1%
Went Ings SSSI	20	0.023	0.007	0.1%	0.0%
Barn Hill Meadows SSSI	20	0.072	0.020	0.4%	0.1%
Burr Closes SSSI	20	0.027	0.008	0.1%	0.0%
Common Plantation SINC	20	0.008	0.002	0.0%	0.0%
Disused Railway Embankment SINC	20	0.019	0.005	0.1%	0.0%
Barmby-on-the-Marsh LWS	20	0.036	0.011	0.2%	0.1%
Brockholes SINC	20	0.009	0.003	0.0%	0.0%
Meadow East of Orchard Farm SINC	20	0.004	0.001	0.0%	0.0%
Barmby Pond LWS	20	0.058	0.017	0.3%	0.1%
Cobble Croft Wood SINC	20	0.013	0.004	0.1%	0.0%
Hagg Green Lane SINC	20	0.047	0.012	0.2%	0.1%
Sand Pitt Wood & Barffs Close Plantation SINC	20	0.013	0.004	0.1%	0.0%
Env. Agency Screening Criterion (as % of CL)					

Table 1.11 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Nitrogen Deposition Rate (Including Mitigation)

Receptor	Annual Nitrogen Deposition Rate (kgN/ha/yr)				
	Critical Load	Max PC Impact – No Mitigation	Max PC Impact – With Mitigation	Max PC Impact as % of CL – No Mitigation	Max PC Impact as % of CL – With Mitigation
River Derwent SAC	15	0.054	0.044	0.4%	0.3%
Thorne Moor SAC	5	0.025	0.021	0.5%	0.4%
Thorne Moor SPA	10	0.025	0.021	0.2%	0.2%
Thorne Moor SSSI	5	0.025	0.021	0.5%	0.4%
Lower Derwent Valley SAC	20	0.055	0.045	0.3%	0.2%
Lower Derwent Valley SPA	20	0.055	0.045	0.3%	0.2%
Skipwith Common SAC	10	0.019	0.016	0.2%	0.2%
Skipwith Common SSSI	10	0.019	0.016	0.2%	0.2%
Humber Estuary SAC	20	0.034	0.041	0.2%	0.2%
Humber Estuary SPA/SSSI	20	0.034	0.041	0.2%	0.2%
Breighton Meadows SSSI	20	0.055	0.045	0.3%	0.2%
Eskamhorn Meadows SSSI	10	0.016	0.012	0.2%	0.1%
Derwent Ings SSSI	20	0.043	0.037	0.2%	0.2%
Went Ings SSSI	15	0.017	0.014	0.1%	0.1%
Barn Hill Meadows SSSI	20	0.039	0.041	0.2%	0.2%
Burr Closes SSSI	20	0.020	0.016	0.1%	0.1%
Common Plantation SINC	10	0.010	0.007	0.1%	0.1%
Disused Railway Embankment SINC	10	0.022	0.016	0.2%	0.2%
Barmby-on-the-Marsh LWS	10	0.043	0.032	0.4%	0.3%
Brockholes SINC	10	0.007	0.005	0.1%	0.0%

Receptor	Annual Nitrogen Deposition Rate (kgN/ha/yr)				
	Critical Load	Max PC Impact – No Mitigation	Max PC Impact – With Mitigation	Max PC Impact as % of CL – No Mitigation	Max PC Impact as % of CL – With Mitigation
Meadow East of Orchard Farm SINC	20	0.003	0.002	0.0%	0.0%
Barmby Pond LWS	10	0.044	0.033	0.4%	0.3%
Cobble Croft Wood SINC	10	0.015	0.011	0.2%	0.1%
Hagg Green Lane SINC	10	0.058	0.046	0.6%	0.5%
Sand Pitt Wood & Barffs Close Plantation SINC	10	0.016	0.011	0.2%	0.1%
Barlow Common LNR	10	0.010	0.007	0.1%	0.1%
Env. Agency Screening Criterion (as % of CL)				**1%**	

Table 1.12 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Acid Deposition Rate (Including Mitigation)

Receptor	Annual Acid Deposition Rate (keq/ha/yr)				
	Critical Load	Max PC Impact – No Mitigation	Max PC Impact – With Mitigation	Max PC Impact as % of CL – No Mitigation	Max PC Impact as % of CL – With Mitigation
Thorne Moor SAC	0.462	0.006	0.003	**1.3%**	0.6%
Thorne Moor SSSI	0.462	0.006	0.003	**1.3%**	0.6%
Lower Derwent Valley SAC	4.856	0.013	0.006	0.3%	0.1%
Skipwith Common SAC	0.802	0.005	0.002	0.6%	0.3%
Skipwith Common SSSI	0.802	0.005	0.002	0.6%	0.3%
Breighton Meadows SSSI	0.643	0.013	0.006	**2.1%**	1.0%
Eskamhorn Meadows SSSI	1.998	0.004	0.002	0.2%	0.1%
Derwent Ings SSSI	0.643	0.010	0.005	**1.6%**	0.8%
Went Ings SSSI	2.008	0.004	0.002	0.2%	0.1%
Barn Hill Meadows SSSI	4.856	0.010	0.006	0.2%	0.1%

Receptor	Annual Acid Deposition Rate (keq/ha/yr)				
	Critical Load	**Max PC Impact – No Mitigation**	**Max PC Impact – With Mitigation**	**Max PC Impact as % of CL – No Mitigation**	**Max PC Impact as % of CL – With Mitigation**
Burr Closes SSSI	1.248	0.005	0.002	0.4%	0.2%
Env. Agency Screening Criterion (as % of CL)				**1%**	

CUMULATIVE IMPACTS (WITH PROPOSED SCHEME & OTHER PROJECTS)

1.1.7. Results pertaining to the cumulative impacts, both before mitigation ("No Mitⁿ") and after mitigation ("Mitigⁿ") associated With Proposed Scheme Mitigation is applied (as detailed in **Section 6.10 of Chapter 6 (Air Quality)**) are presented in **Tables 1.13 to 1.18**.

