Appendix 14.13 – Ecological Impacts

As set out in the ES, the Development in isolation and in conjunction with other schemes does trigger a requirement of a impact assessment on Dearne Valley SSSI – Gypsy Marsh in a number of scenarios, due to the exceedances of both the DMRB (2019) and Natural England (2018) criteria and the 1% screening criteria. This is set out below.

Site-relevant critical levels and loads have been obtained from the APIS website for the SSSI. To note, there are no specific critical levels or loads to the Dearne Valley SSSI – Gypsy Marsh, these have been obtained from the grid square where the SSSI is located. These critical levels and loads are detailed in Table14.13.1 and Table 14.13.2 below.

Table 14.13.1: Critical Levels

Designated Feature	NO_x (µg/m³)		NH_3 (µg/m³)
	Annual	24-Hour	Annual
Fen, Marsh and Swamp & Acid Grassland	30	75	1 - 3

Table 14.13.2: Critical Loads

Designated Feature	Nitrogen Deposition (kgN/ha/year)	Nitrogen-Derived Acid Deposition	
		MinCLminN (kEq/ha/year)	MinCLmaxN (kEq/ha/year)
Fen, Marsh and Swamp	5 – 25	-	-
Acid Grassland	5 – 25	0.438	2.088
Lowest habitat-specific critical loads used in order to provide a robust assessment			

The discrete indicative transect points modelled at the Dearne Valley Park SSSI – Gypsy Marsh are set out below:

Table 14.13.3: Modelled Transect Points

Receptor	Coordinates (m)		
	X	Y	Z
E1_0	441930	402383	
E1_2	441929	402383	0
E1_5	441926	402384	

Receptor	Coordinates (m)		
	X	Y	Z
E1_10	441921	402386	
E1_20	441911	402389	
E1_30	441902	402392	
E1_40	441892	402395	
E1_50	441883	402398	
E1_60	441873	402401	
E1_70	441864	402404	
E1_80	441854	402407	
E1_90	441845	402410	
E1_100	441835	402413	
E1_110	441826	402417	
E1_120	441816	402420	
E1_130	441807	402423	
E1_140	441797	402426	
E1_150	441788	402429	
E1_160	441778	402432	
E1_170	441769	402435	
E1_180	441759	402438	
E1_190	441750	402441	
E1_200	441740	402444	
E2_0	441886	402355	
E2_2	441885	402357	
E2_5	441885	402360	
E2_10	441883	402364	
E2_20	441880	402374	
E2_30	441877	402383	
E2_40	441874	402393	
E2_50	441871	402402	
E2_60	441868	402412	

Receptor	Coordinates (m)		
	X	Y	Z
E2_70	441864	402421	
E2_80	441861	402431	
E2_90	441858	402440	
E2_100	441855	402450	
E2_110	441852	402459	
E2_120	441849	402469	
E2_130	441846	402479	
E2_140	441843	402488	
E2_150	441840	402498	
E2_160	441837	402507	
E2_170	441834	402517	
E2_180	441830	402526	
E2_190	441827	402536	
E2_200	441824	402545	

Traffic Emissions in Isolation – Dearne Valley SSSI – Gypsy Marsh

Construction Phase:

The process contribution to annual mean NO_x and NH_3 concentrations have been assessed as a percentage of the critical level. The process contribution to nutrient nitrogen and acid has been assessed as a percentage of the appropriate critical load.

The modelled annual mean NO_x concentrations at the identified transect points are set out in Table 14.13.4 below.

Table 14.13.4: Predicted Annual Mean NO_x Concentrations

Receptor	2025 Do Min ($\mu g/m^3$)	2025 Do Some ($\mu g/m^3$)	Difference ($\mu g/m^3$)	% of Critical Level
E1_0	56.5	57.5	1.0	**3.3%**
E1_2	53.0	53.9	0.9	**3.0%**
E1_5	48.7	49.5	0.8	**2.7%**

Receptor	2025 Do Min (µg/m³)	2025 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_10	43.5	44.1	0.7	**2.2%**
E1_20	36.9	37.4	0.5	**1.6%**
E1_30	32.9	33.3	0.4	**1.3%**
E1_40	30.2	30.5	0.3	**1.1%**
E1_50	28.2	28.5	0.3	0.9%
E1_60	26.8	27.0	0.2	0.8%
E1_70	25.6	25.8	0.2	0.7%
E1_80	24.7	24.9	0.2	0.6%
E1_90	23.9	24.1	0.2	0.6%
E1_100	23.3	23.5	0.2	0.5%
E1_110	22.8	22.9	0.1	0.5%
E1_120	22.3	22.5	0.1	0.5%
E1_130	21.9	22.1	0.1	0.4%
E1_140	21.6	21.7	0.1	0.4%
E1_150	21.3	21.4	0.1	0.4%
E1_160	21.0	21.1	0.1	0.4%
E1_170	20.8	20.9	0.1	0.4%
E1_180	20.5	20.6	0.1	0.4%
E1_190	20.3	20.4	0.1	0.4%
E1_200	20.2	20.3	0.1	0.3%
E2_0	53.0	53.7	0.7	**2.2%**
E2_2	49.8	50.4	0.6	**2.0%**
E2_5	45.9	46.4	0.6	**1.8%**
E2_10	41.0	41.5	0.5	**1.6%**
E2_20	34.7	35.1	0.4	**1.2%**
E2_30	30.9	31.2	0.3	**1.0%**
E2_40	28.2	28.5	0.3	0.9%
E2_50	26.3	26.6	0.2	0.8%
E2_60	24.9	25.1	0.2	0.7%

Receptor	2025 Do Min (µg/m³)	2025 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E2_70	23.8	24.0	0.2	0.6%
E2_80	22.9	23.1	0.2	0.5%
E2_90	22.2	22.3	0.2	0.5%
E2_100	21.6	21.7	0.1	0.5%
E2_110	21.1	21.2	0.1	0.4%
E2_120	20.6	20.8	0.1	0.4%
E2_130	20.3	20.4	0.1	0.4%
E2_140	19.9	20.0	0.1	0.4%
E2_150	19.6	19.7	0.1	0.3%
E2_160	19.4	19.5	0.1	0.3%
E2_170	19.1	19.2	0.1	0.3%
E2_180	18.9	19.0	0.1	0.3%
E2_190	18.7	18.8	0.1	0.3%
E2_200	18.5	18.6	0.1	0.3%
Notes:				
Bold indicates the 1% threshold criteria is exceeded.				

Predicted annual mean concentrations of NO_x are above the 30 µg/m³ critical level in both the 'Do Min' and 'Do Some' scenarios at modelled transect points up to 40 m from the edge of the SSSI along Transect E1and 30 m along Transect E2. As expected, the highest concentrations were predicted at the locations closest to the A6195. The highest predicted concentration was at Transect point E1.0 (0 m from the edge of the SSSI), predicted at 57.5 µg/m³ in the '2025 Baseline + Development Construction Traffic' scenario.

No background 24-hour mean nitrogen oxides concentrations are available, therefore baseline 24-hour mean concentrations have not been calculated. Notwithstanding this, the maximum changes in predicted concentrations of the 24-hour NO_x in 2025, as a result of the Development (Process Contributions, PC) are set out in Table 14.13.5.

Table 14.13.5: Predicted 24-Hour Mean NO_x Process Contribution

Receptor	2025 Do Min PC (µg/m³)	2025 Do Some PC (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_0	38.7	39.6	0.9	1.2%

Receptor	2025 Do Min PC (µg/m³)	2025 Do Some PC (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_2	36.0	36.9	0.8	1.1%
E1_5	32.7	33.4	0.8	1.0%
E1_10	28.3	29.0	0.6	0.9%
E1_20	22.4	22.9	0.5	0.7%
E1_30	18.6	19.0	0.4	0.5%
E1_40	16.1	16.4	0.3	0.4%
E1_50	14.1	14.4	0.3	0.4%
E1_60	12.6	12.8	0.2	0.3%
E1_70	11.4	11.6	0.2	0.3%
E1_80	10.6	10.8	0.2	0.2%
E1_90	9.9	10.1	0.2	0.2%
E1_100	9.3	9.5	0.2	0.2%
E1_110	8.8	9.0	0.2	0.2%
E1_120	8.4	8.6	0.1	0.2%
E1_130	8.1	8.2	0.1	0.2%
E1_140	7.7	7.9	0.1	0.2%
E1_150	7.5	7.6	0.1	0.2%
E1_160	7.2	7.3	0.1	0.2%
E1_170	7.0	7.1	0.1	0.2%
E1_180	6.7	6.8	0.1	0.2%
E1_190	6.5	6.6	0.1	0.2%
E1_200	6.3	6.4	0.1	0.1%
E2_0	33.0	33.5	0.5	0.7%
E2_2	30.7	31.2	0.5	0.7%
E2_5	27.9	28.3	0.5	0.6%
E2_10	24.3	24.7	0.4	0.5%
E2_20	19.4	19.8	0.3	0.5%
E2_30	16.2	16.5	0.3	0.4%
E2_40	13.8	14.1	0.3	0.3%

