Calderdale Council

CALDERDALE LOCAL PLAN HABITATS REGULATIONS ASSESSMENT – AIR QUALITY

Results Table

JUNE 2019

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Calderdale Council

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Results Table

WSP

8 First Street

WSP.com

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
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1. INTRODUCTION

1.1.1. Calderdale Council (CC) is producing a New Local Plan to set the framework for development in the borough. WSP have been asked by CC to undertake vehicle emissions calculations and an air quality modelling assessment in relation to the development associated with the new Local Plan.

1.1.2. After consultation with Natural England it was decided to carry out a Habitat Regulations Assessment (HRA) focussing on potential impacts of M62 emissions on the South Pennine Moors (SAC, SSSI and SPA). In order to carry out this HRA, traffic data was provided for a section of the M62 and an adjoining A-road (**Figure 1**) for the following scenarios:

- 2017 Baseline;
- 2032 Future Baseline;
- 2032 Without New Local Plan; and
- 2032 With New Local Plan

1.1.3. This report presents the initial findings of the HRA only with a full technical memo to follow at a later date.

2. HRA RESULTS

2.1.1. An assessment of changes in air quality at the South Pennine Moors designated site was undertaken with reference to the DMRB HA207/07 guidance[1]. This involved the modelling of pollutant concentrations at regular points along six transects within the designated site (as shown in **Figure 1**).

2.1.2. Average N-deposition and critical load ranges for the South Pennine Moors varies with the different types of habitat/species. As a conservative approach, the critical load range of 5 – 10 kg N/ha/yr was selected as it represents the minimum range of values of species most sensitive to changes. Furthermore, an average background N deposition of 37.6 kg N/ha/yr was selected as it represents the highest deposition. Full details of N-deposition and critical load ranges for the South Pennine Moors can be found on the APIS website[2].

2.1.3. The difference in modelled annual mean NO_x concentrations and N-deposition rates without versus with the new Local Plan are shown in **Table 1** below.

Table 1 – Preliminary Annual Mean NO_x Concentrations and Nitrogen Deposition Rates Impact (2032)*

Distance from designated site boundary (m)	Change in Annual Mean NO_x ($\mu g/m^3$)		Change in Nitrogen Deposition (kg N/ha/yr)	
	Difference between 2032 With and Without Local Plan	Difference between 2032 With Local Plan and 2017 Base	Difference between 2032 With and Without Local Plan	Difference between 2032 With Local Plan and 2017 Base
Transect 1				
0	1.35	-20.14	0.07	-5.33
10	0.92	-14.52	0.05	-5.11
20	0.70	-11.48	0.04	-4.97
30	0.57	-9.68	0.03	-4.89
40	0.48	-8.46	0.03	-4.83
50	0.43	-7.67	0.02	-4.80
60	0.38	-7.00	0.02	-4.76
70	0.35	-6.43	0.02	-4.74
80	0.32	-6.00	0.02	-4.72

[1] DMRB Volume 11, Section 3, Part 1 HA 207/07 Air Quality

[2] http://www.apis.ac.uk/

90	0.30	-5.69	0.02	-4.70
100	0.28	-5.39	0.02	-4.68
110	0.27	-5.14	0.02	-4.67
120	0.26	-4.92	0.01	-4.66
130	0.25	-4.75	0.01	-4.65
140	0.24	-4.58	0.01	-4.64
150	0.24	-4.43	0.01	-4.64
160	0.24	-4.30	0.01	-4.63
170	0.23	-4.19	0.01	-4.62
180	0.23	-4.08	0.01	-4.62
190	0.24	-3.98	0.01	-4.61
200	0.24	-3.89	0.01	-4.61
Transect 2				
0	1.28	-22.05	0.06	-5.40
10	0.88	-15.42	0.04	-5.15
20	0.68	-12.21	0.04	-5.01
30	0.57	-10.48	0.03	-4.93
40	0.49	-9.16	0.03	-4.87
50	0.42	-8.19	0.02	-4.82
60	0.38	-7.48	0.02	-4.79
70	0.34	-6.96	0.02	-4.76
80	0.31	-6.48	0.02	-4.74
90	0.28	-6.10	0.01	-4.72
100	0.26	-5.80	0.01	-4.70
110	0.24	-5.51	0.01	-4.69
120	0.23	-5.27	0.01	-4.68
130	0.21	-5.06	0.01	-4.67
140	0.20	-4.88	0.01	-4.66
150	0.19	-4.71	0.01	-4.65