Table 1.13 - Modelled Maximum Cumulative Impacts at Ecological Receptors – Annual Mean NO_x

Receptor	Annual Mean NO_x concentration (µg/m^3)								
	Critical Level	Max Cumulative PC Impact		Max PC Impact as % of CL		Max Cumulative PEC		Max PEC as % of CL	
		No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]
River Derwent SAC	30	0.675	0.647	2.3%	2.2%	12.63	12.60	42.1%	42.0%
Thorne Moor SAC/SPA/SSSI	30	0.348	0.336	1.2%	1.1%	13.58	13.57	45.3%	45.2%
Lower Derwent Valley SAC	30	0.681	0.653	2.3%	2.2%	10.64	10.62	35.5%	35.4%
Lower Derwent Valley SPA	30	0.681	0.653	2.3%	2.2%	10.64	10.62	35.5%	35.4%
Skipwith Common SAC	30	0.504	0.495	1.7%	1.7%	10.29	10.28	34.3%	34.3%
Skipwith Common SSSI	30	0.504	0.495	1.7%	1.7%	10.29	10.28	34.3%	34.3%
Humber Estuary SAC	30	0.498	0.474	1.7%	1.6%	15.05	15.03	50.2%	50.1%
Humber Estuary SPA/SSSI	30	0.498	0.474	1.7%	1.6%	15.05	15.03	50.2%	50.1%
Breighton Meadows SSSI	30	0.681	0.653	2.3%	2.2%	10.64	10.62	35.5%	35.4%
Eskamhorn Meadows SSSI	30	0.488	0.483	1.6%	1.6%	11.84	11.83	39.5%	39.4%
Derwent Ings SSSI	30	0.640	0.619	2.1%	2.1%	10.49	10.47	35.0%	34.9%
Went Ings SSSI	30	0.303	0.296	1.0%	1.0%	12.40	12.40	41.3%	41.3%
Barn Hill Meadows SSSI	30	0.557	0.527	1.9%	1.8%	13.48	13.45	44.9%	44.8%
Burr Closes SSSI	30	0.283	0.276	0.9%	0.9%	10.83	10.82	36.1%	36.1%
Common Plantation SINC	30	0.728	0.723	2.4%	2.4%	12.16	12.15	40.5%	40.5%
Disused Railway Embankment SINC	30	0.558	0.546	1.9%	1.8%	11.32	11.31	37.7%	37.7%
Barmby-on-the-Marsh LWS	30	0.575	0.555	1.9%	1.8%	11.07	11.05	36.9%	36.8%
Brockholes SINC	30	0.480	0.476	1.6%	1.6%	11.70	11.70	39.0%	39.0%
Meadow East of Orchard Farm SINC	30	0.701	0.699	2.3%	2.3%	11.53	11.53	38.4%	38.4%
Barmby Pond LWS	30	0.611	0.585	2.0%	2.0%	10.59	10.57	35.3%	35.2%
Cobble Croft Wood SINC	30	0.697	0.690	2.3%	2.3%	12.32	12.31	41.1%	41.0%
Hagg Green Lane SINC	30	0.704	0.684	2.3%	2.3%	11.67	11.65	38.9%	38.8%

Receptor	Annual Mean NO_x concentration ($\mu g/m^3$)							
	Critical Level	Max Cumulative PC Impact		Max PC Impact as % of CL		Max Cumulative PEC		Max PEC as % of CL	
		No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]
Sand Pitt Wood & Barffs Close Plantation SINC	30	0.798	0.790	2.7%	2.6%	12.23	12.22	40.8%	40.7%
Env. Agency Screening Criterion (as % of CL)				**1%**				**70%**	

Table 1.14 - Modelled Maximum Cumulative Impacts at Ecological Receptors – Daily Mean NO_x