Receptor	2025 Do Min PC ($\mu g/m^3$)	2025 Do Some PC ($\mu g/m^3$)	Difference ($\mu g/m^3$)	% of Critical Level
E2_50	12.1	12.4	0.2	0.3%
E2_60	11.0	11.2	0.2	0.3%
E2_70	10.1	10.3	0.2	0.2%
E2_80	9.3	9.5	0.2	0.2%
E2_90	8.7	8.9	0.2	0.2%
E2_100	8.2	8.3	0.2	0.2%
E2_110	7.7	7.8	0.1	0.2%
E2_120	7.2	7.3	0.1	0.2%
E2_130	6.8	7.0	0.1	0.2%
E2_140	6.5	6.7	0.1	0.2%
E2_150	6.3	6.4	0.1	0.2%
E2_160	6.0	6.1	0.1	0.2%
E2_170	5.8	5.9	0.1	0.2%
E2_180	5.6	5.7	0.1	0.2%
E2_190	5.3	5.4	0.1	0.1%
E2_200	5.1	5.2	0.1	0.1%
Notes: **Bold** indicates the 10% threshold criteria is exceeded.				

Table 14.13.6 sets out the annual mean NH_3 model results.

Table 14.13.6: Predicted Annual Mean NH_3 Process Contribution

Receptor	2025 Do Min ($\mu g/m^3$)	2025 Do Some ($\mu g/m^3$)	Difference ($\mu g/m^3$)	% of Critical Level
E1_0	2.4	2.4	0.009	0.9%
E1_2	2.4	2.4	0.008	0.8%
E1_5	2.3	2.3	0.007	0.7%
E1_10	2.2	2.2	0.006	0.6%
E1_20	2.1	2.1	0.005	0.5%
E1_30	2.1	2.1	0.004	0.4%
E1_40	2.0	2.1	0.004	0.4%

Receptor	2025 Do Min (µg/m³)	2025 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_50	2.0	2.0	0.003	0.3%
E1_60	2.0	2.0	0.003	0.3%
E1_70	2.0	2.0	0.003	0.3%
E1_80	2.0	2.0	0.003	0.3%
E1_90	2.0	2.0	0.002	0.2%
E1_100	1.9	1.9	0.002	0.2%
E1_110	1.9	1.9	0.002	0.2%
E1_120	1.9	1.9	0.002	0.2%
E1_130	1.9	1.9	0.002	0.2%
E1_140	1.9	1.9	0.002	0.2%
E1_150	1.9	1.9	0.002	0.2%
E1_160	1.9	1.9	0.002	0.2%
E1_170	1.9	1.9	0.002	0.2%
E1_180	1.9	1.9	0.002	0.2%
E1_190	1.9	1.9	0.002	0.2%
E1_200	1.9	1.9	0.002	0.2%
E2_0	2.5	2.5	0.009	0.9%
E2_2	2.4	2.4	0.008	0.8%
E2_5	2.4	2.4	0.007	0.7%
E2_10	2.3	2.3	0.006	0.6%
E2_20	2.1	2.1	0.005	0.5%
E2_30	2.1	2.1	0.004	0.4%
E2_40	2.0	2.0	0.003	0.3%
E2_50	2.0	2.0	0.003	0.3%
E2_60	2.0	2.0	0.003	0.3%
E2_70	1.9	1.9	0.002	0.2%
E2_80	1.9	1.9	0.002	0.2%
E2_90	1.9	1.9	0.002	0.2%
E2_100	1.9	1.9	0.002	0.2%

Receptor	2025 Do Min (µg/m³)	2025 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E2_110	1.9	1.9	0.002	0.2%
E2_120	1.9	1.9	0.002	0.2%
E2_130	1.9	1.9	0.002	0.2%
E2_140	1.9	1.9	0.001	0.1%
E2_150	1.9	1.9	0.001	0.1%
E2_160	1.9	1.9	0.001	0.1%
E2_170	1.9	1.9	0.001	0.1%
E2_180	1.9	1.9	0.001	0.1%
E2_190	1.9	1.9	0.001	0.1%
E2_200	1.9	1.9	0.001	0.1%
Notes:				
Bold indicates the 1% threshold criteria is exceeded.				

Nitrogen Deposition

Table 14.13.7 sets out the predicted annual nutrient nitrogen deposition for the modelled transect points.

Table 14.13.7: Predicted Annual Mean Nitrogen Deposition Process Contribution

Receptor	2025 Do Min (kgN/ha/year)	2025 Do Some (kgN/ha/year)	Difference (kgN/ha/year)	% of Critical Load
E1_0	22.5	22.6	0.11	**2%**
E1_2	22.0	22.1	0.10	**2%**
E1_5	21.4	21.5	0.09	**2%**
E1_10	20.6	20.7	0.08	**2%**
E1_20	19.7	19.7	0.06	**1%**
E1_30	19.1	19.1	0.05	1%
E1_40	18.7	18.7	0.04	1%
E1_50	18.4	18.4	0.04	1%
E1_60	18.2	18.2	0.03	1%
E1_70	18.0	18.0	0.03	1%

Receptor	2025 Do Min (kgN/ha/year)	2025 Do Some (kgN/ha/year)	Difference (kgN/ha/year)	% of Critical Load
E1_80	17.9	17.9	0.03	1%
E1_90	17.7	17.8	0.03	1%
E1_100	17.6	17.7	0.02	0%
E1_110	17.6	17.6	0.02	0%
E1_120	17.5	17.5	0.02	0%
E1_130	17.4	17.4	0.02	0%
E1_140	17.4	17.4	0.02	0%
E1_150	17.3	17.3	0.02	0%
E1_160	17.3	17.3	0.02	0%
E1_170	17.2	17.2	0.02	0%
E1_180	17.2	17.2	0.02	0%
E1_190	17.1	17.2	0.02	0%
E1_200	17.1	17.1	0.02	0%
E2_0	22.6	22.7	0.09	**2%**
E2_2	22.0	22.1	0.08	**2%**
E2_5	21.4	21.5	0.08	**2%**
E2_10	20.6	20.6	0.07	**1%**
E2_20	19.5	19.6	0.05	**1%**
E2_30	18.9	18.9	0.04	1%
E2_40	18.4	18.5	0.04	1%
E2_50	18.1	18.1	0.03	1%
E2_60	17.9	17.9	0.03	1%
E2_70	17.7	17.7	0.03	1%
E2_80	17.5	17.6	0.02	0%
E2_90	17.4	17.4	0.02	0%
E2_100	17.3	17.3	0.02	0%
E2_110	17.2	17.2	0.02	0%
E2_120	17.2	17.2	0.02	0%
E2_130	17.1	17.1	0.02	0%

Receptor	2025 Do Min (kgN/ha/year)	2025 Do Some (kgN/ha/year)	Difference (kgN/ha/year)	% of Critical Load
E2_140	17.0	17.0	0.02	0%
E2_150	17.0	17.0	0.02	0%
E2_160	16.9	17.0	0.02	0%
E2_170	16.9	16.9	0.01	0%
E2_180	16.9	16.9	0.01	0%
E2_190	16.8	16.8	0.01	0%
E2_200	16.8	16.8	0.01	0%
Notes:				
Bold indicates the 1% threshold criteria is exceeded.				

Acid Deposition

Table 14.13.8 sets out the predicted annual nutrient acid deposition for the modelled transect points.