160	0.18	-4.56	0.01	-4.64
170	0.17	-4.43	0.01	-4.63
180	0.16	-4.31	0.01	-4.63
190	0.15	-4.20	0.01	-4.62
200	0.15	-4.10	0.01	-4.62
Transect 3				
0	1.08	-19.62	0.05	-5.32
10	0.75	-13.81	0.04	-5.08
20	0.60	-11.24	0.03	-4.97
30	0.50	-9.60	0.03	-4.89
40	0.44	-8.59	0.02	-4.85
50	0.39	-7.77	0.02	-4.81
60	0.35	-7.18	0.02	-4.78
70	0.32	-6.69	0.02	-4.75
80	0.30	-6.32	0.02	-4.73
90	0.28	-6.01	0.01	-4.72
100	0.26	-5.71	0.01	-4.70
110	0.24	-5.48	0.01	-4.69
120	0.23	-5.26	0.01	-4.68
130	0.22	-5.08	0.01	-4.67
140	0.20	-4.91	0.01	-4.66
150	0.19	-4.77	0.01	-4.66
160	0.19	-4.63	0.01	-4.65
170	0.18	-4.51	0.01	-4.64
180	0.17	-4.41	0.01	-4.64
190	0.16	-4.30	0.01	-4.63
200	0.16	-4.22	0.01	-4.63
Transect 4				
0	0.83	-13.38	0.04	-5.06

10	0.63	-10.60	0.03	-4.94
20	0.52	-9.09	0.03	-4.87
30	0.45	-8.09	0.02	-4.82
40	0.39	-7.27	0.02	-4.78
50	0.35	-6.70	0.02	-4.75
60	0.32	-6.26	0.02	-4.73
70	0.29	-5.86	0.02	-4.71
80	0.27	-5.56	0.02	-4.69
90	0.25	-5.30	0.01	-4.68
100	0.23	-5.06	0.01	-4.67
110	0.22	-4.88	0.01	-4.66
120	0.21	-4.71	0.01	-4.65
130	0.20	-4.55	0.01	-4.64
140	0.19	-4.42	0.01	-4.64
150	0.19	-4.31	0.01	-4.63
160	0.18	-4.19	0.01	-4.62
170	0.17	-4.10	0.01	-4.62
180	0.17	-4.01	0.01	-4.61
190	0.16	-3.92	0.01	-4.61
200	0.16	-3.85	0.01	-4.61
Transect 5				
0	3.10	-4.07	0.16	-4.61
10	1.71	-4.15	0.09	-4.62
20	1.23	-4.22	0.07	-4.62
30	0.98	-4.29	0.05	-4.63
40	0.83	-4.35	0.04	-4.63
50	0.72	-4.42	0.04	-4.63
60	0.65	-4.48	0.04	-4.64
70	0.60	-4.55	0.03	-4.64

80	0.56	-4.62	0.03	-4.65
90	0.52	-4.70	0.03	-4.65
100	0.50	-4.77	0.03	-4.65
110	0.48	-4.85	0.03	-4.66
120	0.46	-4.94	0.02	-4.66
130	0.45	-5.03	0.02	-4.67
140	0.44	-5.13	0.02	-4.67
150	0.43	-5.23	0.02	-4.68
160	0.43	-5.34	0.02	-4.68
170	0.43	-5.47	0.02	-4.69
180	0.42	-5.60	0.02	-4.70
190	0.42	-5.73	0.02	-4.70
200	0.43	-5.88	0.02	-4.71
Transect 6				
0	2.55	-3.48	0.13	-4.58
10	1.34	-3.50	0.07	-4.58
20	0.95	-3.49	0.05	-4.59
30	0.75	-3.48	0.04	-4.59
40	0.61	-3.46	0.03	-4.59
50	0.53	-3.44	0.03	-4.58
60	0.47	-3.42	0.02	-4.58
70	0.42	-3.40	0.02	-4.58
80	0.38	-3.38	0.02	-4.58
90	0.35	-3.36	0.02	-4.58
100	0.32	-3.34	0.02	-4.58
110	0.30	-3.32	0.02	-4.58
120	0.28	-3.30	0.02	-4.58
130	0.27	-3.29	0.02	-4.58
140	0.26	-3.27	0.01	-4.58

150	0.24	-3.26	0.01	-4.57
160	0.23	-3.24	0.01	-4.57
170	0.22	-3.23	0.01	-4.57
180	0.21	-3.21	0.01	-4.57
190	0.21	-3.19	0.01	-4.57
200	0.20	-3.18	0.01	-4.57

*A positive value represents an increase in NO_x concentration or N deposition rate, and a negative value a decrease.