Receptor	Daily Mean NO_x concentration ($\mu g/m^3$)							
	Critical Level	Max Cumulative PC Impact		Max PC Impact as % of CL		Max Cumulative PEC		Max PEC as % of CL	
		No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]
River Derwent SAC	75	5.459	5.078	7.3%	6.8%	31.44	31.24	41.9%	41.7%
Thorne Moor SAC/SPA/SSSI	75	0.446	0.446	0.6%	0.6%	32.43	32.34	43.2%	43.1%
Lower Derwent Valley SAC	75	0.308	0.308	0.4%	0.4%	27.00	26.90	36.0%	35.9%
Lower Derwent Valley SPA	75	0.308	0.308	0.4%	0.4%	27.00	26.90	36.0%	35.9%
Skipwith Common SAC	75	0.253	0.253	0.3%	0.3%	24.75	24.66	33.0%	32.9%
Skipwith Common SSSI	75	0.253	0.253	0.3%	0.3%	24.75	24.66	33.0%	32.9%
Humber Estuary SAC	75	0.469	0.469	0.6%	0.6%	35.14	35.01	46.9%	46.7%
Humber Estuary SPA/SSSI	75	0.469	0.469	0.6%	0.6%	35.14	35.01	46.9%	46.7%
Breighton Meadows SSSI	75	0.306	0.306	0.4%	0.4%	27.00	26.89	36.0%	35.9%
Eskamhorn Meadows SSSI	75	0.983	0.983	1.3%	1.3%	30.40	29.99	40.5%	40.0%
Derwent Ings SSSI	75	0.308	0.308	0.4%	0.4%	26.63	26.47	35.5%	35.3%
Went Ings SSSI	75	0.245	0.245	0.3%	0.3%	30.27	30.14	40.4%	40.2%
Barn Hill Meadows SSSI	75	0.691	0.691	0.9%	0.9%	32.25	32.14	43.0%	42.9%
Burr Closes SSSI	75	0.346	0.346	0.5%	0.5%	25.99	25.95	34.7%	34.6%
Common Plantation SINC	75	7.240	7.596	9.7%	10.1%	30.30	30.65	40.4%	40.9%
Disused Railway Embankment SINC	75	6.035	5.779	8.0%	7.7%	27.93	27.62	37.2%	36.8%

Receptor	Daily Mean NO_x concentration (µg/m^3)								
	Critical Level	Max Cumulative PC Impact		Max PC Impact as % of CL		Max Cumulative PEC		Max PEC as % of CL	
		No Mit^n	Mitig^n	No Mit^n	Mitig^n	No Mit^n	Mitig^n	No Mit^n	Mitig^n
Barmby-on-the-Marsh LWS	75	6.310	5.938	8.4%	7.9%	28.32	27.95	37.8%	37.3%
Brockholes SINC	75	5.892	5.440	7.9%	7.3%	28.71	28.26	38.3%	37.7%
Meadow East of Orchard Farm SINC	75	5.436	5.702	7.2%	7.6%	27.18	27.44	36.2%	36.6%
Barmby Pond LWS	75	5.189	4.763	6.9%	6.4%	27.29	27.09	36.4%	36.1%
Cobble Croft Wood SINC	75	7.028	6.706	9.4%	8.9%	31.22	30.90	41.6%	41.2%
Hagg Green Lane SINC	75	5.261	4.843	7.0%	6.5%	29.27	28.95	39.0%	38.6%
Sand Pitt Wood & Barffs Close Plantation SINC	75	7.720	7.948	10.3%	10.6%	31.06	31.02	41.4%	41.4%
Env. Agency Screening Criterion (as % of CL)				**10%**					

Table 1.15 - Modelled Maximum Cumulative Impacts at Ecological Receptors – Annual Mean NH_3

Receptor	Annual Mean NH_3 concentration (µg/m^3)								
	Critical Level	Max Cumulative PC Impact		Max PC Impact as % of CL		Max Cumulative PEC		Max PEC as % of CL	
		No Mit^n	Mitig^n	No Mit^n	Mitig^n	No Mit^n	Mitig^n	No Mit^n	Mitig^n
River Derwent SAC	3	0.008	0.007	0.3%	0.2%	4.58	4.58	152.7%	152.7%
Thorne Moor SAC/SPA/SSSI	1	0.006	0.006	0.6%	0.6%	2.60	2.60	259.8%	259.8%
Lower Derwent Valley SAC	3	0.008	0.007	0.3%	0.2%	4.58	4.58	152.7%	152.7%
Lower Derwent Valley SPA	3	0.008	0.007	0.3%	0.2%	4.58	4.58	152.7%	152.7%
Skipwith Common SAC	1	0.003	0.003	0.3%	0.3%	2.58	2.58	258.4%	258.4%
Skipwith Common SSSI	1	0.003	0.003	0.3%	0.3%	2.58	2.58	258.4%	258.4%
Humber Estuary SAC	3	0.006	0.007	0.2%	0.2%	3.59	3.59	119.6%	119.7%
Humber Estuary SPA/SSSI	3	0.006	0.007	0.2%	0.2%	3.59	3.59	119.6%	119.7%
Breighton Meadows SSSI	3	0.008	0.007	0.3%	0.2%	3.09	3.09	103.0%	103.0%
Eskamhorn Meadows SSSI	3	0.003	0.003	0.1%	0.1%	2.40	2.40	80.1%	80.1%

Receptor	Annual Mean NH_3 concentration (µg/m^3)								
	Critical Level	Max Cumulative PC Impact		Max PC Impact as % of CL		Max Cumulative PEC		Max PEC as % of CL	
		No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]
Derwent Ings SSSI	3	0.006	0.005	0.2%	0.2%	4.58	4.58	152.7%	152.6%
Went Ings SSSI	3	0.004	0.004	0.1%	0.1%	2.36	2.35	78.5%	78.5%
Barn Hill Meadows SSSI	3	0.006	0.007	0.2%	0.2%	2.33	2.33	77.6%	77.7%
Burr Closes SSSI	3	0.003	0.003	0.1%	0.1%	2.50	2.50	83.5%	83.5%
Common Plantation SINC	3	0.002	0.001	0.1%	0.0%	2.33	2.33	77.7%	77.7%
Disused Railway Embankment SINC	3	0.003	0.002	0.1%	0.1%	2.28	2.28	76.1%	76.1%
Barmby-on-the-Marsh LWS	3	0.004	0.004	0.1%	0.1%	2.29	2.28	76.2%	76.1%
Brockholes SINC	3	0.002	0.002	0.1%	0.1%	2.28	2.28	76.1%	76.1%
Meadow East of Orchard Farm SINC	3	0.001	0.001	0.0%	0.0%	2.33	2.33	77.7%	77.7%
Barmby Pond LWS	3	0.007	0.005	0.2%	0.2%	2.29	2.29	76.3%	76.2%
Cobble Croft Wood SINC	3	0.002	0.002	0.1%	0.1%	2.33	2.33	77.7%	77.7%
Hagg Green Lane SINC	3	0.005	0.004	0.2%	0.1%	3.10	3.10	103.2%	103.2%
Sand Pitt Wood & Barffs Close Plantation SINC	3	0.002	0.002	0.1%	0.1%	2.33	2.33	77.7%	77.7%
Env. Agency Screening Criterion (as % of CL)				**1%**				**70%**	