Table 14.13.8: Predicted Annual Mean Acid Deposition Process Contribution

Receptor	2025 Do Min (keq/ha/year)	2025 Do Some (keq/ha/year)	Difference (keq/ha/year)	% of Critical Load
E1_0	1.42	1.43	0.005	1%
E1_2	1.40	1.41	0.004	1%
E1_5	1.38	1.39	0.004	1%
E1_10	1.36	1.36	0.003	1%
E1_20	1.32	1.33	0.003	1%
E1_30	1.30	1.31	0.002	0%
E1_40	1.29	1.29	0.002	0%
E1_50	1.28	1.28	0.001	0%
E1_60	1.27	1.27	0.001	0%
E1_70	1.26	1.27	0.001	0%
E1_80	1.26	1.26	0.001	0%
E1_90	1.25	1.26	0.001	0%
E1_100	1.25	1.25	0.001	0%

Receptor	2025 Do Min (keq/ha/year)	2025 Do Some (keq/ha/year)	Difference (keq/ha/year)	% of Critical Load
E1_110	1.25	1.25	0.001	0%
E1_120	1.25	1.25	0.001	0%
E1_130	1.24	1.24	0.001	0%
E1_140	1.24	1.24	0.001	0%
E1_150	1.24	1.24	0.001	0%
E1_160	1.24	1.24	0.001	0%
E1_170	1.24	1.24	0.001	0%
E1_180	1.24	1.24	0.001	0%
E1_190	1.23	1.24	0.001	0%
E1_200	1.23	1.23	0.001	0%
E2_0	1.41	1.41	0.003	1%
E2_2	1.39	1.39	0.003	1%
E2_5	1.37	1.37	0.003	1%
E2_10	1.35	1.35	0.002	1%
E2_20	1.31	1.32	0.002	0%
E2_30	1.29	1.29	0.002	0%
E2_40	1.28	1.28	0.001	0%
E2_50	1.27	1.27	0.001	0%
E2_60	1.26	1.26	0.001	0%
E2_70	1.25	1.26	0.001	0%
E2_80	1.25	1.25	0.001	0%
E2_90	1.25	1.25	0.001	0%
E2_100	1.24	1.24	0.001	0%
E2_110	1.24	1.24	0.001	0%
E2_120	1.24	1.24	0.001	0%
E2_130	1.23	1.24	0.001	0%
E2_140	1.23	1.23	0.001	0%
E2_150	1.23	1.23	0.001	0%
E2_160	1.23	1.23	0.001	0%

Receptor	2025 Do Min (keq/ha/year)	2025 Do Some (keq/ha/year)	Difference (keq/ha/year)	% of Critical Load
E2_170	1.23	1.23	0.001	0%
E2_180	1.23	1.23	0.001	0%
E2_190	1.23	1.23	0.001	0%
E2_200	1.22	1.23	0.001	0%
Notes:				
Bold indicates the 1% threshold criteria is exceeded.				

Operational Phase

The process contribution to annual mean NO_x and NH_3 concentrations have been assessed as a percentage of the critical level. The process contribution to nutrient nitrogen and acid has been assessed as a percentage of the appropriate critical load.

The modelled annual mean NO_x concentrations at the identified transect points are set out in Table 14.13.9 below.

Table 14.13.9: Predicted Annual Mean NO_x Concentrations

Receptor	2026 Do Min ($\mu g/m^3$)	2026 Do Some ($\mu g/m^3$)	Difference ($\mu g/m^3$)	% of Critical Level
E1_0	52.4	59.4	7.0	**23.4%**
E1_2	49.1	55.5	6.4	**21.3%**
E1_5	45.3	50.8	5.6	**18.6%**
E1_10	40.5	45.1	4.6	**15.4%**
E1_20	34.5	37.8	3.4	**11.3%**
E1_30	30.8	33.4	2.6	**8.7%**
E1_40	28.4	30.5	2.1	**7.0%**
E1_50	26.6	28.4	1.8	**5.9%**
E1_60	25.2	26.8	1.5	**5.0%**
E1_70	24.2	25.5	1.3	**4.4%**
E1_80	23.4	24.5	1.2	**4.0%**
E1_90	22.7	23.7	1.1	**3.6%**
E1_100	22.1	23.1	1.0	**3.3%**
E1_110	21.6	22.5	0.9	**3.1%**

Receptor	2026 Do Min (µg/m³)	2026 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_120	21.2	22.1	0.9	**2.9%**
E1_130	20.8	21.7	0.8	**2.7%**
E1_140	20.5	21.3	0.8	**2.6%**
E1_150	20.3	21.0	0.7	**2.5%**
E1_160	20.0	20.7	0.7	**2.3%**
E1_170	19.8	20.5	0.7	**2.3%**
E1_180	19.6	20.2	0.7	**2.2%**
E1_190	19.4	20.0	0.6	**2.1%**
E1_200	19.2	19.9	0.6	**2.0%**
E2_0	49.0	53.1	4.2	**13.9%**
E2_2	46.0	49.9	3.9	**13.0%**
E2_5	42.5	46.0	3.5	**11.7%**
E2_10	38.1	41.1	3.0	**10.1%**
E2_20	32.4	34.8	2.4	**7.9%**
E2_30	28.9	30.9	2.0	**6.5%**
E2_40	26.6	28.2	1.7	**5.5%**
E2_50	24.9	26.3	1.4	**4.8%**
E2_60	23.6	24.8	1.3	**4.3%**
E2_70	22.6	23.7	1.1	**3.8%**
E2_80	21.8	22.8	1.0	**3.5%**
E2_90	21.1	22.1	1.0	**3.2%**
E2_100	20.6	21.4	0.9	**2.9%**
E2_110	20.1	20.9	0.8	**2.7%**
E2_120	19.7	20.5	0.8	**2.5%**
E2_130	19.4	20.1	0.7	**2.4%**
E2_140	19.1	19.7	0.7	**2.2%**
E2_150	18.8	19.4	0.6	**2.1%**
E2_160	18.5	19.2	0.6	**2.0%**
E2_170	18.3	18.9	0.6	**1.9%**

Receptor	2026 Do Min (μg/m³)	2026 Do Some (μg/m³)	Difference (μg/m³)	% of Critical Level
E2_180	18.1	18.7	0.5	**1.8%**
E2_190	18.0	18.5	0.5	**1.7%**
E2_200	17.8	18.3	0.5	**1.7%**
Notes:				
Bold indicates the 1% threshold criteria is exceeded.				

Predicted annual mean concentrations of NO$_X$ are above the 30 μg/m³ critical level in both the 'Do Min' and 'Do Some' scenarios at modelled transect points up to 40 m from the edge of the SSSI along Transect E1 and 30 m along Transect E2. As expected, the highest concentrations were predicted at the locations closest to the A6195. The highest predicted concentration was at Transect point E1.0 (0 m from the edge of the SSSI), predicted at 59.4 μg/m³ in the '2026 Future Development Year + Development Traffic' scenario.

No background 24-hour mean nitrogen oxides concentrations are available, therefore baseline 24-hour mean concentrations have not been calculated. Notwithstanding this, the maximum changes in predicted concentrations of the 24-hour NO$_X$ in 2026, as a result of the Development (Process Contributions, PC) are set out in Table 14.13.10.

Table 14.13.10: Predicted 24-Hour Mean NO$_X$ Process Contribution

Receptor	2026 Do Min PC (μg/m³)	2026 Do Some PC (μg/m³)	Difference (μg/m³)	% of Critical Level
E1_0	35.2	41.6	6.3	8.4%
E1_2	32.8	38.6	5.9	7.8%
E1_5	29.7	35.0	5.3	7.0%
E1_10	25.8	30.3	4.5	6.0%
E1_20	20.3	23.7	3.4	4.5%
E1_30	16.9	19.6	2.7	3.5%
E1_40	14.6	16.7	2.1	2.9%
E1_50	12.8	14.6	1.8	2.4%
E1_60	11.4	12.9	1.5	2.0%
E1_70	10.3	11.7	1.3	1.8%
E1_80	9.6	10.7	1.1	1.5%
E1_90	9.0	10.0	1.0	1.4%

Receptor	2026 Do Min PC (µg/m³)	2026 Do Some PC (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_100	8.4	9.4	1.0	1.3%
E1_110	8.0	8.9	0.9	1.2%
E1_120	7.6	8.5	0.8	1.1%
E1_130	7.3	8.1	0.8	1.1%
E1_140	7.0	7.8	0.8	1.0%
E1_150	6.8	7.5	0.7	1.0%
E1_160	6.5	7.2	0.7	1.0%
E1_170	6.3	7.0	0.7	0.9%
E1_180	6.1	6.7	0.7	0.9%
E1_190	5.9	6.5	0.6	0.9%
E1_200	5.7	6.3	0.6	0.8%
E2_0	29.9	33.2	3.4	4.5%
E2_2	27.8	31.0	3.2	4.3%
E2_5	25.2	28.2	2.9	3.9%
E2_10	22.0	24.6	2.6	3.5%
E2_20	17.6	19.8	2.2	2.9%
E2_30	14.7	16.5	1.8	2.4%
E2_40	12.5	14.1	1.6	2.1%
E2_50	11.0	12.4	1.4	1.9%
E2_60	9.9	11.2	1.2	1.6%
E2_70	9.1	10.3	1.1	1.5%
E2_80	8.5	9.5	1.1	1.4%
E2_90	7.9	8.9	1.0	1.3%
E2_100	7.4	8.3	0.9	1.2%
E2_110	7.0	7.8	0.9	1.2%
E2_120	6.5	7.4	0.9	1.2%
E2_130	6.2	7.1	0.9	1.2%
E2_140	5.9	6.8	0.8	1.1%
E2_150	5.7	6.5	0.8	1.1%

Receptor	2026 Do Min PC ($\mu g/m^3$)	2026 Do Some PC ($\mu g/m^3$)	Difference ($\mu g/m^3$)	% of Critical Level
E2_160	5.5	6.2	0.7	1.0%
E2_170	5.2	6.0	0.7	0.9%
E2_180	5.0	5.7	0.7	0.9%
E2_190	4.8	5.5	0.6	0.9%
E2_200	4.7	5.3	0.6	0.8%
Notes:				
Bold indicates the 10% threshold criteria is exceeded.				

