

A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010041

6.8 Environmental Statement – Appendix 5.7 Air Quality DMRB Sensitivity Test

Part B

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

June 2020

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009**

**The A1 in Northumberland: Morpeth to Ellingham
Development Consent Order 20[xx]**

Environmental Statement - Appendix

Regulation Reference:	APFP Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010041
Application Document Reference	TR010041/APP/6.8
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Version	Date	Status of Version
Rev 0	June 2020	Application Issue

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5 AIR QUALITY DMRB SENSITIVITY TEST

5.1 INTRODUCTION

- 5.1.1. This appendix identifies the key changes in the assessment methodology and presents the assessment of the potential for additional likely significant environmental effects of Part B on air quality, as a result of the updated Design Manual for Roads and Bridges (DMRB) guidance LA 105 Air Quality (**Ref. 5.1**) released November 2019. This was undertaken as part of the DMRB sensitivity test, as detailed in **Chapter 5: Air Quality, Volume 3** of this Environmental Statement (ES) (**Application Document Reference: TR010041/APP/6.3**).
- 5.1.2. A full description of Part B is provided in **Chapter 2: The Scheme, Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**).

5.2 ASSESSMENT METHODOLOGY

SCOPE OF ASSESSMENT

- 5.2.1. Both the DMRB HA 207/07 (**Ref. 5.2**) and LA 105 (**Ref. 5.1**) define scoping criteria to determine if air quality impacts are scoped in or out of the assessment. The criteria for changes in total and heavy-duty vehicle annual average daily traffic (AADT) flows and carriageway alignment are unchanged. LA 105 (**Ref. 5.1**) replaces the criteria for changes in average and peak hour speeds with a criterion for change in speed band. When defining the affected road network (ARN) using the DMRB HA 207/07 (**Ref. 5.2**) scoping criteria, changes in speed that met one or more of the criteria also tended to occur where changes in total AADT flow exceeded 1,000. With LA 105 (**Ref. 5.1**), change in speed band is also most likely where there is a change in AADT of 1,000 or more. The change to scoping criteria is unlikely to increase the extent of the ARN for Part B.
- 5.2.2. While both the DMRB HA 207/07 (**Ref. 5.2**) and LA 105 (**Ref. 5.1**) stipulate the assessment of air quality effects on ecological receptors, the term 'designated sites' has been replaced with 'designated habitats', and updated to include Local Nature Reserves (LNRs), Local Wildlife Sites (LWS), Nature Improvement Areas, ancient woodland and veteran trees. At the request of the Inspectorate, LNRs, LWSs and ancient woodlands were included in the original assessment. There are no Nature Improvement Areas within the Study Area.
- 5.2.3. The Woodland Trust classifies trees of special interest as 'ancient', 'veteran' and 'notable' (**Ref. 5.3**). Both ancient and veteran trees are considered of similar and high ecological importance and are irreplaceable (much the same as ancient woodland). As such, both ancient and veteran trees are scoped into the assessment under LA 105 (**Ref. 5.1**).
- 5.2.4. LA 105 (**Ref. 5.1**) provides refined guidance on the level of assessment required (simple or detailed) based on project risk potential and the receiving environment sensitivity. In the case of Part B, the project risk potential is 'low' due to the size of the scheme and receiving environment sensitivity is 'medium' due to receptors close to the ARN. According to LA 105 (**Ref. 5.1**), the need for a simple level of assessment is supported.

- 5.2.5. LA 105 (**Ref. 5.1**) also provides refined guidance on assessing compliance with the Air Quality Directive (**Ref. 5.4**). The original Part B assessment determined 'neutral' of affecting compliance according to IAN 175/13 (**Ref. 5.5**), as there are no Pollution Climate Mapping (PCM) model links in the Study Area. Therefore, the changes to the guidance are insufficient to alter this finding.

METHODOLOGY - CONSTRUCTION

- 5.2.6. The construction assessment in LA 105 (**Ref. 5.1**) introduces a 'dust risk potential' and 'sensitivity to construction dust' to assess required mitigation measures. This would not affect the findings of the original assessment including mitigation measures that are reported in **Chapter 5: Air Quality, Volume 2** of this ES (**Application Document Reference:TR010041/APP/6.3**).
- 5.2.7. For construction traffic LA 105 (**Ref. 5.1**) advises that construction periods over two years duration should be considered for a quantitative assessment. The approach detailed in **Appendix 5.2: Construction Traffic Assessment, Volume 8** of this ES (**Application Document Reference: TR010041/APP/6.8**) details the simple level assessment of the worse two construction years quantitatively, and therefore the outcomes of the original assessment do not change.