Table 1.16 - Modelled Maximum Cumulative Impacts at Ecological Receptors – Annual Mean SO_2

Receptor	Annual Mean SO_2 concentration (µg/m^3)								
	Critical Level	Max Cumulative PC Impact		Max PC Impact as % of CL		Max Cumulative PEC		Max PEC as % of CL	
		No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]
River Derwent SAC	20	0.074	0.022	0.4%	0.1%	4.04	3.98	20.2%	19.9%
Thorne Moor SAC/SPA/SSSI	20	0.041	0.017	0.2%	0.1%	1.40	1.38	7.0%	6.9%
Lower Derwent Valley SAC	20	0.074	0.022	0.4%	0.1%	1.81	1.76	9.0%	8.8%
Lower Derwent Valley SPA	20	0.074	0.022	0.4%	0.1%	1.81	1.76	9.0%	8.8%

Receptor	Annual Mean SO_2 concentration (µg/m^3)							
	Critical Level	Max Cumulative PC Impact		Max PC Impact as % of CL		Max Cumulative PEC		Max PEC as % of CL	
		No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]
Skipwith Common SAC	20	0.026	0.008	0.1%	0.0%	1.46	1.44	7.3%	7.2%
Skipwith Common SSSI	20	0.026	0.008	0.1%	0.0%	1.46	1.44	7.3%	7.2%
Humber Estuary SAC	20	0.073	0.023	0.4%	0.1%	7.59	7.54	38.0%	37.7%
Humber Estuary SPA/SSSI	20	0.073	0.023	0.4%	0.1%	7.59	7.54	38.0%	37.7%
Breighton Meadows SSSI	20	0.074	0.022	0.4%	0.1%	1.81	1.76	9.0%	8.8%
Eskamhorn Meadows SSSI	20	0.024	0.009	0.1%	0.0%	1.32	1.30	6.6%	6.5%
Derwent Ings SSSI	20	0.061	0.017	0.3%	0.1%	1.78	1.74	8.9%	8.7%
Went Ings SSSI	20	0.028	0.011	0.1%	0.1%	1.35	1.33	6.7%	6.7%
Barn Hill Meadows SSSI	20	0.075	0.024	0.4%	0.1%	1.91	1.86	9.6%	9.3%
Burr Closes SSSI	20	0.028	0.009	0.1%	0.0%	1.27	1.25	6.3%	6.3%
Common Plantation SINC	20	0.009	0.004	0.0%	0.0%	1.45	1.44	7.3%	7.2%
Disused Railway Embankment SINC	20	0.021	0.008	0.1%	0.0%	1.34	1.33	6.7%	6.7%
Barmby-on-the-Marsh LWS	20	0.038	0.013	0.2%	0.1%	1.37	1.34	6.8%	6.7%
Brockholes SINC	20	0.011	0.005	0.1%	0.0%	1.33	1.33	6.7%	6.6%
Meadow East of Orchard Farm SINC	20	0.006	0.003	0.0%	0.0%	1.45	1.44	7.2%	7.2%
Barmby Pond LWS	20	0.060	0.019	0.3%	0.1%	1.40	1.36	7.0%	6.8%
Cobble Croft Wood SINC	20	0.014	0.005	0.1%	0.0%	1.46	1.45	7.3%	7.2%
Hagg Green Lane SINC	20	0.049	0.014	0.2%	0.1%	1.50	1.47	7.5%	7.3%
Sand Pitt Wood & Barffs Close Plantation SINC	20	0.014	0.005	0.1%	0.0%	1.46	1.45	7.3%	7.2%
Env. Agency Screening Criterion (as % of CL)				**1%**				**70%**	

Table 1.17 - Modelled Maximum Cumulative Impacts at Ecological Receptors – Annual Nitrogen Deposition Rate