Table 14.13.11 sets out the annual mean NH_3 model results.

Table 14.13.11: Predicted Annual Mean NH_3 Process Contribution

Receptor	2026 Do Min ($\mu g/m^3$)	2026 Do Some ($\mu g/m^3$)	Difference ($\mu g/m^3$)	% of Critical Level
E1_0	2.45	2.50	0.05	**5.5%**
E1_2	2.39	2.44	0.05	**5.0%**
E1_5	2.33	2.37	0.05	**4.5%**
E1_10	2.25	2.29	0.04	**3.9%**
E1_20	2.15	2.19	0.03	**3.1%**
E1_30	2.10	2.12	0.03	**2.6%**
E1_40	2.06	2.08	0.02	**2.3%**
E1_50	2.03	2.05	0.02	**2.1%**
E1_60	2.01	2.02	0.02	**1.9%**
E1_70	1.99	2.00	0.02	**1.7%**
E1_80	1.97	1.99	0.02	**1.6%**
E1_90	1.96	1.97	0.02	**1.5%**
E1_100	1.95	1.96	0.01	**1.4%**
E1_110	1.94	1.95	0.01	**1.4%**
E1_120	1.93	1.95	0.01	**1.3%**
E1_130	1.92	1.94	0.01	**1.3%**
E1_140	1.92	1.93	0.01	**1.2%**
E1_150	1.91	1.93	0.01	**1.2%**

Receptor	2026 Do Min (µg/m³)	2026 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_160	1.91	1.92	0.01	**1.1%**
E1_170	1.90	1.91	0.01	**1.1%**
E1_180	1.90	1.91	0.01	**1.1%**
E1_190	1.90	1.91	0.01	**1.0%**
E1_200	1.89	1.90	0.01	**1.0%**
E2_0	2.51	2.57	0.06	**5.6%**
E2_2	2.45	2.50	0.05	**5.1%**
E2_5	2.37	2.42	0.05	**4.6%**
E2_10	2.28	2.31	0.04	**3.9%**
E2_20	2.16	2.19	0.03	**3.0%**
E2_30	2.08	2.11	0.02	**2.4%**
E2_40	2.03	2.05	0.02	**2.1%**
E2_50	2.00	2.02	0.02	**1.8%**
E2_60	1.97	1.99	0.02	**1.6%**
E2_70	1.95	1.97	0.01	**1.5%**
E2_80	1.93	1.95	0.01	**1.3%**
E2_90	1.92	1.93	0.01	**1.2%**
E2_100	1.91	1.92	0.01	**1.2%**
E2_110	1.90	1.91	0.01	**1.1%**
E2_120	1.89	1.90	0.01	**1.0%**
E2_130	1.89	1.90	0.01	1.0%
E2_140	1.88	1.89	0.01	0.9%
E2_150	1.87	1.88	0.01	0.9%
E2_160	1.87	1.88	0.01	0.8%
E2_170	1.86	1.87	0.01	0.8%
E2_180	1.86	1.87	0.01	0.8%
E2_190	1.86	1.86	0.01	0.7%
E2_200	1.85	1.86	0.01	0.7%
Notes:				
Bold indicates the 1% threshold criteria is exceeded.				

Nitrogen Deposition

Table 14.13.12 sets out the predicted annual nutrient nitrogen deposition for the modelled transect points.

Table 14.13.12: Predicted Annual Mean Nitrogen Deposition Process Contribution

Receptor	2026 Do Min (kgN/ha/year)	2026 Do Some (kgN/ha/year)	Difference (kgN/ha/year)	% of Critical Load
E1_0	22.31	23.05	0.74	**15%**
E1_2	21.82	22.50	0.68	**14%**
E1_5	21.23	21.84	0.61	**12%**
E1_10	20.50	21.02	0.52	**10%**
E1_20	19.57	19.97	0.40	**8%**
E1_30	19.01	19.34	0.32	**6%**
E1_40	18.63	18.90	0.27	**5%**
E1_50	18.35	18.58	0.24	**5%**
E1_60	18.13	18.34	0.21	**4%**
E1_70	17.95	18.14	0.19	**4%**
E1_80	17.81	17.99	0.17	**3%**
E1_90	17.70	17.86	0.16	**3%**
E1_100	17.60	17.75	0.15	**3%**
E1_110	17.52	17.66	0.14	**3%**
E1_120	17.44	17.58	0.13	**3%**
E1_130	17.38	17.51	0.13	**3%**
E1_140	17.32	17.45	0.12	**2%**
E1_150	17.28	17.39	0.12	**2%**
E1_160	17.23	17.34	0.11	**2%**
E1_170	17.19	17.30	0.11	**2%**
E1_180	17.15	17.26	0.11	**2%**
E1_190	17.12	17.22	0.10	**2%**
E1_200	17.09	17.19	0.10	**2%**
E2_0	22.44	23.00	0.57	**11%**
E2_2	21.91	22.43	0.53	**11%**

Receptor	2026 Do Min (kgN/ha/year)	2026 Do Some (kgN/ha/year)	Difference (kgN/ha/year)	% of Critical Load
E2_5	21.26	21.74	0.48	**10%**
E2_10	20.46	20.87	0.41	**8%**
E2_20	19.43	19.76	0.33	**7%**
E2_30	18.80	19.07	0.27	**5%**
E2_40	18.37	18.60	0.23	**5%**
E2_50	18.06	18.26	0.20	**4%**
E2_60	17.83	18.01	0.18	**4%**
E2_70	17.65	17.81	0.16	**3%**
E2_80	17.50	17.65	0.15	**3%**
E2_90	17.38	17.52	0.14	**3%**
E2_100	17.28	17.41	0.13	**3%**
E2_110	17.20	17.31	0.12	**2%**
E2_120	17.12	17.24	0.11	**2%**
E2_130	17.06	17.17	0.10	**2%**
E2_140	17.01	17.10	0.10	**2%**
E2_150	16.96	17.05	0.09	**2%**
E2_160	16.91	17.00	0.09	**2%**
E2_170	16.88	16.96	0.08	**2%**
E2_180	16.84	16.92	0.08	**2%**
E2_190	16.81	16.88	0.08	**2%**
E2_200	16.78	16.85	0.08	**2%**

Notes:

Bold indicates the 1% threshold criteria is exceeded.

Acid Deposition

Table 14.13.13 sets out the predicted annual nutrient acid deposition for the modelled transect points.

Table 14.13.13: Predicted Annual Mean Acid Deposition Process Contribution

Receptor	2026 Do Min (keq/ha/year)	2026 Do Some (keq/ha/year)	Difference (keq/ha/year)	% of Critical Load
E1_0	1.40	1.44	0.033	8%
E1_2	1.39	1.42	0.030	7%
E1_5	1.37	1.40	0.027	6%
E1_10	1.34	1.37	0.023	5%
E1_20	1.31	1.33	0.017	4%
E1_30	1.29	1.31	0.014	3%
E1_40	1.28	1.29	0.011	3%
E1_50	1.27	1.28	0.009	2%
E1_60	1.26	1.27	0.008	2%
E1_70	1.26	1.27	0.007	2%
E1_80	1.25	1.26	0.006	1%
E1_90	1.25	1.26	0.006	1%
E1_100	1.25	1.25	0.005	1%
E1_110	1.24	1.25	0.005	1%
E1_120	1.24	1.25	0.005	1%
E1_130	1.24	1.24	0.004	1%
E1_140	1.24	1.24	0.004	1%
E1_150	1.24	1.24	0.004	1%
E1_160	1.24	1.24	0.004	1%
E1_170	1.23	1.24	0.004	1%
E1_180	1.23	1.24	0.004	1%
E1_190	1.23	1.24	0.003	1%
E1_200	1.23	1.23	0.003	1%
E2_0	1.39	1.41	0.020	5%
E2_2	1.37	1.39	0.019	4%
E2_5	1.36	1.37	0.017	4%
E2_10	1.33	1.35	0.015	4%
E2_20	1.30	1.32	0.013	3%
E2_30	1.28	1.29	0.010	2%