2.1.4. The results in Table 1 show that development associated with the New Local Plan will contribute additional NO_x emissions compared to without the new Local Plan. However, the increase is small and drops off rapidly with distance from the road. Overall, the NO_x emissions associated with the New Local Plan in 2032 are lower than the existing emissions in 2017. This is due to anticipated improvements in emission rates and background concentration over time.

2.1.5. When converted into N-deposition, the New Local Plan is expected to contribute a negligible increase, even at the roadside locations. When compared to 2017, the impacts of the new Local Plan are predicted to cause a reduction in N-deposition.

2.1.6. Exceedances of the annual mean NO_x concentration of 30µg/m^3 are predicted at three receptors in the base year only. No exceedances are predicted in any of the future scenarios (full results will be provided in a subsequent Technical Memo).

2.1.7. Critical load ranges are predicted to be exceeded at all transect points assessed in 'without' and 'with' New Local Plan scenarios. However, this is attributed to the existing high N-deposition rates reported by APIS[2], which in 2017 (35.34 kg N/h/yr, Acidophilous Quercus dominated woodland) already exceed even the highest critical load values (20-30).

2.1.8. The maximum contribution to N-deposition attributed to the new Local Plan is 0.16 kg N/ha/yr, which equates to 3.2% of the lower end of the respective critical load ranges (5 kg N/ha/yr).

2.1.9. In addition to the six transects, a grid originating at X-Y coordinate 398900, 414600 and ending at 401620, 416300 was modelled. The area covered by the grid is shown in **Figure 2**.

2.1.10. The N-deposition change attributed to the New Local Plan has been calculated for the entire grid. The areas in which the N-deposition change equates to >1% of the lower critical load (5 kg N/ha/yr) are shown in **Figure 2**. This equates to 8.7% of the entire grid. However, it should be noted that many of these are located on the road rather than the South Pennine Moors.