Receptor	Annual Nitrogen Deposition Rate (kgN/ha/yr)								
	Critical Load	Max Cumulative PC Impact		Max PC Impact as % of CL		Max Cumulative PEC		Max PEC as % of CL	
		No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]	No Mit[n]	Mitig[n]
River Derwent SAC	15	0.106	0.098	0.7%	0.7%	30.35	30.34	202.3%	202.3%
Thorne Moor SAC	5	0.061	0.063	**1.2%**	**1.3%**	21.38	21.38	427.6%	427.6%
Thorne Moor SPA	10	0.061	0.063	0.6%	0.6%	21.38	21.38	213.8%	213.8%
Thorne Moor SSSI	5	0.061	0.063	**1.2%**	**1.3%**	21.38	21.38	427.6%	427.6%
Lower Derwent Valley SAC	20	0.105	0.098	0.5%	0.5%	30.35	30.34	151.8%	151.7%
Lower Derwent Valley SPA	20	0.105	0.098	0.5%	0.5%	30.35	30.34	151.8%	151.7%
Skipwith Common SAC	10	0.067	0.064	0.7%	0.6%	21.19	21.19	211.9%	211.9%
Skipwith Common SSSI	10	0.067	0.064	0.7%	0.6%	21.19	21.19	211.9%	211.9%
Humber Estuary SAC	20	0.073	0.086	0.4%	0.4%	28.96	28.98	144.8%	144.9%
Humber Estuary SPA/SSSI	20	0.073	0.086	0.4%	0.4%	28.96	28.98	144.8%	144.9%
Breighton Meadows SSSI	20	0.105	0.098	0.5%	0.5%	23.63	23.62	118.2%	118.1%
Eskamhorn Meadows SSSI	10	0.058	0.061	0.6%	0.6%	20.01	20.02	200.1%	200.2%
Derwent Ings SSSI	20	0.096	0.091	0.5%	0.5%	30.34	30.34	151.7%	151.7%
Went Ings SSSI	15	0.049	0.046	0.3%	0.3%	19.44	19.43	129.6%	129.6%
Barn Hill Meadows SSSI	20	0.082	0.088	0.4%	0.4%	20.52	20.54	102.6%	102.7%
Burr Closes SSSI	20	0.045	0.041	0.2%	0.2%	20.69	20.69	103.5%	103.4%
Common Plantation SINC	10	0.158	0.155	**1.6%**	**1.5%**	33.90	33.90	339.0%	339.0%
Disused Railway Embankment SINC	10	0.126	0.129	**1.3%**	**1.3%**	33.45	33.45	334.5%	334.5%
Barmby-on-the-Marsh LWS	10	0.141	0.141	**1.4%**	**1.4%**	33.47	33.47	334.7%	334.7%
Brockholes SINC	10	0.056	0.057	0.6%	0.6%	19.80	19.80	198.0%	198.0%
Meadow East of Orchard Farm SINC	20	0.075	0.076	0.4%	0.4%	19.96	19.96	99.8%	99.8%
Barmby Pond LWS	10	0.095	0.085	1.0%	0.9%	19.85	19.84	198.5%	198.4%

Receptor	Annual Nitrogen Deposition Rate (kgN/ha/yr)								
	Critical Load	Max Cumulative PC Impact		Max PC Impact as % of CL		Max Cumulative PEC		Max PEC as % of CL	
		No Mit^{n}	Mitig^{n}	No Mit^{n}	Mitig^{n}	No Mit^{n}	Mitig^{n}	No Mit^{n}	Mitig^{n}
Cobble Croft Wood SINC	10	0.155	0.151	**1.6%**	**1.5%**	33.90	33.89	339.0%	338.9%
Hagg Green Lane SINC	10	0.176	0.173	**1.8%**	**1.7%**	40.94	40.93	409.4%	409.3%
Sand Pitt Wood & Barffs Close Plantation SINC	10	0.176	0.171	**1.8%**	**1.7%**	33.92	33.91	339.2%	339.1%
Barlow Common LNR	10	0.173	0.170	**1.7%**	**1.7%**	33.91	33.91	339.1%	339.1%
Env. Agency Screening Criterion (as % of CL)				**1%**				**70%**	

Table 1.18 - Modelled Maximum Cumulative Impacts at Ecological Receptors – Annual Acid Deposition Rate

Receptor	Annual Acid Deposition Rate (keq/ha/yr)								
	Critical Load	Max Cumulative PC Impact		Max PC Impact as % of CL		Max Cumulative PEC		Max PEC as % of CL	
		No Mit^{n}	Mitig^{n}	No Mit^{n}	Mitig^{n}	No Mit^{n}	Mitig^{n}	No Mit^{n}	Mitig^{n}
Thorne Moor SAC	0.4623	0.010	0.007	**2.1%**	**1.5%**	1.74	1.74	375.8%	377.1%
Thorne Moor SSSI	0.4623	0.010	0.007	**2.1%**	**1.5%**	1.75	1.74	377.8%	377.1%
Lower Derwent Valley SAC	4.856	0.017	0.010	0.4%	0.2%	2.43	2.42	50.0%	49.8%
Skipwith Common SAC	0.802	0.008	0.006	1.0%	0.7%	1.74	1.73	216.4%	216.1%
Skipwith Common SSSI	0.802	0.008	0.006	1.0%	0.7%	1.74	1.73	216.4%	216.1%
Breighton Meadows SSSI	0.643	0.017	0.010	**2.6%**	**1.6%**	1.95	1.94	302.8%	301.7%
Eskamhorn Meadows SSSI	1.998	0.007	0.005	0.3%	0.3%	1.64	1.64	82.3%	82.2%
Derwent Ings SSSI	0.643	0.014	0.009	**2.2%**	**1.4%**	2.42	2.42	377.1%	376.2%
Went Ings SSSI	2.008	0.007	0.005	0.4%	0.2%	1.60	1.60	79.7%	79.6%
Barn Hill Meadows SSSI	4.856	0.014	0.010	0.3%	0.2%	1.71	1.70	35.2%	35.1%
Burr Closes SSSI	1.248	0.007	0.004	0.5%	0.3%	1.69	1.69	135.3%	135.1%
Env. Agency Screening Criterion (as % of CL)				**1%**				**70%**	

SENSITIVITY TEST: WORST CASE EMISSIONS PROFILE

1.1.8. Results pertaining to the worst-case emissions profile sensitivity test are presented in **Tables 1.19 to 1.24**, based on emissions from the Proposed Scheme alone.