Receptor	2026 Do Min (keq/ha/year)	2026 Do Some (keq/ha/year)	Difference (keq/ha/year)	% of Critical Load
E2_40	1.27	1.28	0.009	2%
E2_50	1.26	1.27	0.008	2%
E2_60	1.25	1.26	0.007	2%
E2_70	1.25	1.26	0.006	1%
E2_80	1.24	1.25	0.006	1%
E2_90	1.24	1.25	0.005	1%
E2_100	1.24	1.24	0.005	1%
E2_110	1.24	1.24	0.005	1%
E2_120	1.23	1.24	0.004	1%
E2_130	1.23	1.24	0.004	1%
E2_140	1.23	1.23	0.004	1%
E2_150	1.23	1.23	0.003	1%
E2_160	1.23	1.23	0.003	1%
E2_170	1.23	1.23	0.003	1%
E2_180	1.22	1.23	0.003	1%
E2_190	1.22	1.23	0.003	1%
E2_200	1.22	1.23	0.003	1%
Notes:				
Bold indicates the 1% threshold criteria is exceeded.				

Traffic Emissions in Isolation – Dearne Valley SSSI – Gypsy Marsh

Construction Phase:

The process contribution to annual mean NO_x and NH_3 concentrations have been assessed as a percentage of the critical level. The process contribution to nutrient nitrogen and acid has been assessed as a percentage of the appropriate critical load.

The modelled annual mean NO_x concentrations at the identified transect points are set out in Table 14.13.14 below.

Table 14.13.14: Predicted Annual Mean NO_x Concentrations

Receptor	2025 Do Min (µg/m³)	2025 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_0	56.5	60.7	4.1	**13.8%**
E1_2	53.0	56.8	3.8	**12.6%**
E1_5	48.7	52.1	3.4	**11.3%**
E1_10	43.5	46.3	2.9	**9.5%**
E1_20	36.9	39.1	2.2	**7.4%**
E1_30	32.9	34.7	1.8	**6.1%**
E1_40	30.2	31.7	1.6	**5.2%**
E1_50	28.2	29.6	1.4	**4.5%**
E1_60	26.8	28.0	1.2	**4.1%**
E1_70	25.6	26.7	1.1	**3.7%**
E1_80	24.7	25.7	1.0	**3.4%**
E1_90	23.9	24.9	0.9	**3.2%**
E1_100	23.3	24.2	0.9	**3.0%**
E1_110	22.8	23.6	0.8	**2.8%**
E1_120	22.3	23.1	0.8	**2.6%**
E1_130	21.9	22.7	0.8	**2.5%**
E1_140	21.6	22.3	0.7	**2.4%**
E1_150	21.3	22.0	0.7	**2.3%**
E1_160	21.0	21.7	0.7	**2.2%**
E1_170	20.8	21.4	0.6	**2.2%**
E1_180	20.5	21.2	0.6	**2.1%**
E1_190	20.3	20.9	0.6	**2.0%**
E1_200	20.2	20.7	0.6	**2.0%**
E2_0	53.0	56.7	3.7	**12.2%**
E2_2	49.8	53.1	3.4	**11.2%**
E2_5	45.9	48.9	3.0	**10.0%**
E2_10	41.0	43.5	2.5	**8.5%**
E2_20	34.7	36.7	2.0	**6.5%**
E2_30	30.9	32.5	1.6	**5.3%**

Receptor	2025 Do Min (µg/m³)	2025 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E2_40	28.2	29.6	1.4	**4.5%**
E2_50	26.3	27.5	1.2	**3.9%**
E2_60	24.9	26.0	1.0	**3.5%**
E2_70	23.8	24.7	0.9	**3.1%**
E2_80	22.9	23.8	0.9	**2.8%**
E2_90	22.2	23.0	0.8	**2.6%**
E2_100	21.6	22.3	0.7	**2.4%**
E2_110	21.1	21.8	0.7	**2.3%**
E2_120	20.6	21.3	0.6	**2.1%**
E2_130	20.3	20.9	0.6	**2.0%**
E2_140	19.9	20.5	0.6	**1.9%**
E2_150	19.6	20.2	0.5	**1.8%**
E2_160	19.4	19.9	0.5	**1.7%**
E2_170	19.1	19.6	0.5	**1.6%**
E2_180	18.9	19.4	0.5	**1.6%**
E2_190	18.7	19.2	0.5	**1.5%**
E2_200	18.5	19.0	0.4	**1.4%**
Notes:				
Bold indicates the 1% threshold criteria is exceeded.				

Predicted annual mean concentrations of NO_X are above the 30 µg/m³ critical level in both the 'Do Min' and 'Do Some' scenarios at modelled transect points up to 40 m from the edge of the SSSI along Transect E1and 30 m along Transect E2. As expected, the highest concentrations were predicted at the locations closest to the A6195,. The highest predicted concentration was at Transect point E1 (0 m from the edge of the SSSI), predicted at 60.7 µg/m³ in the '2025 Baseline + Development Construction Traffic' scenario.

No background 24-hour mean nitrogen oxides concentrations are available, therefore baseline 24-hour mean concentrations have not been calculated. Notwithstanding this, the maximum changes in predicted concentrations of the 24-hour NO_X in 2025, as a result of the Development (Process Contributions, PC) are set out in Table 14.13.15.

Table 14.13.15: Predicted 24-Hour Mean NO$_x$ Process Contribution

Receptor	2025 Do Min PC (µg/m³)	2025 Do Some PC (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_0	38.7	42.3	3.6	4.8%
E1_2	36.0	39.4	3.4	4.5%
E1_5	32.7	35.7	3.1	4.1%
E1_10	28.3	31.0	2.6	3.5%
E1_20	22.4	24.4	2.1	2.7%
E1_30	18.6	20.3	1.7	2.3%
E1_40	16.1	17.5	1.5	1.9%
E1_50	14.1	15.4	1.3	1.7%
E1_60	12.6	13.7	1.1	1.5%
E1_70	11.4	12.4	1.0	1.4%
E1_80	10.6	11.5	0.9	1.3%
E1_90	9.9	10.8	0.9	1.2%
E1_100	9.3	10.2	0.8	1.1%
E1_110	8.8	9.6	0.8	1.1%
E1_120	8.4	9.2	0.8	1.0%
E1_130	8.1	8.8	0.7	1.0%
E1_140	7.7	8.5	0.7	1.0%
E1_150	7.5	8.2	0.7	0.9%
E1_160	7.2	7.9	0.7	0.9%
E1_170	7.0	7.6	0.7	0.9%
E1_180	6.7	7.4	0.6	0.9%
E1_190	6.5	7.2	0.6	0.8%
E1_200	6.3	6.9	0.6	0.8%
E2_0	33.0	35.8	2.8	3.8%
E2_2	30.7	33.3	2.6	3.5%
E2_5	27.9	30.3	2.4	3.2%
E2_10	24.3	26.4	2.1	2.8%
E2_20	19.4	21.1	1.7	2.2%
E2_30	16.2	17.6	1.4	1.9%

Receptor	2025 Do Min PC (µg/m³)	2025 Do Some PC (µg/m³)	Difference (µg/m³)	% of Critical Level
E2_40	13.8	15.1	1.2	1.6%
E2_50	12.1	13.2	1.1	1.5%
E2_60	11.0	12.0	1.0	1.3%
E2_70	10.1	11.0	0.9	1.2%
E2_80	9.3	10.2	0.9	1.1%
E2_90	8.7	9.5	0.8	1.1%
E2_100	8.2	8.9	0.8	1.0%
E2_110	7.7	8.4	0.7	1.0%
E2_120	7.2	7.9	0.7	0.9%
E2_130	6.8	7.5	0.7	0.9%
E2_140	6.5	7.2	0.7	0.9%
E2_150	6.3	6.9	0.6	0.8%
E2_160	6.0	6.6	0.6	0.8%
E2_170	5.8	6.3	0.6	0.8%
E2_180	5.6	6.1	0.6	0.7%
E2_190	5.3	5.9	0.5	0.7%
E2_200	5.1	5.6	0.5	0.7%
Notes:				
Bold indicates the 10% threshold criteria is exceeded.				

Table 14.13.16 sets out the annual mean NH_3 model results.