METHODOLOGY - OPERATION

- 5.2.8. In assessing the impacts at designated habitats, unlike DMRB HA 207/07 (**Ref. 5.2**), LA 105 (**Ref. 5.1**) does not require initial consideration of impacts in relation to the critical level for NO_x. Consequently, the impacts on nitrogen deposition at all designated habitat sites within 200 m of the ARN with nutrient nitrogen sensitive features must be assessed. For Part B, under LA 105 (**Ref. 5.1**) four veteran trees are scoped into the assessment. These were added as new receptors in the detailed model to ensure consistency with previous assessment.
- 5.2.9. With LA 105 the calculation of nitrogen deposition, the assumption regarding nitrogen deposition rate has changed. Instead of assuming 1 µg/m³ of nitrogen dioxide (NO₂) equates to a deposition rate of 0.1 kg N/ha/Yr for all habitats, LA 105 applies different rates dependant on whether the habitat has low or tall vegetation. Whilst the assumption for 'grassland and similar habitats' (low vegetation) is a little different (1 µg/m³ of NO₂ = 0.14 kg N/ha/Yr) the assumption for 'forests and similar habitats' (tall vegetation) is almost three times higher (1 µg/m³ of NO₂ = 0.29 kg N/ha/Yr). The consequence of this change is that the calculated nitrogen deposition rates are higher and the impacts more pronounced, particularly in the case of woodland.
- 5.2.10. Apart from the changes identified above, the remainder of the methodology set out in LA 105 (**Ref. 5.1**) is as detailed in **Section 5.4 of Chapter 5: Air Quality of Part B, Volume 3** of this ES (**Application Document Reference:TR010041/APP/6.3**).

Selection of Ecological Receptors

- 5.2.11. Four ancient and veteran trees were identified using the Woodland Trusts Ancient tree inventory (**Ref. 5.4**) as well as baseline information collected in Part B (refer to **Appendix**

7.1: Arboricultural Report, Volume 8 of this ES (**Application Document Reference: TR010041/APP/6.8**)).

5.3 ASSUMPTIONS AND LIMITATIONS

- 5.3.1. The assumptions and limitations presented in **Section 5.5 of Chapter 5 Air Quality, Volume 3** of this ES (**Application Document Reference:TR010041/APP/6.3**) also apply to this sensitivity test.
- 5.3.2. In addition to the updated guidance the latest set of emission factors from Defra (EFT v9) (**Ref. 5.6**) have been issued. These have not been tested in this sensitivity test. However, high level calculations show that it would be unlikely to change the outcomes of the original assessment.

5.4 STUDY AREA

- 5.4.1. The Study Area is defined as 200 m from the ARN as required under LA 105 (**Ref. 5.1**) and presented in **Figure 5.1: Air Quality Affected Road Network, Volume 6** of this ES (**Application Document Reference: TR010041/APP/6.6**).

5.5 POTENTIAL IMPACTS

OPERATIONAL ASSESSMENT – DESIGNATED HABITATS

- 5.5.1. Based on LA 105 methodology (**Ref. 5.1**), the impacts on nitrogen deposition at each designated habitat are summarised in **Table 5-1**. The designated habitats comprise four veteran and ancient trees. All experience changes in nitrogen deposition that are less than 1% of the lower critical load.

Table 5-1 – Summary of Potential Impacts on Nitrogen Deposition at Designated Habitats (LA 105 guidance).

Site ID	Distance of Habitat from road (m)	Transect	Lower Critical Load for Most Sensitive Feature	Nitrogen Deposition Rate (Kg N/ha/Yr)			
				Do-Minimum (Part B)	Do-Something (Part B)	Change with Do-Something (Part B)	Distance (m) from Road with greater than 1% Change (m)
Ancient and Veteran Trees							
Eco_VT1	185	-	10	21.2	21.2	0.02	-
Eco_VT2	168	-	10	21.3	21.3	0.06	-
Eco_VT28	98	-	10	21.2	21.2	0.00	-
Eco_VT29	58	-	10	21.4	21.4	-0.01	-

5.6 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

- 5.6.1. The changes in LA 105 (**Ref. 5.1**) would not affect the findings of the original assessment including mitigation measures that are reported in **Chapter 5: Air Quality, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**).

OPERATION

- 5.6.2. At all four designated habitats considered in this sensitivity test, the change in nitrogen deposition is less than 1% of the lower critical load. According to LA 105 (**Ref. 5.1**) the impacts would not give rise to a significant effect. For further discussion, reference should be made to **Appendix 9.12: Biodiversity DMRB Sensitivity Test, Volume 8** of this ES (**Application Document Reference:TR010041/APP/6.8**).

SUMMARY

- 5.6.3. Overall, following the guidance on the evaluation of significant effects in LA 105 (**Ref. 5.1**), the effects of Part B are **not significant** and therefore the conclusions of the original assessment remain unchanged.

REFERENCES

- Ref 5.1** - Highways Agency, Air Quality, Design Manual for Roads and Bridges LA 105 Air Quality, Revision 0, Sustainability & Environment Appraisal. Available at: <http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol11/section3/LA%20105%20Air%20quality-web.pdf>
- Ref 5.2** - Highways Agency, Air Quality, Design Manual for Roads and Bridges HA 207/07, Volume 11, Section 3, Part 1 (May 2007).
- Ref 5.3** - Woodland Trust. Ancient Tree Inventory. <https://ati.woodlandtrust.org.uk/tree-search/> [Accessed March 2020].
- Ref 5.4** - European Union (2008) Ambient Air Quality Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe. [online]. Available at: <https://eur-lex.europa.eu/eli/dir/2008/50/oj> [Accessed October 2019]
- Ref 5.5** - Highways England (2013) Interim Advice Note 175/13. Updated air quality advice on risk assessment related to compliance with the EU Directive on ambient air quality and on the production of Scheme Air Quality Action Plans for user of DMRB Volume 11, Section 3, Part 1 'Air Quality'. [online]. Available at: <http://www.standardsforhighways.co.uk/ha/standards/ians/pdfs/ian175.pdf> [Accessed October 2019].
- Ref 5.6** - Department for Environment Food and Rural Affairs, Emission Factor Toolkit (v9) Available at: <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html> [Accessed May 2020]

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