1.1.9. For all pollutant concentrations and deposition rates, it is evident that the modelled maximum PC impacts attributed to the with Proposed Scheme scenario are lower at all receptors relative to the core model scenarios. This is a function of all four biomass units in the Baseline scenario switching from 'mid-merit' operation (full load for 4,000 hours per year) to continuous operation (full load for 8,760 hours per year), resulting in more pollutants being emitted and thus more pronounced changes (increases) in concentrations / deposition rates relative to the With Proposed Scheme scenario. In the With Proposed Scheme scenario, operation changes from 'mid-merit' to continuous full load at the two non-BECCS biomass units only (BECCS units already assumed to operate at continuous full load in core modelling scenario), meaning the changes (increases and decreases) in concentrations / deposition rates are relatively small compared to the Baseline.

1.1.10. As a consequence, the maximum modelled impacts of the Proposed Scheme decrease at all receptors under the worst-case emissions profile scenario relative to the core modelling. Whilst some modelled maximum PEC concentrations do increase under worst case emissions in both the Baseline and With Proposed Scheme scenarios, there are no material changes relative to the core modelling equivalents, meaning that the respective assessment significance criteria are not exceeded.

1.1.11. The results confirm that the assessment of likely significant effects reported in **Chapter 6 (Air Quality)** is not affected when considering the worst-case emissions profiles in both the Baseline and With Proposed Scheme scenarios. Given that the modelled maximum impacts are lower under a worst-case emissions profile, there was no need to repeat the test in relation to cumulative impacts, as the core modelling results for the cumulative scenarios represent the most conservative results in terms of potential impacts.

Table 1.19 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Mean NO_x (Worst Case Emissions Profile)

Receptor	Annual Mean NO_x concentration ($\mu g/m^3$)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
River Derwent SAC	30	11.91	0.055	0.2%	12.10	40.3%
Thorne Moor SAC/SPA/SSSI	30	13.21	0.026	0.1%	13.33	44.4%
Lower Derwent Valley SAC	30	9.92	0.058	0.2%	10.11	33.7%
Lower Derwent Valley SPA	30	9.92	0.058	0.2%	10.11	33.7%
Skipwith Common SAC	30	9.76	0.023	0.1%	9.84	32.8%
Skipwith Common SSSI	30	9.76	0.023	0.1%	9.84	32.8%
Humber Estuary SAC	30	14.50	0.056	0.2%	14.68	48.9%
Humber Estuary SPA/SSSI	30	14.50	0.056	0.2%	14.68	48.9%
Breighton Meadows SSSI	30	9.92	0.058	0.2%	10.11	33.7%
Eskamhorn Meadows SSSI	30	11.35	0.012	0.0%	11.38	37.9%
Derwent Ings SSSI	30	9.80	0.048	0.2%	9.98	33.3%
Went Ings SSSI	30	12.09	0.018	0.1%	12.15	40.5%
Barn Hill Meadows SSSI	30	12.89	0.055	0.2%	13.04	43.5%
Burr Closes SSSI	30	10.53	0.020	0.1%	10.59	35.3%
Common Plantation SINC	30	11.43	0.004	0.0%	11.44	38.1%
Disused Railway Embankment SINC	30	10.76	0.009	0.0%	10.78	35.9%
Barmby-on-the-Marsh LWS	30	10.48	0.021	0.1%	10.53	35.1%
Brockholes SINC	30	11.22	0.004	0.0%	11.23	37.4%
Meadow East of Orchard Farm SINC	30	10.83	0.002	0.0%	10.83	36.1%
Barmby Pond LWS	30	9.96	0.036	0.1%	10.06	33.5%
Cobble Croft Wood SINC	30	11.62	0.007	0.0%	11.64	38.8%
Hagg Green Lane SINC	30	10.93	0.034	0.1%	11.05	36.8%

Receptor	Annual Mean NO_x concentration (µg/m^3)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Sand Pitt Wood & Barffs Close Plantation SINC	30	11.43	0.007	0.0%	11.45	38.2%
Env. Agency Screening Criterion (as % of CL)				**1%**		**70%**

Table 1.20 - Modelled Maximum Operational Impacts at Ecological Receptors – Daily Mean NO_x (Worst Case Emissions Profile)

Receptor	Daily Mean NO_x concentration (µg/m^3)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
River Derwent SAC	75	23.82	1.787	2.4%	27.96	37.3%
Thorne Moor SAC/SPA/SSSI	75	26.42	0.893	1.2%	29.27	39.0%
Lower Derwent Valley SAC	75	19.84	0.893	1.2%	23.75	31.7%
Lower Derwent Valley SPA	75	19.84	0.893	1.2%	23.75	31.7%
Skipwith Common SAC	75	19.52	0.646	0.9%	21.71	28.9%
Skipwith Common SSSI	75	19.52	0.646	0.9%	21.71	28.9%
Humber Estuary SAC	75	29.01	1.200	1.6%	32.02	42.7%
Humber Estuary SPA/SSSI	75	29.01	1.200	1.6%	32.02	42.7%
Breighton Meadows SSSI	75	19.84	0.893	1.2%	23.75	31.7%
Eskamhorn Meadows SSSI	75	22.70	1.912	2.5%	25.59	34.1%
Derwent Ings SSSI	75	19.60	0.831	1.1%	23.37	31.2%
Went Ings SSSI	75	24.18	0.971	1.3%	26.60	35.5%
Barn Hill Meadows SSSI	75	25.78	0.962	1.3%	28.30	37.7%
Burr Closes SSSI	75	21.06	0.761	1.0%	22.99	30.7%
Common Plantation SINC	75	22.86	1.038	1.4%	24.19	32.3%
Disused Railway Embankment SINC	75	21.52	1.184	1.6%	23.07	30.8%
Barmby-on-the-Marsh LWS	75	20.96	1.621	2.2%	23.44	31.3%