Table 14.13.16: Predicted Annual Mean NH_3 Process Contribution

Receptor	2025 Do Min (µg/m³)	2025 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_0	2.4	2.5	0.06	**6.3%**
E1_2	2.4	2.4	0.06	**5.8%**
E1_5	2.3	2.4	0.05	**5.2%**
E1_10	2.2	2.3	0.05	**4.5%**
E1_20	2.1	2.2	0.04	**3.6%**
E1_30	2.1	2.1	0.03	**3.1%**

Receptor	2025 Do Min (µg/m³)	2025 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_40	2.0	2.1	0.03	**2.7%**
E1_50	2.0	2.0	0.02	**2.4%**
E1_60	2.0	2.0	0.02	**2.2%**
E1_70	2.0	2.0	0.02	**2.0%**
E1_80	2.0	2.0	0.02	**1.9%**
E1_90	2.0	2.0	0.02	**1.8%**
E1_100	1.9	2.0	0.02	**1.7%**
E1_110	1.9	2.0	0.02	**1.6%**
E1_120	1.9	1.9	0.02	**1.5%**
E1_130	1.9	1.9	0.01	**1.5%**
E1_140	1.9	1.9	0.01	**1.4%**
E1_150	1.9	1.9	0.01	**1.4%**
E1_160	1.9	1.9	0.01	**1.3%**
E1_170	1.9	1.9	0.01	**1.3%**
E1_180	1.9	1.9	0.01	**1.3%**
E1_190	1.9	1.9	0.01	**1.2%**
E1_200	1.9	1.9	0.01	**1.2%**
E2_0	2.5	2.6	0.07	**6.7%**
E2_2	2.4	2.5	0.06	**6.2%**
E2_5	2.4	2.4	0.05	**5.5%**
E2_10	2.3	2.3	0.05	**4.6%**
E2_20	2.1	2.2	0.04	**3.5%**
E2_30	2.1	2.1	0.03	**2.9%**
E2_40	2.0	2.1	0.02	**2.5%**
E2_50	2.0	2.0	0.02	**2.1%**
E2_60	2.0	2.0	0.02	**1.9%**
E2_70	1.9	2.0	0.02	**1.7%**
E2_80	1.9	1.9	0.02	**1.6%**
E2_90	1.9	1.9	0.01	**1.5%**

Receptor	2025 Do Min (µg/m³)	2025 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E2_100	1.9	1.9	0.01	**1.4%**
E2_110	1.9	1.9	0.01	**1.3%**
E2_120	1.9	1.9	0.01	**1.2%**
E2_130	1.9	1.9	0.01	**1.1%**
E2_140	1.9	1.9	0.01	**1.1%**
E2_150	1.9	1.9	0.01	**1.0%**
E2_160	1.9	1.9	0.01	1.0%
E2_170	1.9	1.9	0.01	0.9%
E2_180	1.9	1.9	0.01	0.9%
E2_190	1.9	1.9	0.01	0.9%
E2_200	1.9	1.9	0.01	0.8%
Notes: **Bold** indicates the 1% threshold criteria is exceeded.				

Nitrogen Deposition

Table 14.13.17 sets out the predicted annual nutrient nitrogen deposition for the modelled transect points.

Table 14.13.17: Predicted Annual Mean Nitrogen Deposition Process Contribution

Receptor	2025 Do Min (kgN/ha/year)	2025 Do Some (kgN/ha/year)	Difference (kgN/ha/year)	% of Critical Load
E1_0	22.5	23.1	0.59	**12%**
E1_2	22.0	22.5	0.55	**11%**
E1_5	21.4	21.9	0.50	**10%**
E1_10	20.6	21.0	0.43	**9%**
E1_20	19.7	20.0	0.34	**7%**
E1_30	19.1	19.4	0.29	**6%**
E1_40	18.7	18.9	0.25	**5%**
E1_50	18.4	18.6	0.23	**5%**
E1_60	18.2	18.4	0.21	**4%**

Receptor	2025 Do Min (kgN/ha/year)	2025 Do Some (kgN/ha/year)	Difference (kgN/ha/year)	% of Critical Load
E1_70	18.0	18.2	0.19	**4%**
E1_80	17.9	18.0	0.18	**4%**
E1_90	17.7	17.9	0.16	**3%**
E1_100	17.6	17.8	0.15	**3%**
E1_110	17.6	17.7	0.15	**3%**
E1_120	17.5	17.6	0.14	**3%**
E1_130	17.4	17.5	0.13	**3%**
E1_140	17.4	17.5	0.13	**3%**
E1_150	17.3	17.4	0.12	**2%**
E1_160	17.3	17.4	0.12	**2%**
E1_170	17.2	17.3	0.12	**2%**
E1_180	17.2	17.3	0.11	**2%**
E1_190	17.1	17.3	0.11	**2%**
E1_200	17.1	17.2	0.11	**2%**
E2_0	22.6	23.2	0.59	**12%**
E2_2	22.0	22.6	0.54	**11%**
E2_5	21.4	21.9	0.49	**10%**
E2_10	20.6	21.0	0.41	**8%**
E2_20	19.5	19.8	0.32	**6%**
E2_30	18.9	19.1	0.27	**5%**
E2_40	18.4	18.7	0.23	**5%**
E2_50	18.1	18.3	0.20	**4%**
E2_60	17.9	18.1	0.18	**4%**
E2_70	17.7	17.8	0.16	**3%**
E2_80	17.5	17.7	0.15	**3%**
E2_90	17.4	17.6	0.14	**3%**
E2_100	17.3	17.4	0.13	**3%**
E2_110	17.2	17.3	0.12	**2%**
E2_120	17.2	17.3	0.11	**2%**

Receptor	2025 Do Min (kgN/ha/year)	2025 Do Some (kgN/ha/year)	Difference (kgN/ha/year)	% of Critical Load
E2_130	17.1	17.2	0.10	**2%**
E2_140	17.0	17.1	0.10	**2%**
E2_150	17.0	17.1	0.09	**2%**
E2_160	16.9	17.0	0.09	**2%**
E2_170	16.9	17.0	0.09	**2%**
E2_180	16.9	16.9	0.08	**2%**
E2_190	16.8	16.9	0.08	**2%**
E2_200	16.8	16.9	0.08	**2%**
Notes:				
Bold indicates the 1% threshold criteria is exceeded.				

Acid Deposition

Table 14.13.18 sets out the predicted annual nutrient acid deposition for the modelled transect points.

Table 14.13.18: Predicted Annual Mean Acid Deposition Process Contribution

Receptor	2025 Do Min (keq/ha/year)	2025 Do Some (keq/ha/year)	Difference (keq/ha/year)	% of Critical Load
E1_0	1.42	1.44	0.02	**4%**
E1_2	1.40	1.42	0.02	**4%**
E1_5	1.38	1.40	0.02	**4%**
E1_10	1.36	1.37	0.01	**3%**
E1_20	1.32	1.34	0.01	**3%**
E1_30	1.30	1.31	0.01	**2%**
E1_40	1.29	1.30	0.01	**2%**
E1_50	1.28	1.29	0.01	**2%**
E1_60	1.27	1.28	0.01	**2%**
E1_70	1.26	1.27	0.01	**1%**
E1_80	1.26	1.26	0.01	**1%**
E1_90	1.25	1.26	0.01	**1%**

Receptor	2025 Do Min (keq/ha/year)	2025 Do Some (keq/ha/year)	Difference (keq/ha/year)	% of Critical Load
E1_100	1.25	1.26	0.00	**1%**
E1_110	1.25	1.25	0.00	**1%**
E1_120	1.25	1.25	0.00	**1%**
E1_130	1.24	1.25	0.00	1%
E1_140	1.24	1.25	0.00	1%
E1_150	1.24	1.24	0.00	1%
E1_160	1.24	1.24	0.00	1%
E1_170	1.24	1.24	0.00	1%
E1_180	1.24	1.24	0.00	1%
E1_190	1.23	1.24	0.00	1%
E1_200	1.23	1.24	0.00	1%
E2_0	1.41	1.42	0.02	**4%**
E2_2	1.39	1.41	0.02	**4%**
E2_5	1.37	1.39	0.01	**3%**
E2_10	1.35	1.36	0.01	**3%**
E2_20	1.31	1.32	0.01	**2%**
E2_30	1.29	1.30	0.01	**2%**
E2_40	1.28	1.29	0.01	**2%**
E2_50	1.27	1.27	0.01	**1%**
E2_60	1.26	1.27	0.01	**1%**
E2_70	1.25	1.26	0.01	**1%**
E2_80	1.25	1.25	0.00	**1%**
E2_90	1.25	1.25	0.00	**1%**
E2_100	1.24	1.25	0.00	1%
E2_110	1.24	1.24	0.00	1%
E2_120	1.24	1.24	0.00	1%
E2_130	1.23	1.24	0.00	1%
E2_140	1.23	1.24	0.00	1%
E2_150	1.23	1.23	0.00	1%

Receptor	2025 Do Min (keq/ha/year)	2025 Do Some (keq/ha/year)	Difference (keq/ha/year)	% of Critical Load
E2_160	1.23	1.23	0.00	1%
E2_170	1.23	1.23	0.00	1%
E2_180	1.23	1.23	0.00	1%
E2_190	1.23	1.23	0.00	1%
E2_200	1.22	1.23	0.00	1%
Notes:				
Bold indicates the 1% threshold criteria is exceeded.				