Figure 1 - Modelled Roads and Transects

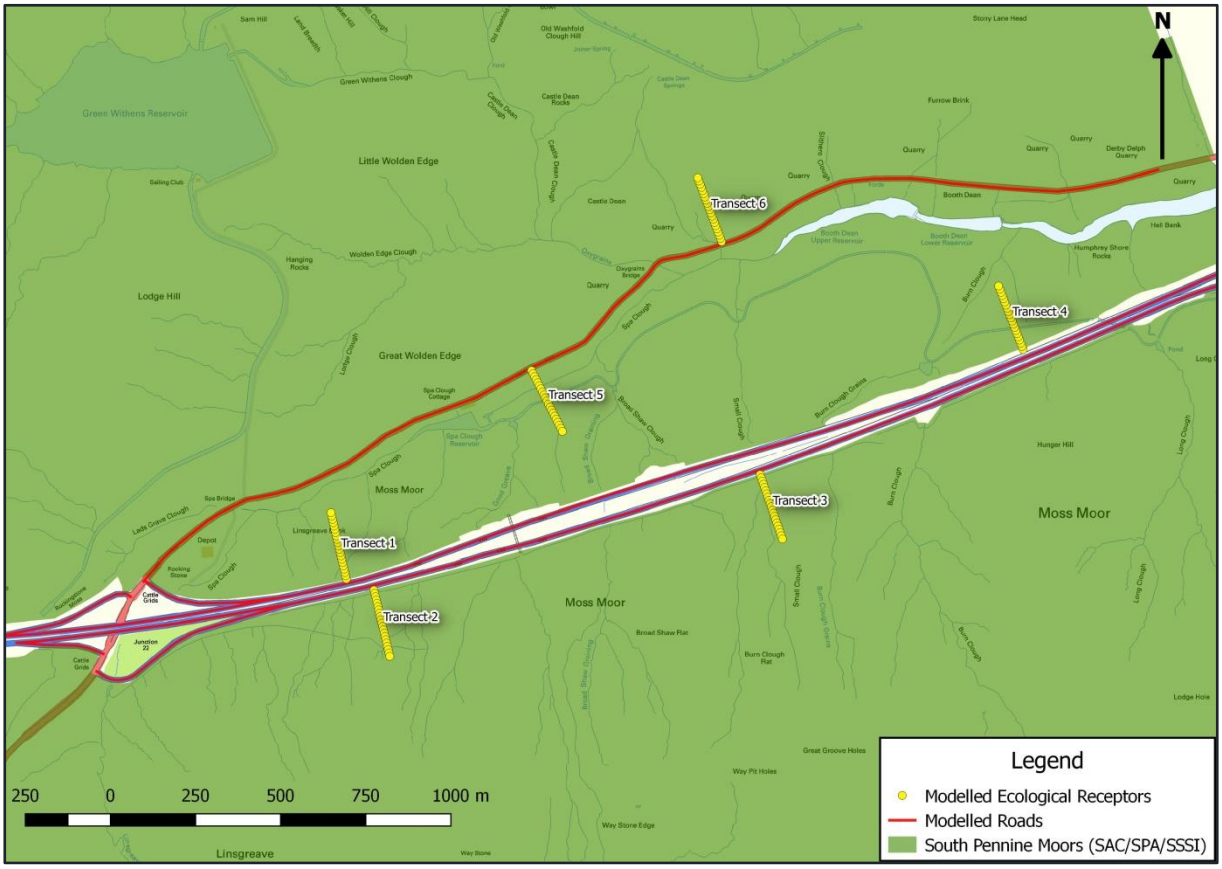
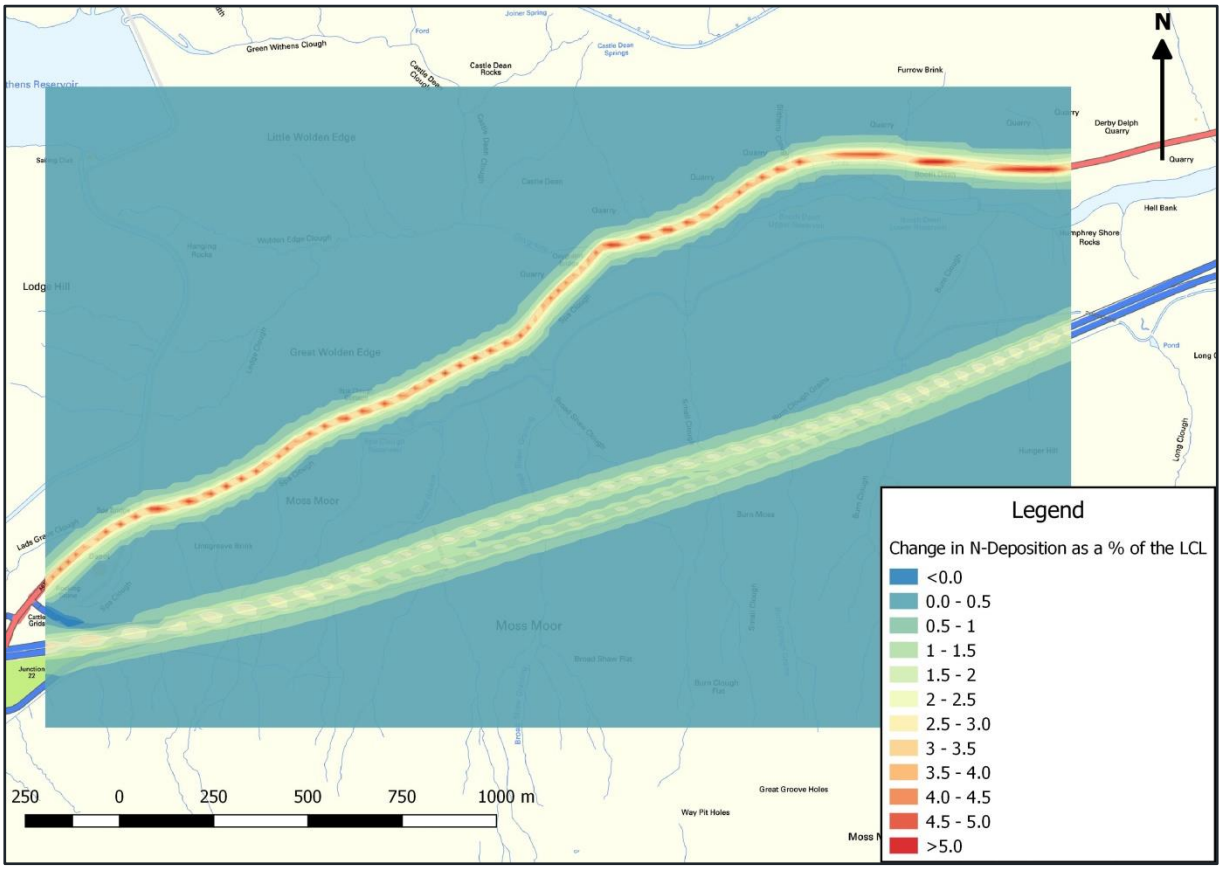


Figure 2 – Change in N-Deposition as a % of the Lower Critical Load (LCL)



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