Receptor	Daily Mean NO_x concentration ($\mu g/m^3$)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Brockholes SINC	75	22.44	1.623	2.2%	24.44	32.6%
Meadow East of Orchard Farm SINC	75	21.66	0.554	0.7%	22.33	29.8%
Barmby Pond LWS	75	19.92	1.577	2.1%	23.29	31.1%
Cobble Croft Wood SINC	75	23.24	1.176	1.6%	25.28	33.7%
Hagg Green Lane SINC	75	21.86	1.248	1.7%	25.22	33.6%
Sand Pitt Wood & Barffs Close Plantation SINC	75	22.86	1.630	2.2%	24.97	33.3%
Env. Agency Screening Criterion (as % of CL)				10%		

Table 1.21 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Mean NH_3 (Worst Case Emissions Profile)

Receptor	Annual Mean NH_3 concentration ($\mu g/m^3$)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
River Derwent SAC	3	4.57	0.002	0.1%	4.58	152.6%
Thorne Moor SAC/SPA/SSSI	1	2.59	0.001	0.1%	2.60	259.6%
Lower Derwent Valley SAC	3	4.57	0.002	0.1%	4.58	152.6%
Lower Derwent Valley SPA	3	4.57	0.002	0.1%	4.58	152.6%
Skipwith Common SAC	1	2.58	0.001	0.1%	2.58	258.4%
Skipwith Common SSSI	1	2.58	0.001	0.1%	2.58	258.4%
Humber Estuary SAC	3	3.58	0.002	0.1%	3.59	119.6%
Humber Estuary SPA/SSSI	3	3.58	0.002	0.1%	3.59	119.6%
Breighton Meadows SSSI	3	3.08	0.002	0.1%	3.09	103.0%
Eskamhorn Meadows SSSI	3	2.40	0.001	0.0%	2.40	80.1%
Derwent Ings SSSI	3	4.57	0.002	0.1%	4.58	152.6%
Went Ings SSSI	3	2.35	0.001	0.0%	2.35	78.4%

Receptor	Annual Mean NH_3 concentration ($\mu g/m^3$)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Barn Hill Meadows SSSI	3	2.32	0.002	0.1%	2.33	77.6%
Burr Closes SSSI	3	2.50	0.001	0.0%	2.50	83.4%
Common Plantation SINC	3	2.33	0.000	0.0%	2.33	77.7%
Disused Railway Embankment SINC	1	2.28	0.000	0.0%	2.28	76.0%
Barmby-on-the-Marsh LWS	3	2.28	0.001	0.0%	2.28	76.1%
Brockholes SINC	3	2.28	0.000	0.0%	2.28	76.0%
Meadow East of Orchard Farm SINC	1	2.33	0.000	0.0%	2.33	77.7%
Barmby Pond LWS	1	2.28	0.001	0.0%	2.29	76.2%
Cobble Croft Wood SINC	3	2.33	0.000	0.0%	2.33	77.7%
Hagg Green Lane SINC	3	3.09	0.001	0.0%	3.10	103.2%
Sand Pitt Wood & Barffs Close Plantation SINC	3	2.33	0.000	0.0%	2.33	77.7%
Env. Agency Screening Criterion (as % of CL)				**1%**	[redacted]	**70%**

Table 1.22 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Mean SO_2 (Worst Case Emissions Profile)

Receptor	Annual Mean SO_2 concentration ($\mu g/m^3$)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
River Derwent SAC	20	3.93	0.021	0.1%	4.03	20.1%
Thorne Moor SAC/SPA/SSSI	20	1.34	0.009	0.0%	1.40	7.0%
Lower Derwent Valley SAC	20	1.70	0.021	0.1%	1.80	9.0%
Lower Derwent Valley SPA	20	1.70	0.021	0.1%	1.80	9.0%
Skipwith Common SAC	20	1.42	0.008	0.0%	1.46	7.3%
Skipwith Common SSSI	20	1.42	0.008	0.0%	1.46	7.3%
Humber Estuary SAC	20	7.49	0.021	0.1%	7.58	37.9%