Operational Phase

The process contribution to annual mean NO_x and NH_3 concentrations have been assessed as a percentage of the critical level. The process contribution to nutrient nitrogen and acid has been assessed as a percentage of the appropriate critical load.

The modelled annual mean NO_x concentrations at the identified transect points are set out in Table 14.13.19 below.

Table 14.13.19: Predicted Annual Mean NO_x Concentrations

Receptor	2026 Do Min ($\mu g/m^3$)	2026 Do Some ($\mu g/m^3$)	Difference ($\mu g/m^3$)	% of Critical Level
E1_0	52.4	62.2	9.8	**32.8%**
E1_2	49.1	58.1	9.0	**29.9%**
E1_5	45.3	53.2	7.9	**26.3%**
E1_10	40.5	47.1	6.6	**22.0%**
E1_20	34.5	39.4	4.9	**16.4%**
E1_30	30.8	34.7	3.9	**13.0%**
E1_40	28.4	31.6	3.2	**10.7%**
E1_50	26.6	29.3	2.7	**9.1%**
E1_60	25.2	27.6	2.4	**8.0%**
E1_70	24.2	26.3	2.1	**7.1%**
E1_80	23.4	25.3	1.9	**6.4%**
E1_90	22.7	24.4	1.8	**5.9%**
E1_100	22.1	23.7	1.6	**5.5%**

Receptor	2026 Do Min (µg/m³)	2026 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_110	21.6	23.2	1.5	**5.1%**
E1_120	21.2	22.7	1.5	**4.8%**
E1_130	20.8	22.2	1.4	**4.6%**
E1_140	20.5	21.8	1.3	**4.4%**
E1_150	20.3	21.5	1.3	**4.2%**
E1_160	20.0	21.2	1.2	**4.0%**
E1_170	19.8	21.0	1.2	**3.9%**
E1_180	19.6	20.7	1.1	**3.7%**
E1_190	19.4	20.5	1.1	**3.6%**
E1_200	19.2	20.3	1.1	**3.5%**
E2_0	49.0	55.8	6.8	**22.8%**
E2_2	46.0	52.4	6.3	**21.1%**
E2_5	42.5	48.2	5.7	**19.0%**
E2_10	38.1	43.0	4.9	**16.3%**
E2_20	32.4	36.2	3.8	**12.7%**
E2_30	28.9	32.1	3.1	**10.4%**
E2_40	26.6	29.2	2.6	**8.8%**
E2_50	24.9	27.2	2.3	**7.7%**
E2_60	23.6	25.6	2.0	**6.8%**
E2_70	22.6	24.4	1.8	**6.1%**
E2_80	21.8	23.4	1.7	**5.5%**
E2_90	21.1	22.6	1.5	**5.1%**
E2_100	20.6	22.0	1.4	**4.7%**
E2_110	20.1	21.4	1.3	**4.4%**
E2_120	19.7	20.9	1.2	**4.1%**
E2_130	19.4	20.5	1.2	**3.9%**
E2_140	19.1	20.1	1.1	**3.6%**
E2_150	18.8	19.8	1.0	**3.4%**
E2_160	18.5	19.5	1.0	**3.3%**

Receptor	2026 Do Min (µg/m³)	2026 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E2_170	18.3	19.3	0.9	**3.1%**
E2_180	18.1	19.0	0.9	**3.0%**
E2_190	18.0	18.8	0.9	**2.9%**
E2_200	17.8	18.6	0.8	**2.7%**
Notes:				
Bold indicates the 1% threshold criteria is exceeded.				

Predicted annual mean concentrations of NO_x are above the 30 µg/m³ critical level in both the 'Do Min' and 'Do Some' scenarios at modelled transect points up to 40 m from the edge of the SSSI along Transect E1 and 30 m along Transect E2. As expected, the highest concentrations were predicted at the locations closest to the A6195. The highest predicted concentration was at Transect point E1 (0 m from the edge of the SSSI), predicted at 62.2 µg/m³ in the '2026 Future Development Year + Development Traffic' scenario.

No background 24-hour mean nitrogen oxides concentrations are available, therefore baseline 24-hour mean concentrations have not been calculated. Notwithstanding this, the maximum changes in predicted concentrations of the 24-hour NO_x in 2026, as a result of the Development (Process Contributions, PC) are set out in Table 14.13.20.

Table 14.13.20: Predicted 24-Hour Mean NO_x Process Contribution

Receptor	2026 Do Min PC (µg/m³)	2026 Do Some PC (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_0	35.2	44.0	8.7	**11.6%**
E1_2	32.8	40.9	8.1	**10.8%**
E1_5	29.7	37.1	7.3	9.7%
E1_10	25.8	32.0	6.3	8.4%
E1_20	20.3	25.1	4.8	6.4%
E1_30	16.9	20.7	3.8	5.1%
E1_40	14.6	17.7	3.1	4.2%
E1_50	12.8	15.5	2.7	3.6%
E1_60	11.4	13.7	2.3	3.1%
E1_70	10.3	12.4	2.1	2.7%
E1_80	9.6	11.4	1.8	2.4%

Receptor	2026 Do Min PC (µg/m³)	2026 Do Some PC (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_90	9.0	10.6	1.7	2.2%
E1_100	8.4	10.0	1.6	2.1%
E1_110	8.0	9.5	1.5	2.0%
E1_120	7.6	9.0	1.4	1.9%
E1_130	7.3	8.7	1.4	1.8%
E1_140	7.0	8.3	1.3	1.8%
E1_150	6.8	8.0	1.3	1.7%
E1_160	6.5	7.7	1.2	1.6%
E1_170	6.3	7.5	1.2	1.6%
E1_180	6.1	7.2	1.2	1.5%
E1_190	5.9	7.0	1.1	1.5%
E1_200	5.7	6.8	1.1	1.5%
E2_0	29.9	35.3	5.4	7.2%
E2_2	27.8	32.8	5.1	6.7%
E2_5	25.2	29.9	4.6	6.2%
E2_10	22.0	26.1	4.1	5.5%
E2_20	17.6	21.0	3.3	4.5%
E2_30	14.7	17.5	2.8	3.8%
E2_40	12.5	15.0	2.5	3.3%
E2_50	11.0	13.2	2.2	3.0%
E2_60	9.9	11.9	1.9	2.6%
E2_70	9.1	10.9	1.8	2.4%
E2_80	8.5	10.1	1.7	2.2%
E2_90	7.9	9.5	1.6	2.1%
E2_100	7.4	8.9	1.5	2.0%
E2_110	7.0	8.3	1.4	1.9%
E2_120	6.5	7.9	1.4	1.9%
E2_130	6.2	7.6	1.4	1.8%
E2_140	5.9	7.2	1.3	1.7%

Receptor	2026 Do Min PC (µg/m³)	2026 Do Some PC (µg/m³)	Difference (µg/m³)	% of Critical Level
E2_150	5.7	6.9	1.2	1.7%
E2_160	5.5	6.6	1.2	1.6%
E2_170	5.2	6.4	1.1	1.5%
E2_180	5.0	6.1	1.1	1.4%
E2_190	4.8	5.9	1.0	1.4%
E2_200	4.7	5.7	1.0	1.3%
Notes:				
Bold indicates the 10% threshold criteria is exceeded.				

Table 14.13.21 sets out the annual mean NH$_3$ model results.