Receptor	Annual Mean SO_2 concentration (µg/m^3)					
	Critical Level	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Humber Estuary SPA/SSSI	20	7.49	0.021	0.1%	7.58	37.9%
Breighton Meadows SSSI	20	1.70	0.021	0.1%	1.80	9.0%
Eskamhorn Meadows SSSI	20	1.29	0.005	0.0%	1.31	6.5%
Derwent Ings SSSI	20	1.69	0.016	0.1%	1.78	8.9%
Went Ings SSSI	20	1.31	0.007	0.0%	1.34	6.7%
Barn Hill Meadows SSSI	20	1.81	0.022	0.1%	1.89	9.4%
Burr Closes SSSI	20	1.23	0.008	0.0%	1.26	6.3%
Common Plantation SINC	20	1.44	0.002	0.0%	1.44	7.2%
Disused Railway Embankment SINC	20	1.32	0.004	0.0%	1.33	6.7%
Barmby-on-the-Marsh LWS	20	1.32	0.009	0.0%	1.35	6.7%
Brockholes SINC	20	1.32	0.002	0.0%	1.32	6.6%
Meadow East of Orchard Farm SINC	20	1.44	0.001	0.0%	1.44	7.2%
Barmby Pond LWS	20	1.32	0.015	0.1%	1.37	6.9%
Cobble Croft Wood SINC	20	1.44	0.003	0.0%	1.45	7.2%
Hagg Green Lane SINC	20	1.43	0.013	0.1%	1.49	7.5%
Sand Pitt Wood & Barffs Close Plantation SINC	20	1.44	0.003	0.0%	1.45	7.2%
Env. Agency Screening Criterion (as % of CL)				**1%**	[redacted]	**70%**

Table 1.23 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Nitrogen Deposition Rate (Worst Case Emissions Profile)

Receptor	Annual Nitrogen Deposition Rate (kgN/ha/yr)					
	Critical Load	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
River Derwent SAC	15	30.22	0.017	0.1%	30.29	201.9%
Thorne Moor SAC	5	21.31	0.008	0.2%	21.35	427.0%

Receptor	Annual Nitrogen Deposition Rate (kgN/ha/yr)					
	Critical Load	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Thorne Moor SPA	10	21.31	0.008	0.1%	21.35	213.5%
Thorne Moor SSSI	5	21.31	0.008	0.2%	21.35	427.0%
Lower Derwent Valley SAC	20	30.22	0.017	0.1%	30.29	151.5%
Lower Derwent Valley SPA	20	30.22	0.017	0.1%	30.29	151.5%
Skipwith Common SAC	10	21.12	0.007	0.1%	21.14	211.4%
Skipwith Common SSSI	10	21.12	0.007	0.1%	21.14	211.4%
Humber Estuary SAC	20	28.87	0.017	0.1%	28.93	144.7%
Humber Estuary SPA/SSSI	20	28.87	0.017	0.1%	28.93	144.7%
Breighton Meadows SSSI	20	23.51	0.017	0.1%	23.57	117.9%
Eskamhorn Meadows SSSI	10	19.95	0.004	0.0%	19.96	199.6%
Derwent Ings SSSI	20	30.22	0.014	0.1%	30.29	151.4%
Went Ings SSSI	15	19.38	0.005	0.0%	19.40	129.4%
Barn Hill Meadows SSSI	20	20.43	0.017	0.1%	20.49	102.4%
Burr Closes SSSI	20	20.64	0.006	0.0%	20.66	103.3%
Common Plantation SINC	10	33.74	0.002	0.0%	33.75	337.5%
Disused Railway Embankment SINC	10	33.32	0.005	0.1%	33.33	333.3%
Barmby-on-the-Marsh LWS	10	33.32	0.011	0.1%	33.35	333.5%
Brockholes SINC	10	19.74	0.001	0.0%	19.74	197.4%
Meadow East of Orchard Farm SINC	20	19.88	0.001	0.0%	19.88	99.4%
Barmby Pond LWS	10	19.74	0.012	0.1%	19.78	197.8%
Cobble Croft Wood SINC	10	33.74	0.004	0.0%	33.75	337.5%
Hagg Green Lane SINC	10	40.74	0.017	0.2%	40.81	408.1%
Sand Pitt Wood & Barffs Close Plantation SINC	10	33.74	0.004	0.0%	33.75	337.5%

Receptor	Annual Nitrogen Deposition Rate (kgN/ha/yr)					
	Critical Load	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Barlow Common LNR	10	33.74	0.002	0.0%	33.75	337.5%
Env. Agency Screening Criterion (as % of CL)				**1%**	[redacted]	**70%**

Table 1.24 - Modelled Maximum Operational Impacts at Ecological Receptors – Annual Acid Deposition Rate (Worst Case Emissions Profile)

Receptor	Annual Acid Deposition Rate (keq/ha/yr)					
	Critical Load	Background	Max PC Impact	Max PC Impact as % of CL	Proposed Scheme Max PEC	Max PEC as % of CL
Thorne Moor SAC	0.462	1.73	0.002	0.4%	1.74	377.2%
Thorne Moor SSSI	0.462	1.73	0.002	0.4%	1.74	377.2%
Lower Derwent Valley SAC	4.856	2.40	0.004	0.1%	2.42	49.9%
Skipwith Common SAC	0.802	1.73	0.002	0.2%	1.73	216.0%
Skipwith Common SSSI	0.802	1.73	0.002	0.2%	1.73	216.0%
Breighton Meadows SSSI	0.643	1.92	0.004	0.6%	1.94	301.9%
Eskamhorn Meadows SSSI	1.998	1.64	0.001	0.0%	1.64	82.1%
Derwent Ings SSSI	0.643	2.40	0.003	0.5%	2.42	376.4%
Went Ings SSSI	2.008	1.59	0.001	0.1%	1.60	79.5%
Barn Hill Meadows SSSI	4.856	1.69	0.004	0.1%	1.70	35.1%
Burr Closes SSSI	1.248	1.68	0.001	0.1%	1.69	135.1%
Env. Agency Screening Criterion (as % of CL)				**1%**	[redacted]	**70%**