Table 14.13.21: Predicted Annual Mean NH$_3$ Process Contribution

Receptor	2026 Do Min (µg/m³)	2026 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_0	2.45	2.56	0.11	**11.0%**
E1_2	2.39	2.49	0.10	**10.2%**
E1_5	2.33	2.42	0.09	**9.1%**
E1_10	2.25	2.33	0.08	**7.9%**
E1_20	2.15	2.22	0.06	**6.3%**
E1_30	2.10	2.15	0.05	**5.3%**
E1_40	2.06	2.10	0.05	**4.7%**
E1_50	2.03	2.07	0.04	**4.2%**
E1_60	2.01	2.04	0.04	**3.8%**
E1_70	1.99	2.02	0.04	**3.5%**
E1_80	1.97	2.01	0.03	**3.3%**
E1_90	1.96	1.99	0.03	**3.1%**
E1_100	1.95	1.98	0.03	**2.9%**
E1_110	1.94	1.97	0.03	**2.8%**
E1_120	1.93	1.96	0.03	**2.7%**
E1_130	1.92	1.95	0.03	**2.6%**
E1_140	1.92	1.94	0.02	**2.5%**

Receptor	2026 Do Min (µg/m³)	2026 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
E1_150	1.91	1.94	0.02	**2.4%**
E1_160	1.91	1.93	0.02	**2.3%**
E1_170	1.90	1.93	0.02	**2.2%**
E1_180	1.90	1.92	0.02	**2.2%**
E1_190	1.90	1.92	0.02	**2.1%**
E1_200	1.89	1.91	0.02	**2.1%**
E2_0	2.51	2.63	0.12	**11.5%**
E2_2	2.45	2.55	0.11	**10.5%**
E2_5	2.37	2.47	0.09	**9.4%**
E2_10	2.28	2.36	0.08	**7.9%**
E2_20	2.16	2.22	0.06	**6.1%**
E2_30	2.08	2.13	0.05	**5.0%**
E2_40	2.03	2.08	0.04	**4.3%**
E2_50	2.00	2.04	0.04	**3.7%**
E2_60	1.97	2.00	0.03	**3.3%**
E2_70	1.95	1.98	0.03	**3.0%**
E2_80	1.93	1.96	0.03	**2.7%**
E2_90	1.92	1.95	0.03	**2.5%**
E2_100	1.91	1.93	0.02	**2.4%**
E2_110	1.90	1.92	0.02	**2.2%**
E2_120	1.89	1.91	0.02	**2.1%**
E2_130	1.89	1.91	0.02	**2.0%**
E2_140	1.88	1.90	0.02	**1.9%**
E2_150	1.87	1.89	0.02	**1.8%**
E2_160	1.87	1.89	0.02	**1.7%**
E2_170	1.86	1.88	0.02	**1.6%**
E2_180	1.86	1.88	0.02	**1.6%**
E2_190	1.86	1.87	0.01	**1.5%**
E2_200	1.85	1.87	0.01	**1.4%**
Notes:				

Receptor	2026 Do Min (µg/m³)	2026 Do Some (µg/m³)	Difference (µg/m³)	% of Critical Level
Bold indicates the 1% threshold criteria is exceeded.				

Nitrogen Deposition

Table 14.13.22 sets out the predicted annual nutrient nitrogen deposition for the modelled transect points.

Table 14.13.22: Predicted Annual Mean Nitrogen Deposition Process Contribution

Receptor	2026 Do Min (kgN/ha/year)	2026 Do Some (kgN/ha/year)	Difference (kgN/ha/year)	% of Critical Load
E1_0	22.31	23.52	1.20	**24%**
E1_2	21.82	22.93	1.11	**22%**
E1_5	21.23	22.23	1.00	**20%**
E1_10	20.50	21.36	0.86	**17%**
E1_20	19.57	20.25	0.67	**13%**
E1_30	19.01	19.57	0.56	**11%**
E1_40	18.63	19.11	0.48	**10%**
E1_50	18.35	18.76	0.42	**8%**
E1_60	18.13	18.50	0.38	**8%**
E1_70	17.95	18.30	0.34	**7%**
E1_80	17.81	18.13	0.32	**6%**
E1_90	17.70	17.99	0.29	**6%**
E1_100	17.60	17.88	0.28	**6%**
E1_110	17.52	17.78	0.26	**5%**
E1_120	17.44	17.69	0.25	**5%**
E1_130	17.38	17.62	0.24	**5%**
E1_140	17.32	17.55	0.23	**5%**
E1_150	17.28	17.49	0.22	**4%**
E1_160	17.23	17.44	0.21	**4%**
E1_170	17.19	17.39	0.20	**4%**
E1_180	17.15	17.35	0.20	**4%**

Receptor	2026 Do Min (kgN/ha/year)	2026 Do Some (kgN/ha/year)	Difference (kgN/ha/year)	% of Critical Load
E1_190	17.12	17.31	0.19	**4%**
E1_200	17.09	17.28	0.19	**4%**
E2_0	22.44	23.49	1.05	**21%**
E2_2	21.91	22.88	0.97	**19%**
E2_5	21.26	22.14	0.87	**17%**
E2_10	20.46	21.21	0.75	**15%**
E2_20	19.43	20.02	0.59	**12%**
E2_30	18.80	19.29	0.49	**10%**
E2_40	18.37	18.79	0.42	**8%**
E2_50	18.06	18.42	0.36	**7%**
E2_60	17.83	18.15	0.32	**6%**
E2_70	17.65	17.94	0.29	**6%**
E2_80	17.50	17.77	0.27	**5%**
E2_90	17.38	17.63	0.25	**5%**
E2_100	17.28	17.51	0.23	**5%**
E2_110	17.20	17.41	0.21	**4%**
E2_120	17.12	17.33	0.20	**4%**
E2_130	17.06	17.25	0.19	**4%**
E2_140	17.01	17.19	0.18	**4%**
E2_150	16.96	17.13	0.17	**3%**
E2_160	16.91	17.08	0.16	**3%**
E2_170	16.88	17.03	0.15	**3%**
E2_180	16.84	16.99	0.15	**3%**
E2_190	16.81	16.95	0.14	**3%**
E2_200	16.78	16.91	0.14	**3%**

Notes:

Bold indicates the 1% threshold criteria is exceeded.

Acid Deposition

Table 14.13.23 sets out the predicted annual nutrient acid deposition for the modelled transect points.

Table 14.13.23: Predicted Annual Mean Acid Deposition Process Contribution

Receptor	2026 Do Min (keq/ha/year)	2026 Do Some (keq/ha/year)	Difference (keq/ha/year)	% of Critical Load
E1_0	1.40	1.45	0.046	**11%**
E1_2	1.39	1.43	0.043	**10%**
E1_5	1.37	1.41	0.038	**9%**
E1_10	1.34	1.38	0.033	**7%**
E1_20	1.31	1.34	0.025	**6%**
E1_30	1.29	1.31	0.020	**5%**
E1_40	1.28	1.30	0.017	**4%**
E1_50	1.27	1.29	0.015	**3%**
E1_60	1.26	1.28	0.013	**3%**
E1_70	1.26	1.27	0.012	**3%**
E1_80	1.25	1.26	0.011	**2%**
E1_90	1.25	1.26	0.010	**2%**
E1_100	1.25	1.26	0.009	**2%**
E1_110	1.24	1.25	0.008	**2%**
E1_120	1.24	1.25	0.008	**2%**
E1_130	1.24	1.25	0.008	**2%**
E1_140	1.24	1.25	0.007	**2%**
E1_150	1.24	1.24	0.007	**2%**
E1_160	1.24	1.24	0.007	**2%**
E1_170	1.23	1.24	0.006	**1%**
E1_180	1.23	1.24	0.006	**1%**
E1_190	1.23	1.24	0.006	**1%**
E1_200	1.23	1.24	0.006	**1%**
E2_0	1.39	1.42	0.033	**8%**
E2_2	1.37	1.40	0.031	**7%**

Receptor	2026 Do Min (keq/ha/year)	2026 Do Some (keq/ha/year)	Difference (keq/ha/year)	% of Critical Load
E2_5	1.36	1.38	0.028	**6%**
E2_10	1.33	1.36	0.025	**6%**
E2_20	1.30	1.32	0.020	**5%**
E2_30	1.28	1.30	0.017	**4%**
E2_40	1.27	1.29	0.014	**3%**
E2_50	1.26	1.27	0.012	**3%**
E2_60	1.25	1.27	0.011	**3%**
E2_70	1.25	1.26	0.010	**2%**
E2_80	1.24	1.25	0.009	**2%**
E2_90	1.24	1.25	0.008	**2%**
E2_100	1.24	1.25	0.008	**2%**
E2_110	1.24	1.24	0.007	**2%**
E2_120	1.23	1.24	0.007	**2%**
E2_130	1.23	1.24	0.006	**1%**
E2_140	1.23	1.24	0.006	**1%**
E2_150	1.23	1.23	0.006	**1%**
E2_160	1.23	1.23	0.006	**1%**
E2_170	1.23	1.23	0.005	**1%**
E2_180	1.22	1.23	0.005	**1%**
E2_190	1.22	1.23	0.005	**1%**
E2_200	1.22	1.23	0.005	**1%**

Notes:

Bold indicates the 1% threshold criteria is exceeded.